



Software Engineering

هندسة البرمجيات

جامعة بغداد

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الهيثم

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المرحلة الثالثة

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Structured Analysis (Data Flow Diagram +Data Dictionary)

Topics covered



- ✧ Structured Analysis
- ✧ Structured Analysis Models (Tools):
 - i. Data Flow Diagram
 - ii. Data Dictionary
 - iii. Decision Trees
 - iv. Decision Tables
 - v. Structured English
 - vi. Pseudocode

Structured Analysis



- ✧ **Structured Analysis** is a development method that allows the **analyst** to understand the system and its activities in a logical way.
- ✧ It is a systematic approach, which **uses graphical tools** that analyze and refine the objectives of an existing system and develop a new system specification which can be easily understandable **by user**.
- ✧ It has following attributes :
 - It is **graphic** which specifies the presentation of application.
 - It divides the processes so that it **gives a clear picture of system flow**.
 - It is an approach that works from high-level overviews to lower-level details.

Structured Analysis

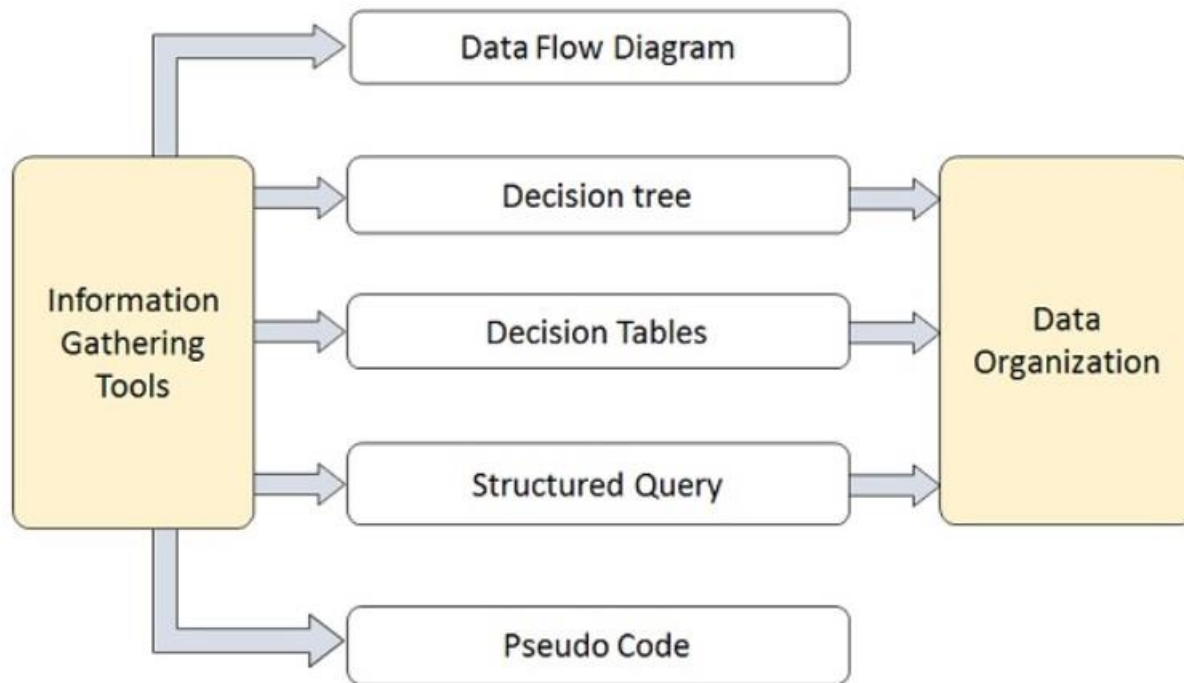


Figure 14: Structured Analysis

Data Flow Diagram (DFD)



- ✧ It is a technique developed by **Larry Constantine** to express the requirements of system in **a graphical form**.
- ✧ A primary tool in structured analysis that graphically illustrates a system's components process and the flow of data between them.
- ✧ It shows the flow of data between various functions of system and specifies how the current system is implemented.
- ✧ It is an **initial stage of design phase** that functionally divides the requirement specifications down to the lowest level of detail.

