Management of Innovation

Topic 5
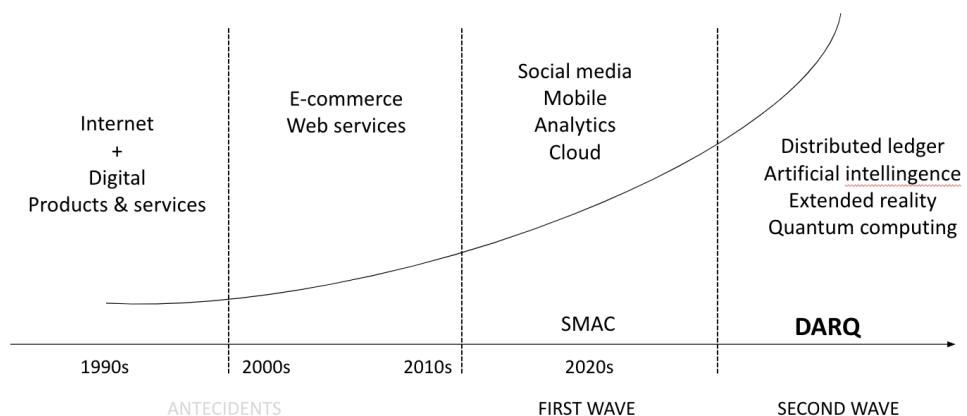# Digital Transformation

Prof. Corrado Cerruti

Digital Transformation

Digital transformation can be defined as the integration of digital technologies into all business areas, fundamentally changing how companies operate (Enterprisers project, 2020). Digital transformation is not primarily about technology and its implementation, but it is mainly about the business impact technology can have.
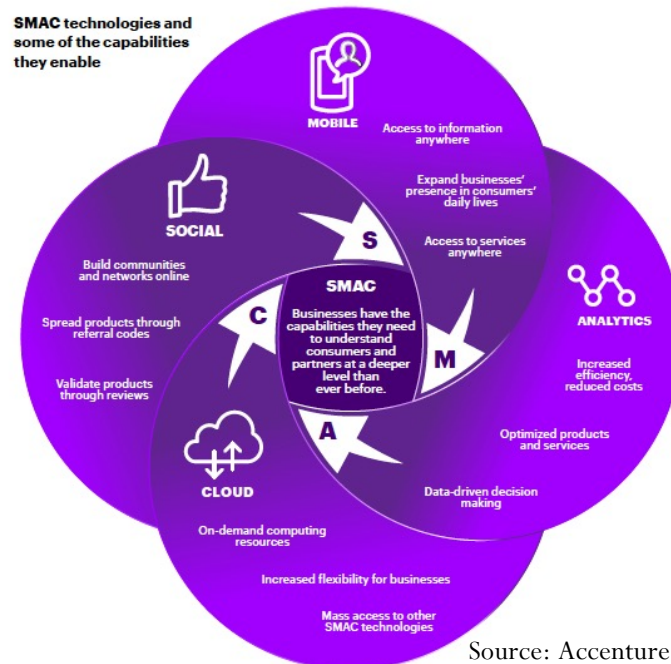
Digital technologies allows
- Exact replications
- Infinite times
- At zero marginal cost

		Social media Mobile Analytics Cloud	
Internet + Digital Products & services	E-commerce Web services		Distributed ledger Artificial intellingence Extended reality Quantum computing
		SMAC	**DARQ**
1990s	2000s	2010s	2020s
ANTECIDENTS		FIRST WAVE	SECOND WAVE

