



CSCA0102

IT and Business Applications

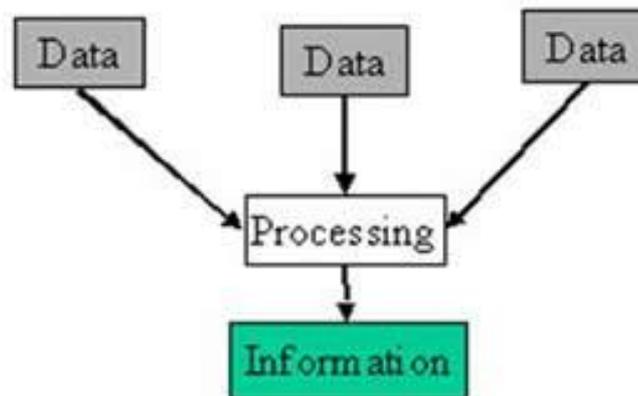
Chapter 7

Data and Information

Data and Information

Data	Information
Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.	When data is processed, organized, structured or presented in a given context so as to make it useful, it is called Information.

Information is created from data



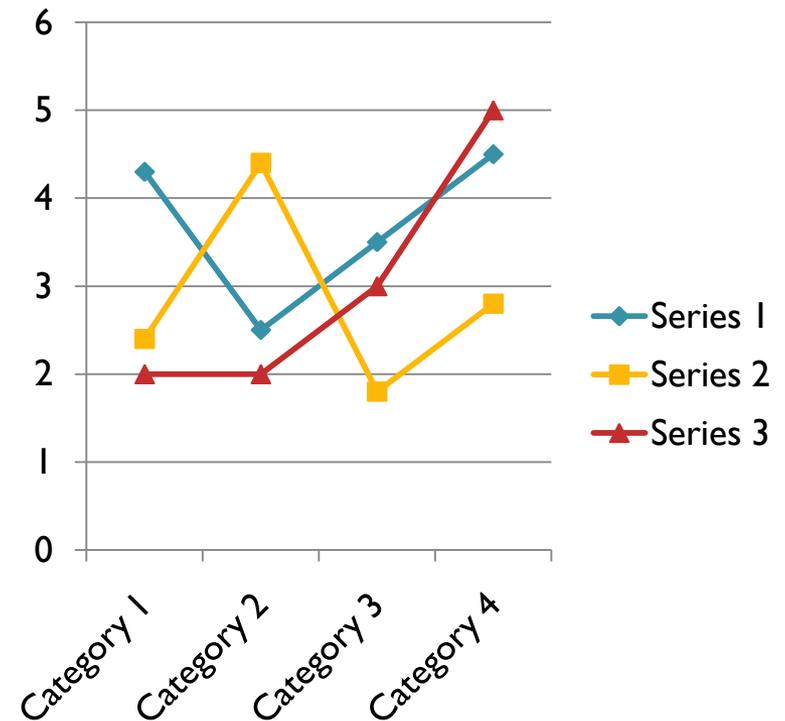
Data and Information

Example:

- **Data:**
 - Each student's test score is one piece of data.
- **Information:**
 - The average score of a class or of the entire school is information that can be derived from the given data.

Data and Information

	Series 1	Series 2	Series 3
Category 1	4.3	2.4	2
Category 2	2.5	4.4	2
Category 3	3.5	1.8	3
Category 4	4.5	2.8	5



Data and Information

The characteristics of Valuable Information

1. **Accurate:** Accurate information is error free.
2. **Complete:** Complete information contains all the important facts to make clear decisions.
3. **Economical:** Information should also be relatively economical.
4. **Flexible:** Flexible information can be used for a variety of purposes.
5. **Reliable:** Reliability of information describes the correctness of the information.

Data and Information

The characteristics of Valuable Information

5. **Relevant:** The relevance of information is determined based on the usefulness of information with respect to the decision making process.
6. **Simple:** Simplicity in the representation of information is also a very useful feature utilized to improve the usability of information in the decision making process.
7. **Timeliness:** Decisions should be made at the right time to achieve effectiveness.
8. **Verifiable:** If it is possible to confirm the reliability of the information about its correctness (validate), it becomes verifiable Information.

