

# Modularization in Plant Layout of Printing Industry for Escalating Productive

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*Abstract*— Paper was aimed at planning the printing industry layout & the locality of additional machine to increase the productivity based on the layout planning model to design a virtual model of the industry to gather the maximum requirements of the industry extension. Factors studied in printing factories were consisted of numbers of machines, space requirements, & process area. The problem in term of material flow of each operation section was identified. There were different models for the layout planning & only one best model would be chosen according to the suitability & the practicalities for the printer. The potential models were analyzed & it was found that has become the best one which met most of the practicalities.

**Key words:** Planning, Layout, Productivity, Systematic, Printing

## I. INTRODUCTION

Plant layout is most valuable in physical arrangement machine, equipment, material & facilities of plant. Plant layout maintains the co-ordination in among of 4M's (men, material, machine & method). In every plant there are some problems are come to face to solve the problems plant layout way are used. To set up a plant layout orderly the techniques are used to help to improve or deal with problems. The plant layout arranges the machine, processing equipment & service department [2].

In other words, we can define Layout planning as the work or the plan for the installation of machine, tools, devices or other objects required for the production process under the conditions of the structure & the existing building so that the production becomes safe & highly efficient. The layout planning must be conducted with care in order to meet the requirements for the production demands & the production process. The Systematic Layout Planning model is an approach based on Analytical Hierarchy Process & computer software called Arena. Moreover, there must be a match of balance among production line & delivery line to reduce the transferring time & the waiting time. Some virtual design computer programs are also used such as Arena & Microsoft Visual Basic in relation to the principle in seeking answers in two ways which are CRAFT & Simulated Annealing. This key will reduce the cost & the waste in production resources so that the area of the industry can be maximized & the working place becomes suitable for the efficiency & the productivity of the industry.

Planning & controlling the productivity is usually aimed at maximizing the use of limited resources & at satisfying the customers. The resources in this context can be defined as all facilities for production such as machine, equipment, labor & raw materials for the production. To maximize the effectiveness of the limited resources, the industry managers must be responsible for this & they could work with the department of planning & controlling the productivity to predict, plan, outline, analyze, control the goods in the warehouse, & control the production process.

The basics & the technique in controlling production could also be applied in other services such as controlling the goods in the warehouse of the department store when the economic situation reaches a high competition status.

## A. Plant Layout Tools & Techniques

In plant layout various types of techniques are used to arrange the work in co- ordination manner. The techniques arrange the quickest flow of material at lower cost & with lesser handling in processing the product from the acknowledged of the raw material to the shipment of finished product. The technique arrange that which method is done, which material is used to performed in which machine all the process are arranged by the plant layout technique[1]. There are some types of tools & techniques are discussed below.

The following tools are used, in layout planning:

- Operation process charts
- Flow process charts
- Flow diagrams
- String diagram
- Machine data cards
- Templates
- Scale models
- Layout drawings

## II. RESEARCH METHODOLOGY

This research would follow the procedure.

- 1) The data about the new industry plan were collected & the area of expansion is shown in fig. 1
- 2) There are Sample Room, Raw material & product storage, proof reading for the customers, control room, production room, and inspection section.
- 3) The pathway in the new industry layout must meet the standard size.
- 4) The data would be analyzed according to
  - The new layout planning in which printers & paper cutter would be moved without taking into consideration the cost of moving them as well as the cost of building & designed the extra space;
  - The design of storage area for the raw materials within the industry site.

## III. GATHERING & EXAMINING THE DATA FROM THE SITE

The author got into the site to gather the data about the industry as well as the old layout planning to do a new layout planning. The data provided will be useful for the modification of the layout planning, the requirements for the size & the considerations for the limitations & areas for the machine to be installed. Other issues include the size & the number of the production machine, the amount & the required space for storage, the size & the direction of the pathway for delivery of raw materials & products, the existing space for machine & tools for delivery.



Fig. 1: Area for Expansion

IV. PROBLEM ANALYSIS

When the relevant data were gathered, the next step was to analyze the problems which occurred to the layout planning & the production line. Afterwards, an approach to the layout planning would be adopted to solve such problems.

