Introduction to Management Information Systems

history

I come from Ireland

Dr Séamus Lyons

I worked near London
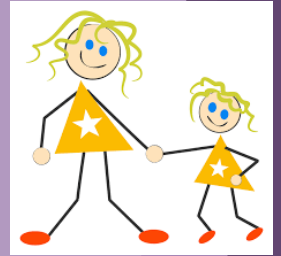
I now live in Thailand

Thailand

I am married with two daughters

I am a vegan & like Thai food

I like sport

I make videos on YouTube

Lectures: Monday, Thursday
11.0 am – 12.30 pm
ICB1210

course syllabus

Course Content	Hours
Foundation of Information Systems	9
Computer Systems	6
Telecommunications and Networks	6
Data Resource Management and DSS	9
Business Application	9
Functional Applications of Information Systems	6
Total	45

Foundation of Information Systems

1. Introduction to Information
2. Introduction to Information Systems

Computer Systems

1. Hardware
2. Software

Telecommunications and Networks

1. Computer Networks
2. Wireless Networks & Security

Data Resource Management and DSS

1. Database Design & SQL
2. Data-based Systems
3. Decision Support Systems

Business Application

1. System Acquisition
2. System Development Lifecycle
3. Project Management

Functional Applications of Information Systems

1. Enterprise Information Systems
2. Functional Information Systems

normal syllabus

	Content	hours
1	Introduction to Information	3
2	Introduction to Information Systems	3
3	Introduction to Business Information Systems	3
4	Hardware	3
5	Software	3
6	Computer networks	3
7	Wireless networks & security	3
8	Database Design & SQL	3
9	Data-based Systems	3
10	Decision Support Systems	3
11	System Acquisition	3
12	System Development Lifecycle	3
13	Project Management	3
14	Enterprise Information Systems	3
15	Functional Information Systems	3

Using AI

Artificial Intelligence (e.g. Chat GPT)
may not be used in graded parts of the course,
e.g. assignments and exams.

Students caught cheating will be subject to
CMU disciplinary procedures
which could lead to failing the course
or being dismissed from the University.

weeks 1 to 7

11th November to 27th December

reading week

30th December – 3rd January

mid-term exams

6th – 10th January

weeks 8 to 15

20th January to 7th March

final exams

10th - 21st March

Mon	Thurs	Monday	Thursday
11-Nov-24	14-Nov-24	Introduction to Information	Need for Information Systems
18-Nov-24	21-Nov-24	Introduction to Information Systems	Inside a Computer
25-Nov-24	28-Nov-24	Hardware	Device Software
2-Dec-24	5-Dec-24	Software	fathers day
9-Dec-24	12-Dec-24	Computer networks	Network Seminar
16-Dec-24	19-Dec-24	Wireless networks	Network Security
23-Dec-24	26-Dec-24	review	*Dec-26*
30-Dec-24	2-Jan-25	reading week	reading week
6-Jan-25	9-Jan-25	midterm exams	midterm exams

Mon	Thurs	Monday	Thursday
13-Jan-25	16-Jan-25	Databases I	database design 1
20-Jan-25	20-Jan-25	Data Systems I	database design 2
27-Jan-25	27-Jan-25	Data Systems II	database design 3
3-Feb-25	3-Feb-25	DSS	business data insight
10-Feb-25	10-Feb-25	SDLC	Project Management
17-Feb-25	17-Feb-25	System Acquisition	Management IS II
24-Feb-25	24-Feb-25	Management IS I	Enterprise IS 1
3-Mar-25	3-Mar-25	Enterprise IS II	review
14-Oct-24	17-Oct-24	final exams	final exams
21-Oct-24	24-Oct-24	final exams	final exams

10%   participation

30%   assignments

       15% #1 - before midterm

       15% #2 - after midterm

30%   midterm exam

30%   final exam

#1 15%
before midterm
group work case study
- deliverables include a group report before midterm & student-led lessons later

 #2   15%
after midterm
- individual assignment

course material

Mango

you can still use Teams for chat

course website

https://www.alps.academy/management-information-systems/

course details, all lessons pdf, and full notes

Introduction to Information

Foundations of Information Systems

- distinguish between data, information and knowledge
- describe and evaluate information quality in terms of its characteristics
- classify decisions by type and organizational level
- identify the information needed to support decisions made at different organisational levels
- identify some of the tools and techniques used to help make decisions

