Foundation University

Rawalpindi Campus

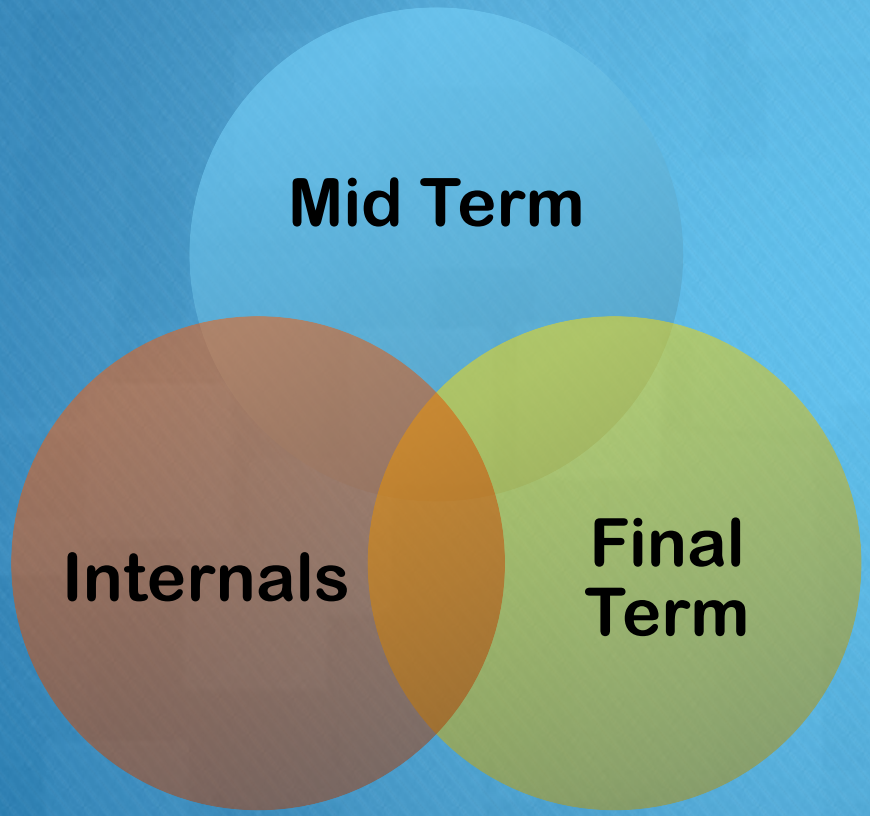
Introduction to Database Systems – CSC - 221

