

Supply Chain Informatics

ACMA4022

Module Introduction

Runnarin Siwapimon

Supply Chain Informatics

Module Aim

- To introduce information systems and recognise that the effectiveness and innovative management of information can sustain organization's competitiveness.
- To develop understanding of the information technologies systems in logistics supply chains.

Learning Outcomes

- Understand the application of information technology and systems in logistics and supply chain management.

Supply Chain Informatics

The study time for the module is divided as follows:

- 10 credit module
- 30 scheduled learning hours
- 70 Independent learning hours.

Activity type	Hours	Percentage
Scheduled learning	30	30%
Independent learning	70	70%
Placement learning	0	0
TOTAL	100	100%

Assessment:

Mode of Assessment	Volume	Weight	Credits
Report	1,500 words	100%	10

- Tentative assignment release on **29th April** & due **10th June**.

Supply Chain Informatics

Module Contents

1. Introduction of Information systems and Information technology
2. Introduction of Logistics & Supply Chain concepts & definitions
3. The benefits and challenges of applying information technology in business
4. Current information systems in organisation (e.g. e-commerce, e-business, ERP, CRM and SCM)
5. Implementation of ERP applications (SAP-ERP)
6. Information systems and technologies for managing Logistics & Supply Chain
7. Knowledge management & Decision making systems in logistics & Supply chain management
8. Future information technologies for supply chain management (AI, Blockchain etc.)

Supply Chain Informatics

Reading list (Essential):

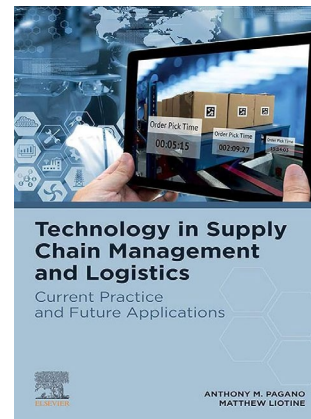
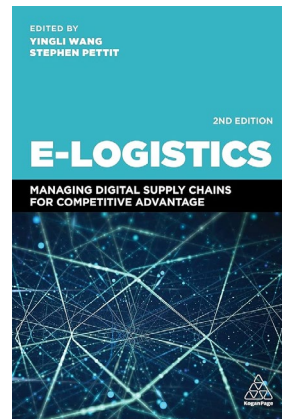
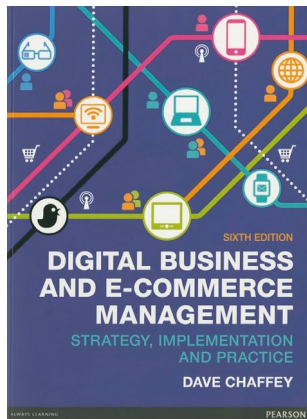
1. Chaffey, D. (2015) **Digital Business and E-Commerce Management** 6th Ed, Harlow: Pearson
2. Wang, Y. and Pettit, S. (2021) **E-Logistics: Managing Digital Supply Chains for Competitive Advantage** London: Kogan Page
3. Pagano, A. and Liotine, M. (2020) **Technology in Supply Chain Management and Logistics : Current Practice and Future Applications** Amsterdam: Elsevier

Online Availability

✓

✓

✓



Online resources link

Supply Chain Informatics

Further Reading List

1.	Rainer K., Prince B. (2021) Introduction to Information Systems 9th Ed, Chichester: Wiley
2.	Information Resources Management Association (2013) Enterprise Resource Planning Concepts, Methodologies, Tools and Applications Hershey PA: Business Science Reference
3.	Mangan, J. (2016) Global Logistics and Supply Chain Management 3rd Ed, Chichester: Wiley
4.	Manners-Bell J., Lyon K. (2022) Logistics and Supply Chain Innovation - A Practical Guide to Disruptive Technologies and New Business Models 2nd Ed, London: Kogan Page

Runnarin Siwapimon

Introduction to Information System

Session overview

1. Definition of data and information
2. Concepts of Information System
3. Components of Information system
4. Levels of information system in organization
5. Current basic Information Systems and technology in Business
6. Roles of Information system in the organization
7. Business Drivers for Information Systems

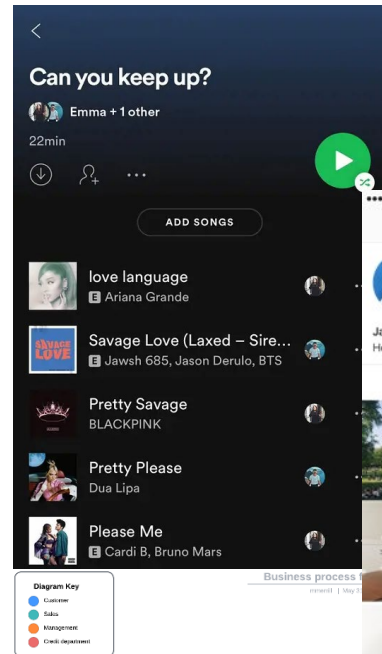
What is information?

Information can be defined as a **processed data** aims for a **purpose** for the recipient to **understand**.

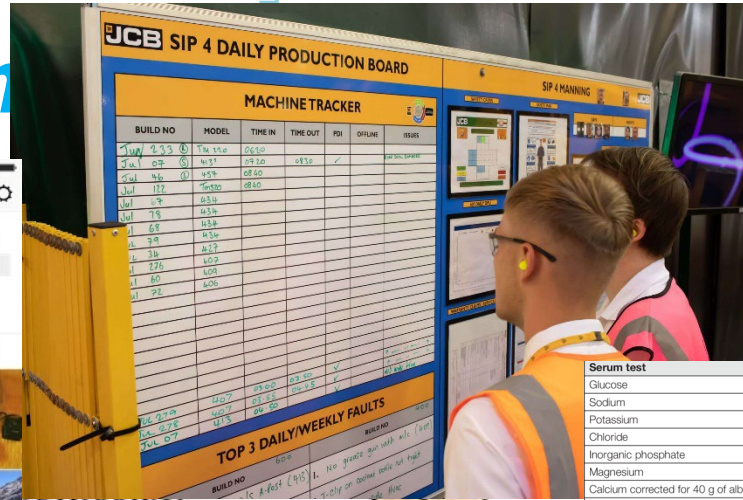
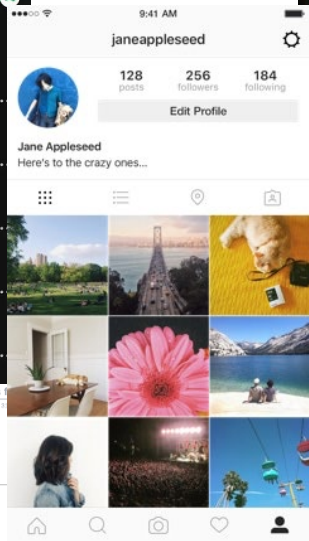


- **Information** will be created when **data** is processed in a manner that has **significance** for the recipient
- Information can be conveyed through various means including language, images, and signs.
- 3 main characteristics of information;
 - ✓ Processed data,
 - ✓ Meaningful
 - ✓ Serve a purpose.