Main technologies driving DT

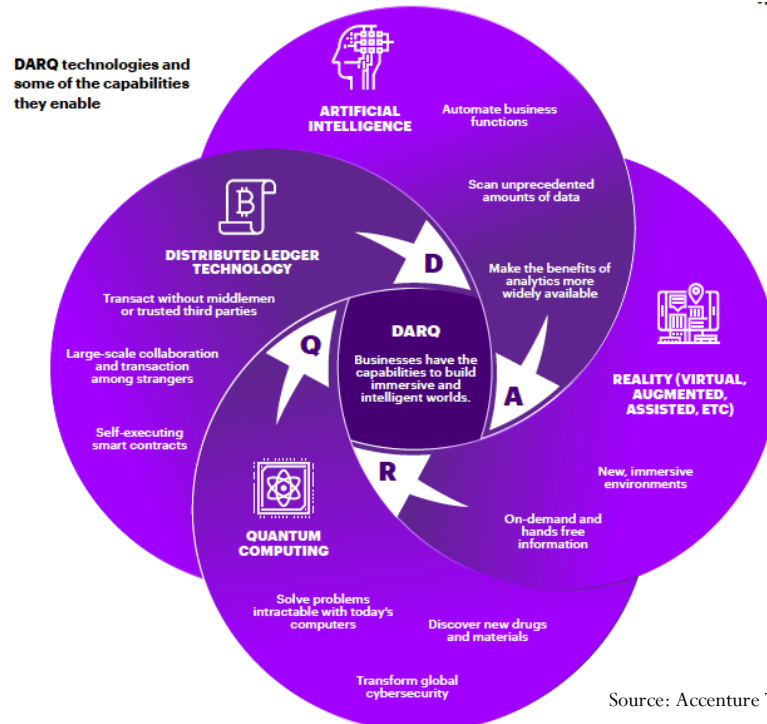«SMAC» technologies have driven the first wave of DT

Source: Accenture Technology Vision, 2019

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Main technologies driving DT

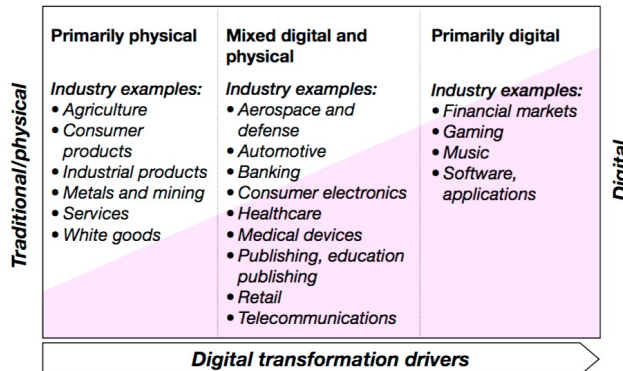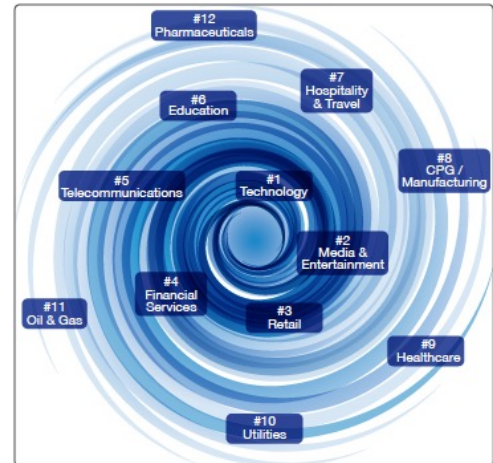«DARQ» technologies are driving the second wave of DT

Source: Accenture Technology Vision, 2019

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Digitalization trends

Degree of product and service digitization

Primarily physical	**Mixed digital and physical**	**Primarily digital**
Industry examples:	*Industry examples:*	*Industry examples:*
• Agriculture	• Aerospace and defense	• Financial markets
• Consumer products	• Automotive	• Gaming
• Industrial products	• Banking	• Music
• Metals and mining	• Consumer electronics	• Software, applications
• Services	• Healthcare	
• White goods	• Medical devices	
	• Publishing, education publishing	
	• Retail	
	• Telecommunications	