V. EVALUATION

The evaluation was made by comparing the existing industry layout planning with the new one proposed by the researchers according to the SLP technique. The data would be compared to do a new layout planning to exp& the industry.

The production of goods is usually made to order by customers. In other words, the production system is a Make-to-Order approach & after the production process ends (Fig. 2), the products will be shipped to the customers immediately. In the production process, the steps will follow the Double Stage Processing procedure in which each manufacturing machine would work independently, namely, each product will be made continuously until it is finished within only one machine. The industry layout planning, therefore, seems to be a good solution so that the company could improve the production procedure & that the products could meet the demands & the deadline as required by the customers the flow of the production must be systematic & the delivery must be convenient. With the current area, however, it is impossible; hence, the need for a layout planning.

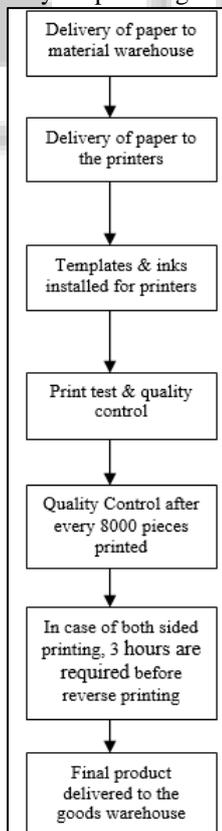


Fig. 2: Printing Procedure

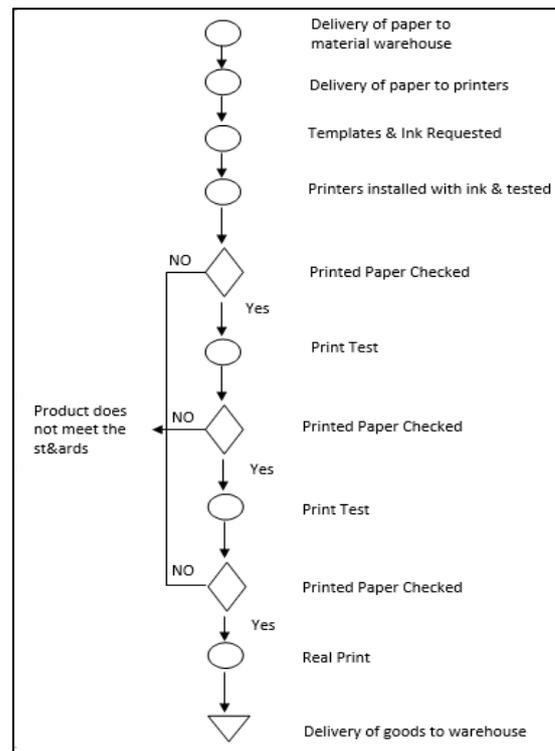


Fig. 3: Printing Production

The production flow chart & the operation process chart are shown below (Fig. 3). Their machines according to the process layout planning. This means that the large machines were installed & fixed at a particular place. Around the same area of the printer, there were also other departments to share the area which included the area for color & template storage, the area for paper sheet preparation before feeding into the printer, the area for storing the printed papers & the area for delivery of the final products.

VI. RESULT

Sample Room	Office	Raw Material Storage	Cutting	Inspection Section
Corridor				Production Area
Product Storage	Proof Reading	Designer Lab	Control Room	

Table 1: Design Layout

The Layout must be convenient for delivery & suitable for storage. Each machine would work independently so that the work could be completed in one machine. The layout planning would focus on the delivery of raw materials & the final products. So, the time for these processes would take the minimum amount. The Design layout is shown in fig.4

VII. CONCLUSION

After the layout planning for the industry had been done, it was found that Model could be operated within short time of span or with the least time & the least distance. Therefore, Model would be the most suitable model for the new layout planning of the industry because it could reduce the time & the length of the operation. The sequence of work & work flow was rearranged, which the rearrange layout can decrease

flow of material, resulting in significantly decreased distance of each operation & finally increased production.

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