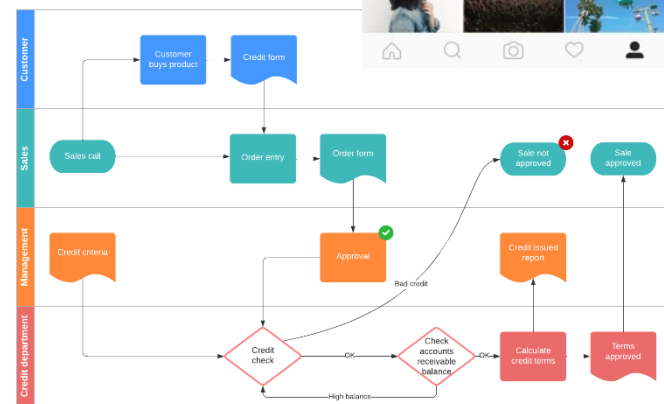
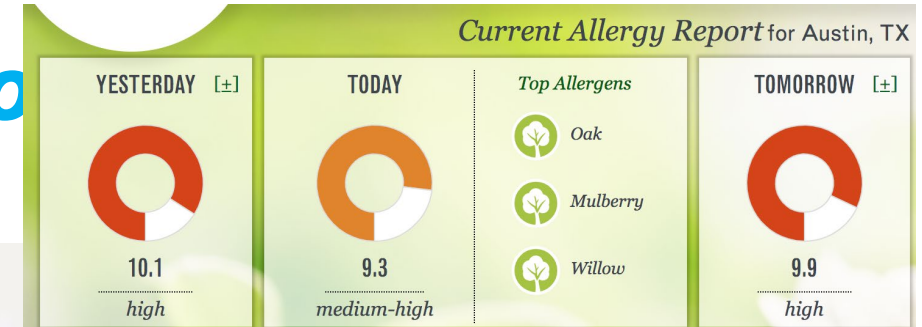
Example of information



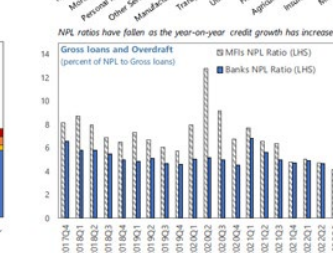
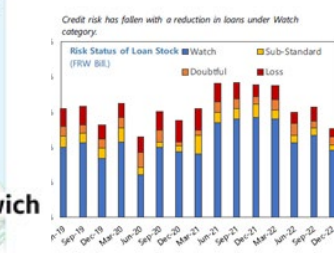
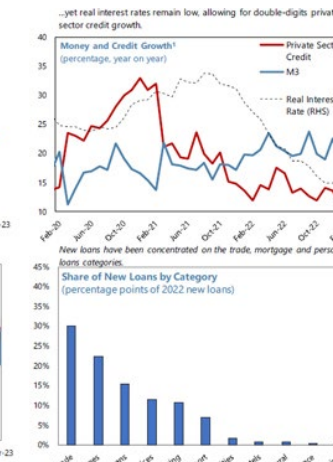
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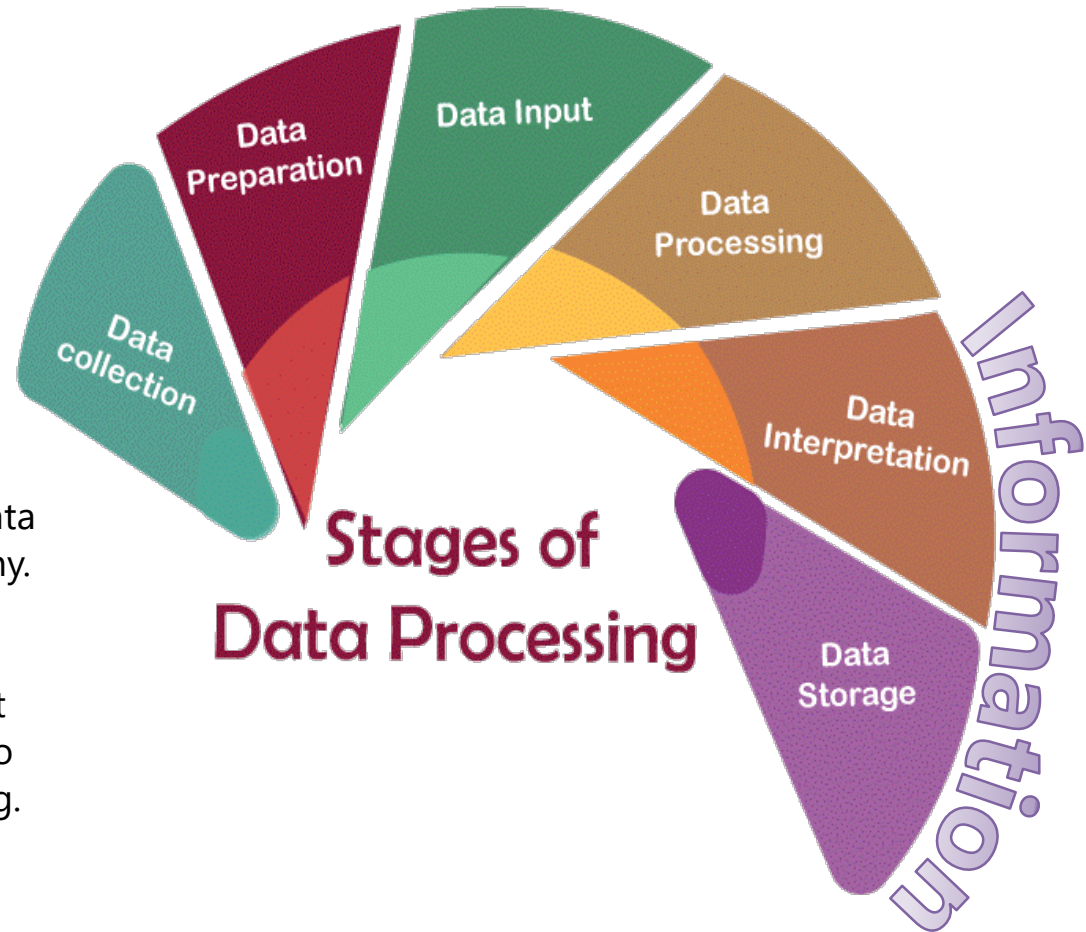
Serum test	Result	Unit	Reference range
Glucose	5.4	mmol/L	3.9 – 5.5
Sodium	138	mmol/L	136 – 144
Potassium	4.0	mmol/L	3.8 – 5.1
Chloride	105	mmol/L	95 – 107
Inorganic phosphate	1.08	mmol/L	0.7 – 1.5
Magnesium	0.84	mmol/L	0.7 – 1.1
Calcium corrected for 40 g of albumin	2.24	mmol/L	2.10 – 2.55
HCO ₃ ⁻	24.3	mmol/L	22.0 – 28.0
Urea	3.9	mmol/L	2.0 – 6.7
Creatinine	73	µmol/L	64 – 104
eGFR (CKD-EPI equation)	1.88	mL/s/1.73m ²	1.50 – 2.50
Uric acid	329	µmol/L	140 – 360
Total bilirubin	23	µmol/L	< 20
ALT	0.43	µkat/L	< 0.73
AST	0.49	µkat/L	< 0.67
GGT	0.48	µkat/L	< 1.77
Alkaline phosphatase	1.36	µkat/L	< 2.5
Total protein	66.6	g/L	64.0 – 79.0
Albumin	44.2	g/L	36.0 – 45.0
Parathyroid hormone intact (1 – 84)	2.6	pmol/L	1.8 – 6.0



Creating valuable Information

Data required a certain *transformation process* to convert data into **information**

- Information depends very much on data, so, the data using in transformation process must be trustworthy.
- Through the stages of data processing, data output can be trustworthy and qualified for the recipient to use for value-added analysis or for decision-making.

