VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

FACULTY OF MECHANICS

DEPARTMENT OF MECHANICAL ENGINEERING

SMIT JAYENDRA LOHAR

PRODUCTION PLANNING PROCESS ACROSS PHARMACEUTICAL INDUSTRIES

Master`s degree Thesis

Study programme: Industrial Engineering and Innovation Management

State code 621H77002

Study field of Production and Manufacturing Engineering

Vilnius, 2017

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Head of Department

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Mindaugas Jurevičius
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2017-05-19
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Supervisor Lect dr.Rūta Banelienė 2017-05-19

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OBJECTIVES FOR MASTER THESIS

2015-11-12 No. 11
Vilnius

For student: Smit Jayendra Lohar

Master Thesis title: PRODUCTION PLANNING PROCESS ACROSS PHARMACEUTICAL INDUSTRIES

Approved on 11th November (day, Month), 2015 (year) by Dean's decree No. 236me

The Final work has to be completed by 19th May (Day, Month), 2017 (Year)

THE OBJECTIVES:
To investigate the different methods for the production planning process for pharmaceutical industries which could make the best use of the technology and construct a general model based on that:

- To analyse theoretical aspect of production planning process in pharmaceutical industries
- To analyze and compare new methods which are already implemented by some industries
- To create and propose model on improvement manufacturing processes in pharmaceutical industry

Consultants of the Master Thesis: .....

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Academic Supervisor ..... (Signature) Lect. Dr.Rūta Banelienė

Objectives accepted as a quidance for my Master Thesis

.....
(Student's signature)

Smit Jayendra Lohar
2015-11-12
(Date)

Vilnius Gediminas Technical University
Faculty of Mechanics
Department of Mechanical Engineering

ISBN ISSN
Copies No. .....
Date .....-.....-.....

Master Degree Studies **Industrial Engineering and Innovation Management** study programme Master Graduation Thesis 4

Title	**Production Planning Process Across Pharmaceutical Industry**
Author	**Smit Jayendra Lohar**
Academic supervisor	**Rūta Banelienė**

Thesis language: English

Annotation

In this paper I have research on production planning process for proper quality performance, time saving during supplying the product and various method implemented in pharmaceutical industries. The production method characterized by complex and diverse technologies, alternative solutions and combined modes of work piece movement in the manufacturing process This paper describes the original approach to production process on the grounds of investigations of manufacturing capacity utilization levels and causes of loss in quality level , in order to measure their effects and to reduce the flow coefficient to an optimum level. The main ideas of the master thesis to cover production methods, planning and the quality control and how to be satisfied the customer needs by proper time. Added to that, this paper includes an empirical part that is based on survey questionnaire, having the purpose to identify the main problem and the technology implementation on the production methods. Based on the results, a generalized model was constructed for the better technology implementation.

Keywords: Production process, methods in production system, Planning, Quality control.

Vilniaus Gedimino technikos universitetas
Mechanikos fakultetas
Mechanikos inžinerijos katedra

ISBN ISSN
Egz. sk. .....
Data .....-.....-.....

Antrosios pakopos studijų **Pramonės inžinerijos ir inovacijų vadybos** programos magistro baigiamasis darbas 4

Pavadinimas **Gamybos planavimo procesų tobulinimo farmacijos pramonėje galimybių tyrimas**

Autorius **Smit Jayendra Lohar**

Vadovas **Rūta Banelienė**

Kalba: anglų

Anotacija

Šiame darbe aš atlikau gamybos planavimo proceso tobulinimo tyrimą, siekiant patobulinti kokybės kontrolės vykdymą, sutrumpinti produktų tiekimo laiką, ir ištyriau kitus veiksnius turinčius įtakos farmacijos pramonėje. Gamybos metodas charakterizuojamas kompleksinėmis ir skirtingomis technologijomis, alternatyviais sprendimais ir kombinuotais gaminamo produkto judėjimo gamybos procesu būdais. Šiame darbe pateikiamas aprašymas originalaus požiūrio į gamybos procesą remiantis gamybos pajėgumų panaudojimo lygiu ir kokybės lygio mažėjimo priežastimis siekiant įvertinti jų poveikį ir sumažinti srauto koeficientą iki optimalaus lygio. Pagrindinė šių magistro tezių idėja yra išnagrinėti gamybos metodus, planavimą ir kokybės kontrolę ir kaip laiku patenkinti vartotojų poreikius. Be to, šis darbas apima empirinę dalį, paremtą anketinės apklausos tyrimu, kurio tikslas yra pagrindinių problemų ir technologijų taikymo gamybos metodams identifikavimas. Remiantis tyrimo rezultatais buvo sukurtas ir pasiūlytas geresnės technologijos diegimo modelis.

