



Master of International Business and Entrepreneurship

Ch 3: Organizational Information Systems and Their Impact

Information Systems for
Managers

Learning objectives

- To categorize systems according to the hierarchical, functional, and process perspectives. You will learn the rationale for each perspective and its limitations.
- To discuss the underlying principles and applications of business process reengineering (BPR), as well as its advantages and disadvantages.
- To explain the genesis of the enterprise systems (ESs) trend and why so many companies are employing or introducing them. You will also learn to articulate the principal benefits and risks associated with these systems.
- To evaluate the integration trend and the role of integration principles in the modern firm.
- To explain enterprise resource planning (ERP) and discuss its main advantages and limits.
- To explain what is meant by supply chain management and the role that supply chain management applications play in modern organizations.
- To explain what is meant by customer relationship management (CRM).

Learning objectives

- ❖ To clarify what is meant by knowledge management, categorize the different types of knowledge commonly found in organizations, and explain why organizations feel the need to employ knowledge management applications.
- ❖ To define the key terms analytics, big data, and business intelligence and define their underlying trends.
- ❖ To clarify the evolution of business and organizational analytics over time, from the early days of batch and transaction processing systems to the modern era of big data and advanced analytics.
- ❖ To evaluate the business intelligence (BI) trend and explain the components of the BI infrastructure. You will learn how to identify and describe the role of the technologies that compose a modern BI infrastructure.
- ❖ To evaluate the big data trend and gain insight on consolidated technologies, computing architectures, and practices.
- ❖ To define the term cloud computing and be able to discuss its underlying delivery models: software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS).

Reminder

- ❖ Information systems are designed and built with the objective of improving the firm's efficiency and effectiveness by fulfilling its information processing needs. Successful information systems are those that are used and that achieve their intended goals.
- ❖ Information systems exist in an **organizational context**, characterized by the firm strategy, culture, and IT infrastructure. The organization itself is subject to the influences of its **external environment**, including regulatory requirements, social and business trends, and competitive pressures.
- ❖ Information systems are subject to **systemic effects**, defined as the notion that the different components of a system are interdependent and that changes in one component affect all other components of the system. Thus, when designing a new information system, or troubleshooting an underperforming one, you can devise multiple ways to achieve the system's goal.
- ❖ Increasingly in modern firms, organizational change stems from the introduction of new information technologies. Depending on the objectives and reach of the new system, we identify **three levels of change**—first-, second-, and third-order change—each requiring different levels of commitment and sponsorship to be successfully managed.



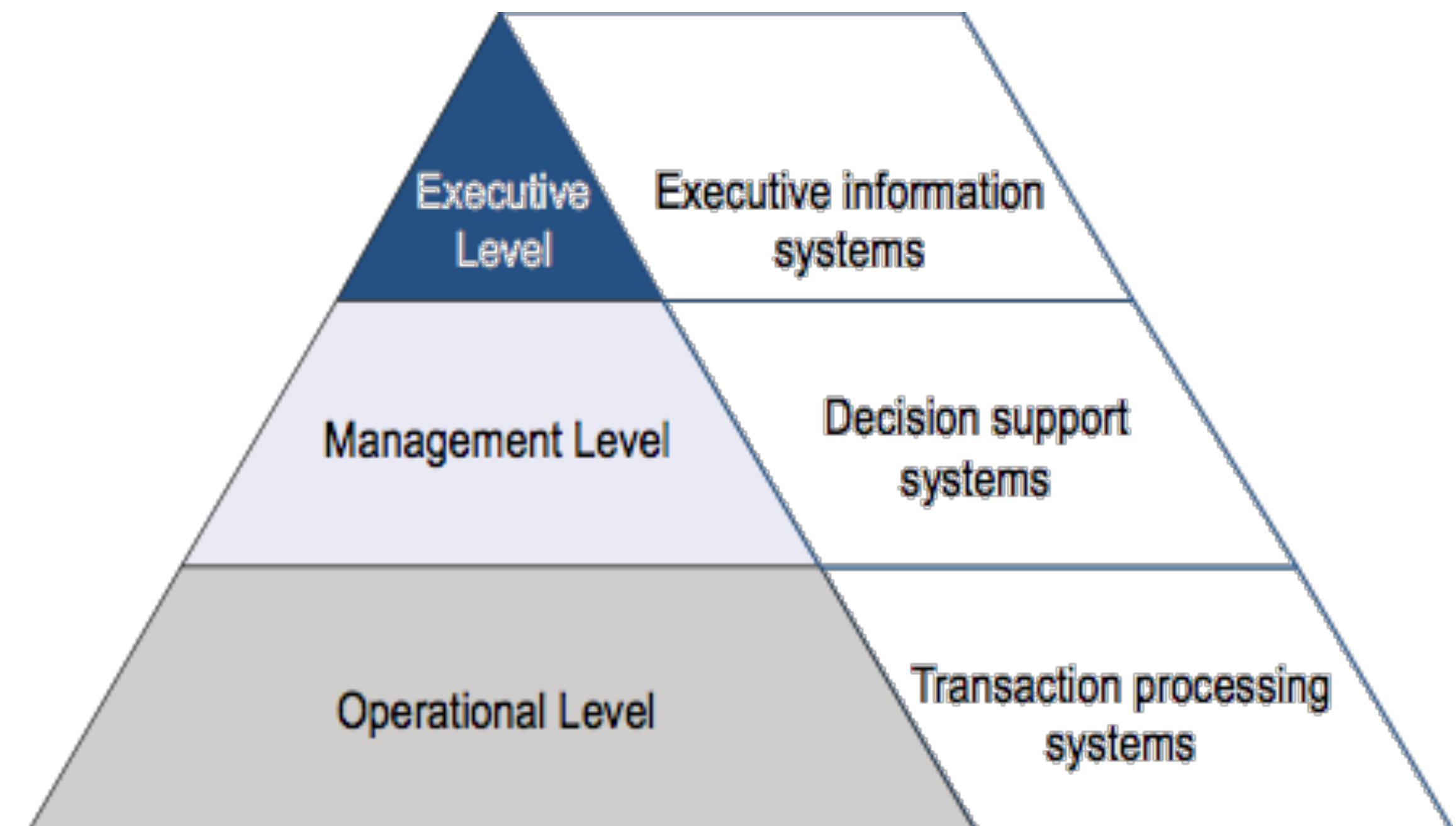
Introduction

- ❖ Information Systems pervade the modern organization
- ❖ Organizational change comes from the introduction of new information technology (IT) and the implementation of information systems (IS).
- ❖ You need to have the appropriate vocabulary and a solid understanding of what classes of software programs underpin information systems in modern organizations.

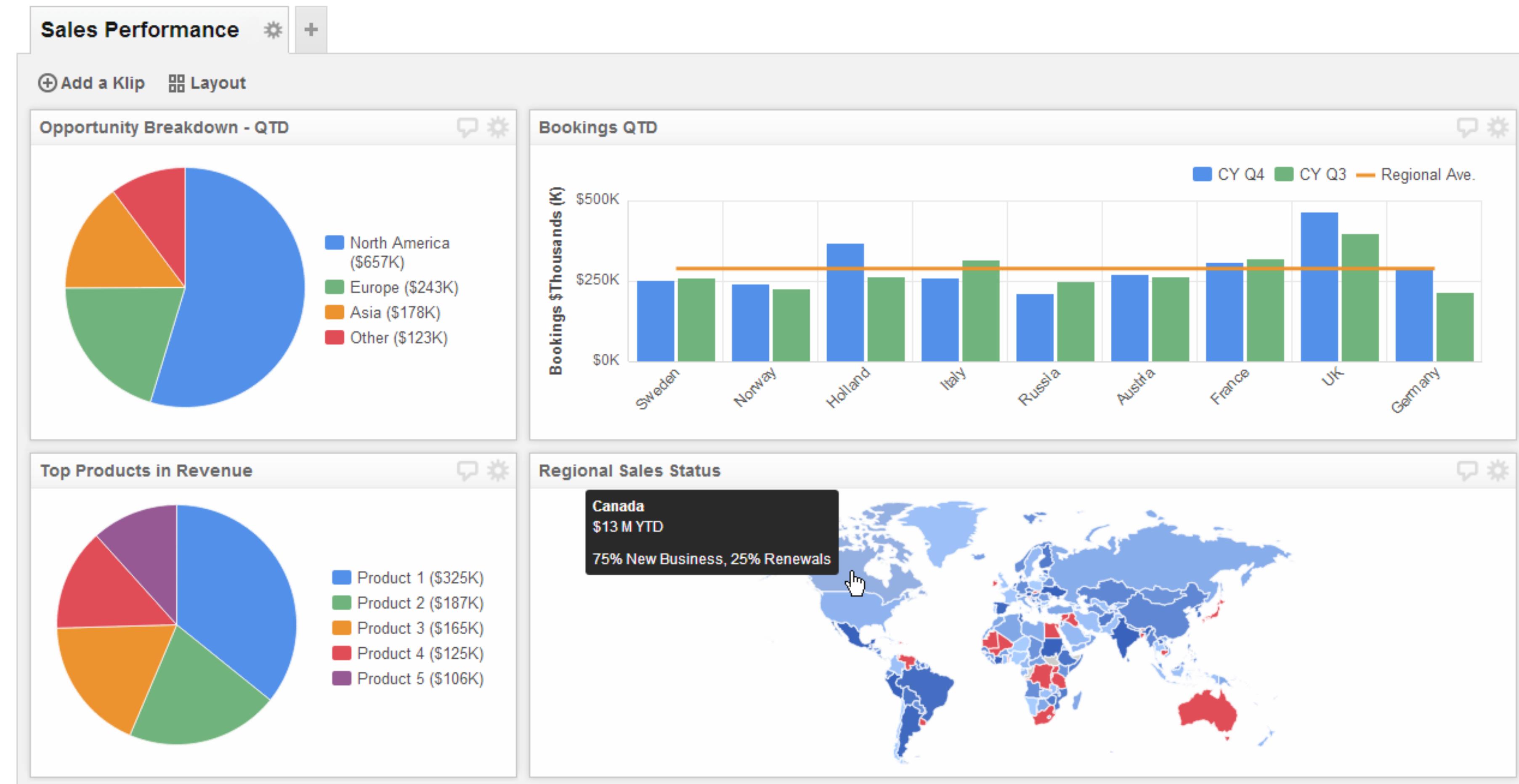


Hierarchical Perspective

- ❖ Recognizes that decision making and activities in organizations occur at different levels
- ❖ At each level of the hierarchy
 - ❖ different responsibilities
 - ❖ make different types of decisions
 - ❖ carry out different kinds of activities
- ❖ The type of information systems introduced to support each level must take these differences into account.

