



# BUSINESS STATISTICS

## Lecture -1



CENTURION  
UNIVERSITY  
*Shaping Lives...  
Empowering Communities!*

# How Do People Decide?

Guesswork Experience Extrapolation Calculation



Intuition

Analysis



# DEFINITION

Quantitative Techniques are techniques which provide the decision maker with a systematic and powerful means of analysis and help, based on the quantitative data, in exploring policies for achieving pre-determined goals.

Quantitative Techniques can be broadly classified as:

- Statistical Techniques
- Programming Techniques  
(Operations Research)

**Statistical Techniques** are those techniques which are used in conducting the statistical enquiry regarding a certain phenomenon. They include all statistical methods beginning from collection of data till the task of interpretation of the collected data.

**Programming Techniques** are the model building techniques used by decision makers viz. LPP, Games theory, Simulation etc.

## QT and Business

- They provide a tool for scientific analysis
- They enable proper deployment of resources
- They assist in choosing an optimum strategy
- They facilitate the process of decision making
- They help us to highlight the problem areas in production process
- It is of great help in future planning and forecasting



# APPLICATION IN BUSINESS

## **Production Management**

- SQC Techniques
- Process Capability
- Inventory Control
- Incoming Quality Assessment

## **Finance**

- Financial Ratio Analysis
- Cash Forecasting

## **Marketing**

- Marketing Research
- Demand Projections

## **Human Resource Management**

- Compensation and Reward
- Training needs

## Important

1. QT are just tools of analysis and not the complete decision making process
2. QT does not take into consideration the intangible factors i.e. non-measurable human factors e.g. attitude, policies, etc.

## Some definitions:

- **Data**- A collection of observations or measurements on one or more variables.
- **Statistics**- A group of methods that is used to collect, analyze, present and interpret data and to make decisions.
- **Descriptive statistics**- A collection of methods that enable us to organise, display and describe data using such devices as table, graph and summary measures.
- **Inferential statistics**- A collection of methods that enable us in making decisions about a population based on sample results.



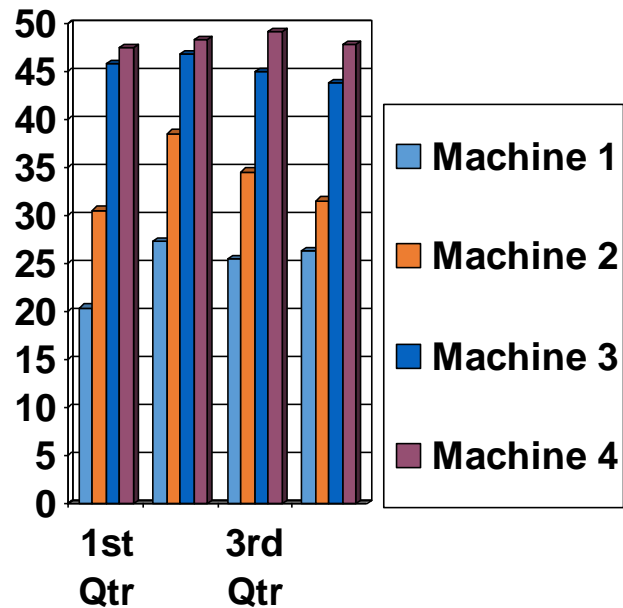


# TYPES OF STATISTICS

**Descriptive Statistics** is concerned with Data Summarization, Graphs/Charts, and Tables

**Inferential Statistics** is a method used to talk about a Population Parameter from a Sample. It involves Point Estimation, Interval Estimation, and Hypothesis Testing. It estimates a characteristic of a set of data, or help uncover patterns in data sets that are unlikely to occur by chance.

# DESCRIPTIVE STATISTICS EXAMPLE



The Quality Control Department of a large manufacturing company would like to compute summary measures such as the mean production per shift for a particular item. The department would also like to get a comparative picture of performance of the mean production across the four machines in the plant by tabulation. Further the company might like to graph the comparative performance of the four machines by a bar chart depicting the mean production per shift.



# INFERENCE STATISTICS EXAMPLE

Suppose you, as a marketing manager would like to identify a niche market for your product. You know from your experience that an accurate assessment of the income of a typical family is crucial. The average income of this type of families in the population is estimated by you to be Rs. 320000 based on figures obtained from a sample. In this example, average income based on sample is a **Point Estimate** of the population. The average income that falls within a statistically formed interval of 320000 plus or minus 40000 is called an **Interval Estimate**. Any statement such as the average income in the population is more than Rs. 300000 per year is a **Hypothesis**. As a manager, the interval estimate may be much more important to you than the rest!

**Caution: Inferential Statistics assumes that the sampling methodology is random .**

# STATISTICAL INVESTIGATION PROCESS

