

# Production operation process and facility layout marketing essay

[Business](#), [Marketing](#)



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## **Introduction**

Kong Long Huat Chemicals Sdn Bhd (KLH) founded in 1940s as a family business by the Heng Family. In the 60's, KLH has ventured into SOAP BAR MANUFACTURING. KLH has diversified into CHEMICALS TRADING & DISTRIBUTION during year 1970. In 1975, KLH was incorporated as a Private Limited Company under its present name. Today it has evolved into a key player of chemical supplier, logistic support and safety environment service provider specialist. The company has Shareholders' Funding exceeding Ringgit Malaysia 50 million which is a very strong financial support for KLH to develop its business. Aiming to be the leading chemical business enterprise in Asia by 2010, KLH achieved the internationally recognized ISO 9001: 2000 accreditation in 2004. KLH has been a trusted choice by the Chemical industry in Malaysia as a Chemical Specialist Provider after more than 30 years. KLH's vision is to be the leading chemical business enterprise in the asean region by 2015. KLH's mission include satisfy customer needs through product reliability and safety, provide responsive service and a trustworthy partnership. Second is to foster human capital development on a continuous basis. Third is to ensure a healthy and safe work environment and comply with all regulatory requirements. Last, KLH wants to achieve sustainable growth and to enhance stakeholder values. Their core values include teamwork, trust, accountability, growth and safety. KLH customers are involved in the follow industrial segment Associated Companies of KLH. First

is Chemetal Company which is the largest Zinc Oxide Manufacturer in Malaysia. It uses thermal process to achieve high purify levels. Second is Pulmas Company which is pioneer in Glucose and Caramel manufacturing in Malaysia. Third is Mapo Company which is manufacturer of quality plastic containers and packaging. Lastly Nagajati Food Company, producer of high quality corn coated and salted green peas

## **Production/Operation Process and Facility Layout**

### **2. 1 Production/Operation Process**

Kong Long Huat (KLH) Sdn. Bhd is a chemical company for manufacturing the chemical process through which a chemical is synthesized from raw materials or other chemical feed stocks. Product formulation is the process by which chemical products, composed of one or more ingredients, are prepared according to the product formula. Example of description of chemical manufacturing Process. C: UsersuserDesktopas. jpgStep 1:

Formation of monoethyl sulfate and diethyl sulfate by the absorption of ethylene in concentrated sulfuric acid.  $\text{CH}_2 = \text{CH}_2 + \text{H}_2\text{SO}_4 \sim$

$\text{CH}_3\text{CH}_2\text{OSO}_3\text{H}$  (Ethylene) (Sulfuric Acid) (Monoethyl Sulfate)  $2 \text{CH}_2 = \text{CH}_2 + \text{H}_2\text{SO}_4 \sim (\text{CH}_3\text{CH}_2\text{O})_2\text{SO}_2$  (Ethylene) (Sulfuric Acid) (Diethyl Sulfate) Step 2:

Formation of ethanol by hydrolysis of ethyl sulfates.  $\text{CH}_3\text{CH}_2\text{OSO}_3\text{H} + \text{H}_2\text{O} \sim$

$\text{CH}_3\text{CH}_2\text{OH} + \text{H}_2\text{SO}_4$  (Monoethyl Sulfate) (Water) (Ethanol) (Sulfuric Acid)

$(\text{CH}_3\text{CH}_2\text{O})_2\text{SO}_2 + 2 \text{H}_2\text{O} \sim 2 \text{CH}_3\text{CH}_2\text{OH} + \text{H}_2\text{SO}_4$  (Diethyl Sulfate) (Water)

(Ethanol) (Sulfuric Acid)  $(\text{CH}_3\text{CH}_2\text{O})_2\text{SO}_2 + \text{CH}_3\text{CH}_2\text{OH} \sim \text{CH}_3\text{CH}_2\text{OSO}_3\text{H} +$

$(\text{CH}_3\text{CH}_2)_2\text{O}$  (Diethyl Sulfate) (Ethanol) (Monoethyl Sulfate) (Diethyl