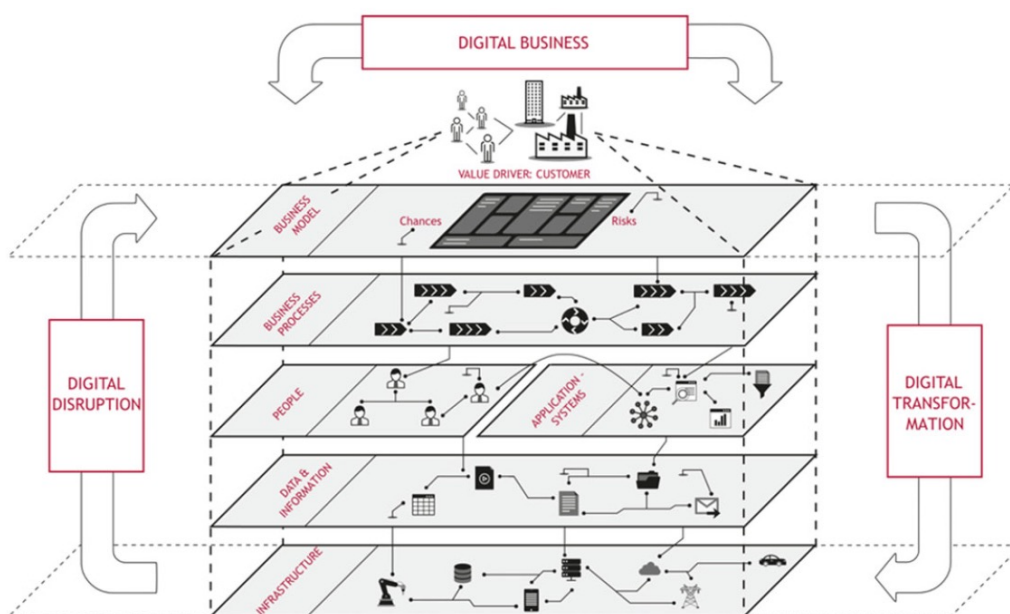*Traditional/physical* → *Digital*

Digital transformation drivers →

Source: IBM Institute for Business Value analysis.

Source: IMD/Cisco, Digital Vortex. How digital disruption is redefining industries, 2015

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# Overall impact of digital transformation

6   Urbach N. and Röglinger M. Editors (2019), Digitalization Cases: How Organizations Rethink Their Business for the Digital Age, Springer.

Dimensions of digital transformation: How and What

What do businesses need to do to get ahead of the widespread forces for change in our digital age?

a. Reconfiguring the customer value proposition (what is being offered)

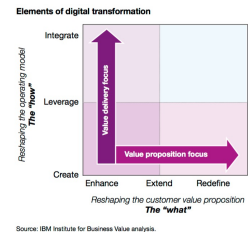b. Reshaping the operating model (how it is delivered).

Elements of digital transformation
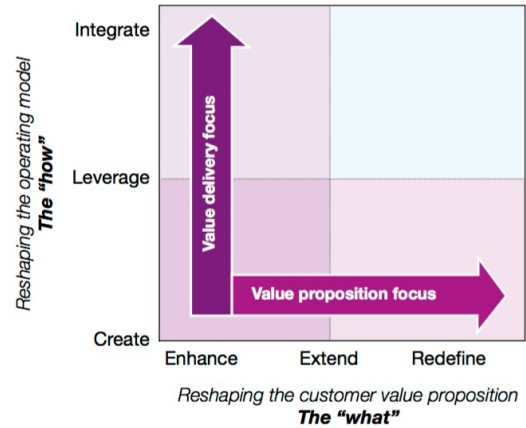
Source: IBM Institute for Business Value analysis.

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University of Rome"Tor Vergata"

Elements of digital transformation

Source: IBM Institute for Business Value analysis.

What: Reshaping the Value Proposition

**Reshaping the customer value proposition**

Enhance or augment physical products or services with digital content, information, insight and engagement	Extend the physical or traditional products and services through digital content, creating new revenue streams	Redefine the value delivered to customers, replace physical with digital or build fully integrated digital/physical value and revenue
Key strategic moves • Augment the customer experience with digital content • Differentiate with digital community • Enhance customer experience across multiple touch-points	**Key strategic moves** • Add new revenue streams to traditional or mostly physical offerings • Create new revenue streams from stretching the brand • Integrate across touch-points to increase sales and transactions	**Key strategic moves** • Design new revenue models in which digital elements replaces physical ones • Recombine or reassemble "information elements" to create new or additional value • Transform the customer experience

Source: IBM Institute for Business Value analysis.

Five Domains of Strategy that Digital is Changing

Across there five domains, digital technologies are redefining many of the underlying principles of strategy and changing the rules by which companies must operate in order to succeed.
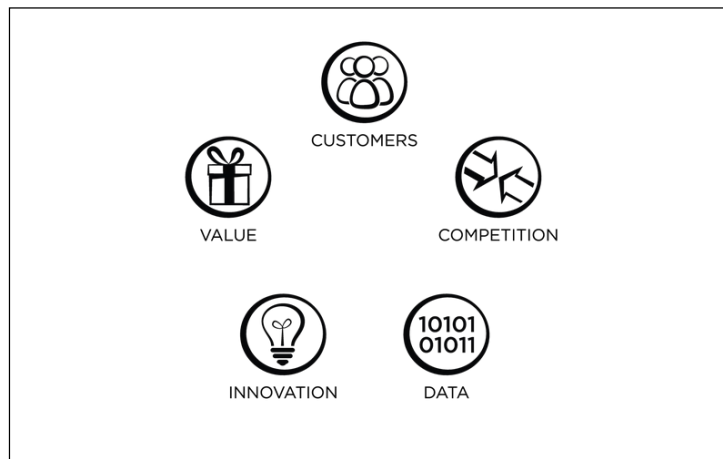
Source: Rogers D.L., The digital transformation playbook, Columbia Business School Publishing, 2016