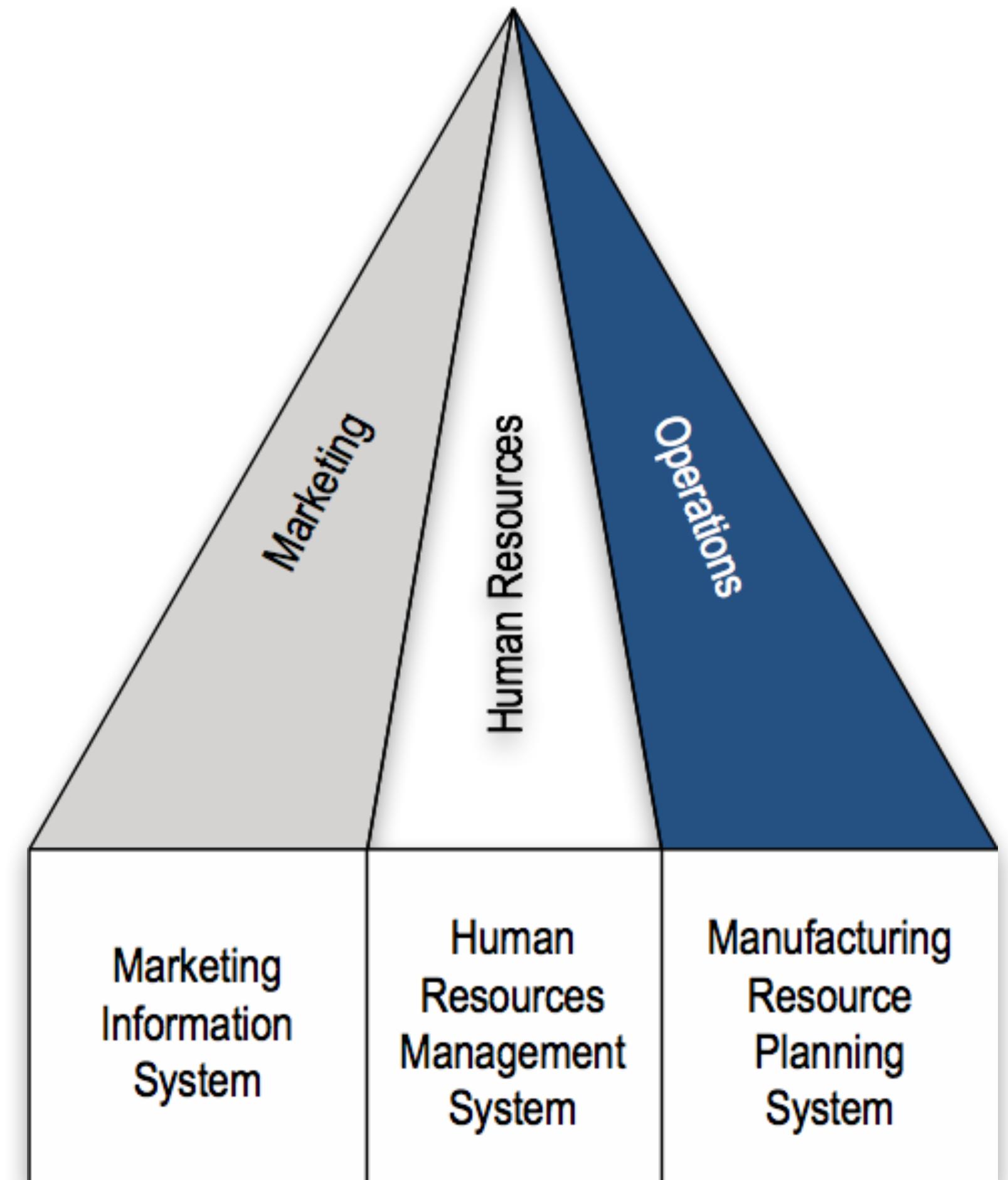


Executive Dashboard



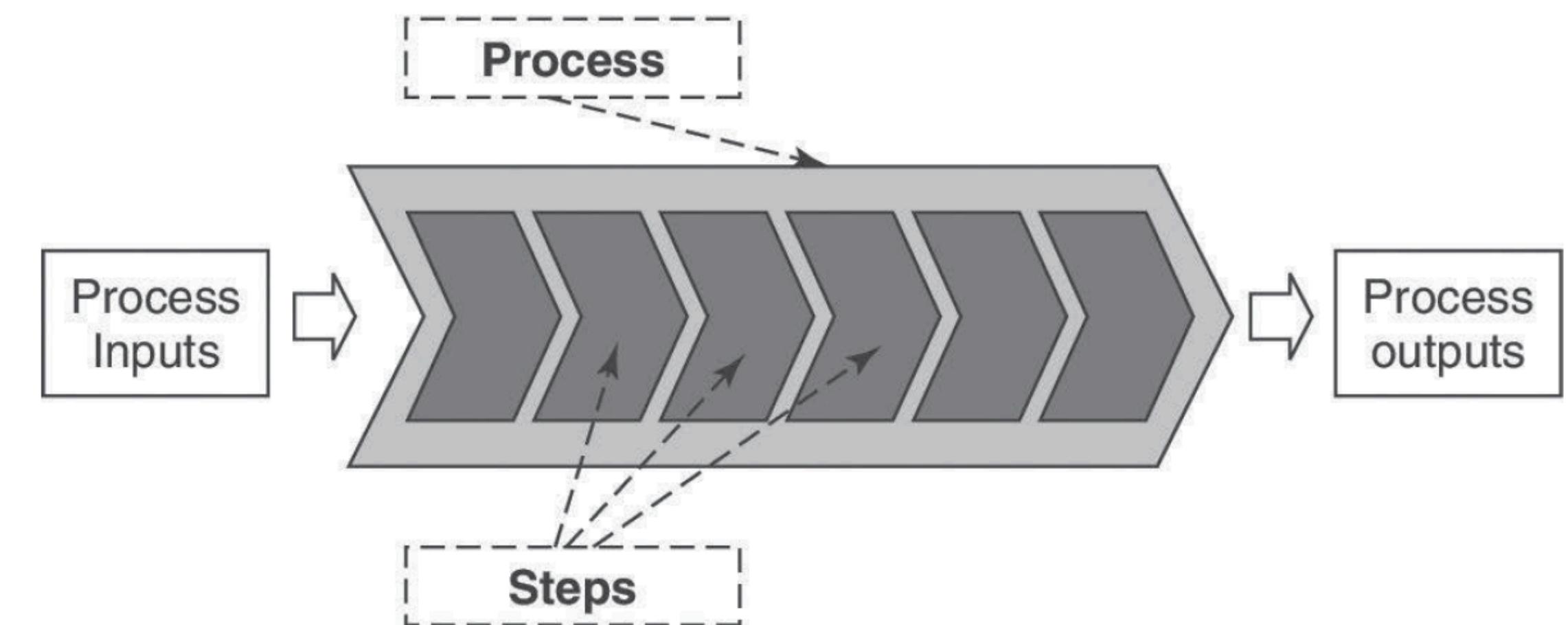
Functional Perspective

- ❖ The functional organization within business units is typically represented in the form of the organizational chart
- ❖ This decentralized management structure solves the coordination problems that happen when firms become large
- ❖ Each business function manages its own budget independently and has unique information processing needs

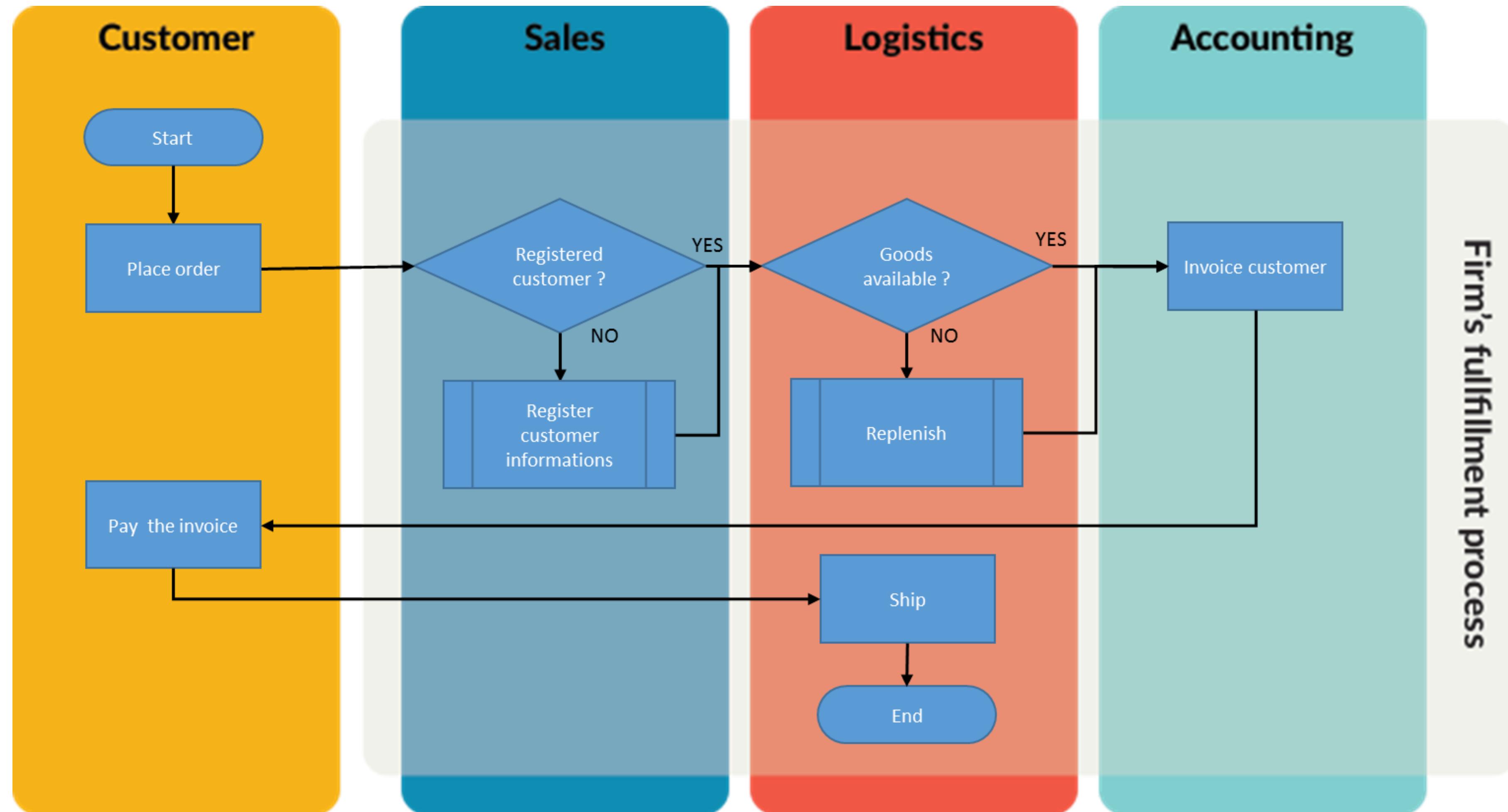


Process Perspective

- ❖ Business process reengineering (BPR) emerged in the early 1990s as a way to break down organizational silos in recognition of the fact that business processes are inherently cross-functional
- ❖ BPR is a managerial approach that employs a process view of organizational activities. BPR seeks dramatic performance improvements through rationalization of activities and elimination of duplication of efforts across separate functions and units



An example



BPR

- ❖ Business processes are inherently cross-functional
- ❖ BPR is a managerial approach that employs a process view of organizational activities
- ❖ BPR seeks to break down the organizational silos
- ❖ BPR achieves internal business integration increases performance



