

**DEVELOPMENT OF A MICROCONTROLLER-BASED TIME
AND TEMPERATURE MONITORING DEVICE FOR A
COFFEE ROASTING MACHINE**

Design Project

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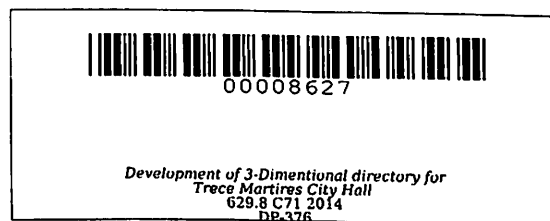
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**DEVELOPMENT OF A MICROCONTROLLER-BASED TIME AND
TEMPERATURE MONITORING DEVICE FOR A
COFFEE ROASTING MACHINE**

Undergraduate Design Project
Submitted to the Faculty of the
College of Engineering and Information Technology
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ABSTRACT

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The main objective of the project was to develop a microcontroller-based time and temperature monitoring device for a coffee roasting machine. Specifically, it aimed to develop a microcontroller unit for the system that is capable of controlling the whole roasting operation. The interfacing process between the microcontroller, sensor, LCD, and memory card was successfully done. The testing and evaluation of the performance of the system was made based on controlling and storing reliability. The cost computation of the study was also conducted.

PIC16F77A microcontroller was used due to its number of ports that is capable of handling the input and output of the data in the system. The ports were used in interfacing the whole system with the other units like the power supply, Liquid Crystal Display (LCD), numeric keypad, temperature sensor, and relay driver circuit.

The testing and evaluation of the project was done at the National Coffee Research Development and Extension Center (NCRDEC) to test the performance of the system. The controlling and storing reliability of the device were tabulated. T-test was used in the analysis of the data.

The results show that there is no significant difference between the measured and stored temperature as well as between the measured and displayed temperature which

proves that the developed project is consistent and reliable in controlling and monitoring as well as data storing of the time and temperature.

The total cost of the design project was P18, 494.00.

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INTRODUCTION

In our generation nowadays, automation of manual processes is one of the key to success for better and faster performance of the machine. According to Jordon Casinger (2010), automation is the use of machines, control systems, and information technologies to optimize productivity in the production of goods and delivery services. The correct incentive for applying automation is to increase productivity and quality beyond that possible with current human labor levels so as to realize economies of scale, also to realize predictable quality levels.

In the agricultural industry, most farmers sell their beans after harvesting, because most of them do not have processing equipment, which commands cheaper price than when it processed. To have a better cost, beans should be properly processed (Austria and Ayos, 2009, p.1).