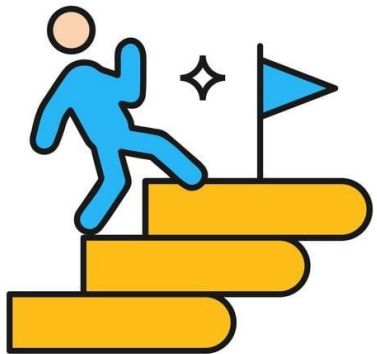


Where business gets the information?



Characteristics of valuable Information

Characteristics	Definitions
Accessible	Information should be easily accessible by authorized users so they can obtain it in the right format and at the right time to meet their needs.
Accurate	Accurate information is error free. In some cases, inaccurate information is generated because inaccurate data is fed into the transformation process
Complete	Complete information contains all the important facts
Economical	Information should also be relatively economical to produce.
Flexible	Flexible information can be used for a variety of purposes.
Relevant	Relevant information is important to the decision maker
Reliable	The reliability of the information depends on the reliability of the data-collection method or the source of the information
Secure	Information should be secure from access by unauthorized users.
Simple	Too much information can cause overload and inability to choose the really important one.
Timely	Timely information is delivered when it is needed
Verifiable	Can be checked to make sure information is correct, perhaps by checking many sources for the same information.

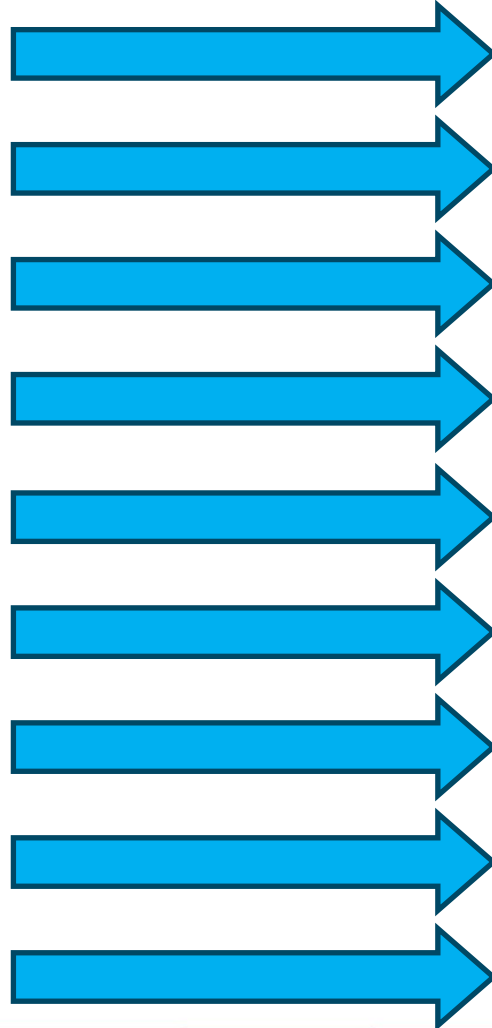


Let's make some tests !



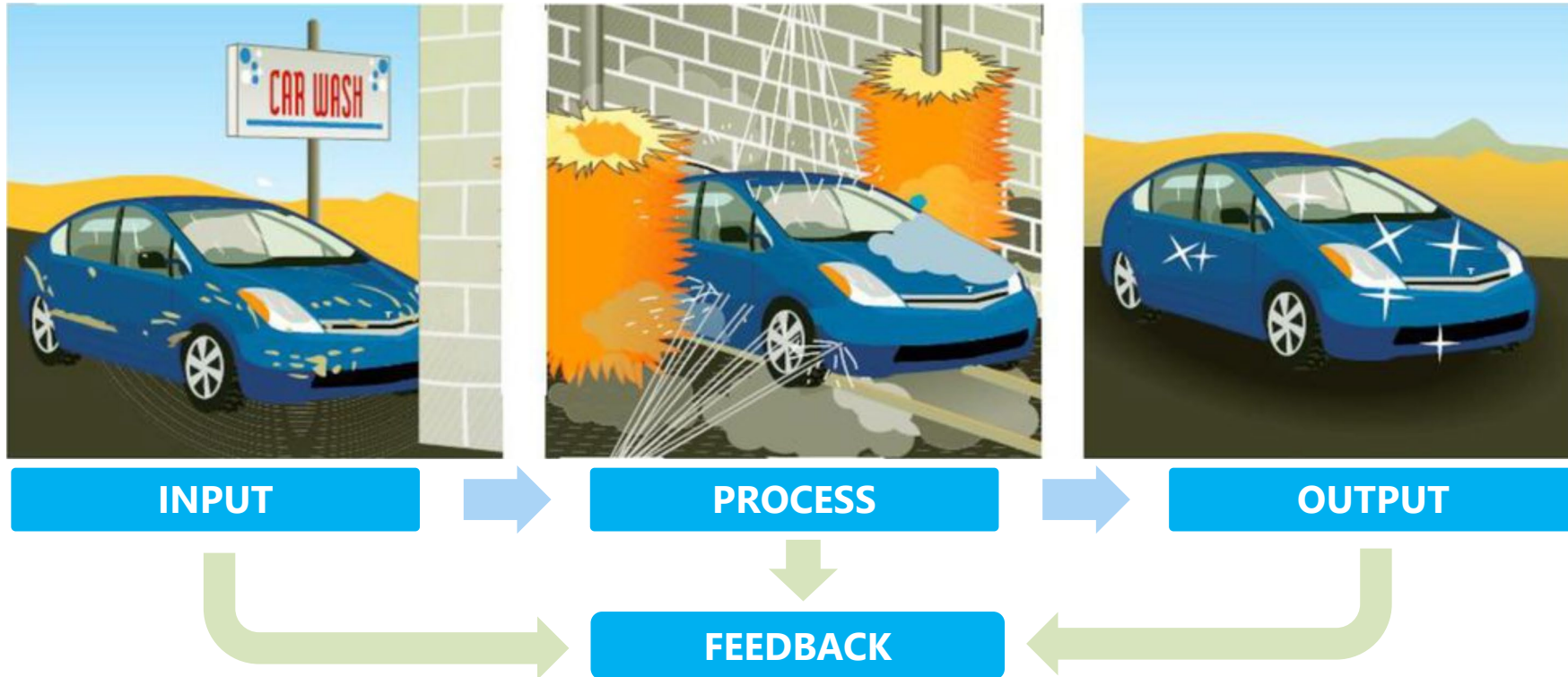
Data or Information ?