Ether) Step 3: Reconciliation of the dilute sulfuric acid. The primary input

streams for this process are the hydrocarbon feedstock containing 35-95 percent ethylene, methane, and ethane; 96-98 percent sulfuric acid, and water. The adsorption is carried out in a column reactor at 80 C and 1.3-1.5 MPa of pressure where the ethylene feedstock is adsorbed in an exothermic reaction with the sulfuric acid. The column is cooled to reduce the reaction temperature and to limit corrosion problems. The hydrolysis of the ethyl sulfates in the second step of the process is done using just enough water to produce a 50-60 percent sulfuric acid solution. The resulting mixture is separated by a stripping column to yield sulfuric acid and a gaseous mixture of alcohol, ether, and water. The gaseous mixture is mixed with water and then distilled until pure. Finally, the sulfuric acid is then reconcentrated using a reboiler and a two stage vacuum evaporation system until the concentration is above 90 percent.

Chemical Manufacturing Process & Product Formulation Module Example Information Flows, C: UsersuserDesktopaa.jpg

This module receives information from the Chemical Properties module and transfers information, if desired, to the Energy Impacts and Resource Conservation modules. This module could also transfer information to other modules if these processes are being fully and quantitatively evaluated. For example, chemical intermediates released during chemical manufacturing process could be evaluated in the hazards summary modules. Many companies use some type of system to determine the minimum value of produced products. Process costing is an allocation system companies use to allocate cost for homogeneous items produced by a company. Homogeneous products represent items that are very similar or indistinguishable from each other. Lumber, soda pop and chemical products are a few examples of

homogeneous products. Process costing provides companies with a few strengths and weaknesses. Easy to Use Process costing is an easier system to use when costing homogenous products compared to other cost allocation methods. Business owners allocate business costs according to the number of processes each good travels through in the production system. Each process applies direct materials, labor and manufacturing overhead to the production cost total. Management accountants take the total number of goods leaving the process and divide the total process cost by this number. This creates a simple average cost for each item produced. Flexible Business owners use process costing because it creates a flexible production process. Companies needing to refine their process can simply add or remove a process as necessary. This also allows companies to lower their production cost for each good. Business owners typically look for ways to refine a production process to increase cost savings. Eliminating redundant processes often achieves this goal. Adding a process allows companies to produce slightly different goods or improve product quality. Management accountants may review the amount of materials and labor used in each process to determine if any costing savings is available in the production system. This flexibility ensures companies can produce at the most competitive cost in the economic marketplace. Cost Errors Process costing can create cost errors in the production system. Production cost errors often represent a significant disadvantage for cost accounting systems. Process costing does not use direct allocation to apply business costs to individual goods. Direct allocation costing applies a specific amount of raw materials, production labor and manufacturing overhead to goods or services. Process

costing may allow non-production costs to be included in the total process cost. Including non-production costs will arbitrarily increase each item's cost; this also increases the consumer product price. Management accountants may also leave out production costs and create under-costed products. Under-costed products usually result in lower business profits because goods are actually more expensive than actually reported. Equivalent Units Management accountants must calculate equivalent units in the process costing system. Equivalent units represent the amount of unfinished goods left in a process at the end of an accounting period. This calculation may only be a best guess or an estimate by management accountants. This information is reported as the work-in-process on a company's balance sheet. Inaccurate work-in-process accounts may also result in distorted finished good totals. This creates a difficult process for managing inventory and determining how many products the company has to sell in the open marketplace.

## **2. Facility Layout**

In this time, it is important for an organization to be effective and efficient manufacturing unit, and it is also vital that the firm gave a special attention to the facility layout. Facility layout is the arrangement of different aspects of manufacturing in an appropriate manner as, to achieve desired production results. Facility layout considers available space, final product, safety of users and facility and also convenience of operations. In other words, facility layout has a direct impact on operational performance, as measured by manufacturing lead time, throughput rate and also work in process (WIP)