Data Flow Diagram (DFD)



- ✧ Its graphical nature makes it a good **communication tool** between **user and analyst** or analyst and system designer.
- ✧ It gives an overview of **what data a system processes, what transformations are performed, what data are stored, what results are produced and where they flow.**

Basic Elements of DFD



- ✧ DFD is **easy to understand** and quite effective when the required design is not clear, and the user wants a notational language for communication.
- ✧ However, it requires a large number of iterations for obtaining the most accurate and complete solution.

Basic Elements of DFD



Symbol Name	Symbol	Meaning
Square		Source or Destination of Data
Arrow		Data flow
Circle		Process transforming data flow
Open Rectangle		Data Store

Figure 15: Basic Elements of DFD

DFD Example: Airline Reservation System

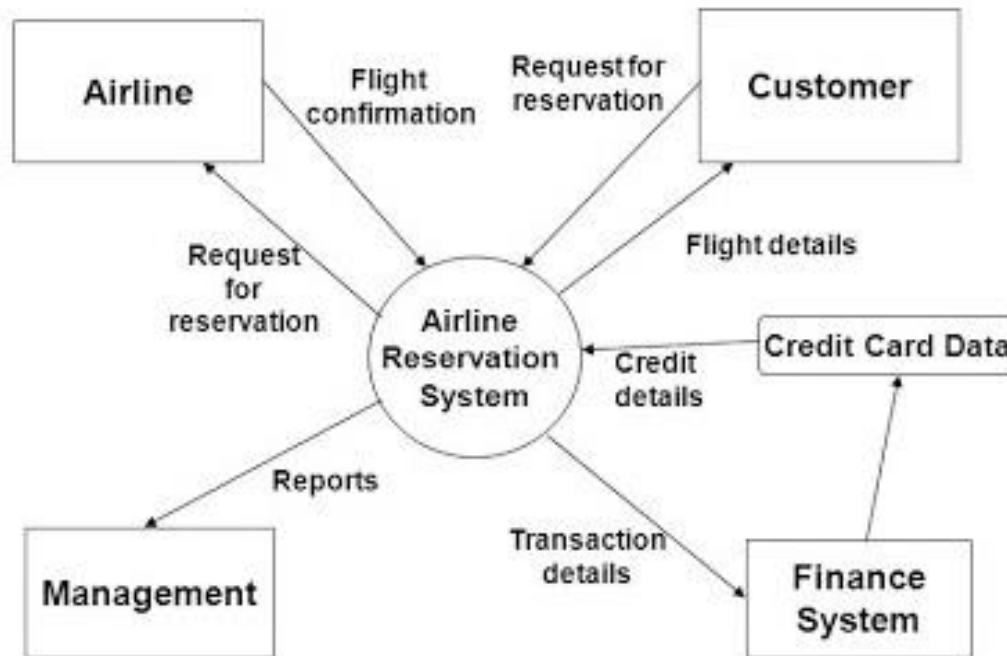


Figure 16: Basic Elements of DFD for Airline Reservation System

Data Dictionary



- ✧ A structured **description** of database.
- ✧ A data dictionary is a structured stores of the data elements in the system. **It stores the descriptions of all DFD** data elements.
- ✧ A data dictionary **improves the communication between the analyst and the user**. It plays an important role in building a database.
- ✧ The information you see in data dictionary is called **metadata**, which, quite simply, is data about data.

Data Dictionary



Data Dictionary

Data Dictionary outlining a Database on Driver Details in NSW

Field Name	Data Type	Data Format	Field Size	Description	Example
License ID	Integer	NNNNNN	6	Unique number ID for all drivers	12345
Surname	Text		20	Surname for Driver	Jones
First Name	Text		20	First Name for Driver	Arnold
Address	Text		50	First Name for Driver	11 Rocky st Como 2233
Phone No.	Text		10	License holders contact number	0400111222
D.O.B	Date / Time	DD/MM/YYYY	10	Drivers Date of Birth	08/05/1956

ScreenCast-O-Matic.com

Figure 17: Data Dictionary

Data Dictionary (Video)



✧ <https://www.youtube.com/watch?v=kH0bcw9P2Lc>

Note:

- ✧ Data model (tool) improves the communication between the **analyst** and the **user**.
- ✧ During the analysis (Requirement) phase, the data model (tool) presents the logical organization of data without indicating how the data are stored, created, or manipulated so that analysts can focus on the business without being distracted by technical details.
- ✧ Later, during the **design phase**, the data model (tool) is changed or reflect exactly how the data will be stored in databases and files.



Thanks