

HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

THE COST OF QUALITY AND
PRODUCTIVITY IMPROVEMENT
IN AN INDUSTRY

M/836

VATALIS VASILIOS

JUNE 1998

THE COST OF QUALITY AND PRODUCTIVITY
IMPROVEMENT IN AN INDUSTRY

by

Vatalis Vasilios

Project Report

Submitted to

the Department of Mechanical Engineering
of the Higher Technical Institute

Nicosia Cyprus

in partial fulfillment of the requirements
for the diploma of

TECHNICIAN ENGINEER

in

MECHANICAL ENGINEERING

June 1998



*To my parents for
tolerating me
for as long as they have*

TABLE OF CONTENTS

Page

Title page

Table of contents

Acknowledgements

Summary

List of abbreviations

Chapter One: Introduction to the project	1
Chapter Two: Definition and importance of Quality	
2.1. Introduction to Quality	4
2.2. The Evolution of Quality	6
2.3. Quality Today	8
2.3.1. Total Quality	9
2.3.2. Total Quality Management	11
Chapter Three: Quality Costing Systems Development	
3.1. The Cost of Quality and Productivity	16
3.2. Development of Quality Costing Systems	18
3.2.1. Quality Cost Categories	18
3.3. Quality Costing Models for Effective Management	22
Chapter Four: Introduction to the company	
4.1. The Cyprus Carlsberg Brewery	32
4.2. What they do/How they do it	33
4.2.1. The Brewhouse	34
4.2.2. The Beer Processing Department	37

<i>Table of contents</i>	<i>Page</i>
4.2.3. Beer Bottling	38
4.3. Existing Quality status of the company	40
Chapter Five: Evaluation of Quality Costs	
5.1. Methodology adopted	42
5.2. Presentation of quality cost figures	45
5.2.1. Comparison with other companies in Cyprus and world-wide	45
5.3. Development of the process Cost Model	46
5.3.1. The Process model	46
5.3.2. The Cost Model	48
5.3.3. The Process Cost Report	51
Chapter Six: The improvement process	
6.1. Instigating quality improvement	52
6.1.1. Quality Improvement through Quality Costing	54
6.2. Suggestions for improvement in Carlsberg	55
Chapter Seven: Discussion and conclusions	57
<hr/>	
Bibliography	

Acknowledgements

I would like to thank Dr I. Angeli, for being a constant source of information and inspiration, by constantly practicing what he preaches.

I would also like to thank my supervisor, Dr L. Lazari, for his open-mindedness, my friend Polyvios Georgiades, for providing me with a personal computer to type the report, and The Cyprus Carlsberg Brewery, for their cooperation.

SUMMARY

THE COST OF QUALITY AND PRODUCTIVITY IMPROVEMENT IN AN INDUSTRY

by VATALIS VASILIOS

A comprehensive coverage of Quality Costing systems aimed at providing a solid grounding on the basic principles of quality and quality costing, and at offering guidance on the subject of quality costing system implementation. A guide to quality costing systems implementation containing an extensive review of the importance of introducing quality in an organisation and of the strong links between quality and productivity.

The main purposes of this study of quality costing systems are to alert people to the importance of developing systems and procedures aiming at cost reduction through the judicious pursuit of quality improvement projects, to explain the procedure of application of such a system and to provide guidance on implementing a quality costing system for the right reasons. That is, the adoption of such an approach to quality must be part of an overall quality business culture.

An overview of the quality growth in recent years is followed by a discussion of contemporary trends in the field. The contribution of quality to increasing competitiveness and profitability is discussed. An analysis of established quality costing models follows a few paragraphs on the relevant theory.

An example of an application of quality costing in a real case assists the explanation of the implementation procedure. A chapter providing information on the process associated with the implementation of this quality costing exercise precedes the exercise itself, to assist the comprehension of the quality cost components discussed in the exercise.

An analysis of procedures and forms that can and should be used together with a quality costing model to enhance its effectiveness, and a conclusive debate on the virtues required of company staff and management to successfully embark on the endless journey of continuous quality improvement.

List of Abbreviations

ANSI- American National Standards Institute
ASQ- American Society for Quality
BSI- British Standards Institution
CEO- Chief Executive Officer
COC- Cost Of Conformance
CONC- Cost Of Non-Conformance
EFQM- European Foundation for Quality Management
H.T.I.- Higher Technical Institute
POC- Price Of Conformance
PONC- Price Of Non-Conformance
QA- Quality Assurance
QC- Quality Control
ROI- Return On Investment
SPC- Statistical Process Control
TQ- Total Quality
TQM- Total Quality Management