A Presentation by

M. Hafeez Javed
Lecturer – Software Engineering
rmhjaved@gmail.com

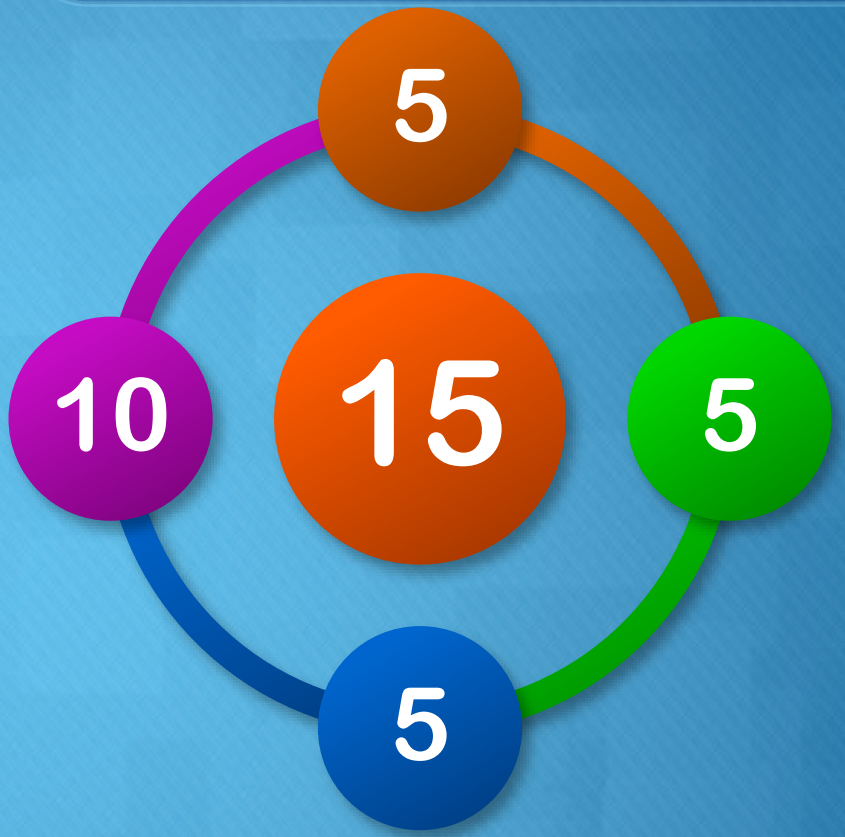
Objectives of Today's Lecture

Course Grading Policy

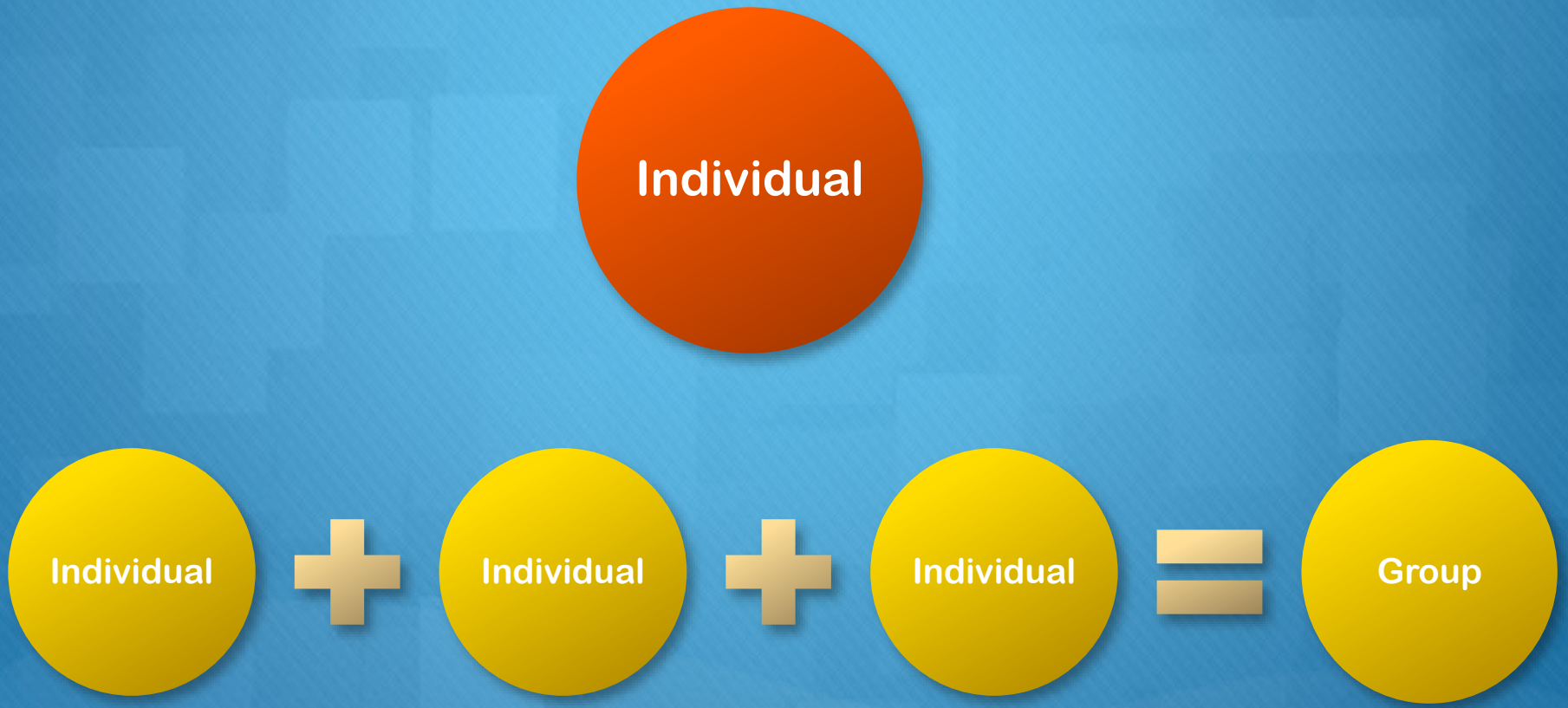


Performance predict Outcome

Internals / Sessional



Course Assignments



Course Assignments and Quizzes

Assignment

Title page with only the required information

Professional submission – A4 Printouts

Quizzes A4 Papers, Pen etc.

Quiz #1 (February 2016)

Name ……. Section …. Reg. No. …….

Important Note!

Important Note!

- There is a difference between **group study** and **copying**…
- Any cases – **Found Guilty**… both cancelled & further…
- Maintain **Integrity & Respect** of an **Adult Student**

Course Introduction

1	Database	A database is a shared collection of logically related data that is stored to meet the requirements of different users of an organization
2	Why we need Database?	Imagine trying to operate a business How businesses process this much data? How they store it all, and then quickly retrieve just the facts that decision makers want to know, just when they want to know it? The answer is that they use databases.
3	Application of Database	Wherever the computer usage occur, there is a database.

Assignment # 2

Basic Concepts of Database Systems

AND THAT IS FAREWELL TO DAY TWO ☺

Database – Foundation

Databases today are essential to every business. Whenever you visit a major Web site — Google, Yahoo!, Amazon.com, or thousands of smaller sites that provide information — there is a database behind the scenes serving up the information you request. Corporations maintain all their important records in databases. Databases are likewise found at the core of many scientific investigations. They represent the data gathered by astronomers, by investigators of the human genome, and by biochemists exploring properties of proteins, among many other scientific activities. The power of databases comes from a body of knowledge and technology that has developed over several decades and is embodied in specialized software called a *database management system,* or *DBMS*, or more colloquially a "database system." A DBMS is a powerful tool for creating and managing large amounts of data efficiently and allowing it to persist over long periods of time, safely.

Database: The Complete Book

- The DBMS is expected to:

1. Allow users to create new databases and specify their *schemas* (logical structure of the data), using a specialized *data-definition language.*
2. Give users the ability to *query* the data (a "query" is database lingo for a question about the data) and modify the data, using an appropriate language, often called a *query language* or *data-manipulation language.*

3. Support the storage of very large amounts of data — many terabytes or more — over a long period of time, allowing efficient access to the data for queries and database modifications.

4. Enable *durability,* the recovery of the database in the face of failures, errors of many kinds, or intentional misuse.

5. Control access to data from many users at once, without allowing unexpected interactions among users (called *isolation)* and without actions on the data to be performed partially but not completely (called *atomicity).*

Why Database?

- Imagine trying to operate a business without knowing who your customers are, what products you are selling, who is working for you, who owes you money, and to whom you owe money. All businesses have to keep this type of data and much more; just as importantly, they must have those data available to decision makers when necessary.

Why database…

- Depending on the type of information system and the characteristics of the business, these data could vary from a few megabytes on just one or two topics to terabytes covering hundreds of topics within the business's internal and external environment. Telecommunications companies such as Sprint and AT&T are known to have systems that keep data on trillions of phone calls, with new data being added to the system at speeds up to 70,000 calls per second!1 Not only do these companies have to store and manage immense collections of data, they have to be able to find any given fact in that data quickly. Consider the case of Internet search staple Google. While Google is reluctant to disclose many details about its data storage specifications, it is estimated that the company responds to over 91 million searches per day across a collection of data that is several terabytes in size. Impressively, the results of these searches are available almost instantly. How can these businesses process this much data? How can they store it all, and then quickly retrieve just the facts that decision makers want to know, just when they want to know it? The answer is that they use databases.