Customer

CUSTOMERS

- In the digital age, we are moving to a world best described not by mass markets but by customer network.

- Customer are dynamically connected and interacting in ways that are changing their relationships to business and to each other and shaping business reputations and brands.

- Customer use digital tools to discover, evaluate, purchase and use products and how they share, interact and stay connected with brands.

- Therefore, businesses should rethink of their traditional marketing funnel and reexamine their customers' path to purchase.

Competition

COMPETITION

- How businesses compete and cooperate with other firms.

- Industry boundaries are blurring.

- A major shift in the locus of competitors.

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Data

DATA

- How business produce, manage, and utilize information.

- Data generates from every conversation, interaction, or process inside or outside business (think about social media, mobile services, sensors,…)

- The "big data" tools allow firms to make new kinds of predictions, uncover unexpected patterns in business activity and unlock new sources of value.

- Data is a vital part of how every business operates, differentiates itself in the market, and generates new value.

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Innovation

INNOVATION

- The process by which new ideas are developed, tested, and brought to the market by businesses.

- Traditionally, innovation mainly focuses on finished products, where market testing was difficult and costly, and the cost of failure was high.

- Digital technologies enable a very different approach to innovation based on rapid experimentation.

- Digital technologies makes it easier and faster to test ideas, having market feedback. Assumptions are repeatedly tested based on validation by real customers.

- The focus is on minimum viable prototypes that maximize learning while minimizing cost.

Value

VALUE

- Traditionally, a firm's value proposition was seen was as fairly constant. A successful business was one that a clear value proposition, found a point of market differentiation, and focus on executing and delivering the best version of the same value proposition to its customers.

- In the digital age,we can observe changing value propositions and disruption by new competitors.

- Any new technology may be a way to extend and improve the value proportions.

- Businesses need to seize emerging opportunities!

THE DIGITAL TRANSFORMATION PLAYBOOK

DOMAINS	STRATEGIC THEMES	KEY CONCEPTS
CUSTOMERS	Harness customer networks	• reinvented marketing funnel • path to purchase • core behaviors of customer networks
COMPETITION	Build platforms, not just products	• platform business models • (in)direct network effects • (dis)intermediation • competitive value trains
DATA	Turn data into assets	• templates of data value • drivers of big data • data-driven decision making
INNOVATION	Innovate by rapid experimentation	• divergent experimentation • convergent experimentation • minimum viable prototype • paths to scaling up
VALUE	Adapt your value proposition	• concepts of market value • paths out of a declining market • steps to value prop evolution

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Rise of the platform

- Many business models related to digital transformation are platforms business models.
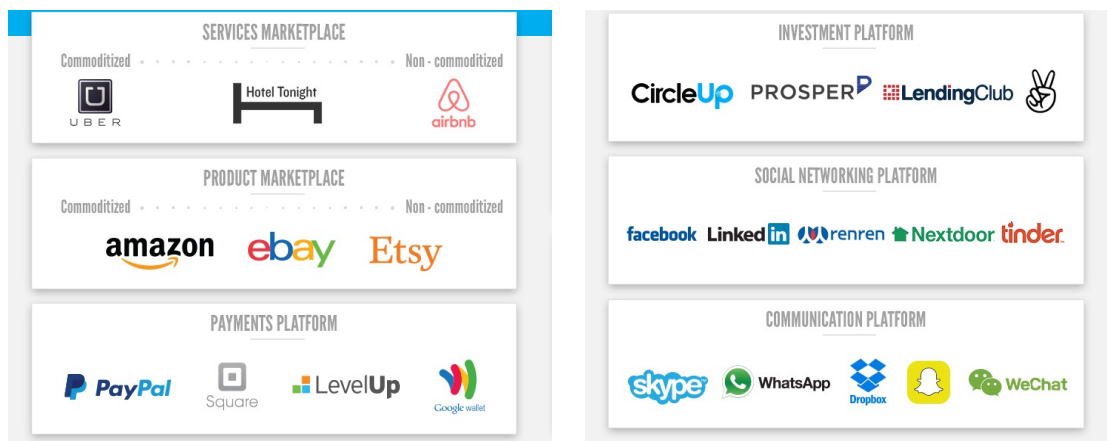
What is a Platform?