Prasminiai žodžiai: Gamybos procesas, gamybos sistemos metodai, planavimas, kokybės kontrolė.

(the document of Declaration of Authorship in the Final Degree Project)

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(Study programme, academic group no.)

DECLARATION OF AUTHORSHIP
IN THE FINAL DEGREE PROJECT

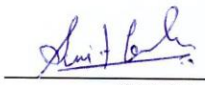
June 1, 2017

I declare that my Final Degree Project entitled „Research on Production Planning Processes Across Pharmaceutical Industry" is entirely my own work. The title was confirmed on November 11, 2015 by Faculty Dean's order No. 236me. I have clearly signalled the presence of quoted or paraphrased material and referenced all sources.

I have acknowledged appropriately any assistance I have received by the following professionals/advisers: Dr Rūta Banelienė.

The academic supervisor of my Final Degree Project is Dr Rūta Banelienė.

No contribution of any other person was obtained, nor did I buy my Final Degree Project.



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: Gamybos procesas, gamybos sistemos metodai, planavimas, kokybės kontrolė.

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INTRODUCTION

Research Relevance

We can say that production planning process is the first and one of the most important managerial function because of its specification the business goals and description of relevant tasks to meet those goals. Within the all managerial functions but mainly in planning, there is also necessary to deal with the decision making process and its elements. Production planning process can be characterised as a system with inputs and outputs. Transformation process is the most effective when it runs under optimal costs, under optimal amount of consumed inputs and by spending optimal time. It must be chosen suitable decision making, monitoring and calculating methods which allow to quantify and to compare particular alternatives and to choose the best one.

Research Novelty

The relations between the different process in pharmaceutical industries has been discussed previously .This research studied on the aspect of the relations between planning of the production system used with different methods.

The main aim of the research is to identify the optimization method in the production cost, labour and proper utilization of man power and to reduce life cycle in production area and how to achieve the market business strategies by using fast supply chain management system by maintaining the quality level in order to place as per customer requirements.

In this research, several processes of production planning are studied and their practical application in the real life it has been successfully implemented in some of the pharmaceuticals companies. The main aim is to make implementation on several circumstances such as improvement in the quality, reduce production cost, reduce inventory suppliers etc

Research Problem

Production planning consolidates an assortment of production components, extending from the ordinary exercises of staff to the capacity to acknowledge precise conveyance times for the client. With a powerful production planning operation at its core, any type of assembling procedure has the capacity to endeavor its maximum capacity. The authorised procedure that happens inside an assembling business and which includes ensuring that adequate unprocessed materials, staff and other important things are obtained and prepared to make completed items as indicated by the

calendar determined. A common huge assembling business participating underway arranging will intend to expand gainfulness while keeping up a fulfilled buyer base.

Production planning takes expected limit necessities and makes an interpretation of them into requirements for particular generation components. It enables an organization to satisfy deals projections in a productive way while looking after quality. Independent companies need to arrange their generation painstakingly to make the best utilization of their constrained assets. You can arrange the standards of generation arranging by their capacities and by the creation components they influence. A sound production arranges utilizes dependable conjectures to relegate assets and control the subsequent yield.

Research problem. How to improve the production system? How to optimize the time in production area? What are the ways to supply the materials? How to improve the Quality of the product?