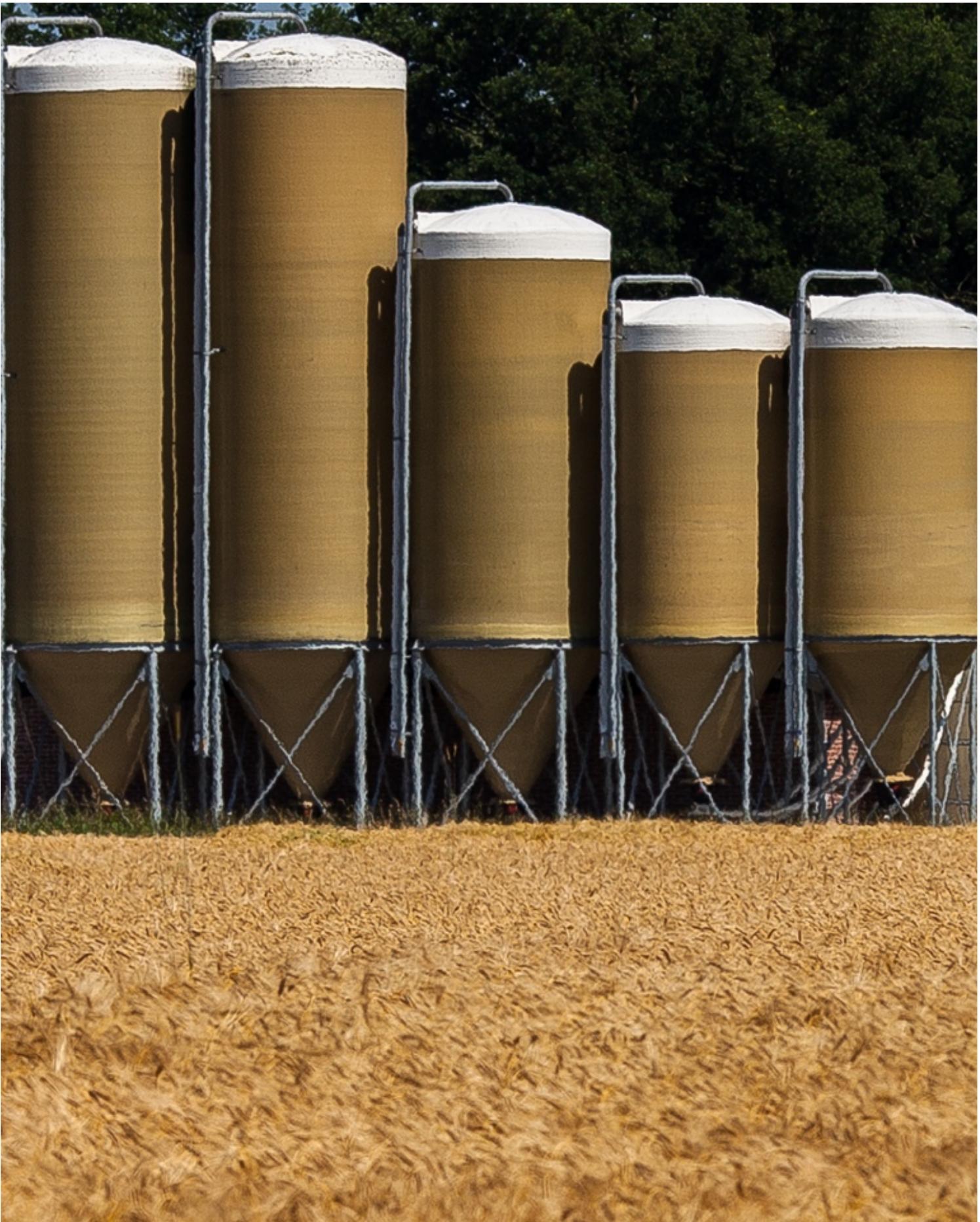
Your turn!

- ❖ **Form small groups** of about 5/6 people
- ❖ **Find details** concerning the following systems:
 - ❖ Enterprise Resource Planning
 - ❖ *These four*
 - ❖ Supply Chain Management
 - ❖ *4Cats*
 - ❖ Customers Relationship Management
 - ❖ *Three musketeers*
 - ❖ Business Intelligence
 - ❖ *The CIAs*
 - ❖ Business Analytics
 - ❖ *The Internationals*
- ❖ **Define** each system
- ❖ **Summarize** the major advantages and issues (pro and cons)
- ❖ **Identify the main players** and actors in the market
- ❖ **Ready a 5 minutes presentation.**



Integration

- ❖ The history of lack of integration
 - ❖ Coordination costs
 - ❖ Mergers and acquisitions
- ❖ Integration
 - ❖ The process of unifying, or joining together, some tangible or intangible assets



Enterprise Systems: Integration

The overarching goal of integration is to organize, streamline, and simplify a process or an application.

- ❖ **Locus**
 - ❖ **Internal**
 - ❖ the firm is seeking to unify and coordinate owned assets that reside within the boundaries of the firm
 - ❖ **External**
 - ❖ the assets being integrated are not all owned by the firm, and interorganizational integration efforts are involved
- ❖ **Object**
 - ❖ **Business integration**
 - ❖ introduction of cohesive, streamlined business processes that encompass previously separate activities
 - ❖ **Systems integration**
 - ❖ unification or tight linkage of IT-enabled information systems and databases



Types of integration

- ❖ Application integration → the systems integration effort seeks to enable communication among separate software programs
- ❖ Data integration → the systems integration effort seeks to enable the merging of data repositories and databases
- ❖ Internal integration → the unification or linkage of intraorganizational systems
- ❖ External integration → the unification or linkage of interorganizational systems

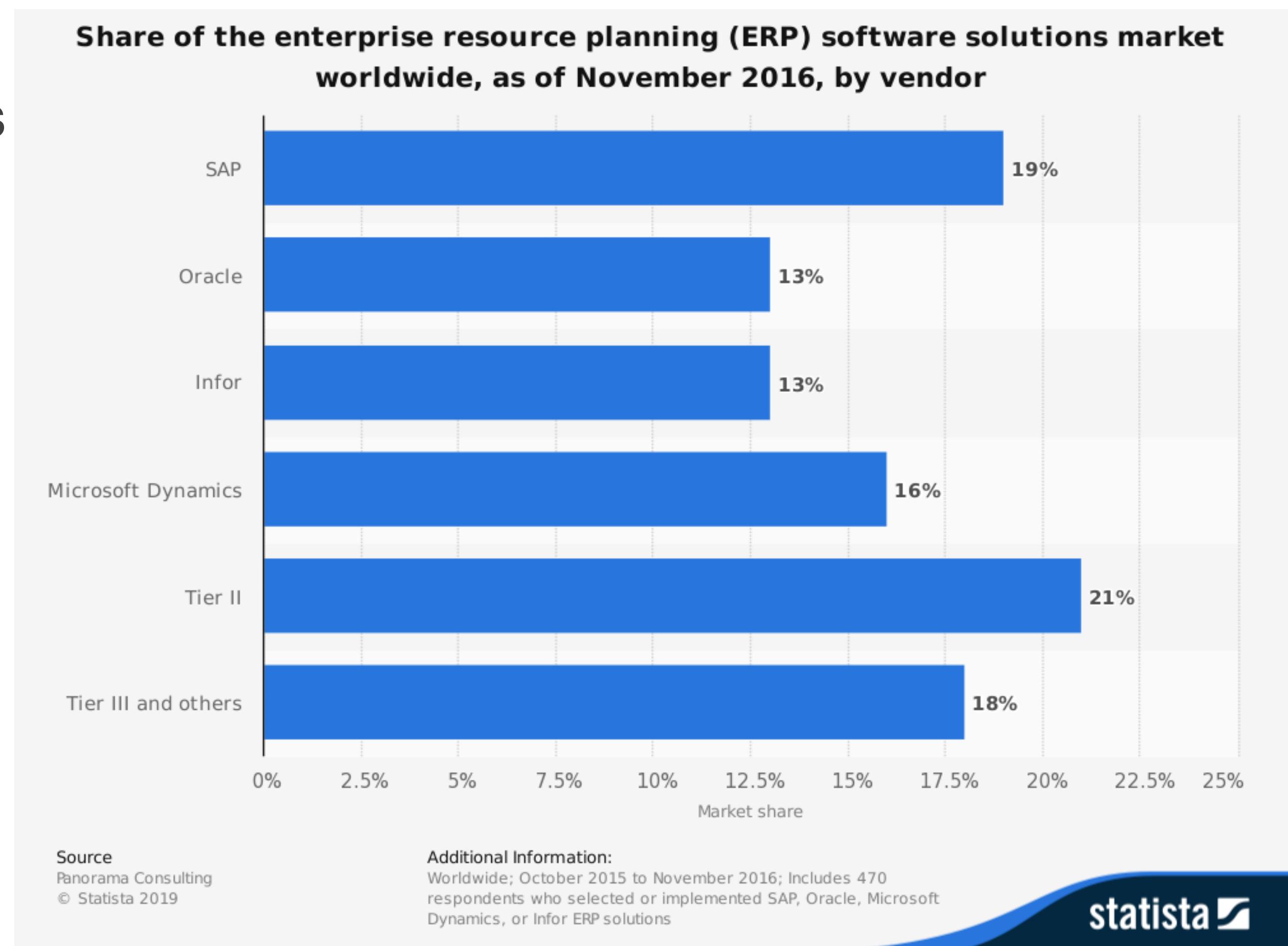
The integration trade-offs

- ❖ Benefits
 - ❖ Reduction of duplication and redundancy
 - ❖ Access to information
 - ❖ Speed
 - ❖ Response time
- ❖ Drawbacks
 - ❖ Increased coordinate costs
 - ❖ Reduced local flexibility



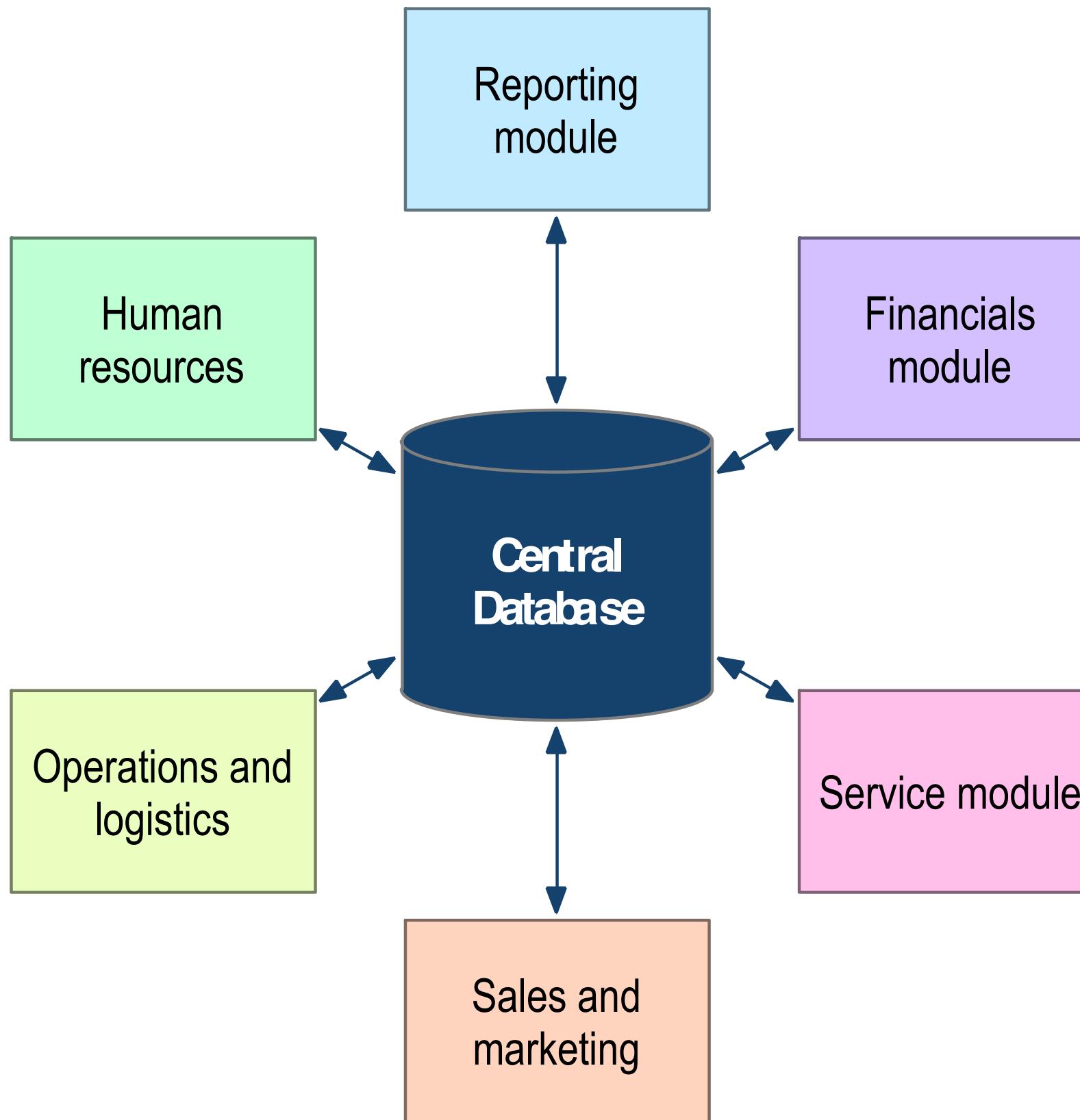
Enterprise Resource Planning (ERP)

