

# Management of a Paper Manufacturing Industry

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**Abstract**—This project focuses on how a paper manufacturing industry looks like and how it operates. For better understanding purpose, we have taken a hypothetical situation here. We have discussed on various factors that are to be considered before constructing a plant. For example, what kind of proprietorship is suitable for this case? We have developed a SWOT Analysis for the plant, thinking about the pros and cons. This project can be a guide for a person who is willing to start up a new manufacturing plant. This report can be used to streamline your approach to planning by outlining the responsibilities of plant managers and external factors, as well as identifying appropriate resources to assist you with the construction of plant.

**Keywords**— Paper industry, Department, Process, SWOT Analysis, Staffing

## I. VISION OF OUR COMPANY

Our vision is to be provide best quality paper to the markets and enhance our creativity day by day. We will be the company that satisfies the customers and provide extraordinary service. In order to fulfill our vision, we will be developing new products by setting up a new line of product by 2025.

## II. MISSION OF OUR COMPANY

Missions that lead us to success are:

- Moral Values
- People
- Quality and Service
- Concern

## III. KEY TO OUR SUCCESS

Achieving four important goals:

- Product quality
- Lower price
- Promotion of Business

## IV. DEPARTMENTATION

### A. Boards of Directors

In this company, Board of directors consists of the Founders: Mr. Amit sharma, Ms. Anitha Singh, Mr. Prem Kumar. They will form the first level of hierarchy. Each and every decision is taken by the directors and implemented by them. According

to the plant design, various departments are listed and managers are appointed accordingly, as shown in Figure 1.

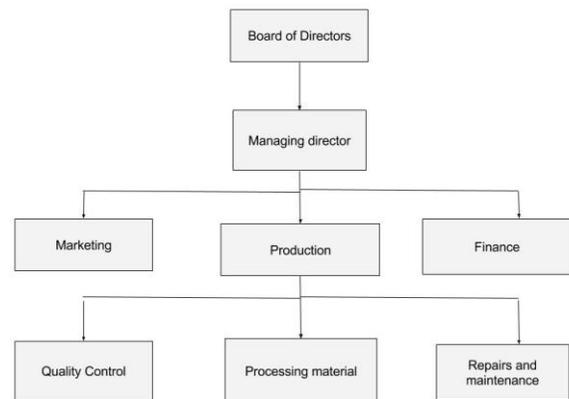


Figure 1: Hierarchy of Departments

### B. Managers

Each department in our company has an authority or a manager in order to ensure the proper functioning and organizing of various activities pertaining to the particular department. Each department has a manager who leads and controls the activities of his subordinates. The manager ensures that decisions and ideas are made by considering everyone's opinion for proper functioning. Each manager reports on a daily basis to the directors about the company's status and proceedings.

### C. Production Department

The core department for a manufacturing plant is the Production department. In order to produce paper, there are several steps to be taken into account. First will be to procure the raw materials, selection of a location of the plant. On selecting the location, we do a detailed research on various methods involved in production of paper. On comparing the methods, we choose the method that is most viable. According to the social demand, the production capacity is calculated. The process/ method of production is tested on a laboratory scale before moving on to plant scale. A preliminary cost estimation is done to have an idea about the overall budget of the plant. Most importantly, an engineering design of the plant is developed by the engineers for construction of plant. Next,

we procure the Equipments according to the calculations done by the engineers. The paper quality, thickness, Quantity is modelled by the production managers, (as shown in Figure 2).

#### D. Marketing Department

Marketing department is responsible for the product to reach the customers in the right way. The Marketing Department plays an important role in promoting the business. It is the Marketing Department's duty to reach out to customers and investors and create an impression that shows your company in a positive light. Advertising is the most common way of marketing. Advertisements in newspaper, Television, Radio can reach people faster.

#### E. Finance Department

This department is responsible for the cash flow in the company. There are so many expenditures starting from the procurement of raw materials to maintenance of the equipment. It is in the hands of the Finance manager to look into methods of reducing the expenditure and maximizing the profit.

#### F. Quality Control Department

This department is like a sub-department to production department. The final product quality is tested before it is sent to market. Intermediates of the paper manufacturing are also tested on a daily basis for safety purpose. Both production and quality managers have to be highly qualified and experienced.