(Khanna, 2007). An effective facility layout ensures that there is smooth and steady flow of production material, equipment and manpower at minimum cost. Facility layout looks at physical allocation of space for economic activity in the plant. Therefore, the main objective of the facility layout is to design effective workflow as to make equipment and workers more productive (Khanna, 2007). There are a few basic types' layouts in the facility layouts. There are process, product, and also fixed position layout. To add more, there are also three hybrid types of layouts which is called cellular, flexible manufacturing systems and also mixed model assembly lines. As for the company called Kong Long Huat Chemicals Sdn Bhd that is being researched in this assignment is using the product layout type. Product layout also called as flow – shop layout is one in which equipment or work processes are arranged according to the progressive steps by which the product is made. The path for each part is in effect a straight line. It means that the machines are arranged in one straight line. Raw materials are introduced at one end and the finished product is taken out at the other end. However, a product line may assume a straight line shape, a U shape or a circular shape. Example, of straight line product layout is given as below: Product A: Raw material Lathe Grinder Assembly Paint shop Finished product In addition, it also means that machine and equipments are arranged according to the sequences of manufacturing operations necessary for the product. The material or the semi finished product moves from one workstation to another, sequentially, without any deviation. Product layout is suitable for this chemical firm as it manufacture a large volume of standards products where repetitive processes of production are involved. There are certain

advantages and disadvantages for the company when they are using this type because this layout can be their strength and also weaknesses. The first advantage or strength that they can obtain is that it is low cost per unit (S. Anil Kumar, 2006). In other words, it has low cost of material handling and low costs due to usage of special equipment, as for example, mechanical handling of the material. In addition, the unit cost will be low because of the high volume. Labour specialization also results in reduced training time and also cost and to add more, a wider span of supervision also reduces labor costs. Besides that, it has a better use of the cubic space (S. N. Chary, 2009). In other words, each of the process has fully utilized the space and there is no waste of space as the location of the process is strategic. As for example, as in this company they use their space by dividing the product that they are producing. Since it involved chemicals, and the product to produce that chemical is quite different, they divide it. If the product needs the same product to produce it, they would simple place two machines that deal with the product in the two compartments. This would reduce the bottleneck problem if any one of the chemical gets hold up. To be clearer, it can be said that the company has optimized the use of floor space and less congestion of work in the process of production. Besides that, since it is a fixed route to produce the product, it helps to ensure the elimination of backtracking or deviations. In addition, the skill level of the worker may be lesser, as a particular worker has to do a particular operation, which seldom changes due to standardized production line. It means that this company can employ a semi skilled labour. Thus, it can be said that this company does not experience the situation of shortage of labourers. This is strength for the



company as they can produce their products despite any economical or physical problems that may occur. This advantage would correlate with the advantage of low cost. Since it only need a semi skilled labors to operate the specialized equipment, thus this company do not have to spend much on the training of the laborers. This is one of the factors that they have low cost. Other than that, it needs simple and effective inspection of work and simplified production control process. In other words, less supervision is required as it is the same job in every product line. Thus, the supervisors need not supervise the line every now and then. This would also reduce the cost, as the company no need to hire a professional supervisor to supervise the labors, just a simple supervisor would do. This is because the routing is fixed, thus attention is required less. Besides that, overall, this kind of layout facilitate better production control, due to less product variety, simple routings, earlier progressing and lower work in process inventory. Thus, it helps to remove the bottleneck positions observed in production line. In addition, quality control is easy to exercise and more effective. Statistical Quality Control (SQC) practices may be implemented to control the quality of the process and to add more materials requirement planning may be done more easily and accurately (James A. Tompkins, 2010). On the other hand, there are also some disadvantages in this product layout that is used in this company. The first disadvantage that can be seen is there is no motivation in the line of workers. It is because the system's inherent division of labour can result in dull, repetitive jobs that can prove to be quite stressful. It is because it has been proven that a repetitive job and if there is no challenge in their job, it would cause the job satisfaction to be low (B. Mahadevan, 2010).