- Class of standardized software applications that would enable and support integrated business processes
- ❖ Principal characteristics
 - ❖ Modularity
 - ❖ Application and data integration
 - ❖ Configurability
- ❖ Firms typically live and die by their enterprise systems



ERP model and functionality

Financials	Operations and Logistics
Accounts receivable and payable	Inventory management
Asset accounting	Material requirements planning
Cash management and forecasting	Materials management
Financial consolidation	Plant maintenance
General ledger	Production planning
Product-cost accounting	Routing management
Profit-center accounting	Shipping
Human Resources	Sales and Marketing
Payroll	Order management
Personnel planning	Pricing
Travel expenses	Sales management
	Sales planning



ERP projects are complex

	2009	2010	2011	2012	2013	2014	2015	2016
Average project cost (million)	\$6.2	\$5.48	\$10.5	\$7.1	\$2.8	\$4.5	\$3.8	\$1.3
Project Duration (months)	18.4	14.3	16	17.8	16.3	14.3	21.1	16.9
Late projects	35.5%	61.1%	54%	61%	72%	75 %	57 %	59 %
Projects over budget	51.4%	74.1%	56%	53%	54%	55%	57 %	74 %

Adapted from Panorama Consulting 2011, 2015 and 2017 ERP Reports

Some failure examples

An ERP system failure has crippled a major Finnish pharmaceutical

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Dan Naumov | 07 Sep 2017 8:09 AM | 1947



According to Fimea, the national competent authority for regulating pharmaceuticals, Oriola Finland has failed to deliver a significant amount of drugs to its clients. A major distributor of health and wellbeing products that employs roughly 2,820 people has been hit with severe downtime after a major Enterprise Resource Planning system upgrade went wrong over the weekend.

According to The Association of Finnish Pharmacies many vendors are in the unfortunate position of not being able to deliver pre-ordered drugs to their customers. The mood of pharmacists getting in touch with the association and asking for advice can be described as that of deep shock and disbelief. HUS - The Hospital District of Helsinki and Uusimaa has put out a statement saying that unless Oriola can sort out its problems quickly, patient safety will be put at risk.

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Vodafone's £4.6m CRM fine – when IT projects attack

By Stuart Lauchlan October 26, 2016

SUMMARY: Vodafone's £4.6 million spanking from regulator Ofcom is the end result of long-running problems with a massive Siebel migration and consolidation program.



3 Comments

Mobile telco Vodafone just chalked up an unwelcome milestone – the single biggest fine for “serious and sustained” breaches of consumer protection rules in the UK, the result of a troubled CRM and billing migration and consolidation program.

UK telecoms regulator Ofcom slapped a £4.6 million fine on Vodafone, payable within 20 working days. The fine is made up of two chunks – £3.7 million for taking pay-as-you-go customers money and not delivering a service in return, and £925,000 for failures relating to the way that the carrier handled complaints.

In a checklist of shame from Ofcom today, the regulator found that:

- 10,452 pay-as-you-go customers lost out when Vodafone failed to credit their accounts after they paid to ‘top-up’ their mobile phone credit. Those customers collectively lost £150,000 over a 17-month period.
- Vodafone also failed to act quickly enough to identify or address these problems, only getting its act together after Ofcom intervened.
- Vodafone also breached Ofcom’s billing rules, because the top-ups that consumers had bought in good faith were not reflected in their credit balances.
- Vodafone’s customer service agents were not given sufficiently clear guidance on what constituted a complaint, while its processes were insufficient to ensure that all complaints were appropriately escalated or dealt with in a fair, timely manner.
- Vodafone’s procedures also failed to ensure that customers were told, in writing, of their right to take an unresolved complaint to a third-party resolution scheme after eight weeks.



— Chanticleer

Anatomy of an IT disaster or how Woolies spent \$200 million on SAP



Tony Boyd

Updated Jun 9, 2016 — 11:58pm, first published at 11:45pm

Save Share

When it comes to IT disasters the \$200 million, six-year implementation of SAP merchandising systems at supermarket and liquor group Woolworths ranks in the middle of the pack.

That is not to say the SAP implementation did not cause enormous problems.

The highest-profile problems occurred at Big W last year. When the SAP system went live, the discount department store was unable to put orders through to suppliers.



Woolworths chief information officer now reports direct to CEO Brad Banducci. Illustration: David Rowe

Suppliers were furious as the systems glitches prevented them from selling products at a time when shelves were empty. It caused millions of dollars in lost sales.

One of the less well-known negative side-effects of the SAP implementation was in the supermarkets group. Prior to the roll-out of the software each supermarket manager was given a weekly profit-and-loss statement.

This was an important part of managing profitability but its value went far beyond that. It contributed to increased accountability among store managers for the performance of their businesses.

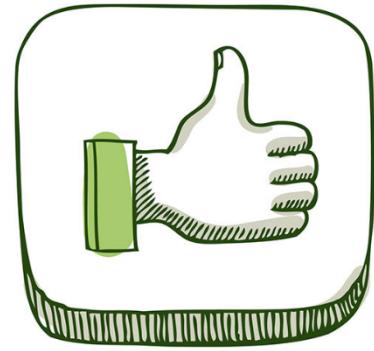
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ERP's Limitations

- ❖ Efficiency
- ❖ Responsiveness
- ❖ Knowledge infusion
- ❖ Adaptability



- ❖ Standardization and flexibility
- ❖ Is the best practice embedded in the enterprise system really the best?
- ❖ Strategic clash
- ❖ High costs and Risks

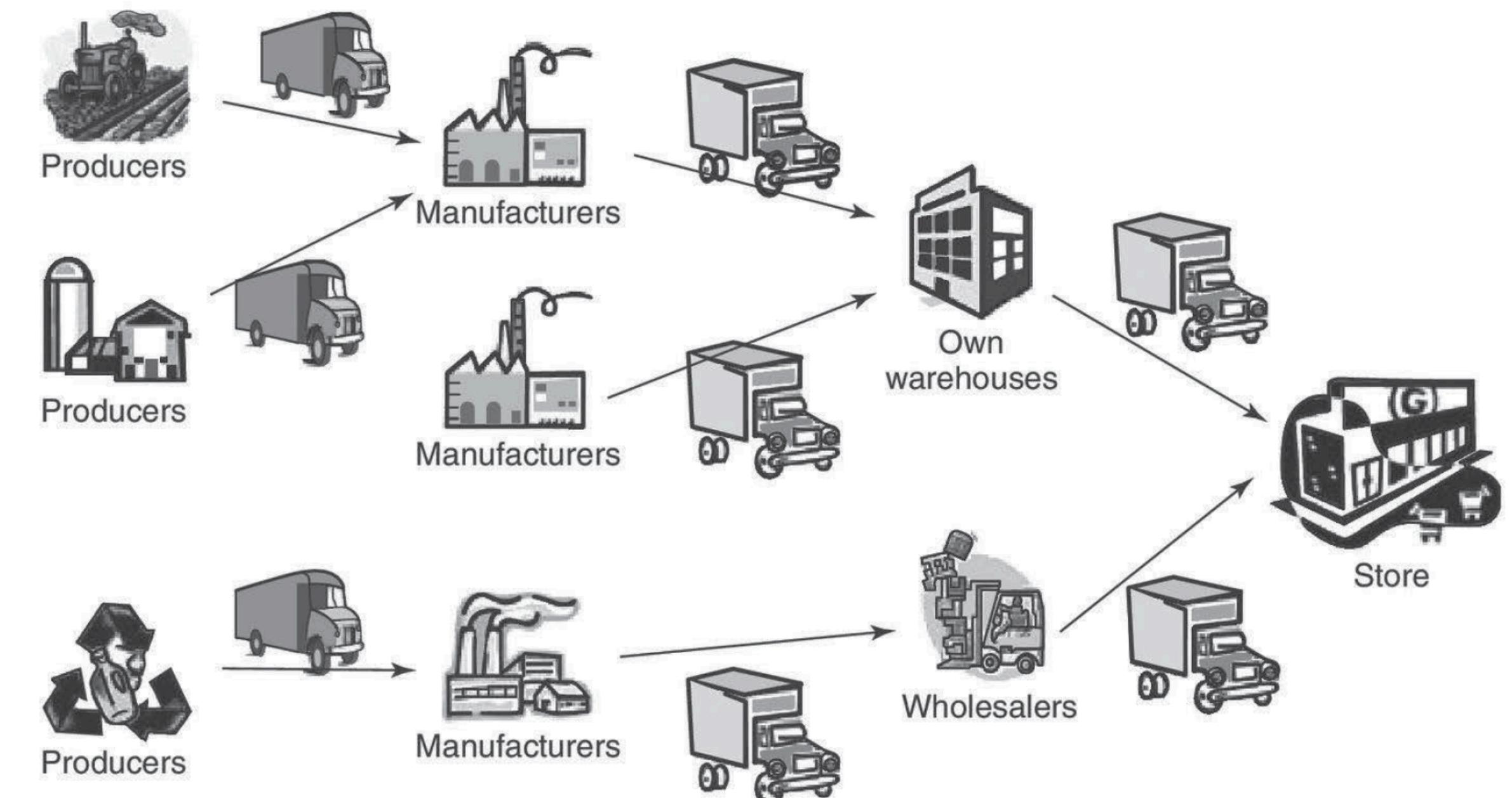
Go and surf online!