- in general "something on which you can build".

- in tech circles may be any underlying software on which additional programs are built.

- in media industries may be a distribution channel.

- in marketing may refer to any brand or product line that could be used to launch additional products.

A definition of Platforms

- "A platform is a business that creates value by facilitating direct interactions between two or more distinct types of customers."

- Three key points:

  1. Distinct types of customers: two or more distinct sides (buyer and seller, software developers and consumers, …)

  2. Direct interaction: direct interactions of two or more sides

  3. Facilitation

Examples of Platforms

Renters ⟷ Hosts

Video viewers ⟷ Video creators
Search advertisers
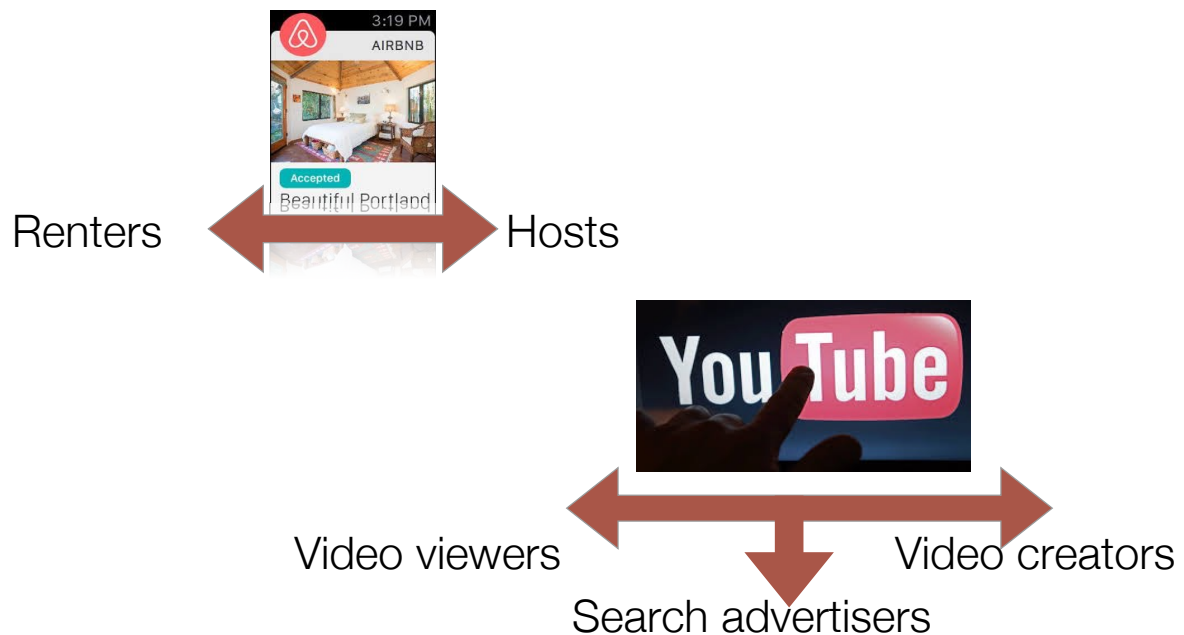
Types of Platforms

Exchange

Bring together two distinct groups
of customers for a direct value exchange.
example: real estate brokers, eBay, Airbnb

Transaction System

Act as an intermediary between different parties
to facilitate payments and financial transactions.
Example: PayPal & Apple Pay

Types of Platforms

Ad-supported media

Play an additional role for creating (or sourcing) media content that is attractive to customers
As platform attract more people, its value to advertisers increases.

Hardware /software standard

Provide a uniform standard for the design of subsequent products to enable their interoperability and the benefit the ultimate consumer.
Apple's iOS and Google's Android

Direct and Indirect Network Effects

- *Network Effect:* the value of platforms increases as more customers use them.

  - *Direct Network Effect: the increase in the number of customers or users of a product drives an increase in value or utility for the same type of user (Facebook)*

  - *Indirect Network Effect: the increase in the number and quality of customers on one side of the platform drives increasing value for customers on the other side of the platform (Airbnb and Paypal).*

How digital impact Platforms?