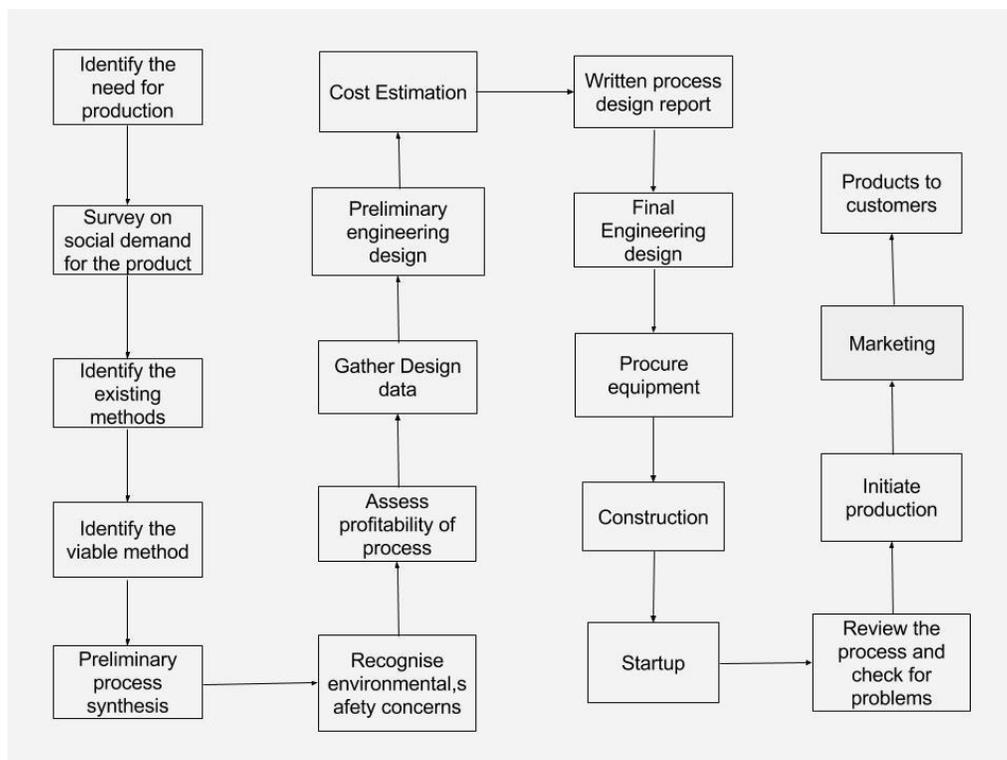


Figure 2: Procedure of Paper Manufacturing

## V. ABOUT THE PROCESS

Our company uses Kraft process for the production of paper. It is the most widely used process. The paper coming out of this process has best quality compared to other processes. The Kraft process is the process for conversion of wood into wood pulp. Wood pulp consists of pure cellulose fibers. The wood chips (from wood pulp) are treated with a mixture of sodium Hydroxide and Sodium Sulfide, which is known as liquor. This is responsible for breaking the bonds that links Lignin to Cellulose.

Steps involved in Kraft process are:

- Impregnation
- Cooking
- Recovery process
- Blowing
- Screening
- Washing
- Bleaching
- Process chemicals

*A. Impregnation*

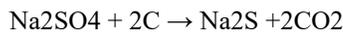
Wood chips of 1.2-2.5 centimeters are pretreated and are wetted to mix up with the white liquor (NaOH + NaSH)

*B. Cooking*

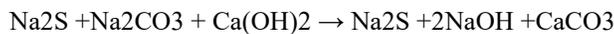
Delignification occurs for several hours at 170 to 176°C. The combined liquids, known as Black liquor contain lignin fragments, Carbohydrates, Sodium Carbonate (Na<sub>2</sub>CO<sub>3</sub>), Sodium sulphate (Na<sub>2</sub>SO<sub>4</sub>).

*C. Recovery process*

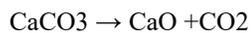
Thermochemical Sulfate reduction process:



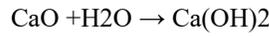
Calcium Carbonate precipitates from white liquor:



Calcination:



Slaking:



*D. Blowing*

Cooked wood chips are blown by decreasing the pressure to atmospheric by removing the steam.