- Come in the form of symbols, numbers, words → DATA
- Come in the form of tables, graphs → INFORMATION
- Have meaningful context → INFORMATION
- Can be used for decision-making → INFORMATION
- Unorganised and meaningless → DATA
- Dates → DATA
- Bus timetable → INFORMATION
- Product price comparison → INFORMATION
- Customers' survey responses → DATA

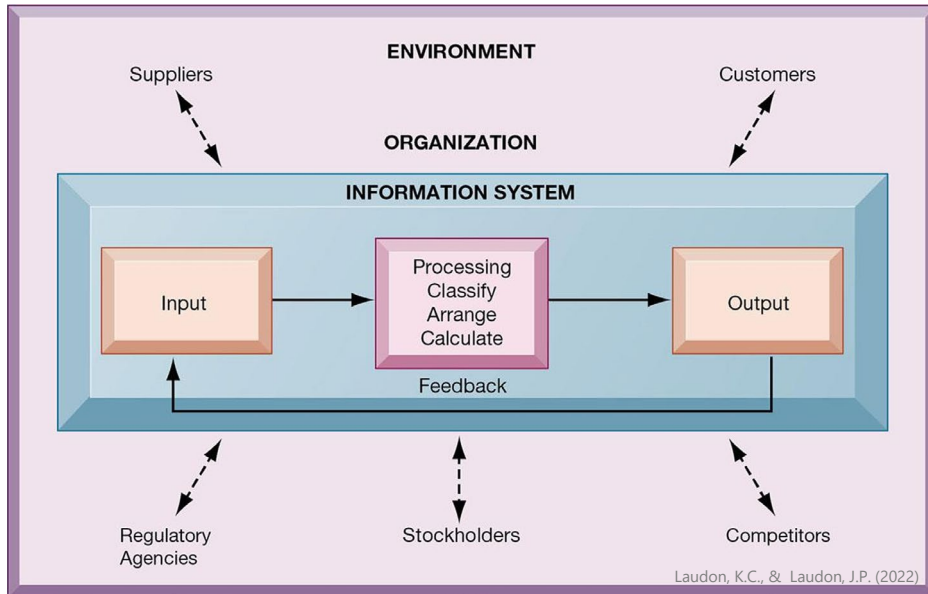


And...What is the system?

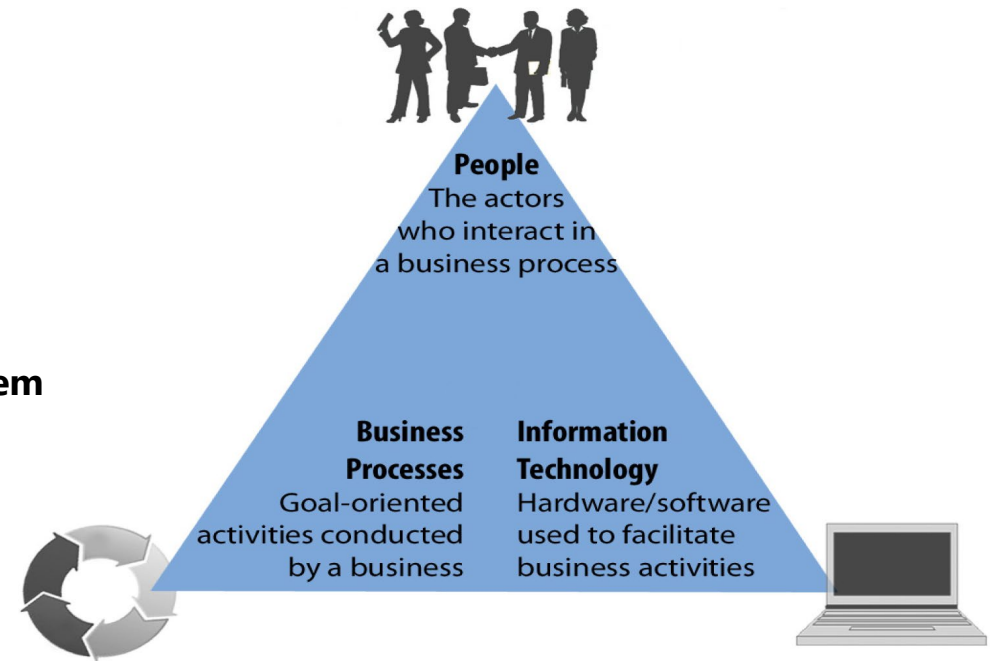
System is a set of components that work together relatively to meet a certain goal.



Information System (IS)



- **Information System** define as a set of interrelated components that work for collect, retrieve, process, store, and distribute information to support decision making and control in an organization.



- **Information Technology (IT)** is used to built **Information System** in the organization.
- IT as part of Information system's components, adding people & process will then be considered as an Information System.
- Investments and good managing of IS components will result in superior returns for the organization.

Components of Information System

The visible & touchable technology
e.g. computers, tablets, mobile
phones, disk drives, and more

A series of steps undertaken to achieve a
desired outcome or goal. Integrated with
organizations' processes to improve the
operation and get better control



Intangible technology programmed, written to
instruct the hardware.

Operating-system software makes hardware
usable (e.g. IOS, Windows). Applications generate
something useful (e.g. Microsoft Offices,
Microsoft Teams, Outlook email).

A collection of non-disputable facts and will be
aggregated, indexed, and organized into value
information.

Big Data, Data Warehouse, Data Mining are
used for database management

From the front-line workers up to the chief information
officer (CIO), all people involved with the information are
essential because they collecting, develop, use, exploit it.

Levels & Types of IS in the organization



Strategic Level

Strategic long-term decisions for survivability. Output is for executives.

Examples: 5-year sales forecasting, New DC location, Market expansion.

Management Level

Tactical decisions for implementing business processes such as productivity, profitability.

Output is for managers to monitor/ control the performance and project.

Examples: Demand forecasting, Inventory projection, Order fulfilment KPI report

Operation Level

For routine, day-to-day operations within individual function.
Output is transactional reports from running processes.