- ❖ Form small groups of about 5 people
- ❖ Find details concerning an ERP system failure
- ❖ Identify the root causes of the failure
- ❖ Categorize the root causes
 - ❖ system design related
 - ❖ project management related
- ❖ Turn in a two slides summary
 - ❖ slide one: the case setting and the problem
 - ❖ slide two: the categorised causes



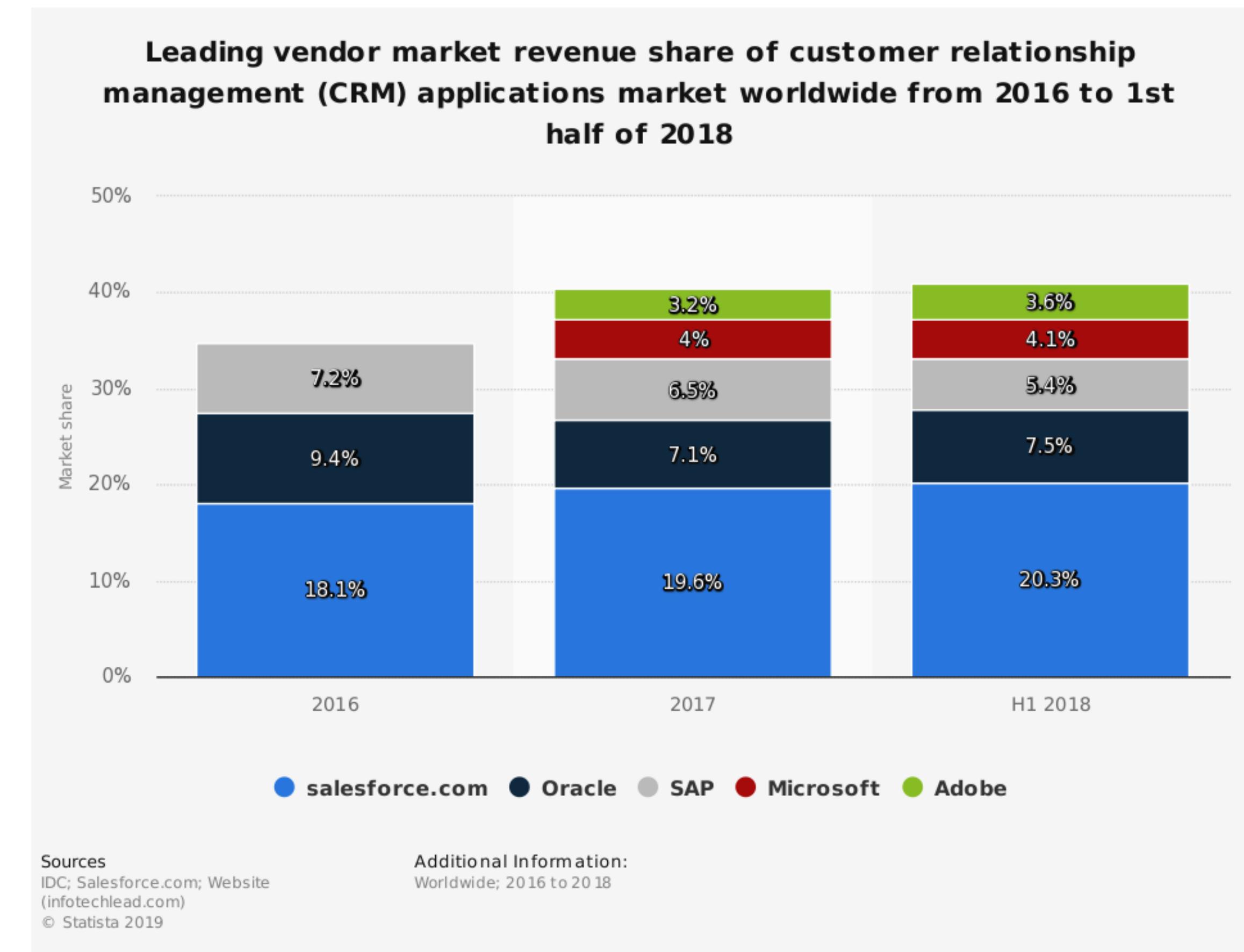
Supply Chain Management (SCM)

- ❖ A supply chain is the set of coordinated entities that contribute to moving a product from its production to its consumption
- ❖ SCM is the set of logistical and financial processes associated with the planning, executing, and monitoring of supply chain operations

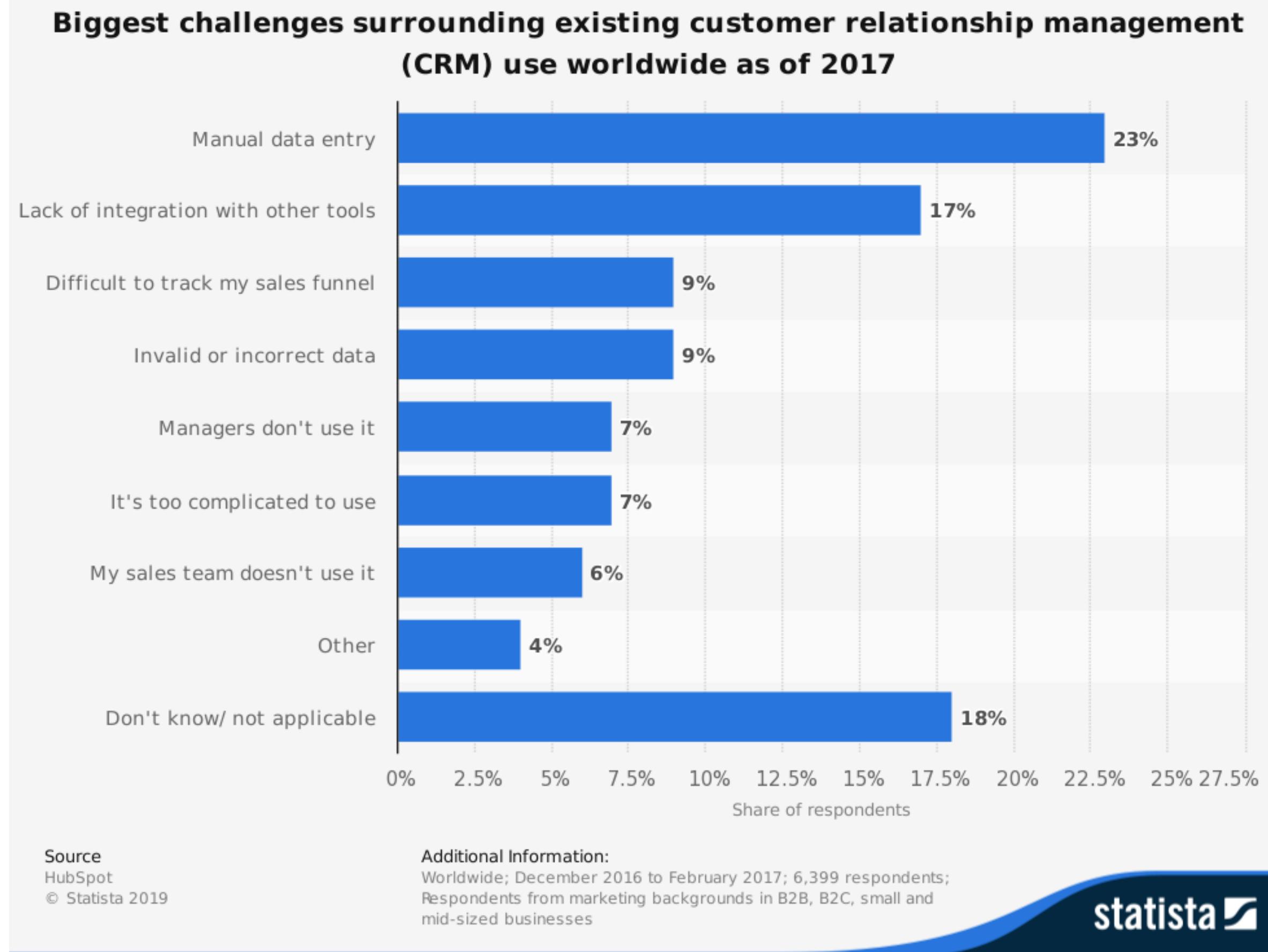
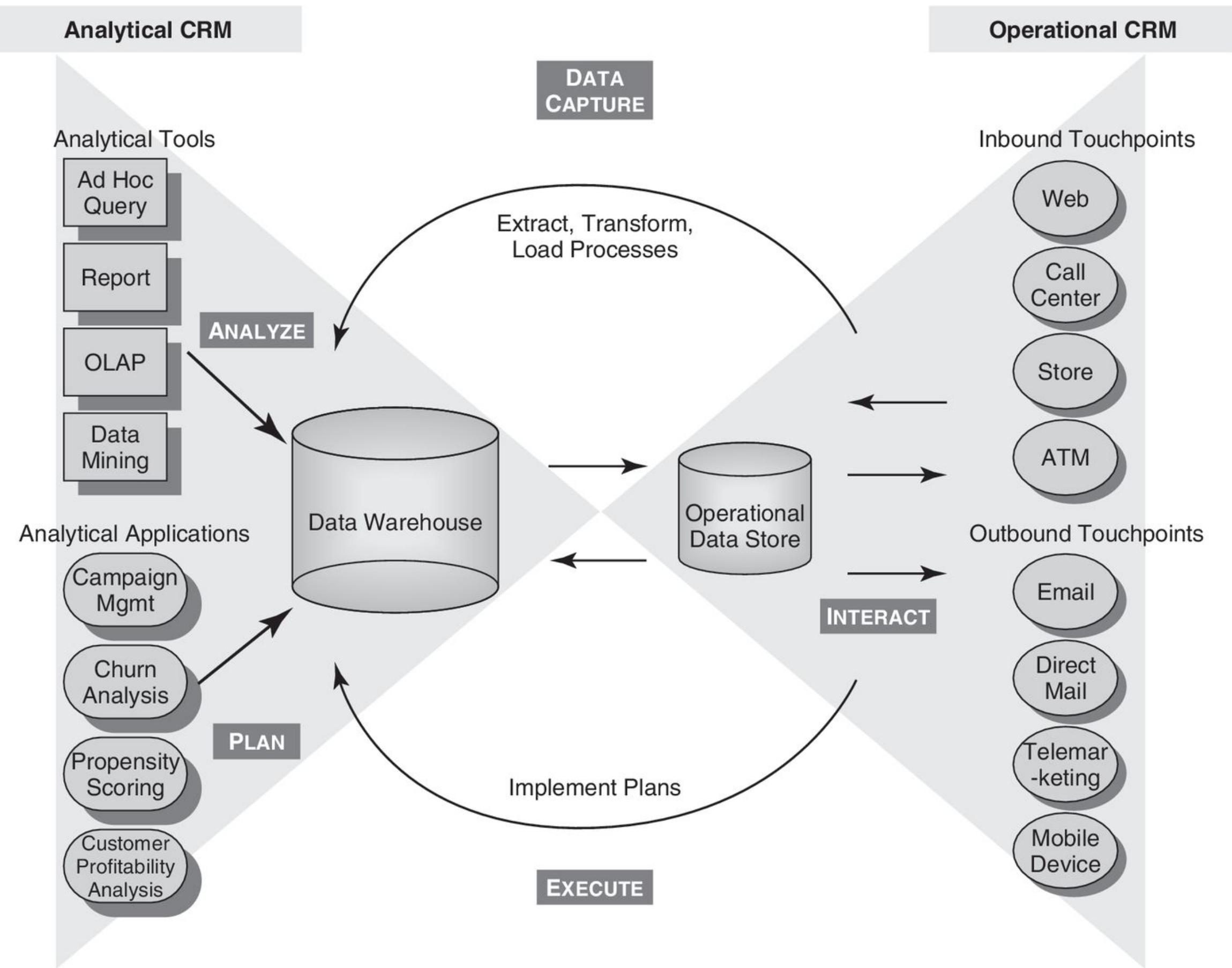


Customer Relationship Management (CRM)

- ❖ CRM is a **strategic initiative**, not a technology. IT is an essential enabler of all but the smallest CRM initiatives.
- ❖ CRM relies on **customer personal and transactional data** and is designed to help the firm learn about customers.
- ❖ The ultimate objective of a CRM initiative is to help the firm use customer data to make inferences about customer behaviors, needs, and value to the firm so as to increase its profitability.