An information system is a set of hardware, software, data, people, and procedures that work together to produce information
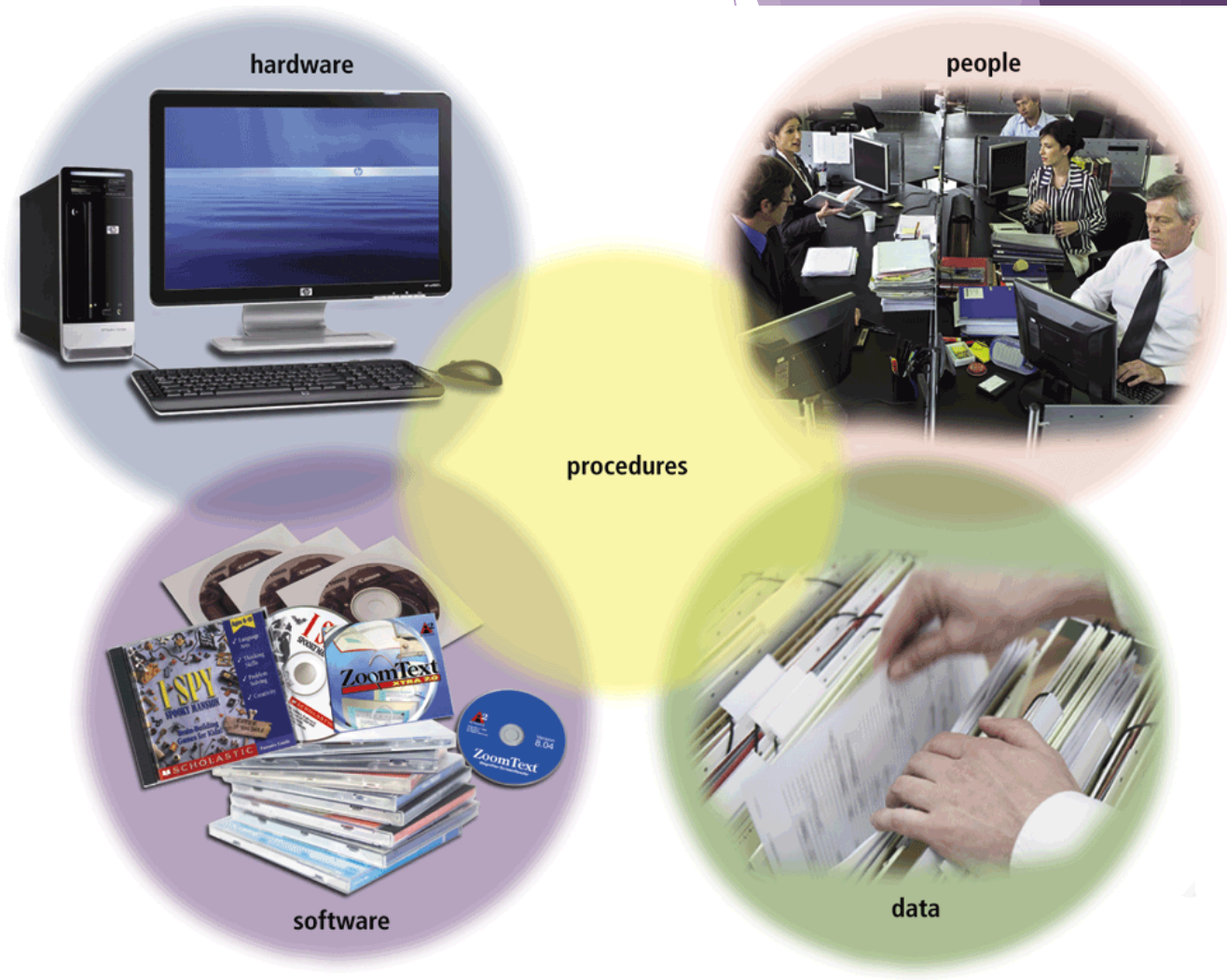
hardware

people

procedures

ZoomText

software

data

a system

provides information

needed by managers

to support activities

in achieving business objectives

definition

A management information system (MIS) is an information system used for decision-making, and for the coordination, control, analysis, and visualization of information in an organization.

