HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

DESIGN OF MATERIALS HANDLING SYSTEM FOR A BOTTLING PLANT

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JUNE 1997

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by

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Project Report
Submitted to

the Department of Mechanical Engineering

of the Higher Technical Institute

Nicosia Cyprus

in partial fulfilment of the requirements

for the diploma of

TECHNICIAN ENGINEER

in

MECHANICAL ENGINEERING

July 1997

Dedicated to my parents for their
praiseworthy and valuable offer to me.

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ACKNOWLEDGEMENTS

I would like to thank Dr. L Lazaris, lecturer in Mechanical Engineering, at H.T.I. for his valuable assistance and guidance offered to me in carrying out the presented diploma project.

I would also like to express my thanks to Mr. A. Armenakis, Chief Engineer, Mr. Charalambos Savva, Technician Engineer and personnel in CARLSBERG who supplied me with very useful information relevant to the subject of the diploma project.

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SUMMARY

The objectives of this project were to study the Materials Handling System of an existing manufacturing industry and afterwards, to proceed with a design of a new system having in mind all the appropriate improvements.

The study was carried out in CARLSBERG Co., a company that produces beer. Having observed and examined all basic departments were the production of beer takes place, I was applied to a research within the bottling plant department to improve its material handling system.

Starting from the first chapter of this project an introduction is made in order to cover the basics about automation since many material handling systems nowadays are designed to be automated.

In the second chapter the coverage focuses on the material handling function, its types of equipment and their characteristics.

In the third chapter a reference is made about the consideration of materials and movement conditions.

In the fourth chapter the manufacturing procedures for CARLSBERG beer are presented in detail.

Proceeding with the fifth chapter, improvements take place to the material handling equipment of the CARLSBERG'S new bottling hall.

In chapter six, an account of savings is presented in order to employ the new material handling equipment.

In chapter seven, the materials handling system for a new department that should produce plastic bottles, is designed.

In chapter eight the general conclusions are presented taken from the whole project.

CHAPTER 1

INTRODUCTION

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Until about the 1950s, most manufacturing operations were carried out on traditional machinery, such as lathes, milling machines, and presses, which lacked flexibility and required considerable skilled labor. Each time a different product was manufactured, the machinery had to be retooled, and the movement of materials had to be rearranged. The development of new products and parts with complex shapes required numerous trial-and-error attempts by the operator to set the proper processing parameters on the machine. Furthermore, because of human involvement, making parts that were exactly alike was difficult.

These circumstances meant that processing methods were generally inefficient and that labor costs were a significant portion of overall production costs. The need for reducing the labor share of product costs gradually became apparent, as did the need to improve the efficiency and flexibility of manufacturing operations. This need was particularly significant in terms of increased competition, both domestic and global.

The crucial step in improving the efficiency of manufacturing operations was automation, from the Greek word automatos, meaning self-acting. The word automation was coined in the mid-1940s by the U.S. automobile industry to indicate automatic handling of parts between productions machines, together with their continuous processing at the machines. During the past four decades, major advances and breakthroughs in the types and extend of automation have occurred. These important developments were made possible largely through rapid advances in the capacity an sophistication of computers and control systems.