- Digital technologies are supercharging the growth and power of multisided platforms: web, on-demand cloud computing, application program interfaces (APIs), social media, mobile computing devices,…

- Digital technologies are driving four key elements of platforms:

  1. Frictionless acquisition

  2. Scalable growth
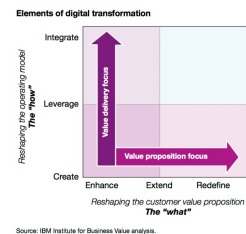
  3. On-demand access and speed

  4. Trust

How digital impact Platforms?

- Frictionless acquisition: Thanks to the Web, APIs, and software development kits, the process of acquiring new customers for a platform is increasingly frictionless.

- Scalable growth: Cloud computing allows any size of business to rapidly scale the size of its platform as fast as it can acquire new customers.

- On-demand access and speed : By mobile computing, any platform can be accessible to all of its customers anywhere at any time.

- Trust: the possibility to authenticate customers through their social media identities (Facebook, Google, Twitter) makes it much easier for businesses to use a verification system for new customers on its platform.

The biggest impact of digital technology on platforms may be in the size of the businesses involved (from large enterprises to start-ups)

Competitive Benefits of Platforms

- Light in Assets: platforms tend to have few assets/employees for the revenue since customers can provide key assets and do much of the work that employees would do in a vertically integrated business. Thus, platform businesses can achieve extremely high operating margins on a percentage basis.

- Scaling fast: cloud computing architecture enables fast grow.

- Winner takes all: it is hard to be a direct competitor to catch up with Google. The real threat to Google is Apple Siri or Amazon's product search, … .

- Economic Efficiency: Platform business models enable the efficient use of distributed resources (labor, assets, skills), the "Sharing Economy".

Elements of digital transformation

Integrate

Leverage

Create

Enhance   Extend   Redefine

Reshaping the customer value proposition
The "what"

Source: IBM Institute for Business Value analysis.

How: reshaping the operating model

Reshaping the operating model

Create	Leverage	Integrate
the basic digital delivery capabilities required to improve operations and engage customers across multiple touch-points	by using information across channels and organizational structures, while optimizing capabilities within each element	and fully optimize all elements of the value delivery around customer touch-points and deliver efficiency/effectiveness

Source: IBM Institute for Business Value analysis.
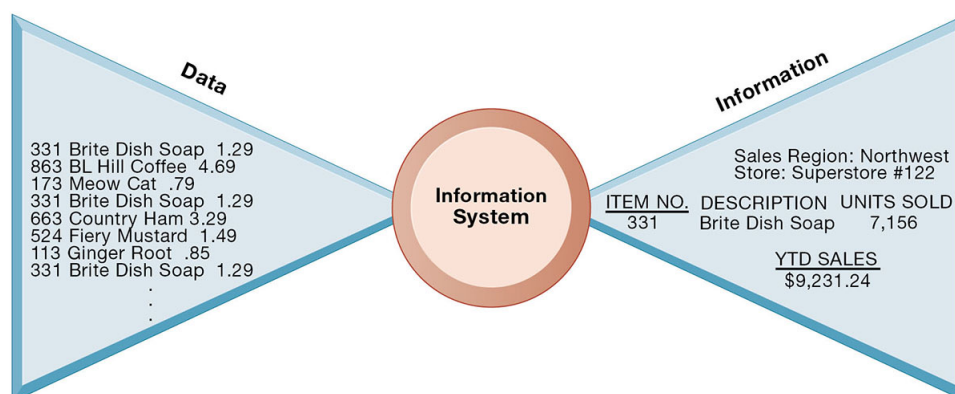
Information System: Definitions

- Information system, an integrated set of components for collecting, storing, and processing data and for providing information, knowledge and digital products. Business firms and other organizations rely on information systems to carry out and manage their operations, interact with their customers and suppliers, and compete in the marketplace.　　　Source: Britannica.com

- An information system (IS) is any organized system for the collection, organization, storage and communication of information. More specifically, it is the study of complementary networks that people and organizations use to collect, filter, process, create and distribute data.　　Source: Wikipedia.com

- The definition of the [M] IS is a structured interacting complex of persons, machines and procedures designed to generate an orderly flow of pertinent information collected from both intra and extra firm sources for use as the basis for decision making …　　　　Source: Axelrod, 1970