Aim

Construct and prepare the outsourcing implementation correct method for production planning process in pharmaceutical industries. The main goals are identify the problem and provide suggestion on improvements in the methods which they are currently using. So they can save costs on the wastes of materials and increase the production

Objectives of research

1) To analyse theoretical aspect of production planning process in pharmaceutical industries
2) To analyze and compare new methods which are already implemented by some industries
3) To create and propose model on improvement manufacturing processes in pharmaceutical industry

1. Theoretical part for production planning process in pharmaceutical industries

1.1. General Principles of Production Planning Process in Pharmaceutical industries

Production planning is the planning of production and manufacturing processes in a company or industry. It utilizes there source allocation of activities of employees, materials and production capacity, in order to serve different customers.

The General Planning principle are:-

1)Planning:- In organization, planning is an management process, worried with characterizing objectives for organization's future goals and deciding on the missions and assets to accomplish those objectives. To meet the goals chiefs may create plans, for example, a strategy for success or an marketing plan.(global.oup.com)

2) Routing:-In Organisation Routing in production lays down the flow of work in the plant. The purpose of Routing in production is to establish the optimum sequence of operations. (www.mbaknol.com)

3).Scheduling:- In project management, a schedule is a listing of a project's milestones, activities, and deliverables, usually with intended start and finish dates. Those items are often estimated by other information included in the project schedule of resource allocation, budget, task duration, and linkages of dependencies and scheduled events. A schedule is commonly used in the project planning and project portfolio management parts of project management(www.revolvy.com)

4) Dispatching: - Dispatching is a function of Production controlling. It ensures the timely movement of semi-finished items from one machines to another machine .Ultimately the target set at the stage of production planning are achieved with the help of this dispatching function, because it deals with the movement of semi-finished items from one machine to another within a specified time frame.(www.answers.com)

5) Quality control: - Quality control, or QC for short, is a process by which entities review the quality of all factors involved in production. ISO 9000 defines quality control as “A part of quality management focused on fulfilling quality requirements”(books.google.lt)

This approach places an emphasis on three aspects

Components, for example, controls, job management characterized and very much oversaw forms execution and honesty criteria, and distinguishing proof of records, fitness, for example, learning, abilities, experience, and capabilities. Soft components, for example, staff, trustworthiness, certainty, authoritative culture, inspiration, camaraderie, and quality connections.

Controls incorporate item investigation, where each item is inspected outwardly, and regularly utilizing a stereo magnifying instrument for fine detail before the item is sold into the outside market. Monitors will be furnished with records and depictions of inadmissible item deformities, for example, breaks or surface flaws for instance.

The quality of the outputs is at hazard if any of these three viewpoints is lacking in any capacity. Quality control underlines testing of items to reveal imperfections and answering to administration who settle on the choice to permit or deny item discharge, while quality affirmation endeavours to enhance and balance out creation (and related procedures) to keep away from, or if nothing else limit, issues which prompted the defect(s) in any case. For contract work, especially work granted by government offices, quality control issues are among the top purposes behind not re-establishing an agreement.

1.1.1 Types of Production Planning Process

Planning is the part of management concerned with creating procedures, rules and guidelines for achieving a stated objective. Planning is carried out at both the macro and micro level. Managers need to create broad objectives and mission statements as well as look after the day to day running of the company.

1 Strategic Plan

A vital arrangement is an abnormal state outline of the whole business, its vision, goals, and esteem. This arrangement is the foundational premise of the association and will manage choices in the long haul. The extent of the arrangement can be two, three, five, or even ten years. Directors at each level will swing to the key arrangement to control their choices. It will likewise impact the way of life inside an association and how it collaborates with clients and the media. Therefore, the key arrangement must be forward looking, vigorous yet adaptable, with a sharp concentrate on pleasing future development. The crucial components of a strategic plan are:

1.1 Vision

These are a portion of the inquiries you should ask when you depict your association's vision. It's alright if this vision is self important and optimistic. On the off chance that there is any space to wax lovely inside an arrangement, it is here. Holding aspirations to "make a scratch in the Universe" is adequate, similar to a more reasonable vision to make the most "client driven organization on Earth". Get a superior perspective of administration with this prologue to administration course!

1.2 Mission

The mission statement is a more realistic overview of the company's aim and ambitions. Why does the company exist? What does it aim to achieve through its existence? A clothing company might want to "bring high street fashion to the masses", while a non-profit might want to "eradicate polio".