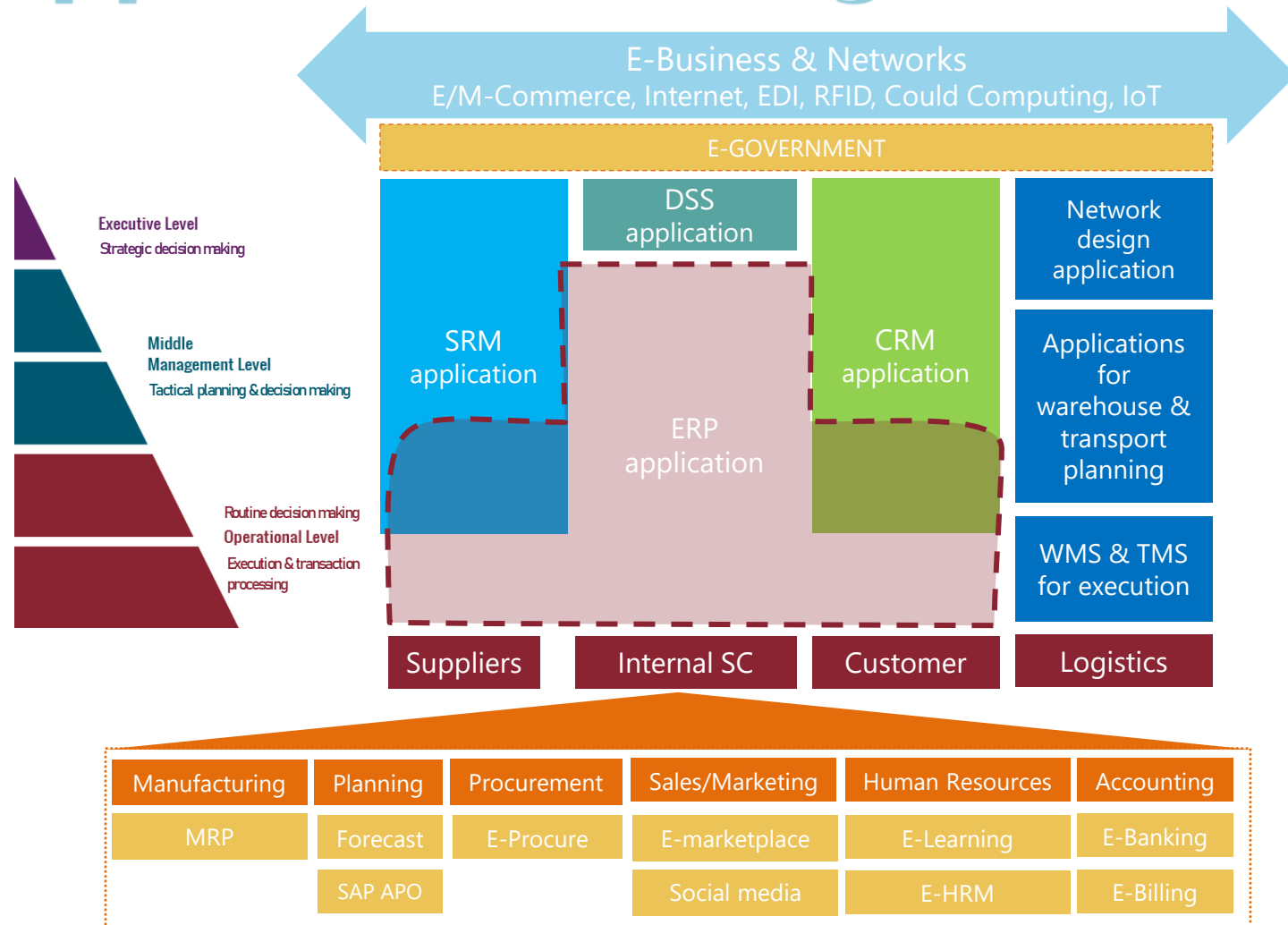
Examples: Picking status tracking in Warehousing, Truck loading scheduling in Logistics dept.

Examples of IS in the organization

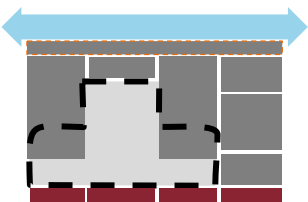


Sales & Marketing	Finance	Human Resources	Production	Supply Chain	Logistics
5-year sales forecast - New market approach	Long term profit planning	- Welfare policy - Organization structures	- New plant location - New machine development	- Supplier switching - New contract manufacturing	- New DC location - EDI development
- Order fulfilment indicators - Customer satisfaction analysis - Pricing setup	- Yearly budgeting - Credit analysis - Company's investment portfolio	- Skill matrix - Career development plan - Performance appraisal	- New product design - Production planning - Production bottleneck analysis	- Demand Projection - Safety stock & inventory control - Supply performance indicators	- Service level indicators - Storage layout - Storage classification - Transport Routing plan
- Order processing - Customer complaint logs - Product return tracking	- AR tracking - Credit controlling - Bill placement scheduling	- Training records - Overtime records - Job descriptions	- Daily production scheduling - Machine maintenance scheduling - Materials scheduling	- Stock quota & allocation - Purchase orders tracking - VAS scheduling	- Picking scheduling - Truck loading scheduling - Stock replenishment

IS applications in organizations

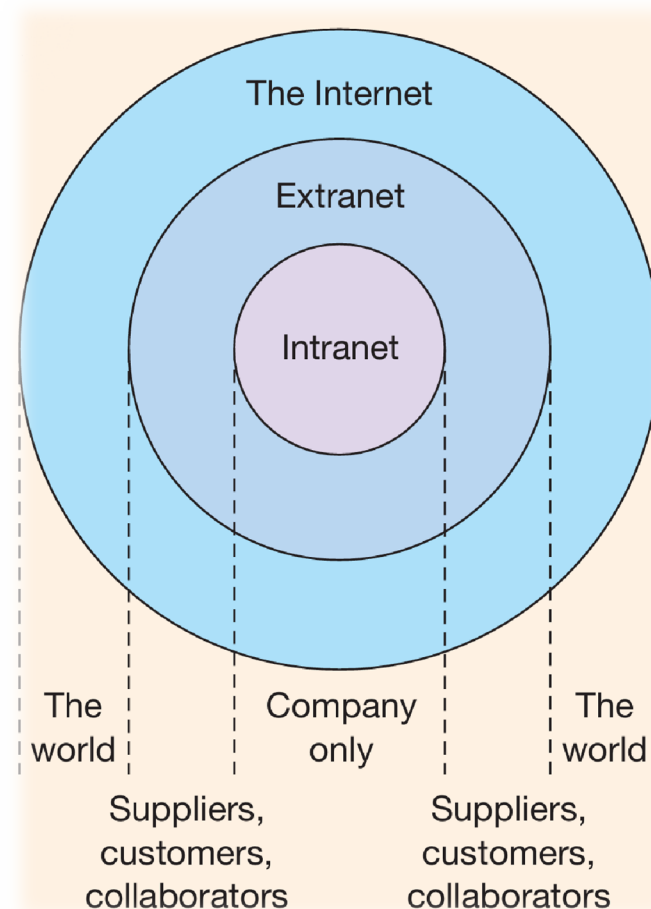


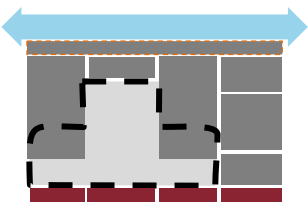
Adopt from 2008 Pearson, *Introduction to Operations and Supply Chain Management*, Bozarth and Handfield



Internet, Intranet & Extranet

- **Internet** is an interconnected networks that links connecting devices all over the world: the WWW, E-mail, streaming, virtual meetings, e-marketplace etc.
- **Intranet** is A private network within a company using Internet to enable employees to access and share information within a company. It has firewall protecting the connection to internal users only. Intranet can be used for company's applications such as ERP, SharePoint, E-learning, Yammer etc.
- **Extranet** extend a private network on to the internet with special access or authorization to business partners outside the organization such as suppliers or customers. Examples are EDI, Purchasing order portal, POS portal etc.





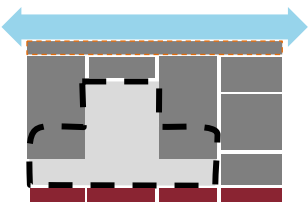
E-Business & communications

E-business : Business model that using information communication technology to use electronic transmissions to conduct business between buyer and seller.

EDI (Electronic Data Interchange) : A standardized data-transmission format for electronic transactions between business partners using a fixed standard configuration. Common documents e.g. purchase orders, sale requests, delivery notes, invoices, etc.