CRM infrastructure and challenges



Knowledge Management

- ❖ The set of activities and processes that an organization enacts to manage the wealth of knowledge it possesses and to ensure that it is properly safeguarded and put to use to help the firm achieve its objectives
- ❖ A number of technologies are used in concert to enable the various aspects of a knowledge management initiative:
 - ❖ *Creating knowledge*: generation of new information, novel solutions to handle existing problems, new explanations for recurrent events
 - ❖ *Capturing and storing knowledge*: codification of new knowledge and maintenance of an organizational memory
 - ❖ *Disseminating knowledge*: transmission and access of knowledge within the organization

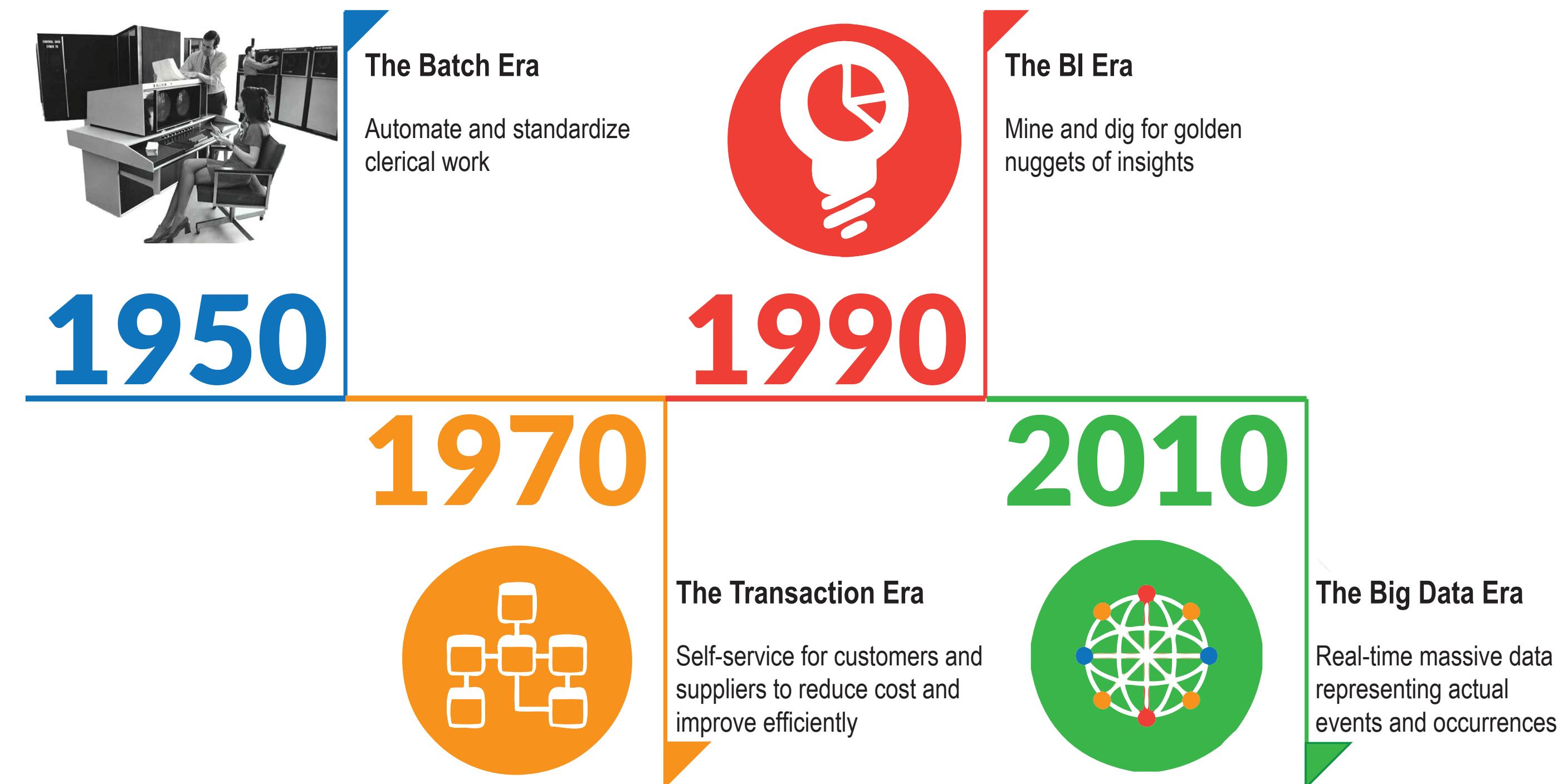
Analytics

- ❖ Business analytics is the examination of business data in an effort to reveal useful insight that enables superior decision making.
- ❖ Depending on the type of insight being extracted from the data we have:
 - ❖ **Descriptive Analytics**
 - ❖ *what has occurred*
 - ❖ **Predictive Analytics**
 - ❖ *what will occur*
 - ❖ **Prescriptive Analytics**
 - ❖ *what should occur*



The Evolution of Business Analytics

- ❖ Why is this concept “trending” now?
- ❖ The real catalyst for the current attention to analytics is the proliferation of data generated by sensors (e.g., humidity, light), machines (e.g., GPS in cars), and increasingly, humans (e.g., Tweets)

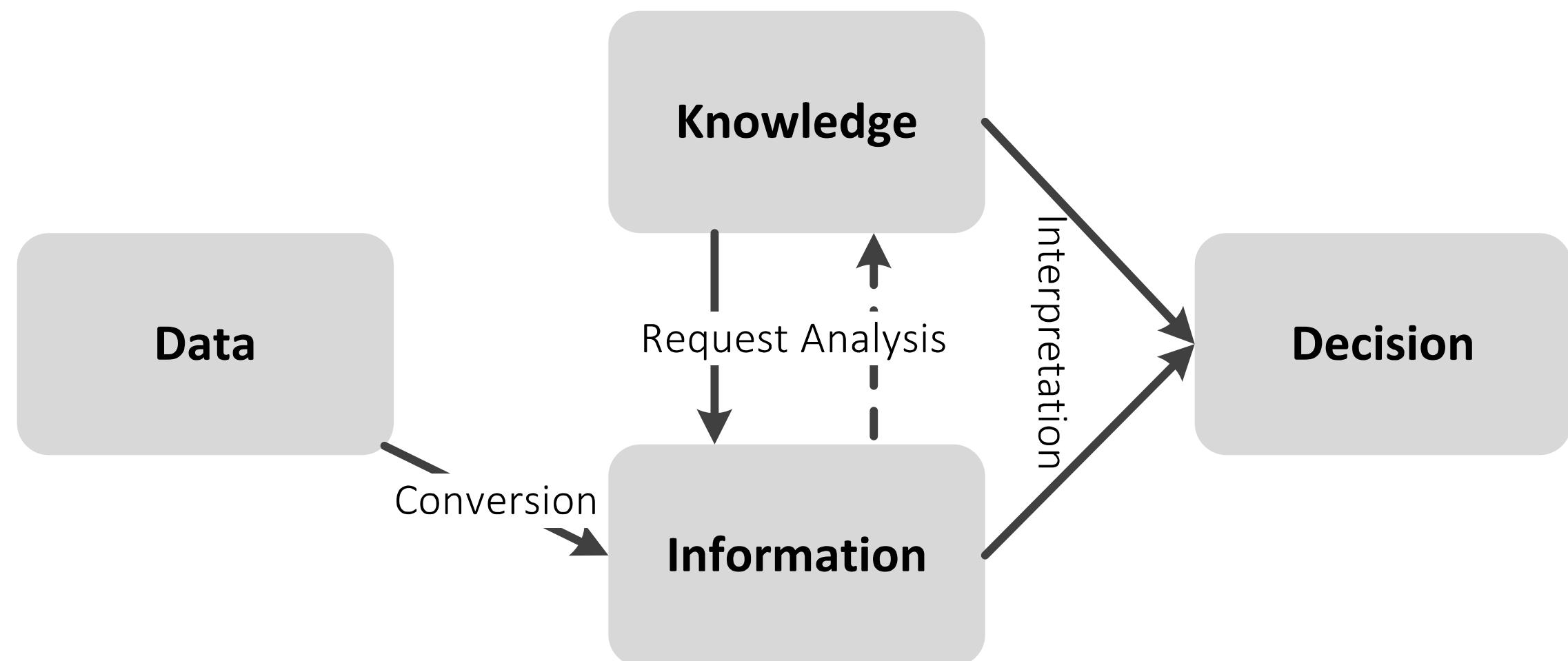


Business Intelligence (BI)

- ❖ BI encompasses the set of techniques, processes, and technologies designed to gather and interpret data about the business in order to improve decision making and advance the organization's interests.
- ❖ A BI infrastructure is the set of applications and technologies designed to create, manage, and analyze large repositories of data in an effort to extract value from them. Beyond the transaction processing systems that generate the needed data
- ❖ The main components of a BI infrastructure are:
 - ❖ Data warehouses
 - ❖ Data marts
 - ❖ Query and reporting tools
 - ❖ Online analytical processing (OLAP)
 - ❖ Data mining