*E. Screening*

The main aim of this step is to remove the pulp by using large screens, sieves. Generally to remove dirt and debris.

*F. Washing*

The brown liquor from the previous stage goes to the washing process where the used liquors are separated from the cellulose fibers. Washing stages are generally placed after oxygen delignification process and also between the bleaching stages. Pulp and washing waters move in the opposite direction so as to increase the rate of washing.

*G. Bleaching*

In bleaching tower, the pulp are bleached to high brightness.

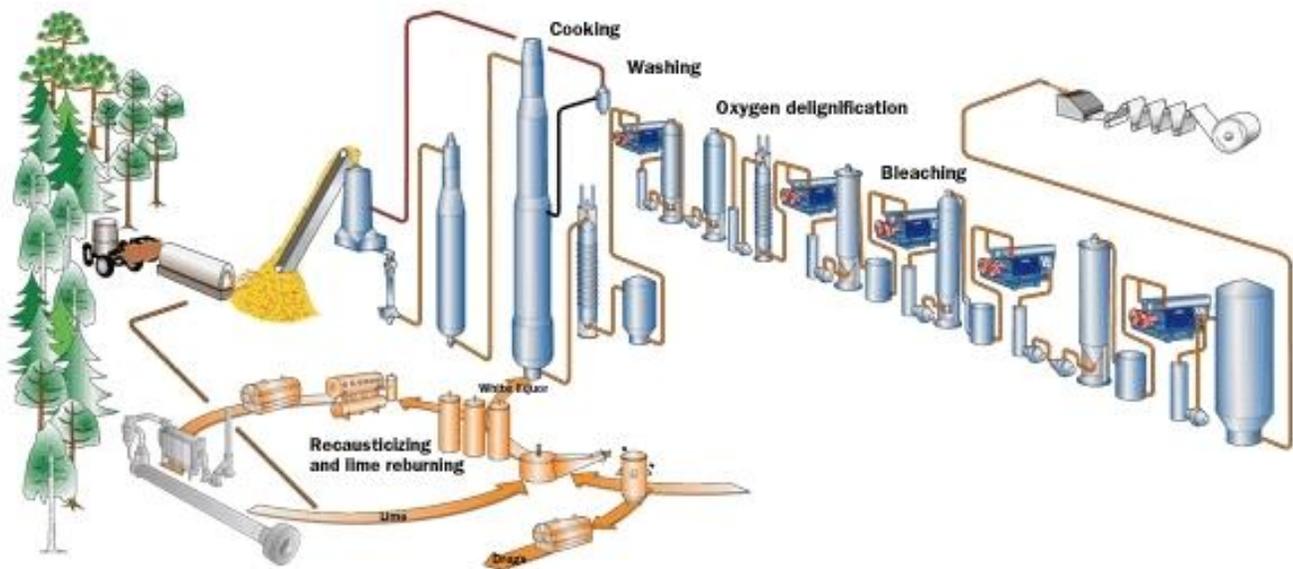


Figure 3: Schematic Representation of Paper Manufacturing

VI. SWOT ANALYSIS

SWOT Analysis is the method used by an organization to assess its internal strengths and weaknesses and also its external opportunities and threats.

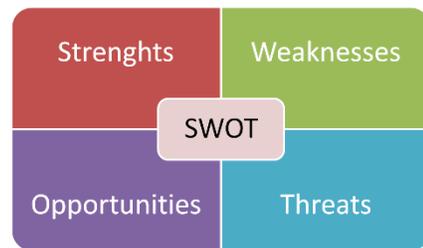


Figure 4: SWOT Analysis

*A. Strengths*

- Brand name
- Paper manufacturing is autonomous and self-governing.
- Raw material is easily available as our plant is constructed next to a forest. Transportation charges are minimized as the location is near to forest.
- High technology of database.
- Highly improved Equipments.
- High quality products and good services.
- Lowest cost producer.
- Efficient water treatment plants.
- Effective re-usage of waste heat.
- Generation of electricity from Bio gas. Bio gas is produced by burning the waste materials from the process.

