

**DUST REDUCTION IN AN ELECTRONIC INDUSTRY THROUGH TRIZ
METHODOLOGY**

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To my beloved husband Muhammad Rais,
my parents Zaharatol Hayat and Ahmad Nizar

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ABSTRACT

The purpose of this project is to reduce dust in electronics products during assembly process. The used of TRIZ concept will improve the process of assembly qualitatively that eliminating the contradiction problem that occurred during the process of improving process. Multimeter products which is has display was selected as a case study to evaluate the process. TRIZ tools 40 Incentive Principles were used to reduce the dust on the display during assembly process. From the proposed solution idea, the results show that clean bench has been selected to control dust at Assembly 1 station. Therefore, results were compared between before and after implementation of clean bench and it show that increasing of yield thus meet the target of yield. Furthermore, the successful of this case study show that TRIZ can be powerful tool to solve a problem.

ABSTRAK

Tujuan projek ini adalah untuk mengurangkan habuk dalam produk elektronik semasa proses pemasangan. Konsep TRIZ digunakan untuk meningkatkan proses pemasangan secara kualitatif yang menghapuskan masalah percanggahan yang berlaku semasa proses proses bertambah baik. Produk Multimeter yang mempunyai paparan telah dipilih sebagai kajian kes untuk menilai proses. Alat TRIZ 40 Prinsip Insentif telah digunakan untuk mengurangkan habuk di paparan semasa proses pemasangan. Hasil dari idea penyelesaian yang dicadangkan itu, keputusan menunjukkan bahawa 'Clean bench' telah dipilih untuk mengawal habuk pada stesen Pemasangan 1 . Oleh itu, keputusan dibandingkan antara sebelum dan selepas pelaksanaan dan ia menunjukkan bahawa peningkatan hasil itu memenuhi sasaran. Tambahan pula, kejayaan kajian kes ini menunjukkan bahawa TRIZ boleh menjadi alat yang mampu untuk menyelesaikan masalah.

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LIST OF ABBREVIATIONS

TRIZ - Teoriya Resheniya Izobretatelskikh Zadatch

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In this chapter will discuss the general overview of this paper. Base on the title, this study is about dust reduction in an electronic industry by using TRIZ method. This chapter will discuss the bad impact of dust to the electronic and the TRIZ method will be selected in order to solve a problem. The objective, scope and limitation of the project also will be discussed.

1.2 Background of the study

As contract manufacturers, customer satisfaction is the top priority of the company. Customers trust on the company by provide them with flexible electronics manufacturing services that enable them to overcome challenges and be successful. To ensure company consistently live up to their expectations, company foster a motivated, high-integrity work environment based on a strong set of corporate values. These values empower all employees to provide superior service. The value is includes producing high quality products to meet customer quality standards,

including the quality of cosmetics. Recently, company has a relatively high cosmetic issue during production, especially in the dust issue. In this research, process engineering team studies how to reduce dust in the current product assembly by using TRIZ method.

TRIZ comes from Russia words 'Teoriya Resheniya Izobretatelskikh Zadatch' means Theory of Inventive Problem Solving. TRIZ is the only solution toolkit which exists so far in the world that offers engineers help beyond brainstorming at the actual concept-solution locating and problem solving moments. There are wonderful toolkits for understanding problems, with analysis processes for capturing the requirements, analyzing the systems, looking at processes and pinpointing actual causes of problems [1]. In chapter two, literature review will elaborate more about TRIZ.

1.3 Problem Statement

During Production perform a cosmetic inspection, most of the cosmetic failure captured due to a dust on the Display of Multimeter products. Based on customer Cosmetic Inspection Specification, the Display part is considered in category I-A1 (Appendix A) which is the small particle specs allowable is not more than 0.12mm or two particles 0.26mm. Hence, production has difficulty to control dust in the factory especially during assembly. Therefore, this study is focuses on using TRIZ method which enables to decide the best method of dust reduction.

1.4 Objective of the Project

The objectives of this paper are as following:

- i To minimize failure due to dust on the product thus to increase yield.
- ii To propose a control system or method of minimizing dust content of a production area below a certain acceptable level.

1.5 Scope and Limitation

The scope and limitation of this study are as follows.

1.5.1 Scope

- (i) The study is confine to dust content in assembly production area.
- (ii) The study will use customer product as a case study.
- (iii)The study will used data taken from January 2013 to March 2013
- (iv)The study will apply TRIZ methodology and using tool 40 Principles.
- (v) The study will be conducted at Celestica electronic industry in Senai, Johor

1.5.2 Limitation

This study has to get approval from top management in order to implement the proposal due to the cost.

1.6 Summary of Literature

The goal of this paper is to minimize dust in electronic industries by using TRIZ methodology. The study is conducted in Celestica Senai in production area as a boundary of the research. From the problem statement, the objective of the research can be achieved in order to solve the problem. The boundary of the study also discussed in this chapter.

1.7 Conceptual Framework

Based on the literature survey, TRIZ is a tool can be used to a solve problem. TRIZ is a creativity method which can be actually described as a structured problem solving process with the integration of a set of problem definition and resolution tools that were created on the basis of the analysis of millions of world-wide patents. With several decades of development and practices, TRIZ has already proven its effectiveness and efficiency in resolving technical problems for physical product design [3]. Due to the universality and capability of TRIZ techniques, there are TRIZ researchers have realized the potentials of extending TRIZ applications to non-technical problems. By applying TRIZ to solve dust issue in electronic industries, below is conceptual framework of a new way of minimizing dust in electronic industries.