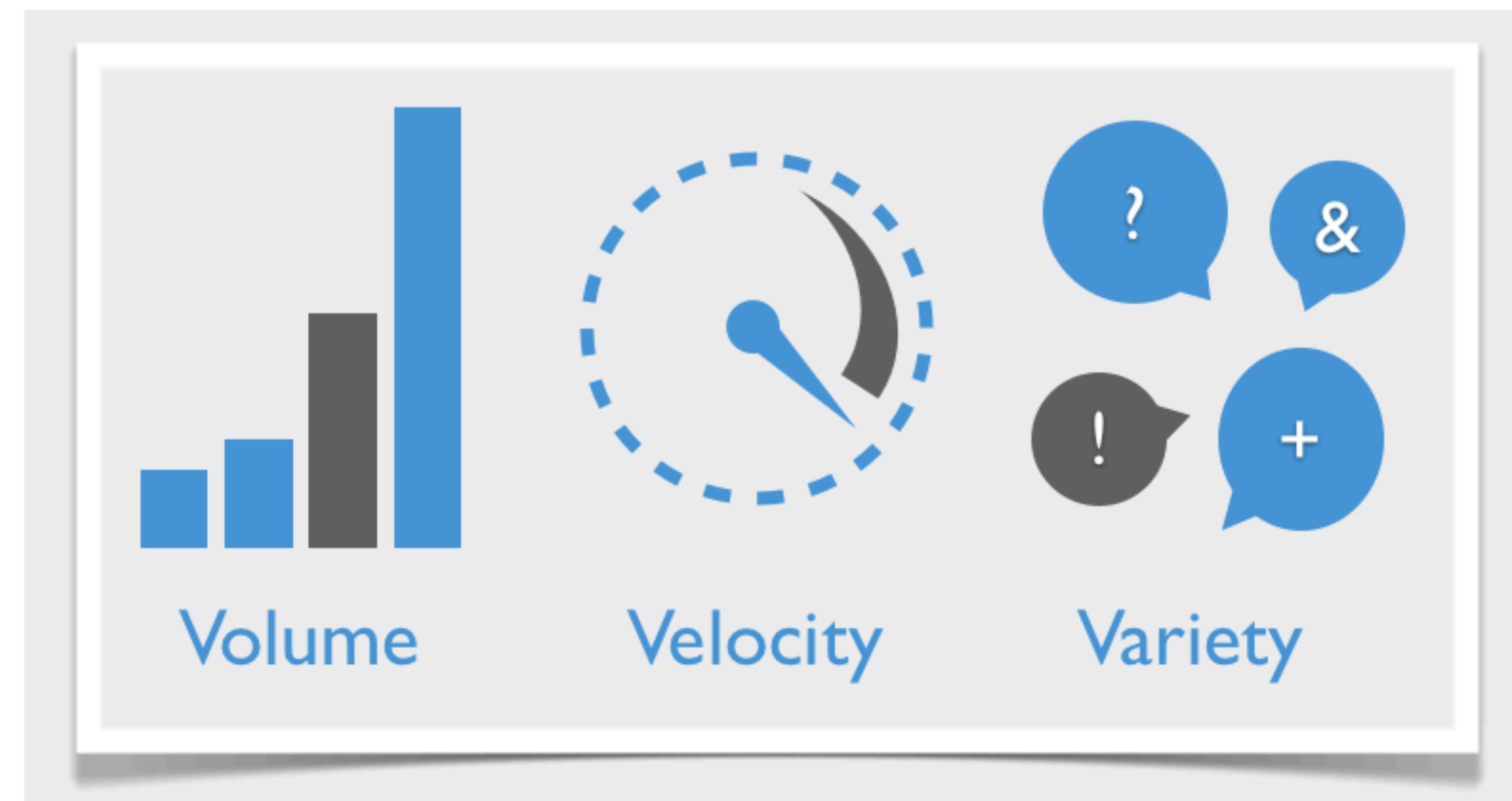
From BI to Big Data

- ❖ Data is defined as codified raw facts—events, occurrences or descriptions coded as letters and numbers and stored, increasingly, by way of digital devices
- ❖ Information is defined as data in context.
 - ❖ data become information when it has been given meaning and can therefore be interpreted by individual users or machines
 - ❖ information is audience dependent; one person's data is another person's information
- ❖ Knowledge is the capacity to identify required problem-related information and interpret it



Big Data

- ❖ Three lines of data evolution:
 - ❖ *Volume* is the amount of digital data that organizations have to store and manage
 - ❖ *Velocity* is the speed of creation and use of new digital data
 - ❖ *Variety* is the kind of digital data that organizations have to store and manage



Computing Architectures: Mainframes and Terminals

2019

- ❖ A large digital computer supporting multiple users and multiple peripherals accessed by "dumb" terminals
- ❖ Centralized architecture

1977



Remote connectivity in Action

- ❖ shorturl.at/ghmB4
- ❖ **Commands**
 - ❖ *Look around:* ls + return
 - ❖ *Move:* cd LOCATION + return
 - ❖ *Interact with things:* less ITEM + return
 - ❖ *Go back:* cd .. + return
- ❖ ls

Welcome! If you are new to the game, here are some tips:

Look at your surroundings with the command "ls".
Move to a new location with the command "cd LOCATION"
You can backtrack with the command "cd ..".
Interact with things in the world with the command "less ITEM"

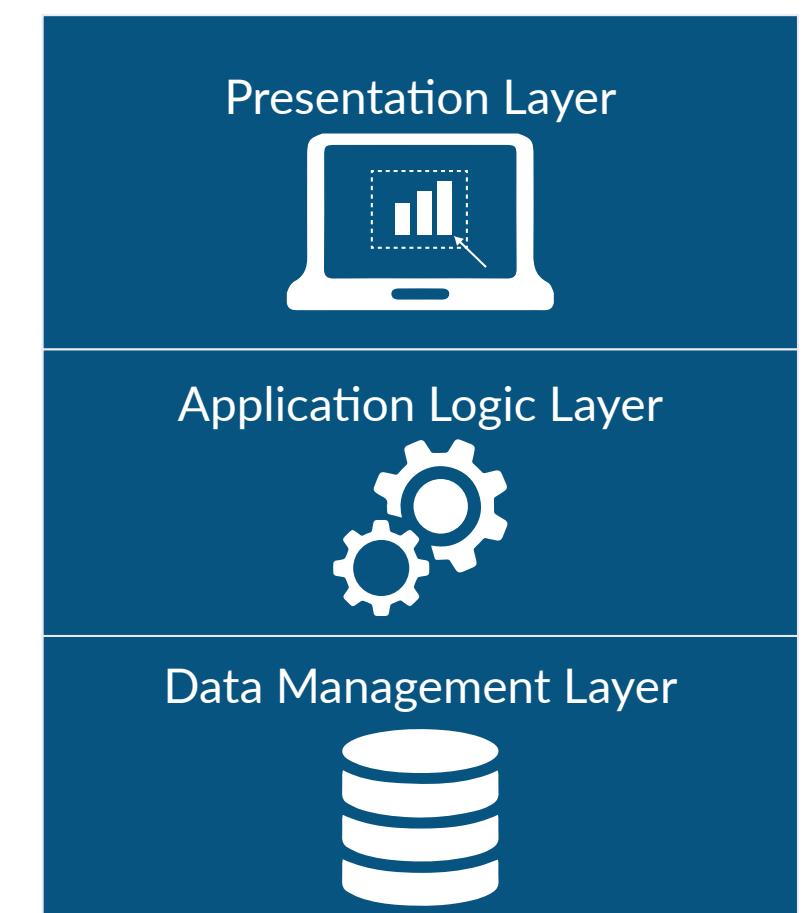
If you forget where you are, type "pwd"

Go ahead, explore. We hope you enjoy what you find. Do ls as your first command

>|

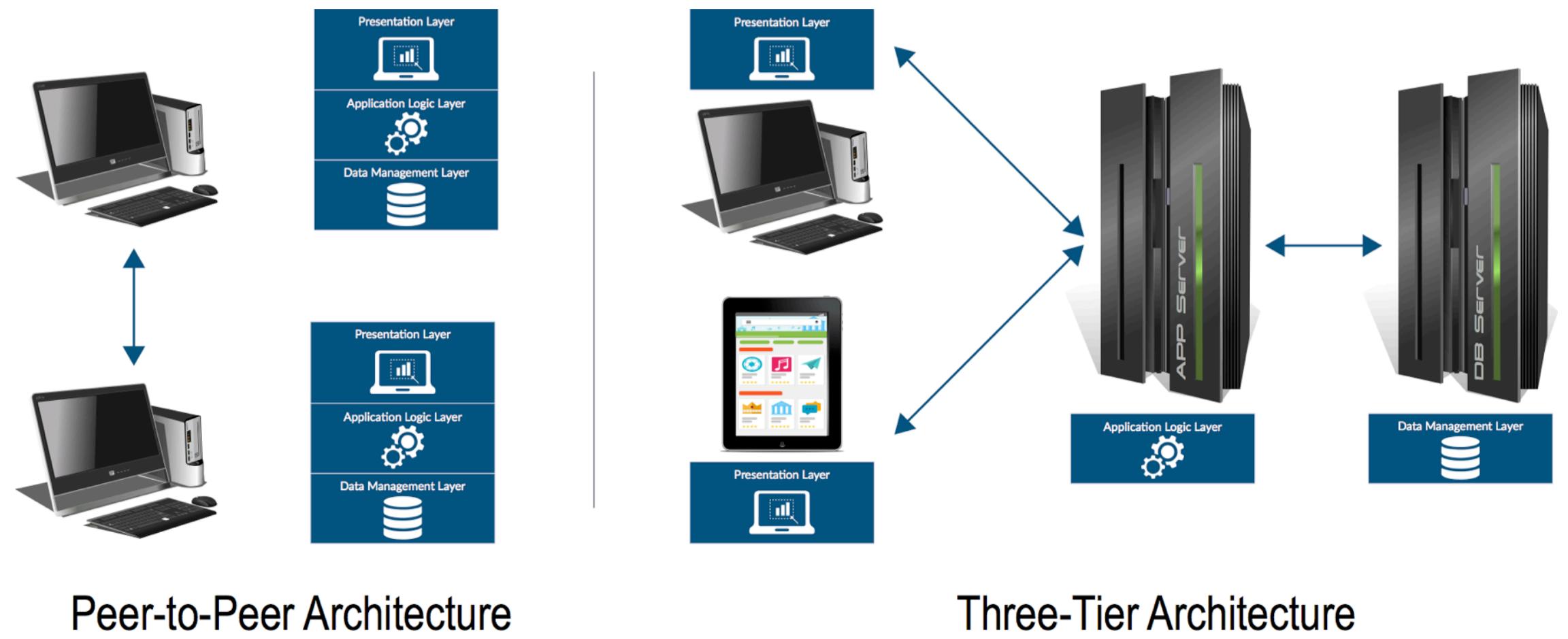
Computing Architectures: Standalone Personal Computing

- ❖ Personal computers are full-fledged digital computers and, as such, are able to execute instructions and run software applications independently
- ❖ Distributed architecture



