CHAPTER I INTRODUCTION

I.1 Background

Main issue of waste in Indonesia is organic waste as the biggest composition and main source of pollution (water, soil water, and air) with less effective handling. The increasing amount of garbage make the waste management in Indonesia changes from collection-transport-disposal (P3) begins to shift to the sorting-processing-use-disposal of residue (P4) . Garbage processing aims to reduce or eliminate problems related to the environment.

As the center of national activities, Bandung Basin area has areas with high activity. Regional urban waste generation include the category of very high generation exceeding 3000 m^3 / day with the largest source of Bandung and Bandung regency.

And Figure 1.1 show that most of garbage composition in Bandung City is organic waste with percentage is more than 60% .

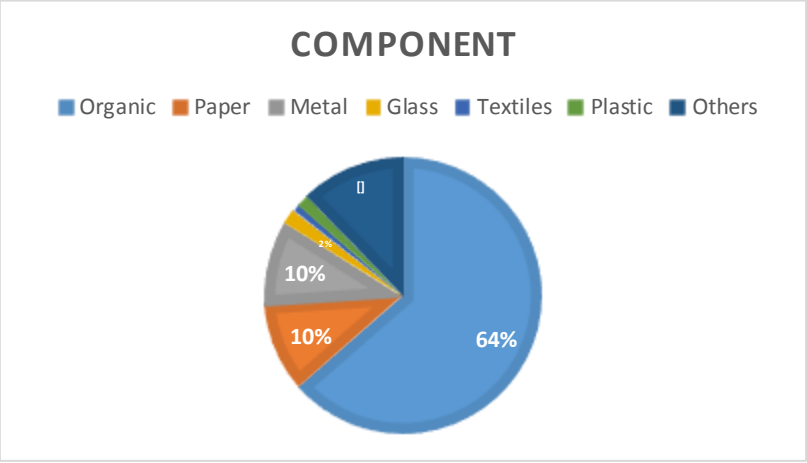

Figure I. 1 Waste composition in Bandung (Civil Cleaning. 2008)

One of the alternative technologies that have been developed to deal with the waste problem in the micro and the macro scale is known as the incinerator.

Burning of by using incinerator, trash is burned and turned into a gas (smoke) and ash.

The advantages of according to Sidik et al. (1985) are :

a. There was a reduction of waste volume approach 75% to 80% from the initial garbage that comes without splitting process.
b. The rest of combustion in the form of ash is quite dry and free from decay

Bandung Techno Park (BTP) Telkom University has also developed a method of waste processing technologies by using incinerator.

Incinerator that used by the Bandung Techno Park is a custom design which made by the developer so it has different form among other incinerator. The waste that allowed is household waste except medical waste and B3. Residues from waste incineration is approximately 2% of the amount of waste burned.

In Figure 1.2 is an SOLAIR incinerator made by the Bandung Techno Park developer and has been placed in Telkom University to process domestic waste.

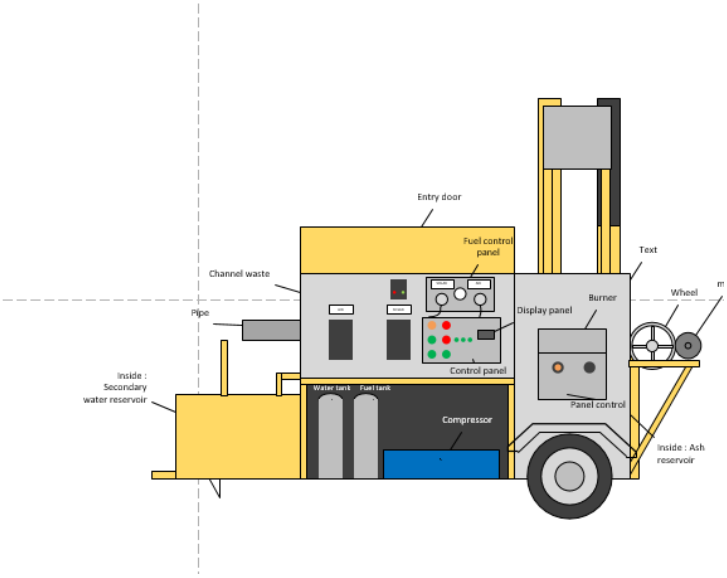

Figure I. 2 SOLAIR Incinerator in Telkom University

From the interview and observation, the authors found some weaknesses and problems that occured such as difficulties way to repair some components when its damaged because the design is integral. And other components placed adjacent

to burner so higher risk for failure. Based on the problem, researcher take modularization approach using Contact and Channel Model Contact (C & CM) as problem identification approach.