1.3 Values

"Inspire. Go above & beyond. Innovate. Exude passion. Stay humble. Make it fun"

These aren't fragments from a motivational speech, but Fab.com's values. Like Fab, each organization has its own values. These values will guide managers and influence the kind of employees you hire. There is no template to follow when jotting down the values. You can write a 1,000 page essay, or something as simple as Google's "Don't be Evil" – it's all up to you.

As you can see, there are really no rules to writing the perfect strategic plan. This is an open-ended, living document that grows with the organization. You can write whatever you want in it, as long as it dictates the future of your organization.

For inspiration, just search for the value/mission/vision statement of your favorite companies on Google.(www.quora.com)

2. Tactical Plan

The tactical plan describes the tactics the organization plans to use to achieve the ambitions outlined in the strategic plan. It is a short range (i.e. with a scope of less than one year), low-level document that breaks down the broader mission statements into smaller, actionable chunks. If the strategic plan is a response to "What?" the tactical plan responds to "How?"

Creating tactical plans is usually handled by mid-level managers.The tactical plan is a very flexible document; it can hold anything and everything required to achieve the organization's goals. That said, there are some components shared by most tactical plans:

a) Specific Goals with Fixed Deadlines

Suppose your organization's aim is to become the largest shoe retailer in the city. The tactical plan will break down this broad ambition into smaller, actionable goals. The goal(s) should be highly specific and have fixed deadlines to spur action – expand to two stores within three months, grow at 25% per quarter, or increase revenues to $1mn within six months, and so on.

b)Budgets

The tactical plan should list budgetary requirements to achieve the aims specified in the strategic plan. This should include the budget for hiring personnel, marketing, sourcing, manufacturing, and running the day-to-day operations of the company. Listing the revenue outflow/inflow is also a recommended practice.

c) Resources

The tactical plan should list all the resources you can muster to achieve the organization's aims. This should include human resources, IP, cash resources, etc. Again, being highly specific is encouraged.

d)Marketing, Funding, etc.

Finally, the tactical plan should list the organization's immediate marketing, sourcing, funding, manufacturing, retailing, and PR strategy. Their scope should be aligned with the goals outlined above.

If you're struggling to create a strong tactical plan, this course on drafting great business plans will point you in the right direction.(www.coursehero.com)

3. Operational Plan

The operational plan describes the day to day running of the company. The operational plan charts out a roadmap to achieve the tactical goals within a realistic timeframe. This plan is highly specific with an emphasis on short-term objectives. "Increase sales to 150 units/day", or "hire 50 new employees" are both examples of operational plan objectives.

Creating the operational plan is the responsibility of low-level managers and supervisors.

Operational plans can be either single use, or ongoing, as described below:

a) Single Use Plans

These plans are created for events/activities with a single occurrence. This can be a one-time sales program, a marketing campaign, a recruitment drive, etc. Single use plans tend to be highly specific.

b) Ongoing Plans

These plans can be used in multiple settings on an ongoing basis. Ongoing plans can be of different types, such as:

Policy: A policy is a general document that dictates how managers should approach a problem. It influences decision making at the micro level. Specific plans on hiring employees, terminating contractors, etc. are examples of policies.

Rule: Rules are specific regulations according to which an organization functions. The rules are meant to be hard coded and should be enforced stringently. "No smoking within premises", or "Employees must report by 9 a.m.", are two examples of rules.

Procedure: A procedure describes a step-by-step process to accomplish a particular objective. For example: most organizations have detailed guidelines on hiring and training employees, or sourcing raw materials. These guidelines can be called procedures.