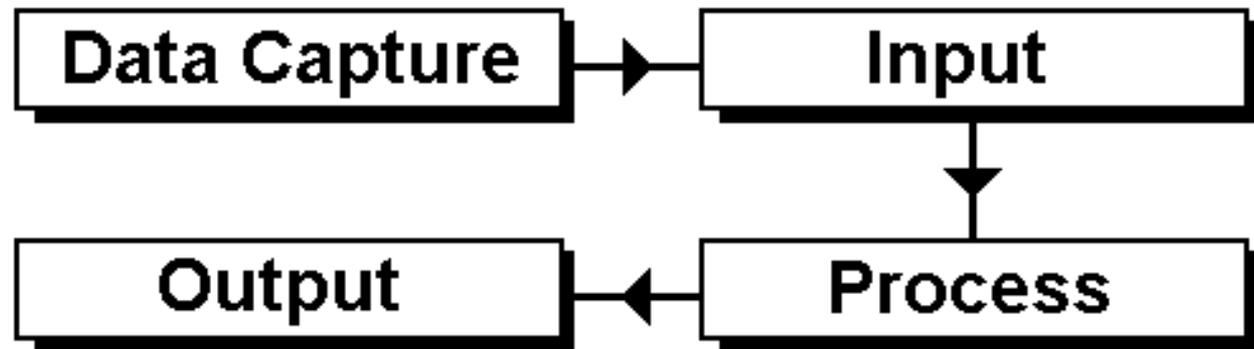
Data and Information

The characteristics of Valuable Information

9. **Accessible:** Accurate information plays a major roll in the decision making process of any organization.
10. **Secure:** the value of information could be lost due to issues such as unauthorized user access or intentionally damaging its existence.

Data Processing Cycle

- Data processing is the re-structuring or re-ordering of data to increase their usefulness & add values for particular purpose.

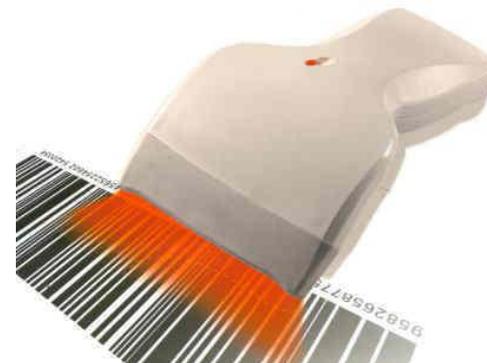


Data Processing Cycle

Data Capture

- Data are obtained & gathered from their source
- There are several different ways that a computer can obtain its data for processing, examples:
 - from a source document such as a questionnaire.
 - from an input device such as a heat sensor or scanner.

Morphology			
Second person plural			
(1) <i>What are youse up to?</i>	<input type="checkbox"/> a bit strange	<input type="checkbox"/> unacceptable	(plural form for you, 1) something else, short comment:
<input type="checkbox"/> no problem	<input type="checkbox"/>	<input type="checkbox"/>	
(2) <i>What sure' sez up to?</i>	<input type="checkbox"/> a bit strange	<input type="checkbox"/> unacceptable	(plural form for you, 2) something else, short comment:
<input type="checkbox"/> no problem	<input type="checkbox"/>	<input type="checkbox"/>	
(3) <i>Are ye going out tonight?</i>	<input type="checkbox"/> a bit strange	<input type="checkbox"/> unacceptable	(plural form for you, 3) something else, short comment:
<input type="checkbox"/> no problem	<input type="checkbox"/>	<input type="checkbox"/>	
Negation of auxiliaries			
(4) <i>Amn' I leaving soon anyway?</i>	<input type="checkbox"/> a bit strange	<input type="checkbox"/> unacceptable	(negative of 1 p sg of be, 1) something else, short comment:
<input type="checkbox"/> no problem	<input type="checkbox"/>	<input type="checkbox"/>	
(5) <i>Aren' I right after all?</i>	<input type="checkbox"/> a bit strange	<input type="checkbox"/> unacceptable	(negative of 1 p sg of be, 2) something else, short comment:
<input type="checkbox"/> no problem	<input type="checkbox"/>	<input type="checkbox"/>	
Demonstrative pronouns			
(6) <i>Them shoes are too small for me. (them as demonstrative pronoun)</i>	<input type="checkbox"/> a bit strange	<input type="checkbox"/> unacceptable	something else, short comment:
<input type="checkbox"/> no problem	<input type="checkbox"/>	<input type="checkbox"/>	