Data

- Data **are** raw facts and figures that on their own have no meaning
- These can be any alphanumeric characters i.e. text, numbers, symbols

Data Examples

- Yes, Yes, No, Yes, No, Yes, No, Yes
- 42, 63, 96, 74, 56, 86
- 111192, 111234

- None of the above data sets have any meaning until they are given a **CONTEXT** and **PROCESSED** into a useable form

Data Into Information

- To achieve its aims the organisation will need to **process** data into information.
- Data needs to be turned into meaningful information and presented in its most useful format
- Data must be processed in a **context** in order to give it meaning

Information

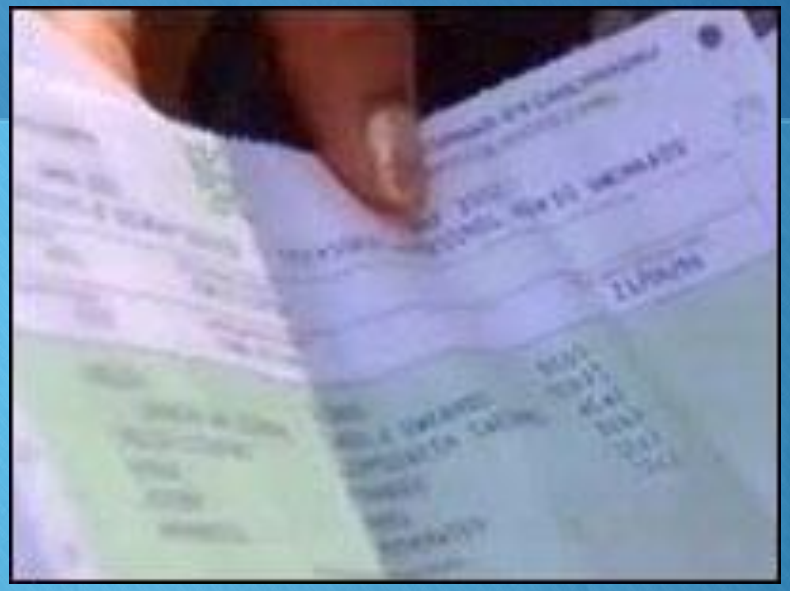
- Data that has been processed within a context to give it meaning