*B. Weaknesses*

- Lack of brand awareness
- Lack of financial suppliers
- Unexpected failure of equipment which reduces the production drastically
- Demand-Supply gap
- Increasing cost of production
- High interest rates.
- Low investment in Research and development
- Lack of experience in System integration

*C. Opportunities*

- Raising living standards
- Government infrastructure spending
- Investment in Industrial and commercial projects
- Commercial construction activity
- Emerging new markets
- Technological developments
- Demand for saver equipment
- Provide more security and effective database environment
- Increase in income levels-increase in purchasing power of customers
- Large domestic market

*D. Threats*

- Competition from other paper manufacturing companies
- Introduction of new advanced manufacturing process
- Improper relationship between suppliers and customers
- Over exploitation of forests for raw materials
- Chemical pollution and quality control
- Imports from other countries which will affect our product's market

- Taxes imposed by government
- Increased international competition
- Changed in legislation could drastically decrease market demand
- In ability to attract necessary finances.
- Rapid urbanization and over exploitation

*E. External Factors*

- 1) *Political*: There must be good political harmony within the state or country. The taxes imposed must be nominal. As paper is one of the most important industries, the legislation can bring about more laws for the development of paper industries.
- 2) *Economic*: Includes the overall economic status of the state or the country, whether, rich or poor, the per capita income of the individuals, their standard of living, education, disposable income.
- 3) *Social*: Includes factors related to society and social wellbeing of individuals living in an area.
- 4) *Technological*: All the Equipments used are not manually operated, but they are run by a software. So, technology plays a very important role in the plant. The plant must be feasible i.e. they should be able to update the upcoming technologies in the Equipments.

## VII. STAFFING

Staffing is process of filling up the positions in an organization. Recruiting also means hiring candidates for a particular role. This means it might take longer to fill searches simply because it is necessary to be more strategic and detailed to find a person who has the proper qualifications for each position, as shown in the Figure 5.

*A. Online Application*

Candidates applicable for the position can apply through our website. Hiring process generally starts during the month of August. Resume, and important certificates are to be attached with the application.

*B. Selection Process*

Need for Valid and reliable information. Validity is the degree to which the data predict the candidate's success as manager. Reliability is the accuracy of the measurement. Based on this, candidates are selected for written test. First stage is the written test. Intelligence tests is to measure mental capacity, memory, speed of thought, ability to see relationships in complex problems. Proficiency and aptitude tests is to discover interests, existing skills and potential for acquiring skills. Personality tests is to reveal the candidate's personal characteristics, interpersonal skills and leadership skills. Second stage is Personal Interview. Interview is normally held by one or more people. It is not about asking the right questions. Questions can be structured, semi-structured or

even unstructured. What really matters in a personal interview is the way how you express yourself.

*C. Orientation of new employees*

Orientation is the introduction of new recruits to the organization, its functions, tasks, and fellow employees. Each department managers give proper training to the new employees on what and how to do. The staff at higher level required to run this organization are:

- Board of directors
- Production managers
- Finance managers
- Marketing manager
- Quality control manager
- Operation director

Engineers employed in our company:

- Mechanical Engineers
- Chemical Engineers
- Civil Engineers
- Electrical Engineers
- Computer Engineers

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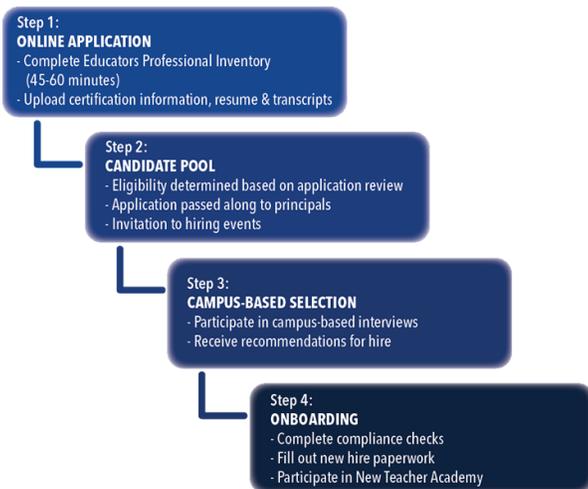


Figure 5: Steps Involved in Staffing