Data Processing Cycle

Data Capture

- **Verification** is the process of checking that the data has been correctly entered into the computer.
- **Validation** takes place before the **processing stage** and its purpose is to check that data is of the correct type.

Data Processing Cycle

Data Capture

Validation type	How it works	Example usage
Check digit	The last one or two digits in a code are used to check the other digits are correct	Bar code readers in supermarkets use check digits
Format check	Checks the data is in the right format	A National Insurance number is in the form LL 99 99 99 L where L is any letter and 9 is any number
Length check	Checks the data isn't too short or too long	A password which needs to be six letters long
Lookup table	Looks up acceptable values in a table	There are only seven possible days of the week
Presence check	Checks that data has been entered into a field	In most databases a key field cannot be left blank
Range check	Checks that a value falls within the specified range	Number of hours worked must be less than 50 and more than 0
Spell check	Looks up words in a dictionary	When word processing

Data Processing Cycle

Data Capture

There are two main methods of verification:

Double entry - entering the data twice and comparing the two copies. This effectively doubles the workload, and as most people are paid by the hour, it costs more too.

Proofreading data - this method involves someone checking the data entered against the original document. This is also time-consuming and costly.

Data Processing Cycle

Input

- The process of feeding data into a computer for processing, examples:
 - Entry from a keyboard.
 - Direct entry from other input devices such as floppy disk drives or hard disk drives.



Data Processing Cycle

Process

- This can involve calculation, analysis, comparison, data manipulation, sorting, searching, transformation of data (for example presenting numerical data as graphs), etc.
- Three types of processing:
 - Batch
 - Interactive
 - Real Time

Data Processing Cycle

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 - Batch
 - Interactive
 - Real Time

Data Processing Cycle

Batch Processing

- Executing a series of non-interactive jobs all at one time.
- Batch processing implies that there is no interaction with the user while the program is being executed.
- Examples:
 - A stock control program may store records of every item sold in a shop that day.
 - Electricity, gas and telephone bills are usually calculated on a monthly basis.
 - Producing monthly bank statements to send out to customers.

Data Processing Cycle

Interactive Processing

- Interactive processing means that the person needs to provide the computer with instructions whilst it is doing the processing.
- Interactive processing takes place one transaction at a time.
- Examples:
 - Booking tickets
 - Ordering books online
 - Handling bank accounts
 - Booking a holiday

Data Processing Cycle

Real-time Processing

- Real time processing is usually found in systems that use computer control.
- Examples:
 - Traffic lights
 - Heart rate monitoring
 - Aircraft control
 - Computer games
 - Controlling robots

Data Processing Cycle

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Data Processing Cycle

Processing Stages

Some important activities in data processing are:

- Summarizing
- Computing Averages
- Graphing
- Creating Charts
- Visualizing Data

Data Processing Cycle

Output

- The end result is produced in a suitable format.
- Output is what we call the results that are produced by processing data.
- Output can take many forms such as text, sound, tables of data, graphs, commands to a device such as a robot, etc.

Data Processing Cycle

Output

- Depending on the form of output required, the data can be transmitted by a range of devices for presentation.
- For example:
 - **Screen** - it can be displayed on a monitor screen. Many companies offer their customers the chance to have electronic bills delivered over the Internet, either by email or on a web page.
 - **Paper** – Information for customers, like bills or statements, is normally outputted in printer form.
 - **File** – Instead of outputting data to a printer or displaying it on the screen, it can be saved in digital form on disk or tape.
 - **Other** - displayed via a data projector, transmitted via an interface to another machine, exported to another software application, etc.