

**GA BASED MODEL FOR  
REAL TIME DISPATCHING IN SILTERRA – AN APPROACH  
TO DISPATCHER OPTIMIZATION**

**A Thesis submitted to the Graduate School in partial  
fulfilment of the requirements for the degree  
Master of Science (Intelligent Systems)  
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## **ABSTRACT**

Real time dispatching in semiconductor manufacturing environment is indeed a critical process. Dispatching itself plays a critical role to determine the success of higher throughput and to achieve minimum cycle time. Dispatching is needed to improve production efficiencies by providing a scheduled and planned way of executing the manufacturing operational procedures. This research uses real time problem experienced by SilTerra Malaysia Sdn. Bhd. Real time dispatching requires rule to execute within seconds, but with SilTerra Dispatch List, current small rules take more than 10 seconds to execute. Since this takes time, most of the manufacturing technicians tend to switch over to the conventional way of lot dispatching by using FactoryWorks. This research proposes a GA model to optimize the use of dispatcher; which is used for real time dispatching. The result of this research concludes that GA approach can be greatly useful in optimizing dispatchers for Real Time Dispatching in the semiconductor industry.

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## **LIST OF ABBREVIATIONS**

APF	Advanced Productivity Family
CIM	Computer Integrated Manufacturing
FAB	Fabrication Foundry
GA	Genetic Algorithm
GUI	Graphic User Interface
MES	Manufacturing Execution System
RTD	Real Time Dispatching
SDL	SilTerra Dispatch List
UUM	Universiti Utara Malaysia
WIP	Work In Progress

# **CHAPTER 1**

## **INTRODUCTION**

Semiconductor manufacturing is an industry that has become highly competitive. Semiconductor manufacturing technologies are concerned with the creation of smaller structures for semiconductor chips. The methods are based on silicon, and structure the surface of the silicon. The manufacturing process is indeed a complicated process and is capital-intensive. In order for a manufacturer to survive in this market, one must be performance and goal driven. Cycle time and throughput is an important factor in wafer fabrication, where both need to be met in order to ensure customer satisfaction.

### **1.1 Wafer Fabrication – An Overall View**

Wafer is a thin, round slice of silicon which resembles a compact disk, from which microchips are made of. Silicon is processed into large cylinder ingots, sliced into highly polished wafers and implanted with transistors before being cut into smaller semiconductor integrated circuit chips. The circuit elements are built in layers on the silicon wafer by etching hundreds of memory chips onto each wafer. Wafer

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