The company information system is not only IT hardware & software

Information System: Definition

An Information System leverage on Information Technology (HW and SW) to transform data into information that can be used to support decision making and control as well as operational run the business.
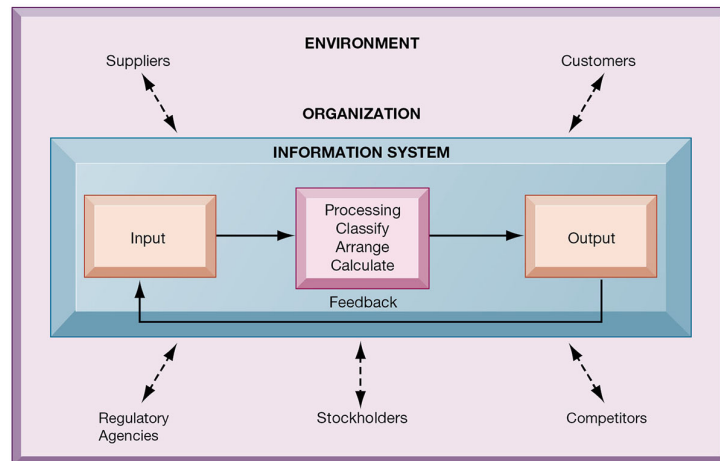

Source: Laudon & Laudon, Management Information Systems, 2018

Information System: Definition

- An Information System includes all those activities required to produce information that will be use to run and manage the business (and the business processes):

  - Input

  - Processing

  - Output

  - Feedback

Source: Laudon & Laudon, Management Information Systems, 2018

Enterprise Resource Planning (ERP) Definition

Enterprise Resource Planning (ERP) is an integrated Enterprise IT system, meaning an IT system that optimizes information, materials, cash across the entire organization.

ERP (enterprise resource planning):

"*framework for organizing, defining, and standardizing the business processes necessary to effectively plan and control an organization so the organization can use its internal knowledge to seek external advantage*".

Source: The Eleventh Edition of the APICS Dictionary (Blackstone and Cox, 2005)

Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) has grown from MRP (Material Requirements Planning) driven by a need for stronger integration between the functional enterprise silos that dominated firms (legacy IT systems).

With the rise of e-Business and the need to integrate multiple sources of information within the enterprise, ERP software has emerged as the standard reference for enterprise IT systems as well as the "digital core" on which digital transformation is built upon.
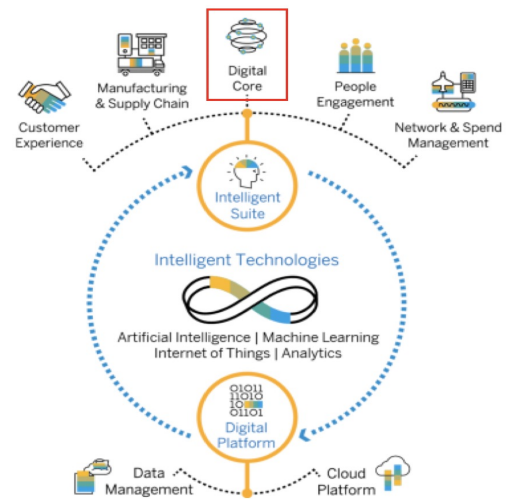
Source: SAP, The Intelligent Enterprise

ERP System structure

ERP provides the backbone for an enterprise-wide information system.

ERP has a **central database** which draws data from and feeds data into **modular applications** that operate on a common computing platform

ERP is based on a **common business model** standardizing business processes and data definitions into a unified IT environment.
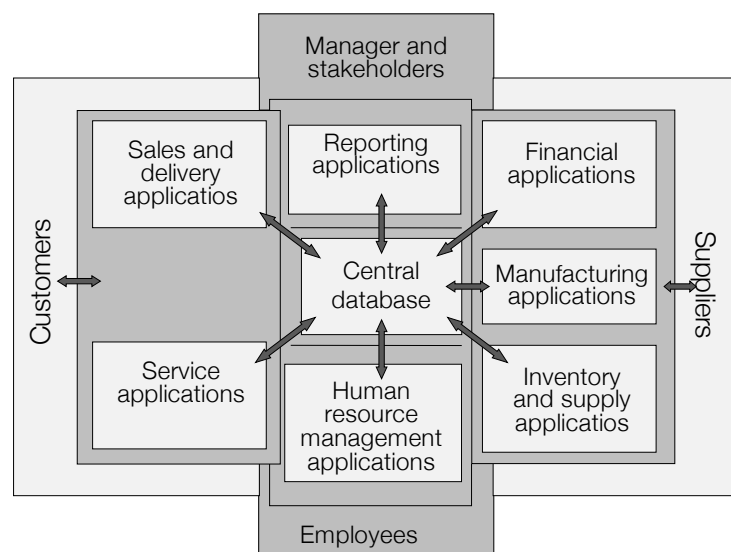
Source: Davenport, Putting the Enterprise into the Enterprise System