The study of the management information systems involves people, processes and technology in an organizational context
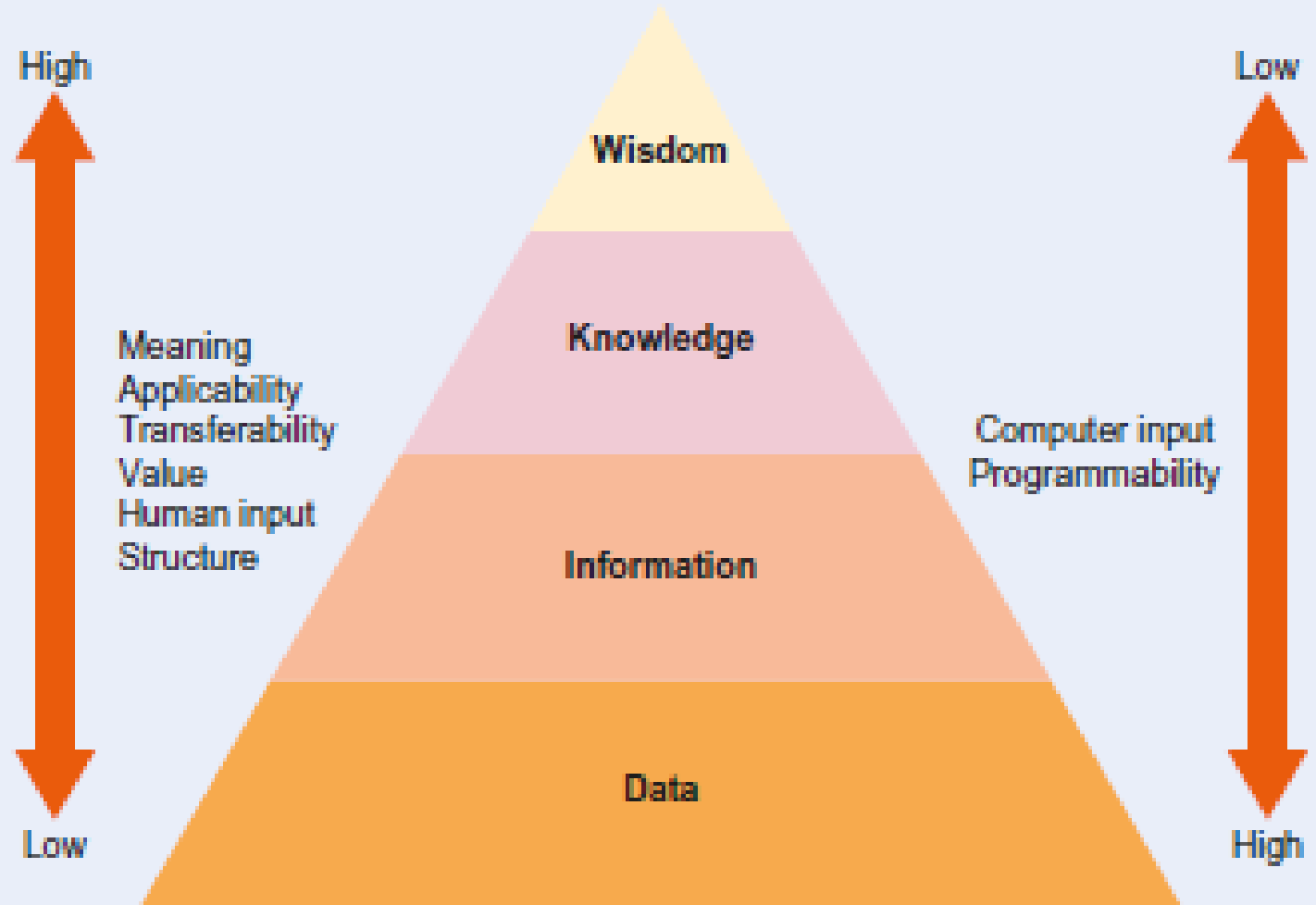
https://en.wikipedia.org/wiki/Management_information_system
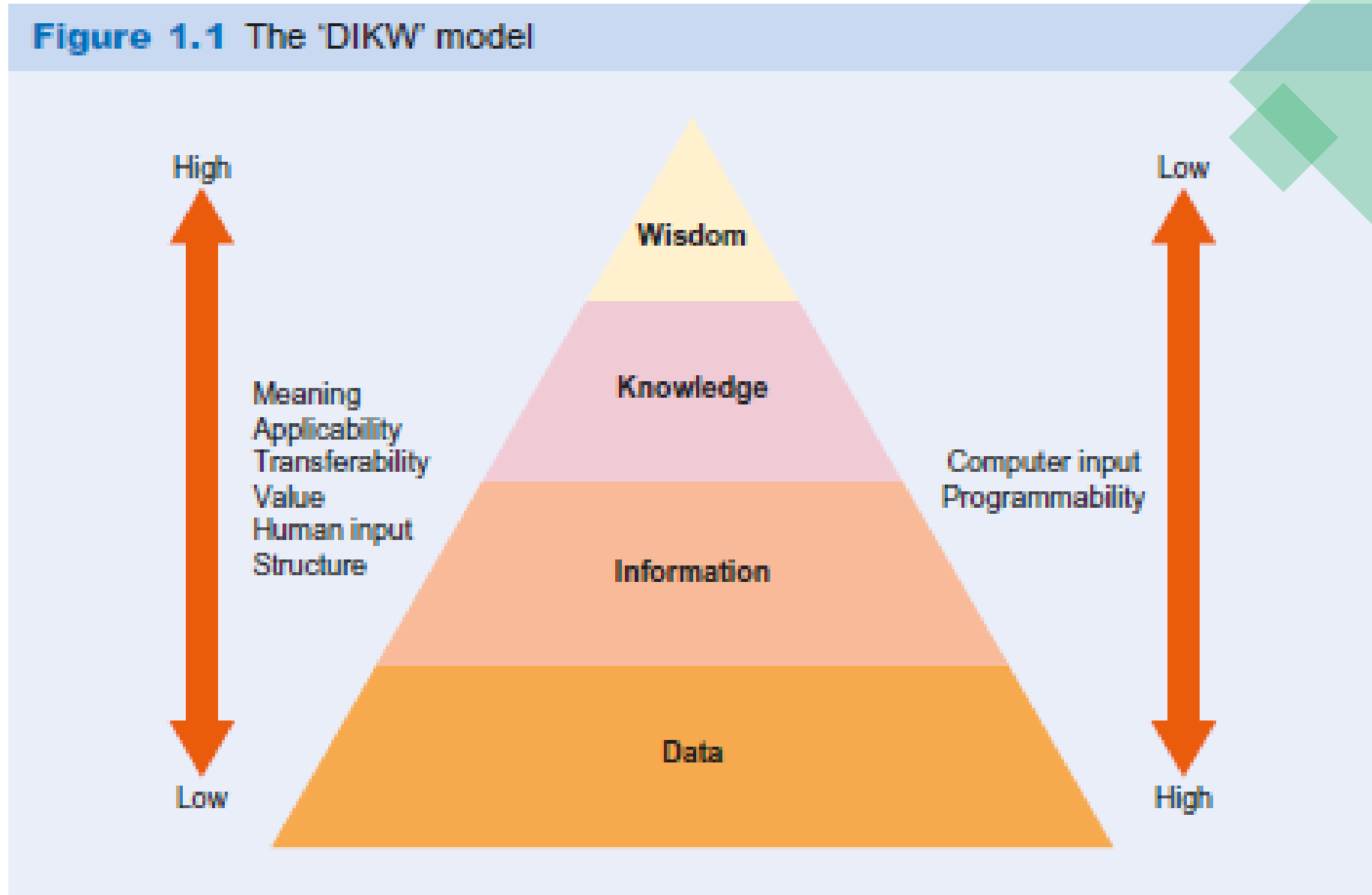
Data & Information