OR

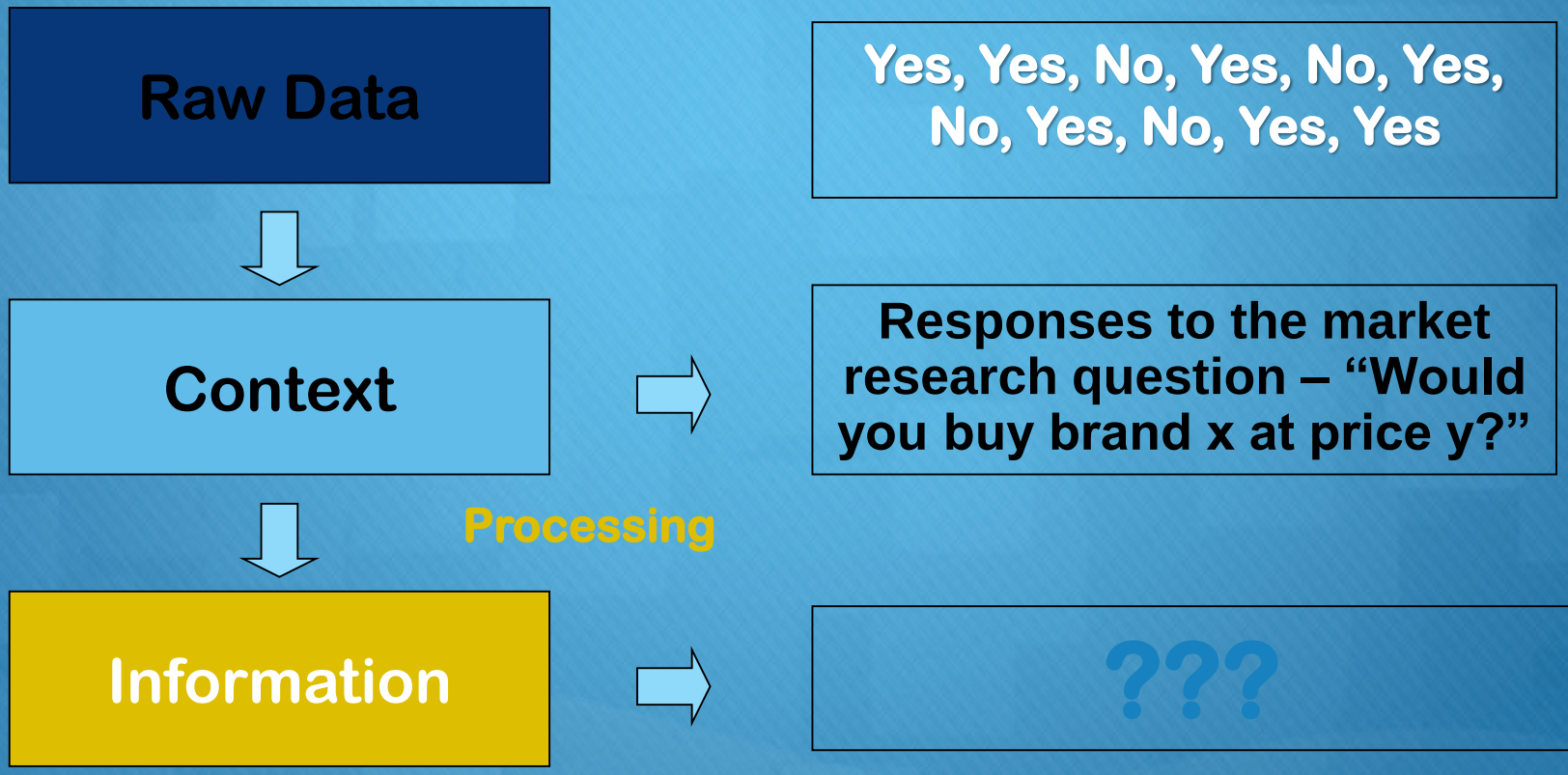
- Data that has been processed into a form that gives it meaning