Product architecture emphasizes how the product can be changed. The architecture of the product determines the functional elements of the product will be influenced by a change to a particular component, and which components must be changed to achieve a desired change to a functional element of the product Ulrich Eppinger ,1995 p 419-440)

This paper implemented effective method for supporting inexperience designer to analyze the the problem of product architecture using elementary design model "Contact & Channel Model" C&CM developed at the Institute of Product Development at the University Karlshruhe (Albers and Ohmer,2003). This paper lead to conclusions regarding problem analysis of SOLAIR incinerator using Faiure Mode Effect Analysis (FMEA) that resulted RPN value for suggestion in future research, coducting with Integration analysis of product decomposition that provide analysis about clustering based on individual interactions types as reference for designing the product architecture improvement in future research.

I.2 Problem Formulation

Problem formulation in this research is :

1. How to analyze the SOLAIR incinerator's problem using intergration analysis of product decomposition and modularization with Contact and Channel Model (C&CM) Approach as a Reference for Designing the Improvement of Product Architecture?

I.3 Research Objective

The objectives from this research is :

1. Analyze the SOLAIR incinerator's problem using intergration analysis of product decomposition and modularization with Contact and Channel Model (C&CM) Approach as a Reference for Designing the Improvement of Product Architecture?

I.4 Limitation Problem

1. Incinerator used in this study is owned incinerator of Bandung Techno Park (BTP), Telkom University named SOLAIR.
2. This research focused on problem analysis only as reference for designing product architecture improvement for future research.
3. This study focuses on problem analysis of SOLAIR incinerator using Integration analysis of product decomposition and modularization with Contact and Channel Model (C&CM) to determine product architecture.
4. This paper is focus on the problem that caused by adjacent of components and their interactions while the technical system solution is developed in future to continue this research.
5. This solution and clustering only based on interactions.

6. This research is not discuss about cost ,so modularization approach can not fully explained and get the overall result. The optimal modular architecture will be explained in the future research.
7. The clustering algorithm that used is Cluster Identification (CI) Algorithm that calculated manually.
8. Data taken from the observation of incinerator in Telkom University.

I.5 Research Benefit

This research benefits as follows:

1. The benefit for us is able to apply knowledge about the product architecture analysis problems as reference for other students to make a improvement design of SOLAIR product architecture in future research using C&CM model .

I.6 Writing Systematics

This study described the systematic writing as follows:

Bab I Introduction

In this chapter the background of the problems outlined in the incinerator SOLAIR product architecture miilik Telkom University. The most important thing is stated problems of the area towards the widespread problem until there is fundamental research. There is also the formulation of the problem, research objectives, limitation of the study, the benefits of research, and systematic in writing.

Bab II Literature Riview

In this chapter, there is a theoretical basis relating to research the product architecture will be discussed. The purpose of this chapter is to establish a framework and theoretical basis that will be used in the implementation of the research and design of the final result. The study of the theory used in this research include knowledge about the product architecture and methods as well as other theories used in analyzing the incinerator SOLAIR malasalah miilik Telkom University.

Bab III Research Methodology

In this chapter described troubleshooting steps used to complete the study to the purpose of the issues discussed serve as the main framework to maintain research achieve the goals set. Structured problem-solving method to see the real condition of the company. The measures detailed study covers the initialization phase and the information contained therein problem formulation, data collection and processing stage in which there are data collection, data processing, analysis malasalah the incinerator so that it can be input to redesign the architecture of the product SOLAIR Incinerator in

future studies. Furthermore terminated by the analysis and conclusions.

Bab IV Data Collecting and Processing

This chapter contains the collection and processing of the data used in the study. Data collection is divided into two, namely data obtained from the operator of the developer incinerator in Bandung Techno Park and the processed data itself in accordance with the data required to perform data processing for research. While the data processing contain data that is processed from the calculation of the maximum degree of modularity and consideration of both interaction between components either positive or negative.

Bab V Analysis

This chapter contains the collection and processing of the data used in the study. Data collection is divided into two, namely data obtained from the operator and developer of incinerator's Bandung Techno Park and the processed data itself in accordance with the data required to perform data processing for research. While the data processing contain data that is processed from the calculation of the maximum degree of modularity and consideration of the interaction between components either positiv or negative.

Bab VI Conclusion and Suggestion

This chapter contains the stages of problem analysis using modularization and integration analysis with pendeketan C & CM models.