1.5 Analyses the activities of data processing

4 periods

Learning Outcomes

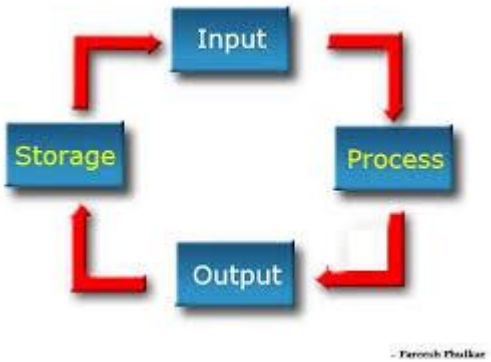
- Lists and briefly describes the data processing steps
- Identifies data gathering methods
- Identifies data validation methods
- Lists data input methods
- Describes data processing methods
- Lists data output methods
- Describes data storage methods

Data processing

The Data Processing Cycle is a series of steps carried out to extract information from raw data. Although each step must be taken in order, the order is cyclic. The output and storage stage can lead to the repeat of the data collection stage, resulting in another cycle of data processing.

Data processing Cycle is consist following steps.

- Data gathering
- Data validation
- Data processing
- Data output
- Data storage



Data gathering methods

Data gathering methods vary as,

- ✓ manual methods
- ✓ Semi-automated
- ✓ Automated methods.

Manual methods

In order to collect data manually can used following methods.

- Interviews.
- Questionnaires and Surveys.
- Observations.
- Focus Groups.
- Case Studies.
- Documents and Records.

Using interviews detailed questions and answers may helpful for making the discussion fair enough to capture deserved data. It's a fast method to use of questionnaires which is most suitable for gathering quantitative data and answering anonymously, may helpful to gather fair and confident data.

Semi-automated and automatic methods

In semi-automatic and automatic data gathering methods, followings tools are popular.

- OMR
- OCR
- MICR
- card/tape readers
- magnetic strip readers
- bar code readers
- sensors and loggers

An **Optical Mark Reader (OMR)** is a scanning device that reads carefully placed pencil marks on a specially designed form or document. Most popular use of OMR is marking of MCQ answer sheets.

Optical Character Recognition (OCR) is done by Optical Character Reader which allows us to identify written or printed characters and extract editable text from it.

Magnetic Ink Character Recognition (MICR) is done by Magnetic Ink Character Reader which supports to input data written in special magnetic ink under cheque.

Magnetic strip readers use to read data stored in a magnetic strip attached on credit cards and bank ATM cards.

Bar code readers use visible light to scan and read barcodes which contain data to be input into computer systems.

Sensors may helpful for collecting data from different places in to a single data center fast. Sensor networks are consisting of variety of electronic sensors. Each node in a wireless sensor network is equipped with one or more sensors in addition to a microcontroller, w ireless transceiver, and energy source.

Data validation methods

There are several types of data validation methods. Some of them are given below.

- Data type check – Check whether correct data type (numeric/text/date/currency etc) is input into the system
- Presence check – Presence of data (i.e. data entry field is not blank) is checked. It is compulsory to input important data
- Range check – Check whether the data is in allowed range (i.e. Marks have to be between 0 and 100) commonly used when working with data which consists of numbers, currency or dates/times

Modes of data input

Direct and remote - In direct data input, data is input into the system directly without direct user interference. In remote entry, system is designed specially to store data. Data storing and transactions are taking place in different geographical places.

Online and offline – In online data input, the data is input at the same time transaction taking place, where data of different transactions input after a specific time period as a batch in offline method.

Data processing methods

Batch processing -Data input and processing occur as a batch in batch processing. It is easy to handle huge amount of data as a batch. So, data stored until the system comes online to process the data in one 'batch'. Batch processing is done in billing systems and pay roll system.

Real time processing - In real time processing of data, input, processing and output as well as data storing occur simultaneously. Any type of monitoring system, any type of booking system, computer controlled systems such as automatic production line, an aircraft auto-pilot, the system controlling a nuclear power stations uses real time processing.

Output methods

Direct presentation to the user can be done by using a,

- monitor
- multimedia projector
- printer

Soft copies are presented with monitors and multimedia projectors whereas printer output printed copies which is said to be hard copies. Storing methods are used to store data securely for further processing needs.

Storage methods

Local storages such as Hard Disks Drives, Compact Disk, Digital Versatile Disks and Tape Drives can be used to store data inside the local computer.

Remote storage such as cloud space can be used to store data securely. To get remote data when needed it is required the access to the internet

References

https://www.tutorialspoint.com/computer_fundamentals/

Teachers' Guide