Examples

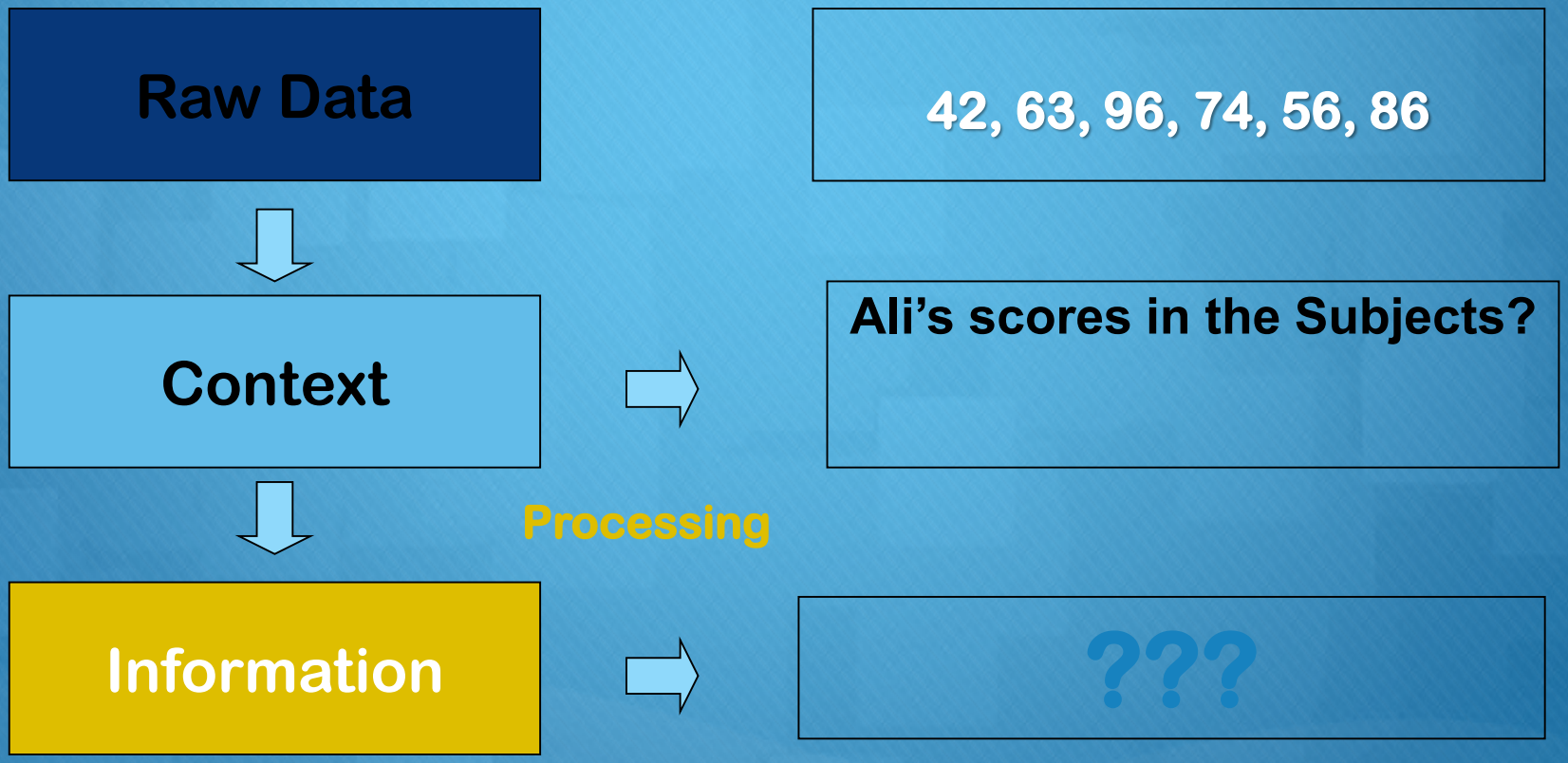
- In the next 3 examples explain how the data could be processed to give it meaning
- What information can then be derived from the data?