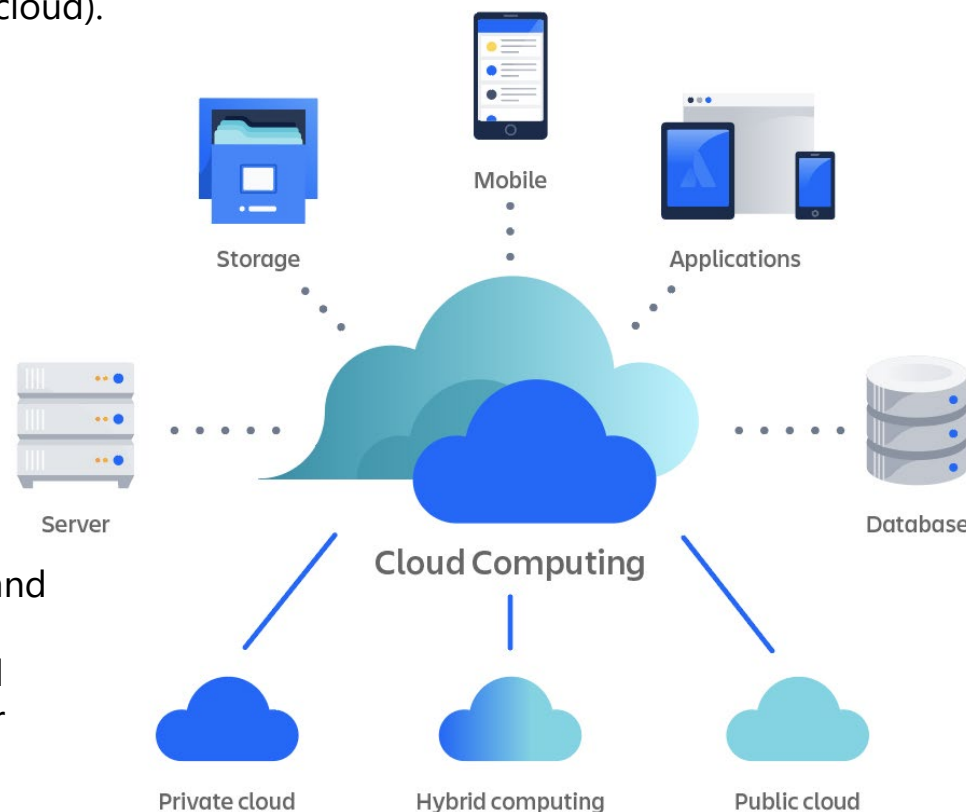
Social Networking or Social media : A digital platform for people to interact to create, share and exchange information and ideas in virtual communities and networks.





Cloud computing

Cloud computing is the delivery of computing resources — including processing, databases, networking, analytics, and software applications — over the internet (the cloud).



Private Cloud

The computing resources are dedicated and isolated by customer. Ranging from the hardware to sometimes even the physical placement of the servers. Mostly used for companies that required enhance data security.

Public Cloud

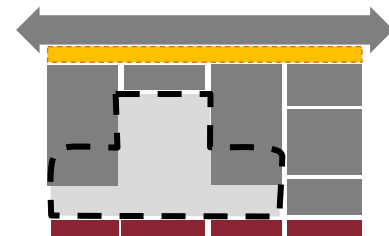
represents a majority of the current market share. Cloud providers own and operate all hardware, software, and other supporting infrastructure offering 'plug in and play' services for anyone.

E-Government

E-government are defined as service delivery within government — as well as between government and the public — using information and communication technologies.

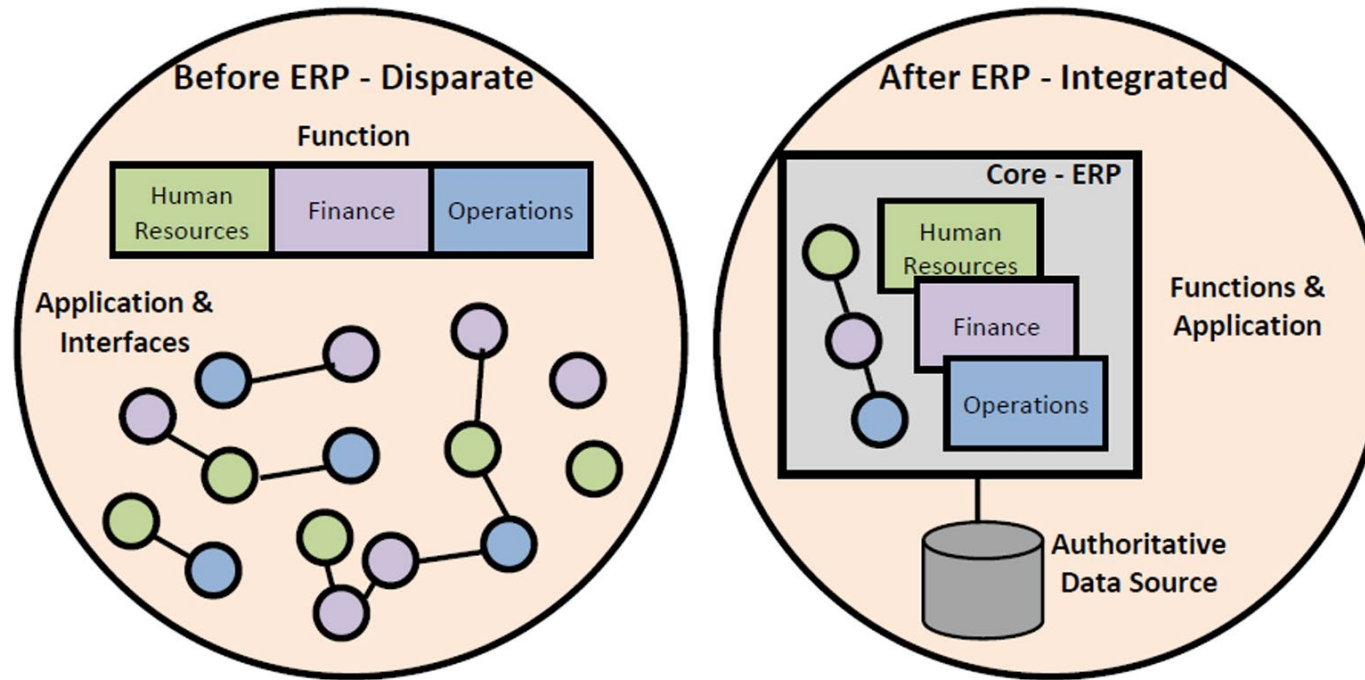
Common digital services range from filling tax returns to renewing a driver's license. Nearly any government form or service can now be offered digitally to facilitate and governance the total supply chain.

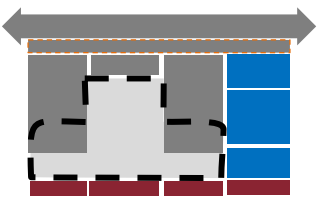
Examples of e-government in Supply Chain can be seen in Port authority services such as paper-less custom process or RFID links to the port operations. Product FDA declaration process.