Besides that, the assembly line layouts make it very hard to administer individual incentive plans. An assembly line is a manufacturing tool, first made popular by Henry ford in his manufacturing of automobiles. The principle of an assembly line is that each worker is assigned one very specific task, which he or she simply repeats and then the process moves to the next worker who does his or her task, till the task is completed and the product is made. The next disadvantage is that there is lower flexibility in this kind layout. In other words, there is no flexibility for changing the product line. It is because it cannot easily respond to required system changes especially changes in the product or process designs (Sunderesh S. Heragu, 2006). In addition, the production process centres on the end product. It is because in a single line design, the manufacturing process can become bottlenecked if one workstation is disabled. Preventative measures could be taken to avoid this problem, but the unplanned maintenance or training new operators for a station can result in the need to shut down the whole assembly line. Workstations ahead of the line can continue to work but downstream modules are affected by upstream production problems in product layout designs. Besides that, the company has not optimized the usage of machine equipment. Since it is in a product layout, the machines are set so that they perform the same work every time. Thus, if the machines have different functions than that, they could not utilize that function. Thus, it can be said that it is a loss to the company. Besides that, the work space can also be limited. It is because it depends on the number of workers needed during certain phase of the production process. The workers must try not to bump into each other while manoeuvring the

equipments. This has created a tense working environment with workers attempting to give space to others, causing them to slow down in the process. Other than that, the disadvantage they face is scheduling. It means the factory must carefully plan the schedule for workers to each have necessary time allotted to work on the specific phase of the production process. As for example, if one worker is not available or is not working to his capacity, this can slow down all the other phase of the process. This product could exceed its development deadline, and the factory can lose money in overhead cost.

## **Study Area's Literature Review & Contributions**

**Definition**New service development is basically creating a new service that is never offered before or changing an existing service. There are several definition for New Service Development. New services can be based on the extend of change to existing service system or it can be based on the operational process and participants (Tax and Stuart, 1997). By recognizing the need to consider both what service to offer and how the service is offered will define a new service. A new service is either an old service with additional service offerings or changes in service concept (Menor, 2000).

**Significance**The service sector is an important one to the economy of industrialized countries. It represents a big portion in gross domestic product (Craig, et al, 2000). The service sector is also a hypercompetitive one (D'Aveni, 1994). Under these circumstances, how a new service is developed and launched is crucial to the growth and competitiveness of service organizations. Service operators will benefit from an enhanced

understanding of New Service Development (Fitzsimmons & Fitzsimmons, 1998). The knowledge of customers' want and need can be incorporated into the new service during the process. Besides that, service operations personnel should also interact directly with customers as it can affect their satisfaction with the service. A close communication and collaboration during the new service development between operations management personnel is vital to the success of the new service (Park et al, 2011). According to Menor & Roth, 2008 In order to have a successful new service development building a competent management of service of service development resources and routines are important. New Service Development is also viewed as an essential part for enhancing profitability of existing services by cutting cost and increasing sales but also to attract new customers and creating a loyal customer base.

**Determinants of New Service Development**

**Service Characteristics**

While preparing to launch a service, service characteristics should be considered as it should indicate the differences between new product development and new service. A close relationship exists between process of developing new services and service characteristics (Cowell, 1988). Service characteristics define what and how an innovation should be and help identify the important factors for new service development.

Transformation of some elements of the services is required to transform any service offering. **Market-Oriented** Being market-oriented is to see the market as an external success factor, factor that can lead to some suitable innovations for that market (Kirca et al, 2005; Naver & Slater, 1990). A firm has to invest in developing customer knowledge in order to understand its customers' preferences or needs by devoting innovation resources towards

the firm's goal. It will also create a very creative environment by rewarding employees for innovation. A firm's New Service Development and innovation efforts can also stem from competitor's ideas and effort. Therefore, if an organization were to enhance its performance through innovation it should allocate resources accordingly to the market orientation which is most effective to the circumstances (Han et al, 1998). Actualizing innovation effort Actualizing innovation effort is said to be a conduct variable, constrained by market orientation structure of the firm and service characteristics. Its performance results from the conduct of such structure (Jaw et al, 2010)'s survey findings indicate that actualizing innovation resources and the rewards are important elements to New Service Development (Smith et al, 2007). New Service Development can make the company success because it may be distinctive from manufacturing-based new product development (Fitzsimmons and Fitzsimmons 1998; John and Storey 1998; Menor 2000). Based on previous research NSD can provide useful guidance for determine which strategy are suitable. NSD are important to business spans industries, cultures and geographic difference. It can help to improving their company capabilities for developing new product and services are the primary concern for the foreseeable future. When the business scholars have hypothesized and repeatedly demonstrated the importance of develop these capabilities at each strategy level, it can make it innovativeness form a core characteristic and different the conceptual typologies and empirically verified taxonomies. Information technology is useful when information-based productivity enhancement on information-handling processes. The use of an NSD-oriented information based such as