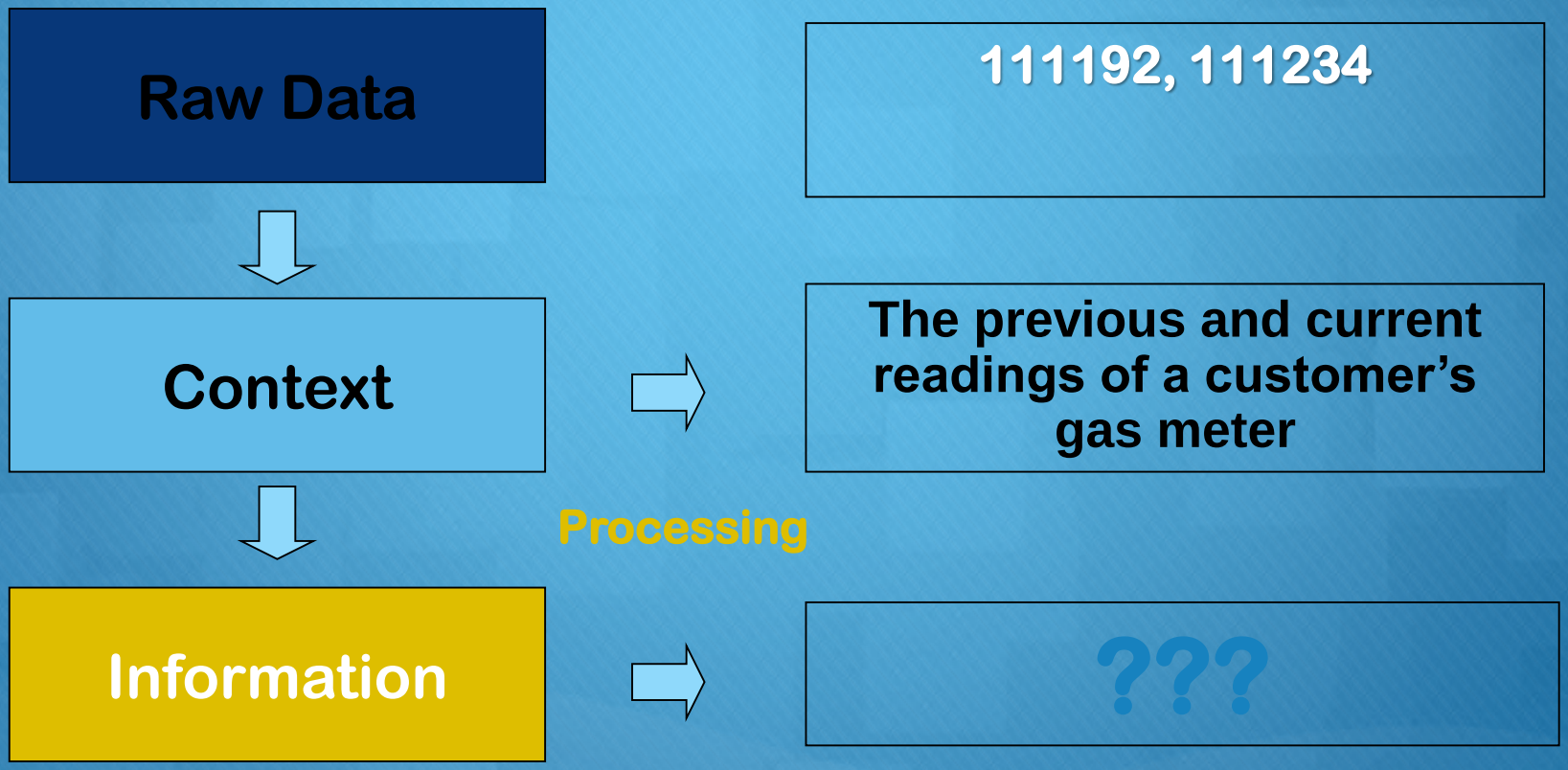
Example 1


Raw Data
Yes, Yes, No, Yes, No, Yes, No, Yes, No, Yes, Yes
Context
Responses to the market research question – "Would you buy brand x at price y?"
Processing
Information
???

Example 2


Raw Data
42, 63, 96, 74, 56, 86
Context
Ali's scores in the Subjects?
Processing
Information
???

Example 3


Raw Data
111192, 111234
Context
The previous and current readings of a customer's gas meter
Processing
Information
???

Knowledge

- Knowledge is the understanding of rules needed to interpret information

"…the capability of understanding the relationship between pieces of information and what to actually do with the information"

Debbie Jones – www.teach-ict.com

Knowledge Examples

- Using the 3 previous examples:
  - A Marketing Manager could use this information to decide whether or not to raise or lower price y
  - Jayne's teacher could analyse the results to determine whether it would be worth her re-sitting a module
  - Looking at the pattern of the customer's previous gas bills may identify that the figure is abnormally low and they are fiddling the gas meter!!!

Suggested answers to examples

- Example 1
  - We could add up the yes and no responses and calculate the percentage of customers who would buy product X at price Y. The information could be presented as a chart to make it easier to understand.
- Example 2
  - Adding Jayne's scores would give us a mark out of 600 that could then be converted to an A level grade. Alternatively we could convert the individual module results into grades.
- Example 3
  - By subtracting the second value from the first we can work out how many units of gas the consumer has used. This can then be multiplied by the price per unit to determine the customer's gas bill.