Data
- raw facts
- not random

Figure 1.1 The 'DIKW' model

Wisdom

Knowledge

Information

Data

High / Low

Meaning
Applicability
Transferability
Value
Human input
Structure

Computer input
Programmability

Low / High

Data & Information

Information

- data processed for a purpose

Figure 1.1 The 'DIKW' model

- transform data using a process
- data in a meaningful context
- response to an information need
- reduce uncertainty to improve decisions

data → transformation process → information

information value

- ▶ Consider cost of getting the information
- ▶ **Tangible value**
  - ▶ Financial value
- ▶ **Intangible value**
  - ▶ Can't always calculate value
  - ▶ Improved decision
  - ▶ Example : Savings implementing a new system

Formal information

Reports, specific purpose

- Benefits:
  - Consistent, same format, structured
  - Accurate, relevant, comprehensive, use templates
- Disadvantages:
  - Inflexible, limited, can overlook information
  - Ignores opinions, important context

informal information

Can be important, conversational

- Upside:
  - Flexible, freedom, more details
  - Liked by some clients – builds relationships
- Downside:
  - Can lack accuracy & relevance, slow & inefficient
  - Restricted (can't deal with large volumes of data)
  - Can be ignored, highly selective

'good' information

▶ Accurate   correct and verifiable

▶ Complete   yet concise

▶ Cost effective   affordable, beneficial

▶ Current   up-to-date, relevant

▶ Accessible   easy to use

also

user-friendly / targeted

reliable (from a reliable source)

timely

information quality

Right information, in the right form, at the right time, given to the right person

Attributes of information quality (O'Brien and Marakas, 2006):