Ongoing plans are created on an ad-hoc basis but can be repeated and changed as required. Operational plans align the company's strategic plan with the actual day to day running of the company. This is where the macro meets the micro. Running a successful company requires paying an equal attention to now just the broad objectives, but also how the objectives are being met on an everyday basis, hence the need for such intricate planning.(www.coursehero.com)

1.2 Methods for production planning process

Production framework is the system inside which the production exercises of an endeavor happen. Manufacturing process is the transformation procedure through which sources of info are changed over into yields. A suitable planning of production framework guarantees the coordination of different creation operations. There is no single example of production framework which is all around material to a wide range of creation framework fluctuates starting with one venture then onto the next. It enables an organization to satisfy deals projections in a productive way while looking after quality. Independent companies need to arrange their generation painstakingly to make the best utilization of their constrained assets. You can order the standards of creation arranging by their capacities and by the production components they influence. A sound production arrange utilizes dependable conjectures to dole out assets and control the subsequent yield While there are numerous philosophies to expand the productivity of generation operations, it is frequently the case that there is a need to apply a mix of devices to accomplish the coveted targets. Production planning is the process by which a producer or business chooses what number of products to deliver. Effectiveness is basic to the accomplishment of a business; arranging decides what number of every great or administration should be created over a given day and age with a specific end goal to take care of demand. There are a wide range of sorts of production planning in which go under a wide range of names in the business world. Some of the main types of production planning include job- or project-based planning, batch planning, and continuous or mass production.

1.2.1 Existing Types of Production Method

Broadly one can think of three types of production systems which are mentioned here under: -

(a) Continuous production or Flow production

(b) Job or unit production

(c) Batch production

(a) Continuous production or Flow production

Flow methods are like cluster techniques - aside from that the issue of rest/sit out of gear generation/bunch lining is dispensed with. Stream has been characterized as a "technique for

creation association where the errand is chipped away at constantly or where the preparing of material is nonstop and dynamic,"

The aim of the flow methods are :

Improved work and material stream

Reduced requirement for work abilities

Added esteem/finished work quicker

Flow methods imply that as work on an assignment at a specific stage is finished, it must be passed specifically to the following stage for handling without sitting tight for the rest of the undertakings in the "cluster". When it lands at the following stage, work must begin quickly on the following procedure. All together for the stream to be smooth, the circumstances that each assignment requires on each stage must be of equivalent length and there ought to be no development off the stream creation line. In principle, consequently, any blame or blunder at a specific stage all together that flow methods can function admirably, a few prerequisites must be met:

(1) There must be significantly steady request.

On the off chance that request is capricious or sporadic, then the stream creation line can prompt a generous this issue by "working for stock" - i.e. keeping the stream line working amid calm times of interest with the goal that yield can be created proficiently.

(2) The product and/or production tasks must be standardised

Flow methods are inflexible - they can't bargain adequately with varieties in the item (albeit some "assortment" can be refined through applying diverse completions, enrichments and so on toward the finish of the generation line).

(3) Materials utilized as a part of production must be to particular and conveyed on time

Since the flow production line is working constantly, it is not a smart thought to utilize materials that fluctuate in style, frame or quality. Essentially, if the required materials are not accessible, then the entire production line will find some conclusion - with possibly genuine cost results.

(4) Each operation in the production line must be deliberately characterized - and recorded in detail

(5) The output from each stage of the flow must conform to quality standards

Since the output from each stage pushes ahead consistently, there is no space for sub-standard yield to be "re-worked" (contrast this and occupation or bunch generation where it is conceivable to make up for an absence of value by doing some additional work at work or the group before it is finished). The accomplishment of an effective production flow line requires extensive planning, especially in guaranteeing that the right production materials are conveyed on time and that operations in the stream are of equivalent term.(www.technologystudent.com)

(b) Job or unit production

With Job production, the complete task is handled by a single worker or group of workers. Jobs can be small-scale/low technology as well as complex/high technology. Low innovation occupations: here the association of creation is to a great degree just, with the required aptitudes and gear effectively realistic. This technique empowers client's particular prerequisites to be incorporated, frequently as the occupation advances. Illustrations include: beauticians; fitting

High innovation occupations: high innovation employments include substantially more noteworthy intricacy - and in this manner show more prominent administration challenge. The imperative fixing in high-innovation work creation is venture administration, or venture control. The fundamental components of good venture control for work are:

- Clear definitions of objectives - how should the job progress (milestones, dates, stages)

- Decision-making process - how are decisions taking about the needs of each process in the job, labour and other resources.(www.yourarticlelibrary.com)

(c) Batch production

As businesses grow and production volumes increase, it is not unusual to see the production process organized so that "Batch methods" can be used.

