Unit 30: Quality Assurance and Management

Unit code: D/601/1486
QCF level: 5
Credit value: 15

• Aim
This unit will develop learners’ knowledge and understanding of the principles and applications of quality management.

• Unit abstract
In this unit learners will investigate total quality management (TQM) and develop an understanding of the key factors that underpin quality assurance (QA) techniques. The unit also introduces learners to the application of quality control (QC) techniques. The basic principles of total quality management will include management structures and TQM techniques. Learners will also develop an understanding of the key factors, internal and external controls and cost implications that underpin quality assurance techniques. Finally, the unit introduces the application of quality control techniques, process capability and software packages to support the processes.

• Learning outcomes
On successful completion of this unit a learner will:
1 Understand how total quality management (TQM) systems operate
2 Know the key factors of quality assurance (QA) techniques
3 Be able to apply quality control (QC) techniques.
Unit content

1 Understand how total quality management (TQM) systems operate

*Principles of TQM*: continuous improvement; total company commitment; quality strategy; management of change; focus eg internal and external customers, products/services, processes and people, fit-for-purpose; leadership; motivation and training; applicable supporting theories eg Deming, Juran, Crosby, Ishikawa

*Management structures*: organisational structures and responsibilities; quality improvement methods eg quality improvement teams and teamwork; quality circles/Kaizen teams; operational theory eg organisational culture, strategy, vision, mission, values and key issues; barriers to TQM eg lack of commitment, fear of change/responsibility, immediacy of pay-off, cost of TQM

*TQM techniques*: use of tools eg process flow charts, tally charts, Pareto analysis, cause and effect analysis, hazard analysis-critical control points, statistical process control SPC, benchmarking; methods eg brainstorming, team building, appraisal, training and development, mentoring; compliance to standards; procedures and manuals; impact of organisational factors eg leadership, communications, performance indicators and objectives

2 Know the key factors of quality assurance (QA) techniques

*Key factors*: procedures; quality manuals; parameters eg fitness-for-purpose, customer satisfaction, cost effectiveness, compliance with standards; standards organisation and documentation charts; communication; feedback; legislation

*Control purposes*: internal and external quality audits eg trace ability, compliance, statistical methods, planned maintenance, condition monitoring

*Costing*: quality vs productivity; cost centres; allocation of overheads; maintenance and downtime cost

3 Be able to apply quality control (QC) techniques

*Quality control techniques*: inventory control eg just-in-time (JIT), kanban, material requirements planning (MRP); statistical process control eg frequency distribution, mean range, standard deviation, control charts, calculation of warning and action limits; acceptance sampling eg producer’s and consumer’s risk, sampling plans, plotting and interpretation of an operating characteristic curve

*Process capability*: relationship between specification limits and control chart limits; modified limits; relative precision index

*Software packages*: eg quality audit procedures, vendor rating, cause and effect analysis, Pareto analysis
# Learning outcomes and assessment criteria

<table>
<thead>
<tr>
<th>Learning outcomes</th>
<th>Assessment criteria for pass</th>
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<tbody>
<tr>
<td><strong>On successful completion of this unit a learner will:</strong></td>
<td><strong>The learner can:</strong></td>
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<tr>
<td>LO1 Understand how total quality management (TQM) systems operate</td>
<td>1.1 explain the principles of TQM in relation to a specific application</td>
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<td>1.2 evaluate management structures that can lead to an effective quality organisation</td>
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<td>1.3 analyse the application of TQM techniques in an organisation</td>
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<td>LO2 Know the key factors of quality assurance (QA) techniques</td>
<td>2.1 identify the key factors necessary for the implementation of a QA system within a given process</td>
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<td>2.2 interpret a given internal and external quality audit for control purposes</td>
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<td>2.3 describe the factors affecting costing</td>
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<td>LO3 Be able to apply quality control (QC) techniques</td>
<td>3.1 report on the applications of quality control techniques</td>
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<td>3.2 apply quality control techniques to determine process capability</td>
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<td>3.3 use software packages for data collection and analysis.</td>
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Guidance

Links

This unit has links with Unit 7: Business Management Techniques and Unit 3: Project Design, Implementation and Evaluation.

The unit can also be linked to the SEMTA Level 4 National Occupational Standards in Engineering Management, particularly Unit 4.29: Implement Quality Assurance Methods and Procedures.

Essential requirements

Centres will need to provide simulated or actual examples for the application of methods used to install, monitor and control the quality of both products/services and their associated processes.

Employer engagement and vocational contexts

Industrial visits, work placements or employment could provide access to additional resource facilities and reinforce relevance. Wherever possible, learners should be given the opportunity to observe quality operations through industry visits. Equally, the work-based experiences of the learners should be used to illustrate applications of theory in practice.