1. Time
2. Context
3. Form

Table 1.1 Summary of attributes of information quality

Time	Content	Form	Additional characteristics
Timeliness	Accuracy	Clarity	Confidence in source
Currency	Relevance	Detail	Reliability
Frequency	Completeness	Order	Formatted correctly
Time period	Conciseness	Presentation	Appropriateness
	Scope	Media	Received by correct person
			Sent by correct channels

information quality - time

▶ Available when needed

▶ Up-to-date, reflects current circumstances

▶ Indicates if / when changes are likely to happen

▶ Covers the correct period
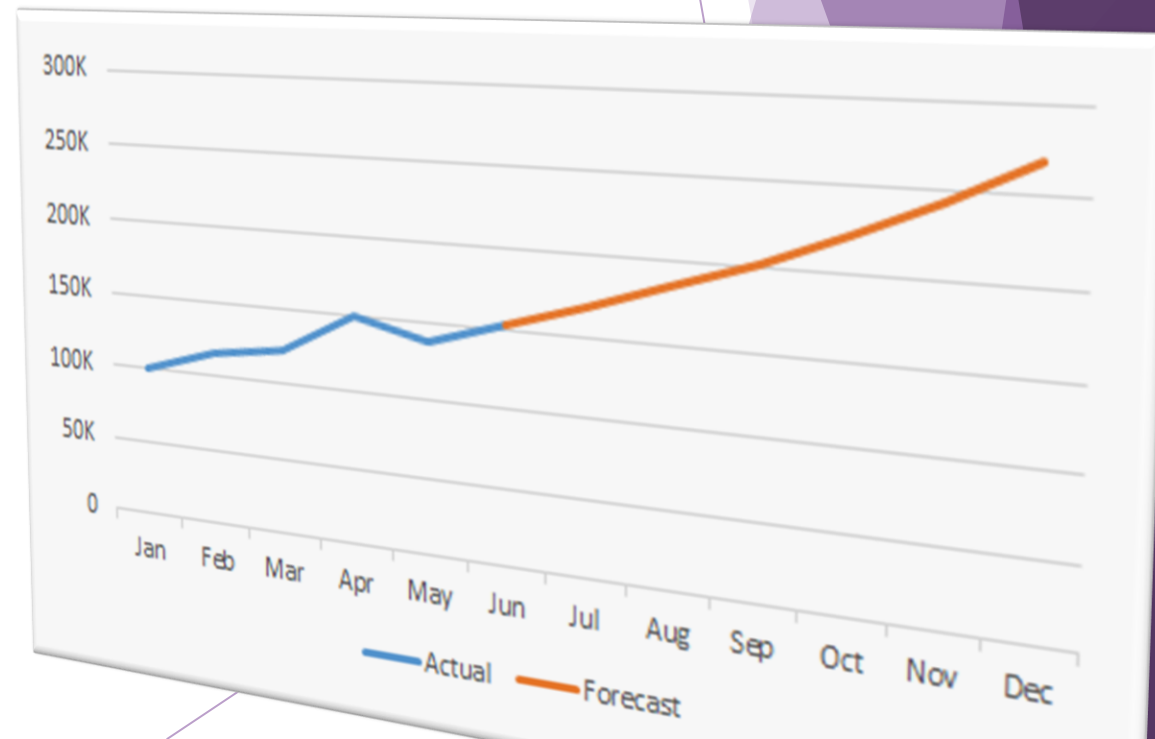
information quality - context

► No errors

► Relevant to need

► Complete

► Only relevant, concise, (images are good!)

► Appropriate to information need

   ► Focused or general

information quality - form

- ▶ Clear, understandable
- ▶ Detail matches need
- ▶ All information / summary
- ▶ Ordered, correctly structured e.g. report / summary
- ▶ Correct form
  - ▶ Printed, graphic, video

information quality - other

- Confidence of source
- Trust
- Reliable
- Appropriateness
- How stored & formatted
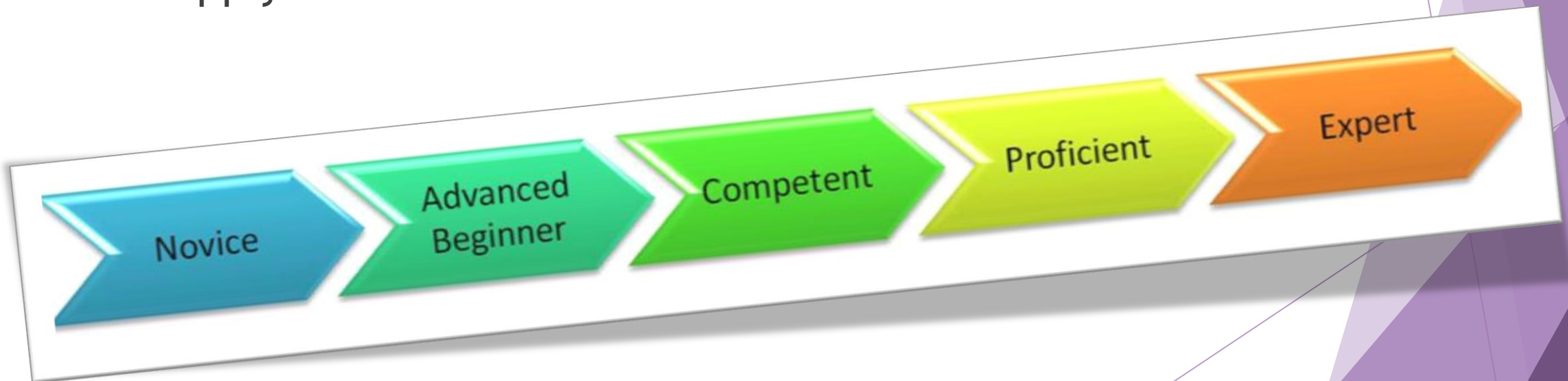- Availability
- Accessibility
  - (e.g. metadata)