Enterprise Resource Planning (ERP)

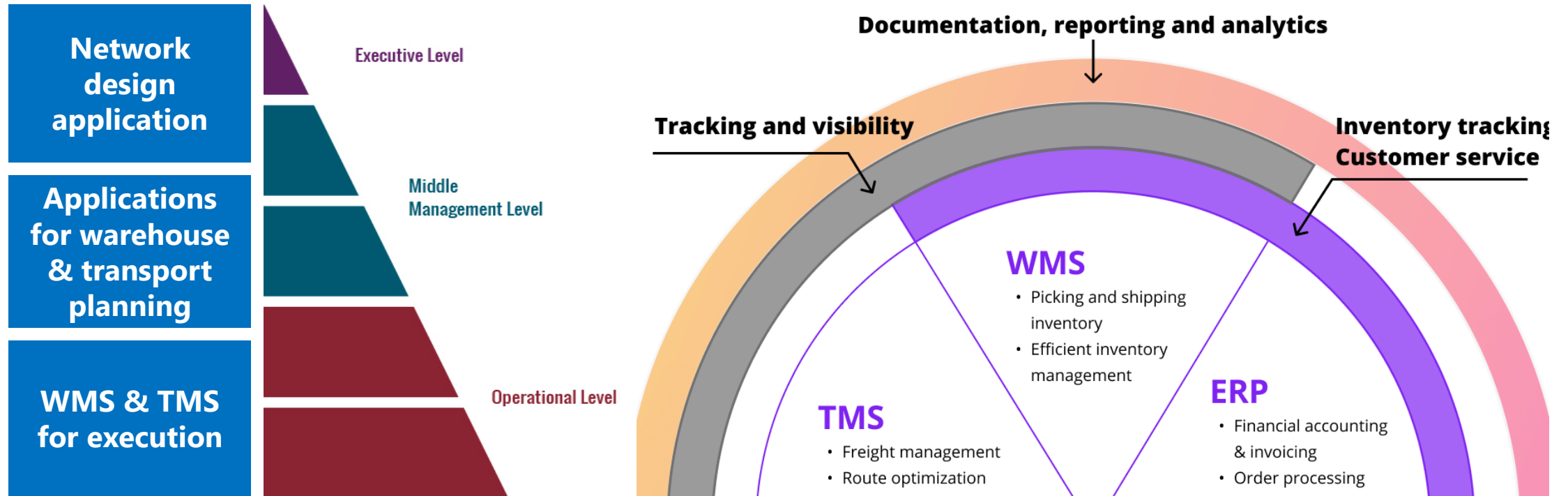
ERP is an integrated system that allows information to enter at a single point in the process and updates a single shared database for all functions that directly or indirectly depend on this information.





E-Logistics

E-Logistics implies the use of information and communication technology to support the planning and operations in logistics activities.

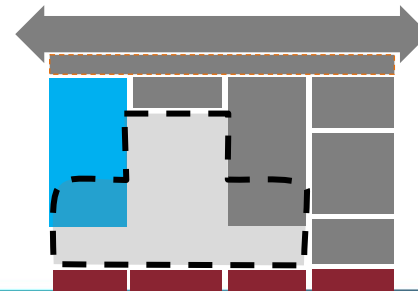


Supplier Relationship Management(SRM)

SRM is a computer-based information system designed to plan and manage the firm's external linkages with its suppliers.

SRM application benefits companies in many aspects;

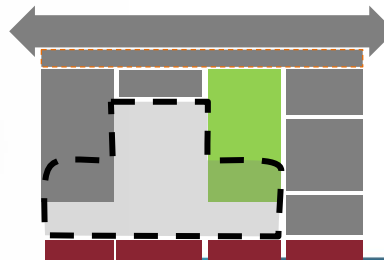
- Reduce costs from automate transactions
- Better-managing risks in supply shortage or price fluctuation
- Enhance supplier responsiveness & collaboration
- Improve visibility on current surroundings



Customer Relationship Management(CRM)

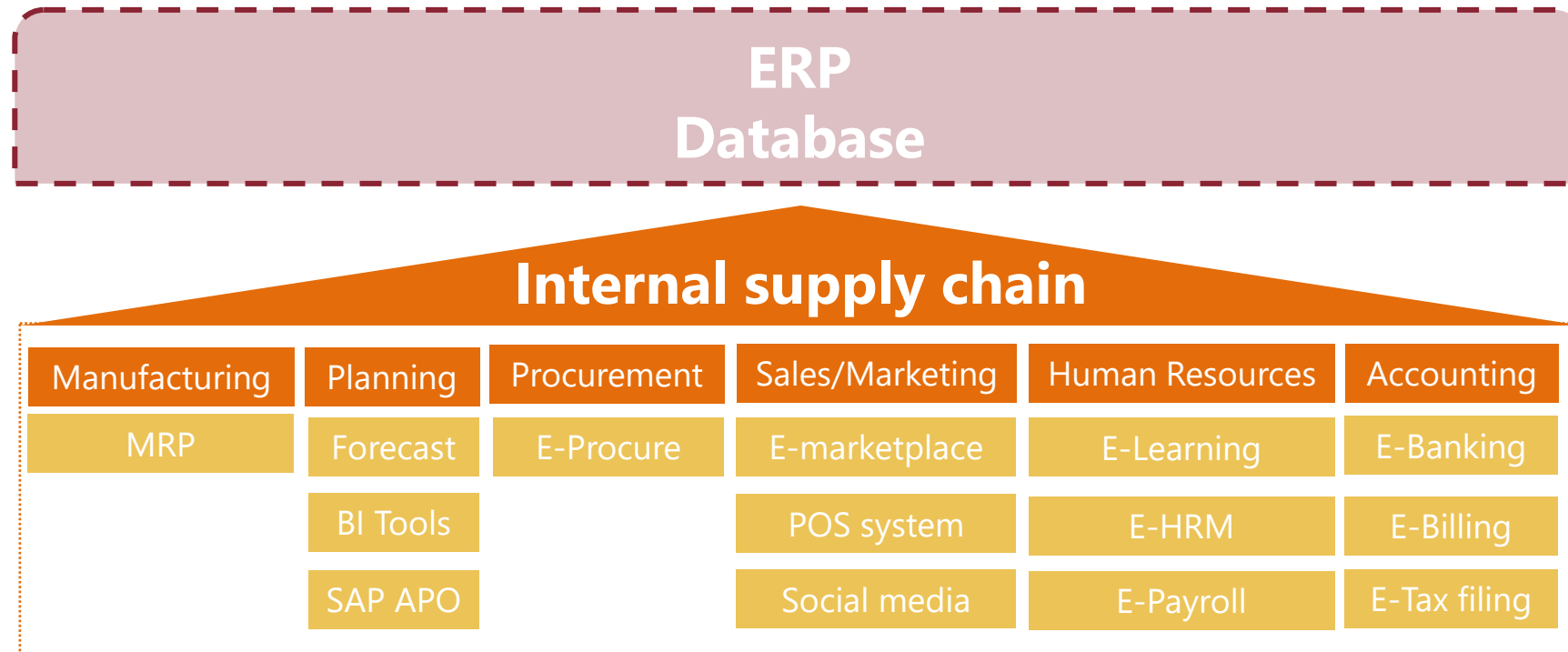
CRM is a software application that helps businesses keep track of their customer interactions and improve their relationships with customers.

CRM data can be used to target marketing efforts, improve customer service, and measure sales performance.