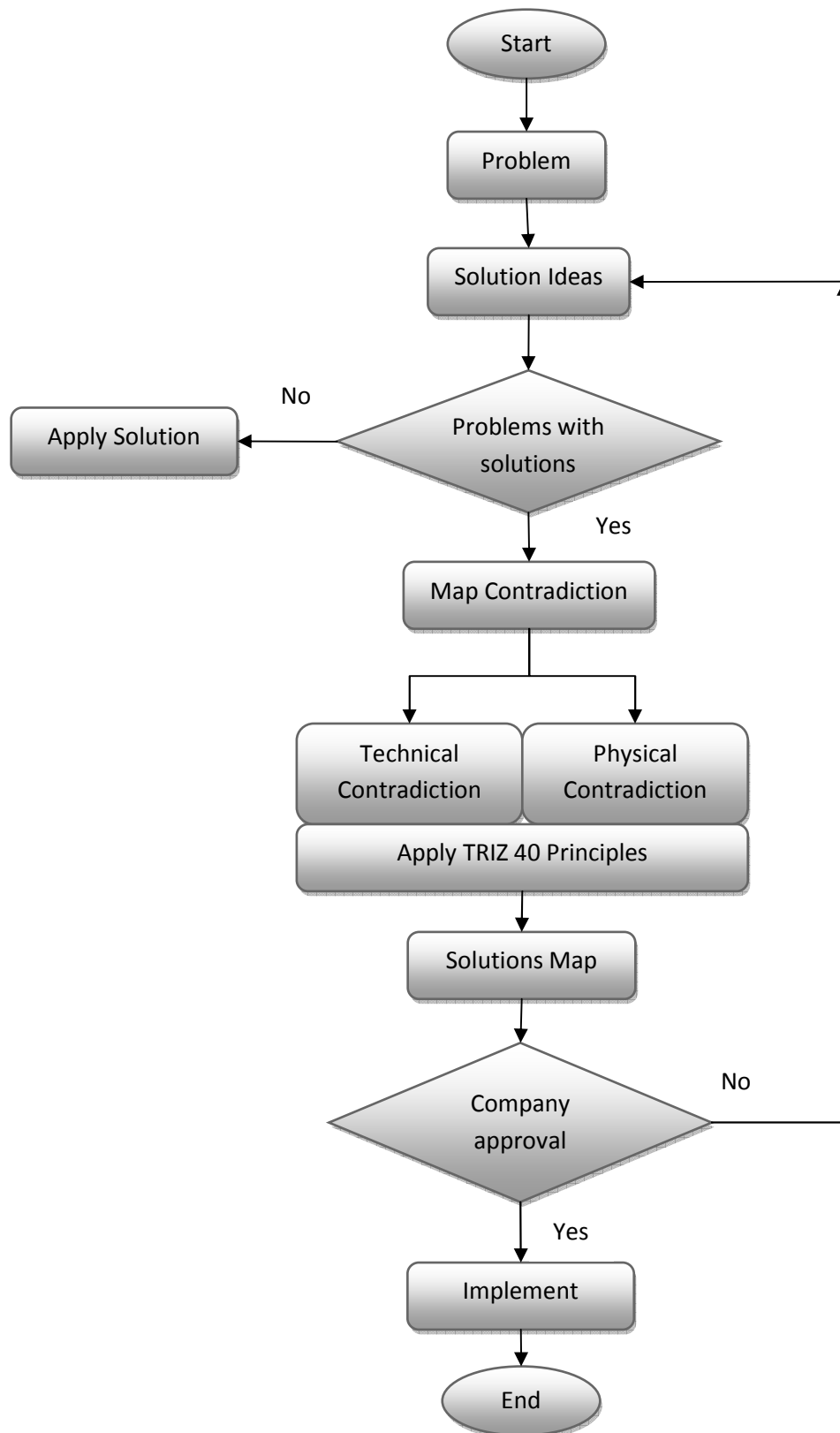


Figure 1.1: Conceptual Framework

1.8 Significant of the Study

This study was given a better picture on how the methodologies were help process engineer to come out a better result to control dust on electronic products and the environment in production area. Result of this method should show an improvement of dust issue and will attract more organization to implement this method in their product quality.

1.9 Organization of Thesis

Chapter 1 provides the introduction of the study which is to describe what are the problems and the objectives. The introduction includes the background of the study and also the idea of TRIZ.

Chapter 2 provides the literature review of the study. In this chapter is discussing the theoretical of TRIZ. Chapter 3 provides the selection of product case study which is Handheld Multimeter was selected.

Presentation of improvement using TRIZ is in Chapter 4. The beginning of this chapter showed the overview of TRIZ selection tool. Then 40 Inventive Principe tool was selected and, it showed the step. Finally, the Ideal Final Solution was obtained.

The description of Results and Discussion are in chapter 5. The data after implementation of clean bench have been showed in this chapter. Furthermore, the

results data has been compared with before implementation of TRIZ. Finally, discussion base on the results.

Lastly, the chapter 6; Conclusions and recommendations. The conclusions describe the overall summary of this project. Recommendations for improvement of dust reduction have been state in this chapter.

1.10 Conclusion

This chapter has presented the justification of the study by carry out the research, background to the problem, problem statement, objective, scope and the organization of the thesis. The next chapter will review the literature of the area under investigation.

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