knowledge

Posses information, experience

- ▶ Explicit
  - ▶ Know-what
  - ▶ Can be stored e.g. manuals / handbooks
- ▶ Tacit
  - ▶ Know-how
  - ▶ Skills, more possessed by human

wisdom

- Posses knowledge
- Have ability to use it
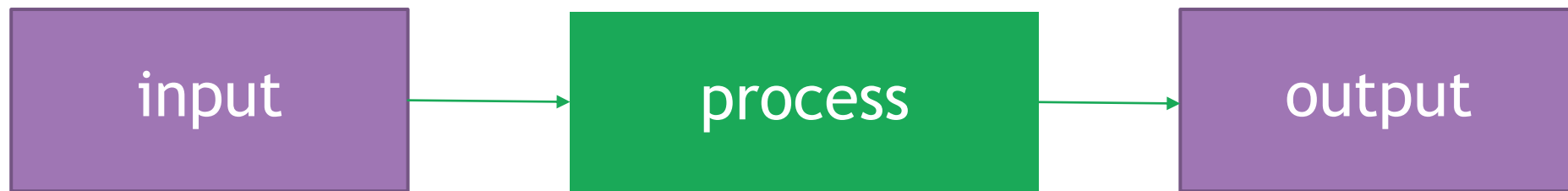- Transferable skills
  - Apply on new circumstances

Novice → Advanced Beginner → Competent → Proficient → Expert

what is a system?

system

a collection of
interrelated components
that work together
towards a collective goal