Functional area applications

Within an organization, chain of activities or functions are internal supply chain. Apart from ERP system that integrate company's database, separated systems are used for supporting functional tasks. These functional system may or may not link with the ERP system.



Roles of IS in transforming business

Roles of IS has expanded over time.
IS changes the way firms handling their business.

1960s – 1980s

Functional system base.
Mainly used for storage and support operations decision makings.

Example : MRP

1980s – 2000s

Integration across organizations.
Supported critical strategic decisions.

Example : Expert systems, ERP, TMS, WMS

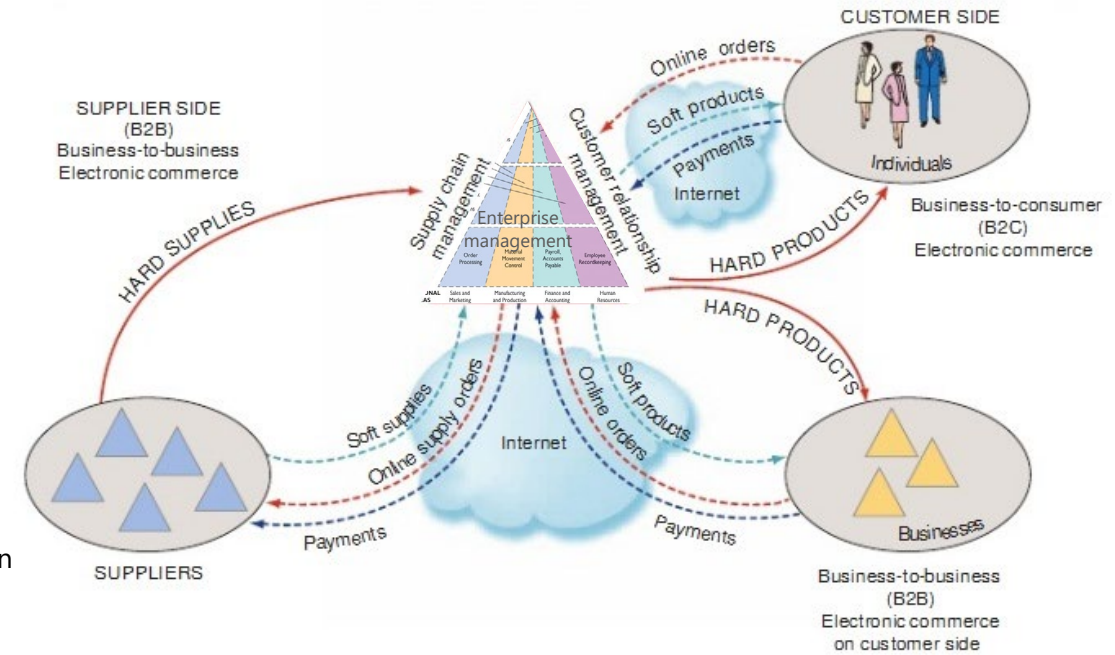
2000s – Present

A key success for surviving in global economy.

Emerging of **e-business** model & digital firms.

More collaboration and prediction capability

Example : CRM, ML, AI



Organisations need to make use of all the technology to gain access to valuable information and insights over their rivals.

The invention of the
world wide web
changed
everything



online shopping

is the most popular activity for half of all web users...

which is about
25,000,000

give or
take a few



you'll try on virtual dresses
in a virtual dressing room

can't wait for

delivery?

you'll click and collect from a store
of your choice

for **FREE**

buy,
stream,
download,
and collect all in one place...

you'll chat to people
about products

you'll
research

you'll
compare

you'll find the
best brands
to suit you

30 billion pieces of information
are shared on Facebook each month



if Facebook was a country...
it would have the world's 3rd largest population



the internet
brings us
together

around **26 million**
people in the UK use social
networking sites



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Trawsnewid Addysg; Trawsnewid Bywydau
Transforming Education; Transforming Lives

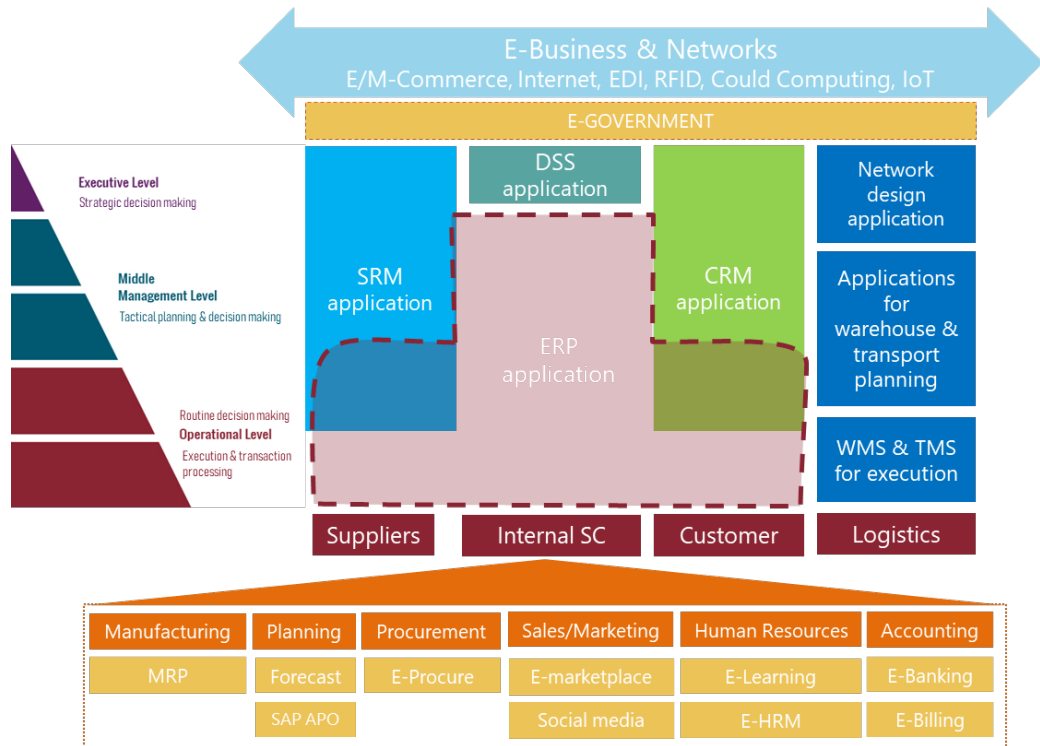
Strategic goals of Information Systems

"Good flow of value information is vital for conducting every business"

Businesses invest in IS to achieve 6 important business strategic objectives

1. Operational excellence
2. New products, services, and business models
3. Customer and supplier intimacy
4. Improved decision making
5. Competitive advantage
6. Survival

Conclusions



- There are 3 important points to define "information".
 1. It needs "Process" to produce information.
 2. Information has to be meaningful & create value to the recipient.
 3. There must be requirement or purpose to use for.
- Information Technology — hardware, software, and data — adding people & process will then be considered as an Information System.
- To become more competitive and efficient, organisations tries to transform themselves into digital firm, all core business processes and relationships with related partners are now digitally enabled with best efforts to invest in information system & technology.
- Information technology is realised as the vast opportunities to develop and apply their innovative solutions into the current practices in supply chain & logistics industry.



THANK YOU