customer relationship management and data warehouse. This can help the information base can be tacit, such as employee's previous experience, or explicit, such as a software-based storehouse of patent ideas, previous discoveries, and market intelligent. That information can help the company understand and make the improvement of the product or service to meet the needs of customer. NSD can help to create the proposition that teamwork and integration are critical to process innovation effort. This can help the organizational become more innovation teams which each member contribute unique abilities knowledge. This can help the company bring out more ideas to meet their goal. In addition, NSD can be link with the company business strategies. It might provide the direction or focus on what types of new services to develop, and helps to define the portfolio of new service types. Successful services in the future will focus less on operational capabilities and more on the delivery of the service to the customer.

#### **4. 0 Discussion and Conclusion**

Discussion Production process is important regardless any industries. Kong Long Huat Sdn. Bhd is major in producing chemicals for several markets. Thus, it's an essential issue for company employees to ensure production process do not goes wrong, as well as operates in safe condition. The company has to focus more on safety environment in production process as their products have potential in harming employees' health. For example, an employee who contact with chemicals and cause disease would directly affect and put on pressures to other production workers. Moreover, production quality would be affected and company reputation could

decrease at the same time. The company could set up several exhaust fans in the factory, to provide employees a better flow of air and temperature. Instead of only set up air conditioners, exhaust fans could drag off some of the chemicals powders in the air to prevent inhalation of chemicals by employees. In the aspect of facility layout, they are applying product layout as production progress. This is because the company's products which are chemicals require such layout in order to perform production in way of effective and efficient. For instance, product like Sulphur dioxide has to be manufactured step by step in order to come out a complete form that delivers to customers. Thus, it is important to locate machines, equipments, and employees into correct position. Or else, the production flow would be taking longer time; more cost and effort have to contribute into the progress. Not to mention about errors that could occurred during production. In order to improve several disadvantages of this layout, company might need to apply certain policies in management in order to prevent such disadvantages to affect company's production and efficiency. Job rotation should be applied into employees' jobs scope. This is because workers may encounter situation such are boredom and frequent mistakes as they keep doing the same task. For instance, workers could move to different department or positions based on particular period of time. So, they may not feel bored and able to learn extra knowledge by involved into different departments. Flexibility of production could be strengthening by applying job rotation. Indeed, new service development is needed in order to gain greater competitive advantages for the company. Instead of constantly deliver company products to customers, Kong Long Huat Chemicals Sdn. Bhd could establish several

innovative services like customize of product package according to clients request. For instance, they could pack chemicals into smaller size, for easier transfer and receive by clients. Besides, the company may conduct an education course for public or clients such are farmers about applying appropriate equipments like mask and gloves to contact with chemicals. Knowledge like applying correct quantity of chemicals in eliminates pesticide also could be delivering from company to certain clients. Meanwhile, company may establish campaigns with purpose of educating people how to handle chemicals if there is leakage issue that goes into people's body. Besides, environmental friendly programs like recycle material collection, plant of trees, as well as several contests to further encourage public to participate in environmental friendly activities. Such application could further increase company reputation and delighted clients at the same time.

Conclusion Overall, the company produces chemicals and acquiring large market shares in the industry. This results Kong Long Huat Sdn. Bhd to stand still as a market leader in the industry. Such achievement in terms of sales and management has assists the company to fulfill demand from such huge market. Nevertheless, creative yet intelligent of top management team lead Kong Long Huat Company to encounter and solved issues from external environment like government policy and economy condition. In a nut shell, constant research and development has to be conducted by the company, regardless aspects of company in order to create greater competitive advantages. Most importantly, new service should be implement frequently for keep company a market leader in the industry.



## 5. 0 References

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## **Appendices**

### **Appendix 1**

location\_map\_2. gif

### **Location of Kong Long Huat Chemicals Sdn Bhd**

### **Appendix 2**

acidpacktower1print. gif

**One of the product layout where they produce the chemicals called SO<sub>2</sub> (Sulphur Dioxide)**