Unit 42: Statistics for Management

Unit code	**R/508/0570**
Unit level	**5**
Credit value	**15**

Introduction

Statistics play an important role in business. Using a range of statistical techniques, such as data sampling and analysis, business managers and organisations can analyse past performance, predict future business practices and lead organisations effectively. Statistics can also be used to describe markets, inform advertising, set prices and respond to changes in consumer demand.

The aim of this unit is to give students an understanding of how management information and decision making are enhanced by applying statistical methods. Students will learn about a range of statistical techniques and how they can inform management thinking. While studying the unit, they will develop their numerical abilities and increase their confidence in handling data in order to turn data into information and knowledge.

On completion of the unit, students will have the skills and knowledge to support further higher education research and data analysis, which is valued at higher-education level. They will also have developed the essential skills required by business managers to build better products and deliver services that satisfy customers and increase their company's market share and profit margins.

Learning Outcomes

By the end of this unit a student will be able to:

LO1 Evaluate business and economic data/information obtained from published sources

LO2 Analyse and evaluate raw business data using a number of statistical methods

LO3 Apply statistical methods in business planning

LO4 Communicate findings using appropriate charts and tables.

Essential Content

LO1 Evaluate business and economic data/information obtained from published sources

Interpretation of business and economic data:

The nature of data and information, and how data can be turned into information and information into knowledge.

Interpreting data from a variety of sources, using different methods of analysis: descriptive, exploratory and confirmatory.

LO2 Analyse and evaluate raw business data using a number of statistical methods

Statistical methods that are used to analyse and evaluate data:

Differences between qualitative and quantitative raw data analysis.

Descriptive statistics:

Measures of central tendency, e.g. mean, median.

Measures of variability, e.g. range, standard deviation.

Application to business data, e.g. finding average earnings, measuring variability in business processes such as queuing times and customer arrival rates.

Inferential statistics:

The difference between sample and population.

Different sampling techniques and methods.

Measuring association:

Use of scatter plots, correlation and regression analysis, simple forecasting.

Business applications such as the association between output and cost, advertising and sales.

Evaluating use of software such as Excel and SPSS Statistics to perform raw data analysis.

Applying the appropriate methods and tools for evaluation of raw data.

LO3 **Apply statistical methods in business planning**

Statistical methods for business planning:

Applying statistical methods to areas of business planning and operations management, including inventory management and capacity management.

Measures of variability:

The issue of variability in business processes, e.g. arrival rates of customers, time taken to deal with customers, and how this leads to a trade-off between waiting time and process utilisation.

Statistical process control in quality management.

Measures of probability:

Probability distributions and application to business operations and processes.

Normal distribution, e.g. weights and measures regulations and statistical process control.

Poisson distribution, e.g. customer arrival rates, and binomial distribution, e.g. inspection sampling.

Inference, e.g. margins of error and confidence limits.

LO4 **Communicate findings using appropriate charts/tables.**

Different variables:

Choosing the most effective way of communicating the results of your analysis and variables.

Nominal, ordinal and interval/ratio levels.

Different types of charts, tables and diagrams:

The use of frequency tables, simple tables, pie charts, histograms, frequency curves and normal curve.

Advantages and disadvantages of different types of methods.

Presentation of information using tables and charts.

Software for producing charts and tables, e.g. Excel.

Learning Outcomes and Assessment Criteria

<table>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td colspan="2">LO1 Evaluate business and economic data/information obtained from published sources</td><td rowspan="5">LO1 and LO2
D1 Critically evaluate the differences in application between methods of descriptive, exploratory and confirmatory analysis of business and economic data.</td></tr>
<tr><td>P1 Evaluate the nature and process of business and economic data/information from a range of different published sources.
P2 Evaluate data from a variety of sources, using different methods of analysis.</td><td>M1 Critically evaluate the methods of analysis used to present business and economic data/information from a range of different published sources.</td></tr>
<tr><td colspan="2">LO2 Analyse and evaluate raw business data using a number of statistical methods</td></tr>
<tr><td>P3 Analyse and evaluate qualitative and quantitative raw business data from a range of examples, using appropriate statistical methods.</td><td>M2 Evaluate the differences in application between descriptive statistics, inferential statistics and measuring association.</td></tr>
<tr><td colspan="2">LO3 Apply statistical methods in business planning</td><td rowspan="2">D2 Make valid recommendations and judgements for improving business planning through the application of statistical methods.</td></tr>
<tr><td>P4 Apply a range of statistical methods used in business planning for quality, inventory and capacity management.</td><td>M3 Justify the use of appropriate statistical methods, supported by specific organisational examples.</td></tr>
<tr><td colspan="2">LO4 Communicate findings using appropriate charts and tables.</td><td rowspan="2">D3 Justify the rationale for choosing the method of communication.</td></tr>
<tr><td>P5 Assess different types of visual representations for communicating findings effectively.
P6 Using appropriate charts and tables, communicate findings for given variables effectively.</td><td>M4 Evaluate the use of different types of charts and tables for effectively communicating findings for given variables.</td></tr>
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Recommended Resources

Textbooks

ANDERSON, D. et al (2019). *Statistics for Business & Economics.* 3rd Ed. Cengage Learning.

NEWBOLD, P. et al (2019) *Statistics for Business and Economics. Global edition.* 9th Ed. Harlow: Pearson.

RENDER, B. (2017) *Quantitative Analysis for Management.* 13th Ed. Harlow: Pearson.

Websites

www.bbc.co.uk	BBC Skills Maths – graphs (General reference)
www.corporatefinanceinstitute.com	Corporate Finance Institute Resources Knowledge (General reference)
www.statstutor.co.uk	Stats Tutor Resources for statistics (General reference)

Links

This unit links to the following related units:

Unit 5: Accounting Principles

Unit 6: Managing a Successful Business Project (Pearson Set)

Unit 11: Business Data and Numerical Skills

Unit 19: Research Project (Pearson Set)