Batch methods require that the work for any task is divided into parts or operations. Each operation is completed through the whole batch before the next operation is performed. By using the batch method, it is possible to achieve specialization of labor. Capital expenditure can also be kept lower although careful planning is required to ensure that production equipment is not idle. The main aims of the batch method are, therefore, to:

-Concentrate skills (specialization)

- Achieve high equipment utilization.

This technique is probably the most commonly used method for organizing manufacture. A good example is the production of electronic instruments.

Batch methods are not without their problems. There is a high probability of poor work flow, particularly if the batches are not of the optimal size or if there is a significant difference in productivity by each operation in the process. Batch methods often result in the build-up of significant "work in progress" or stocks (i.e. completed batches waiting for their turn to be worked on in the next operation).(www.mbaskool.com)

1.2.2 Current Types of Production Method.

Financial weights ask makers to make more modified results of high caliber, in littler arrangement, with shorter lead time and obviously, without expanded expenses. Time is winding up plainly quickly the most key subject of organizations. Expenses are likewise vital, more imperative are aggressive cost and the most huge are attractiveness of fabricated items. Asset cost and occupation cost have fundamental impact on direct item cost. The framework key business objectives can be accomplished by expanded adaptability and efficient data streams. Building exercises acknowledged before assembling are critical in term of affecting of aggregate generation cost. The designing drawing and the procedure arranging as the fundamental building exercises are basic creation cost variables. Subsequently there is intending to arrangement and enthusiasm with process arranging exercises.

Classification is the process of identifying and establishing the various classes or divisions that exist for a set of parts based on relevant attributes. However future manufacturing systems will be increasingly more dynamic. They have to be able to rapidly respond to changing conditions by concurrently balancing and optimizing multiple manufacturing constraints.

The classification of methods is known especially in process planning systems based on new technology. The following methods of classification is known

(a) Lean Manufacturing method

Lean manufacturing reduces errors, increases efficiency and minimizes waste. Planning methods that help achieve lean manufacturing keep their focus on each stage of the production process and improve performance by streamlining activities. A structured approach to planning for a lean manufacturing environment helps generate high-quality products at a pace that matches market demand. (smallbusiness.chron.com)

(b) Kanban method

The term Kanban refers to a visual replenishment signal such as a card or an empty bin for an item. In a kanban system, each work centre has several bins, each containing a certain number of the same item. When a bin becomes empty, the work centre starts the process of replenishing the empty bin by sending the replenishment signal, or a kanban. Meanwhile, the work centre can continue using the other (stocked) bins.

Kanban is a pull replenishment system whose aims are zero stock outs, shorter lead times, and reduced inventory with minimal manual supervision. Instead of waiting for an MRP (plan to release materials down the supply chain, with kanban each operation pulls the materials it needs from its source when it needs them, signalling with a replenishment signal or a kanban that it needs to do so.(docs.oracle.com)

(c) Material requirement method

MRP makes available purchased and company-manufactured components and subassemblies just before they are needed by the next stage of production or for dispatch. This system enables managers to track orders through the entire manufacturing process and helps purchasing and production control departments to move the right amount of materials at the right time to production-distribution stages.(www.researchgate.net)

(d) Just in time method

The just-in-time system is an approach for providing smoother production flows and making continual improvements in processes and products. Kanban attempts to reduce work in progress to an absolute minimum. In addition, the system constantly attempts to reduce lead times, work-in-process inventories, and setup times. The just-in-time system requires strict discipline and cooperation on the part of management, supervisors, and workers, along with new methods and procedures for manufacturing planning and control.(drkresearch.org)

(e) Optimised Production Technology

The OPT system calculates the near-optimum schedule and sequence of operations for all a manufacturing company's work centres, taking into account priorities and capacities it can simultaneously maximize the use of critical resources and the plant output and minimize work-in-process inventories and manufacturing lead times or throughput times. OPT is quite fast; it can produce one day's schedule for several hundred workers in minutes. It can provide 1,000 work instructions within 30 seconds. In companies employing about 500 people, OPT can be implemented within two or three months. For minor disruptions, OPT schedules don't have to be rerun.(www.journals.elsevier.com)

