Unit 17: Quality and Process Improvement

Unit code	**H/615/1491**
Unit level	**4**
Credit value	**15**

Introduction

Quality has always been the key to business success and survivability, but it requires organisations to allocate a lot of effort and resources to achieve it. The key to providing quality services and designing top quality products lies in the strength and effectiveness of the processes used in their development; processes which must be constantly reviewed to ensure they operate as efficiently, economically and as safely as possible.

This unit introduces students to the importance of quality assurance processes in a manufacturing or service environment and the principles and theories that underpin them. Topics included in this unit are: tools and techniques used to support quality control, attributes and variables, testing processes, costing modules, the importance of qualifying the costs related to quality, international standards for management (ISO 9000, 14000, 18000), European Foundation for Quality Management (EFQM), principles, tools and techniques of Total Quality Management (TQM) and implementation of Six Sigma.

On successful completion of this unit students will be able to illustrate the processes and applications of statistical process, explain the quality control tools used to apply costing techniques, identify the standards expected in the engineering environment to improve efficiency and examine how the concept of Total Quality Management and continuous improvement underpins modern manufacturing and service environments.

Learning Outcomes

By the end of this unit students will be able to:

1. Illustrate the applications of statistical process control when applied in an industrial environment to improve efficiency.
2. Analyse cost effective quality control tools.
3. Determine the role of standards in improving efficiency, meeting customer requirements and opening up new opportunities for trade.
4. Analyse the importance of Total Quality Management and continuous improvement in manufacturing environments.

Essential Content

LO1 **Illustrate the applications of statistical process control when applied in an industrial environment to improve efficiency**

Quality control:

The tools and techniques used to support quality control

Attributes and variables

Testing processes

Quality tools and techniques, including statistical process control (SPC)

Designing quality into new products and processes using Quality Function Deployment (QFD)

LO2 **Analyse cost effective quality control tools**

Quality costing:

Costing modules

The importance of qualifying the costs related to quality

How costs can be used to improve business performance

LO3 **Determine the role of standards in improving efficiency, meeting customer requirements and opening up new opportunities for trade**

Standards for efficiency:

The history of standards

The role of standards and their importance in enabling and supporting trade, business and industry

Standards for measurement

International Standards for management (ISO 9000, 14000, 18000)

European Foundation for Quality Management (EFQM) as an aid to developing strategic competitive advantage

LO4 **Analyse the importance of Total Quality Management and continuous improvement in manufacturing environments**

Overview and function of quality:

The importance of quality to industry: how it underpins the ability to improve efficiency, meet customer requirements and improve competitiveness

Principles, tools and techniques of Total Quality Management (TQM)

Understanding and implementation of Six Sigma

Learning Outcomes and Assessment Criteria

<table>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td colspan="2">LO1 Illustrate the applications of statistical process control when applied in an industrial environment to improve efficiency</td><td rowspan="2">D1 Suggest justified recommendations for the application of statistical process control in an industrial environment to improve efficiency</td></tr>
<tr><td>P1 Review the tools and techniques used to support quality control

P2 Describe the processes and applications of statistical process control in industrial environments</td><td>M1 Explain the role and effectiveness of the quality tools and techniques used within an industrial environment</td></tr>
<tr><td colspan="2">LO2 Analyse cost effective quality control tools</td><td rowspan="2">D2 Develop a process for the application of an extensive range of quality control tools and techniques with emphasis on costing</td></tr>
<tr><td>P3 Analyse the effective use of quality control tools and techniques

P4 Analyse costing techniques used within industry</td><td>M2 Determine with justification the quality control tools and techniques that could be used to improve business performance</td></tr>
<tr><td colspan="2">LO3 Determine the role of standards in improving efficiency, meeting customer requirements and opening up new opportunities for trade</td><td rowspan="2">D3 Illustrate a plan for the application of international standards that would improve efficiency, meet customer requirements and open up new opportunities for trade</td></tr>
<tr><td>P5 Determine required standards to improve efficiency, meet customer requirements and open up new opportunities for trade</td><td>M3 Discuss the importance of standards applied in the engineering environment</td></tr>
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Pass	Merit	Distinction
LO4 Analyse the importance of Total Quality Management and continuous improvement in manufacturing and service environments		**D4** Analyse how the appropriate application of Total Quality Management and continuous improvement in tools and techniques affect quality performance in the manufacturing and service environments
P6 Analyse the principles, tools and techniques of Total Quality Management and continuous improvement **P7** Analyse how the concept of Total Quality Management and continuous improvement could help in delivering high quality performance within businesses	**M4** Discuss how the appropriate application of Total Quality Management and continuous improvement in tools and techniques affect quality performance in the manufacturing and service environments	

Recommended Resources

Textbooks

OAKLAND, J.S. (2003) *Total Quality Management: Text with Cases*. 3rd Ed. Butterworth-Heinemann.

SLACK, N., CHAMBERS, S. and JOHNSTON, R. (2016) *Operations Management*. 8th Ed. Essex: Pearson Education Limited.

Links

This unit links to the following related units:

Unit 49: Lean Manufacturing