▶ receive inputs and transform these into outputs

▶ often multiple goals

 ▶ profit

 ▶ improving product quality

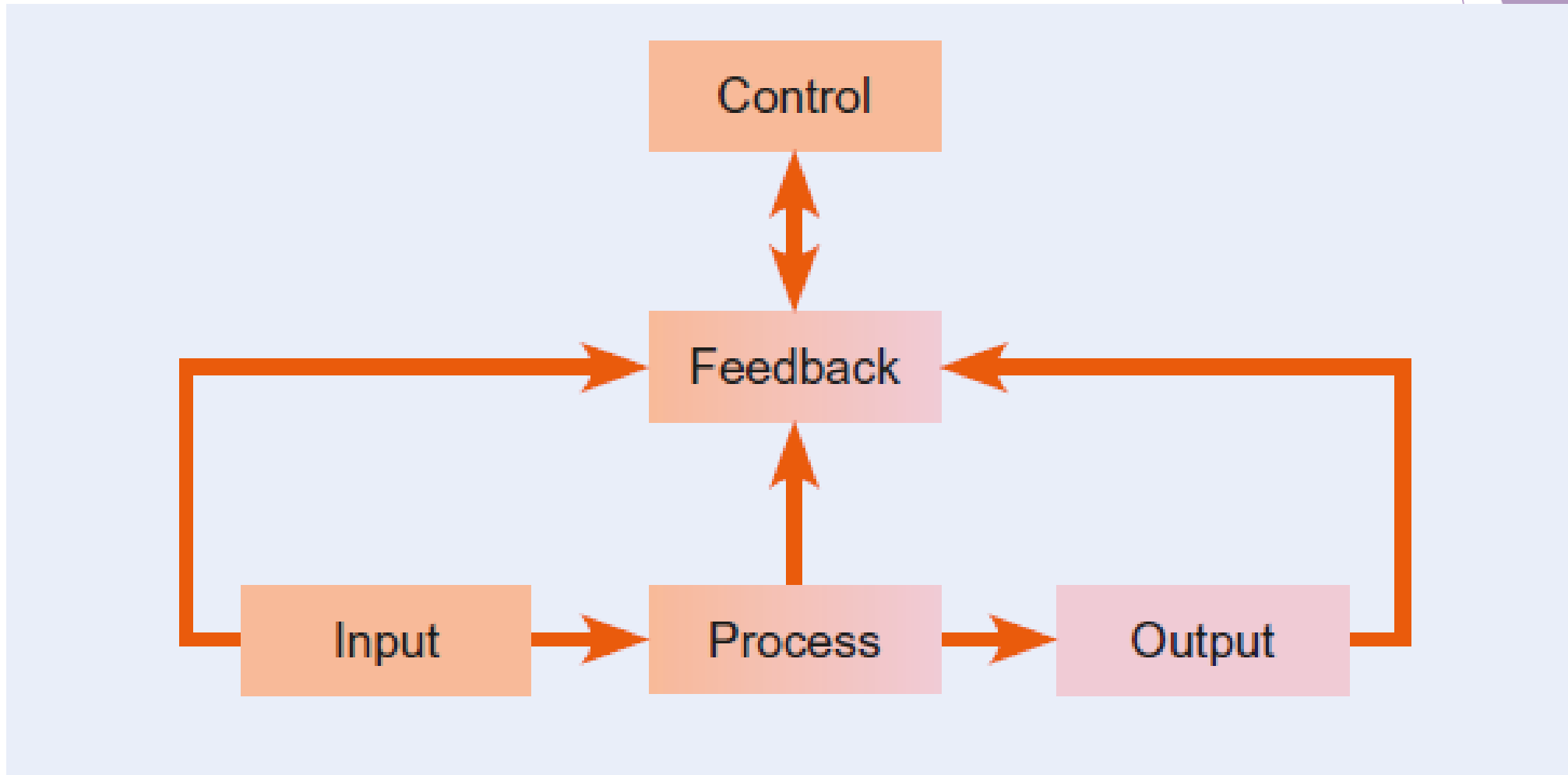| input | → | process | → | output |

requires control, monitoring and feedback

- ▶ system must be 'adaptive' (not static)
- ▶ deal with problems,
- ▶ check it's fulfilling the goal,
- ▶ identify improvements

business system

system components

1. **input** - data, knowledge, raw materials, machinery
2. **transformation** - data into information
3. **output** - information, products and services
4. **feedback** mechanism
   - measure performance, customer feedback
5. **control** mechanism
   - check system working, corrections (for required output)