ERP system main characteristics

As to data, ERP systems provide:
1. Easier access to reliable, integrated information;
2. Elimination of redundant data;

As to business processes, ERP systems provide:
1. Consistency and visibility across the firm;
2. Rationalization of business processes (cost savings).
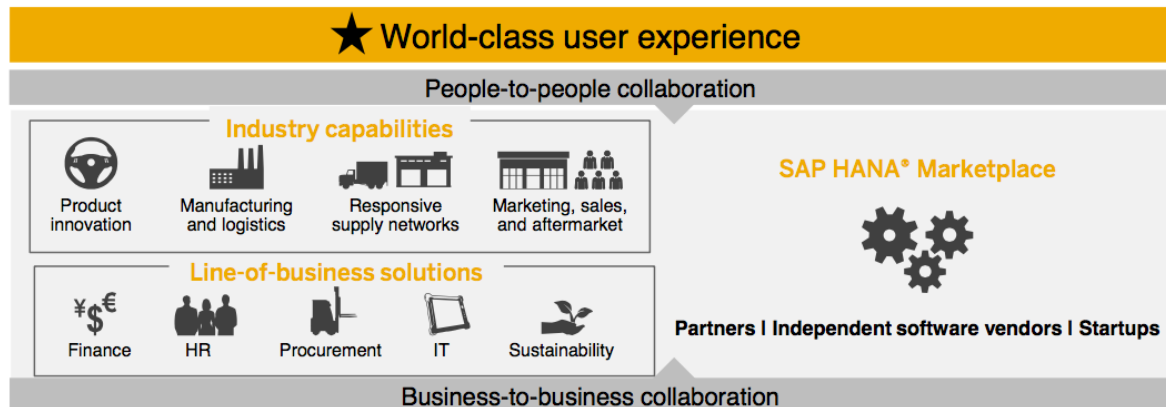
Source: SAP platform solution for Automotive industry   33

ERP common business model

Including all the key processes (industry by industry)
Based on the best practices of leading companies

Enterprise Management	Strategic Enterprise Management	Business Analytics	Business Intelligence & Decision Support	Accounting	Workforce Planning & Alignment
Customer Relationship Management	Customer Engagement	Business Transaction		Order Fulfillment	Customer Service
Design & Marketing	Fashion Industry Market Analysis	Collection Design	Product Data Management	Product & Brand Management	Advertising & Consumer Promotion
Raw Material & Supply Management	Seasonal Demand & procurement Planning	Source Allocation		Purchasing	Inventory Management
Manufacturing	Production Planning	Internal Manufacturing	External & Offshore Manufacturing	Private Label Manufacturing	Product Cost Controlling	Quality Control
Distribution	Distribution Planning	Order Management	Shipping & Transportation	Vendor Managed Inventory	Warehouse Management
Business Support	Human Resources Operations Sourcing & Deployment	Procurement	Financial Supply Chain Management	Treasury / Corporate Finance Management	Fixed Asset Management

Benefits of ERP systems

INTANGIBLE BENEFITS	TANGIBLE BENEFITS
New improved processes	Inventory and/or Personnel reduction
Customer responsiveness	Productivity improvements
Integration	IT and/or procurement cost reduction
Flexibility	No redundant data entry

- ERP systems involve the centralization of control over information and the standardization of processes, consistent with hierarchical, command-and-control organizations

- Real-time access to operating and financial data, ERP allows companies to streamline their management structures, creating *flatter*, more *flexible*, and *more democratic organizations*.

- Multinationals can choose how much uniformity should exist in the way business is carried out in different regions or countries. To preserve *local autonomy* while maintaining a *degree of corporate control*, a company will not implement a single, global ERP but will roll out different versions, tailored to support local operating practices.

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