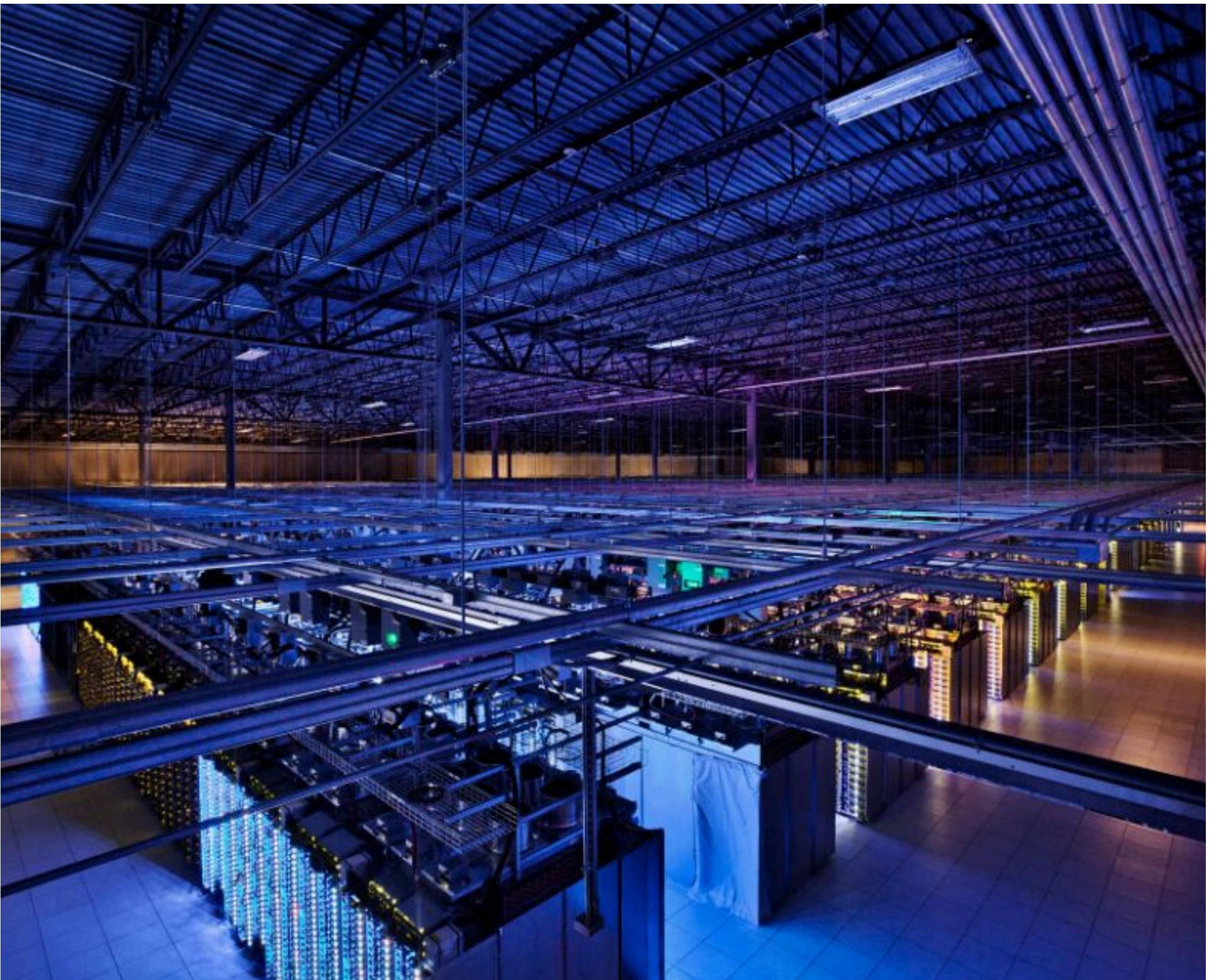
Computing Architectures: Client- Server Model

- ❖ Two or more machines share the load of executing the instructions in a software application.
- ❖ Where a client is any software program that can make structured requests to a server in order to access resources that the server makes available. A server is a software program that makes resources available to clients.
- ❖ Two very popular client- server designs: three- tier architecture and peer- to- peer architecture



Computing Architectures: Cloud Computing

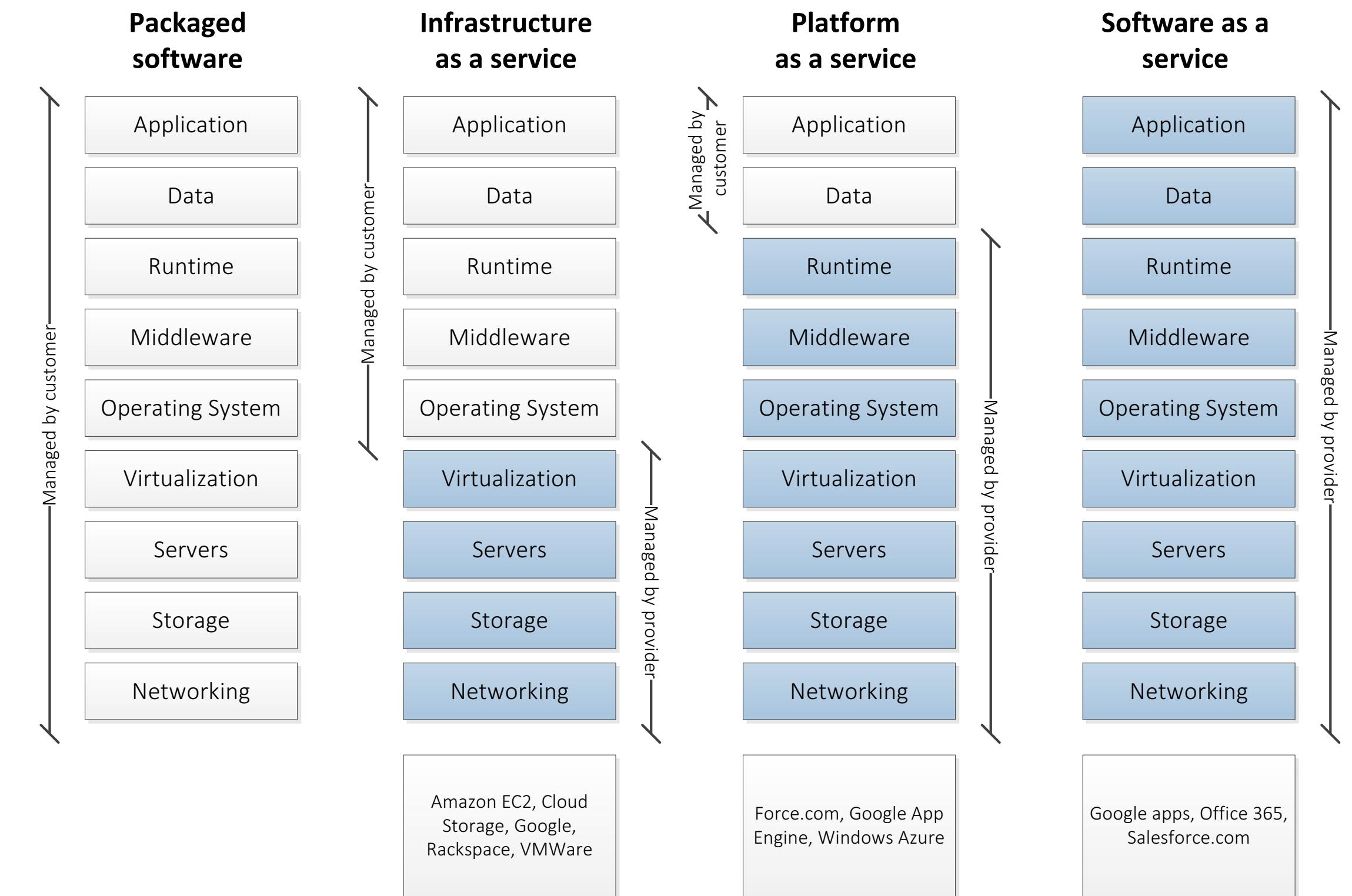
- ❖ Applications or computational or storage components reside online, in the cloud
- ❖ Resources are accessed by clients through the Internet infrastructure
- ❖ The cloud is based on the client- server architecture
- ❖ Scalability
- ❖ CAPEX - OPEX trade-off



source Google

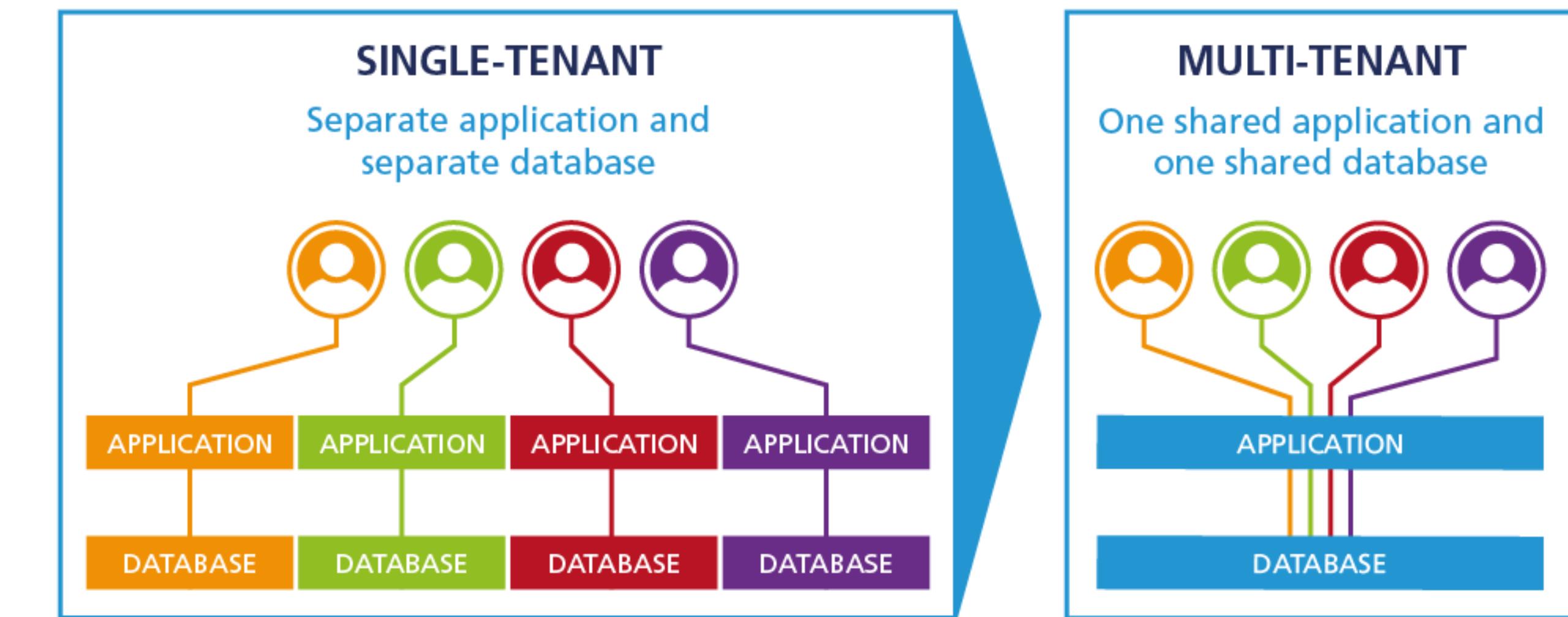
Cloud computing delivery models

- ❖ **Software as a service (SaaS)** is when an application runs in the cloud. Salesforce, Gmail, and Dropbox
- ❖ **Platform as a service (PaaS)** is when what is being rented from the provider is not a full-fledged application but rather a platform on which the client builds its own applications
- ❖ **Infrastructure as a service (IaaS)** is the level closest to hardware. In this case, the client purchases the use of hardware functionality



Single-or Multitenant Approaches

- ❖ When applications are designed to run in the cloud, one of two different models is used:
 - ❖ **Single-tenant:** Traditional server hosting architecture where customers access their own dedicated software resources.
 - Multitenant:** a single instance of the software serves all customers, and hardware resources are shared by all users.



Cloud Computing Advantages

Key advantages compared to on-premises implementations are:

- ❖ *Lower entry barriers:* Firms with limited investment capacity have access to dynamically priced enterprise-class IT resources, shifting IT costs from capital expenditures to operational expenditures. Start-ups can realize their IT project with initial investments an order of magnitude lower than in the past
- ❖ *Faster innovation:* The immediate access to IT resources reduces time to market. Without an up-front investment, firms can deploy solutions faster, thereby facilitating innovation
- ❖ *Higher scalability:* Solutions can easily scale and new IT resources can be allocated or reduced depending on the actual need



What's the downside?

- ❖ Again, go online
- ❖ Look for the main drawbacks
- ❖ Select one drawback
- ❖ Be ready to discuss it!



What we learned

- ❖ To clarify what is meant by knowledge management, categorize the different types of knowledge commonly found in organizations, and explain why organizations feel the need to employ knowledge management applications.
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