positive feedback

▶ rapid growth of sales – positive but still needs action

negative feedback

▶ deal with the difference in desired output and actual output

▶ correct issues

delays unwanted

overcorrection

action can result in non-immediate change

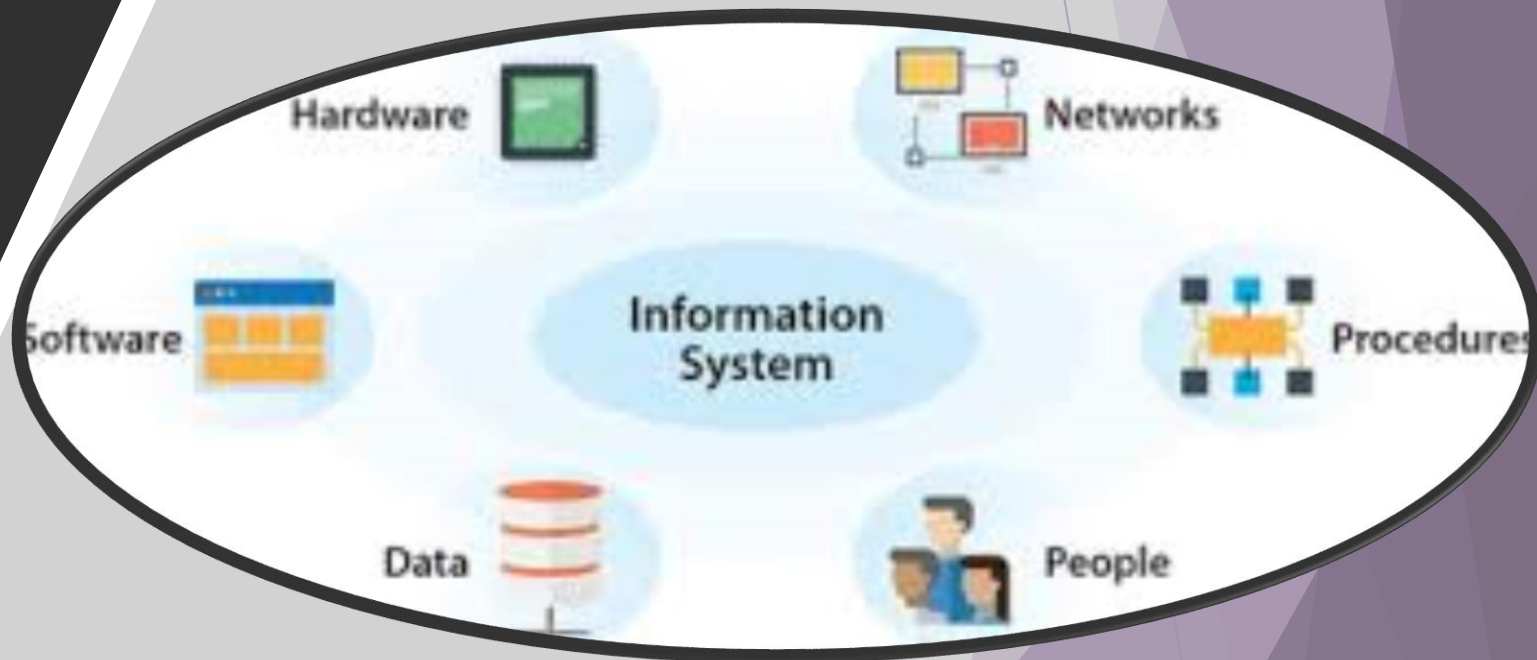## types of systems

adaptive system

- adjusts to environment change

- monitor and regulate its own performance

hard & soft systems

- hard system is governed by fixed rules and procedures
  - e.g. production line
- soft system more unpredictable environment
  - e.g. involves people

Information systems components

- ▶ Hardware
- ▶ Software
- ▶ Databases
- ▶ Networks
- ▶ Procedures
- ▶ People

IS components

1. Hardware   devices, data into information
2. Software   programs
3. Databases   data storage and access
4. Networks   connections & communications
5. People   e.g. users
6. Procedures   set of instructions,

how to combine the above = desired output

resources

People

▶ users of an information system and

▶ those who develop, maintain and operate the system.

▶ include managers, data entry clerks and technical support staff

Hardware

▶ all types of machines, not just computer hardware

    ▶ e.g. telephones, fax machines, switchboards

▶ media used by these machines,

    ▶ such as CDs, USB sticks, hard drives, memory cards or paper

resources

Software

▶ computer programs

▶ procedures used by people

▶ instruction manuals and company policies.

Communications

▶ transfer data

▶ networks and the hardware and software needed to support them

Data resources

▶ organization data

▶ computer databases, paper files, measurements taken by sensors on a production line

Development of Information Systems

The digital age

- Old mainframe computer with magnetic tape storage

- Dumb terminals

- basic screen input interface

- letters to the typists

- Sage accounts

- computer courses e.g. dbase, spreadsheets

- windows & email

- 'the paperless office' (still with hardcopy files)

- WWW - academic

- home computing

- Google

- XML

- companies own webpage

- cloud computing

- smart phone + apps

The Internet

► The worldwide computer network,

► links thousands of smaller networks,

► links educational, commercial, military entities, and individuals,

► originally developed to share only text and numeric data

World Wide Web

- ▶ The multimedia part of the internet
- ▶ An interconnected system of servers that support specially formatted documents in multimedia form
- ▶ Includes text, still images, moving images, sound
- ▶ Responsible for the growth and popularity of the internet
  - ▶ e.g., Gmail, Facebook, EBay

The digital age

- ▶ To compete – give customers what they want
  - ▶ Easier for customer
- ▶ Offer web-based services
  - ▶ e.g. convenient payment methods

The digital age

But,

- You may never meet your customer
- Difficult to form a 'relationship'

Solution?

- Web-based customer relationship management (CRM)
- Management information systems (MIS)
  - Better use of information, IT and people, in company

Digital World

The digital world is the availability and use of digital tools to communicate on the Internet, digital devices, smart devices and other technologies

Social Connectivity
Communication Speeds
Versatile Working
Learning Opportunities
Automation
Information Storage
Editing
Accurate Duplication

GPS and Mapping
Transportation
Low Cost
Entertainment
News
Warfare
Banking and Finance
Smaller Sized Devices

Information age

value of people

- ▶ Specialized (knowledge) workers
- ▶ Specialized (HR, accounting, finance, etc.)
- ▶ Specialized information
  - ▶ Profit / loss statements, , cash-flow, earnings

Knowledge

'knowledge is power' -> competitive advantage

knowledge worker

describes a person whose role is based around creating, using, sharing and applying knowledge.

knowledge engineer

focuses on eliciting knowledge from experts so that it can be recorded and shared with others within the organization.

Information System Professionals

good problem-solving skills

effectively manage time and resources

a clear vision of "the big picture" as well as the "small details"

a desire to work closely with other people

excellent communication skills

ability to think strategically about technology

a desire to take responsibility for developing and implementing their own ideas

Careers

IT Consultant

Web Developer

Information Systems Manager

Business Intelligence Analyst

Network Administrator

Business Application Developer

Systems Analyst

Technical Support Specialist

Business Analyst

Systems Developer

The average starting salary of MIS graduates in 2019 was $65,679

(2 Million Baht)

https://mays.tamu.edu/department-of-information-and-operations-management/management-information-systems/

Thank you!

any questions?