(f) Flexible Manufacturing method

These systems are supposed to incorporate planning and control of their machinery operations within their computerized integrated-control data systems. These data systems have built-in production planning routines; FMS parts-programming routines; and materials-handling routines for parts, tools, and accessories; and stock control in the form of separate modules. Parts programming and scheduling May, in turn, include subroutines like alternative routing of batches, statistical quality monitoring and control, and balancing of assembly tasks among individual FMS stations. (www.sciencedirect.com)

(g) Agile Method

Agile development model is also a type of Incremental model. Software is developed in incremental, rapid cycles. This results in small incremental releases with each release building on previous functionality. Each release is thoroughly tested to ensure software quality is maintained. It is used for time critical applications. Extreme Programming (XP) is currently one of the most well-known agile development life cycle model.(istqbexamcertification.com)

(h) Iterative Method

An iterative life cycle model does not attempt to start with a full specification of requirements. Instead, development begins by specifying and implementing just part of the software, which can then be reviewed in order to identify further requirements. This process is then repeated, producing a new version of the software for each cycle of the model.(www.tutorialspoint.com)

1.3 Porter value chain

The value chain portrays the full scope of exercises which are required to bring an item or administration from origination, through the diverse periods of creation (including a blend of physical change and the contribution of different maker administrations), conveyance to definite buyers, and last transfer after utilize.

The Value chain investigation depicts the exercises the association performs and interfaces them to the associations focused position.

Value chain investigation portrays the exercises inside and around an association, and relates them to an examination of the aggressive quality of the association. In this manner, it assesses which esteem every specific movement adds to the associations items or services.This thought was based upon the knowledge that an association is more than an irregular assemblage of apparatus, gear, individuals and cash.

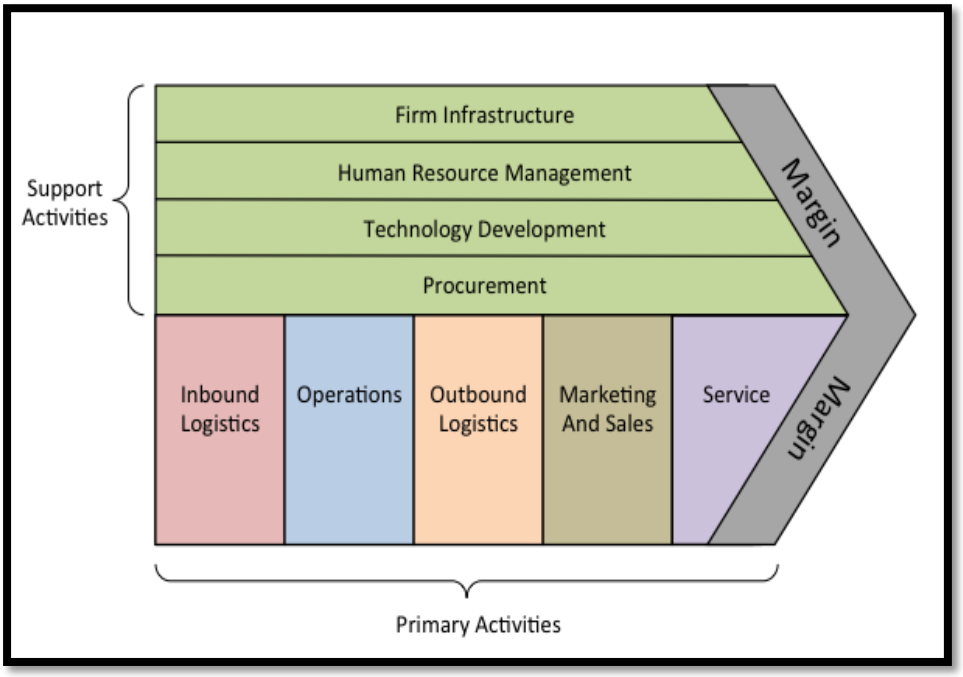


FIG-1 The Basic Model of Porters Value Chain

Source: www.businesssetfree.com

Porter distinguishes between primary activities and support activities. Primary activities are directly concerned with the creation or delivery of a product or service. They can be grouped into

five main areas: inbound logistics, operations, outbound logistics, marketing and sales, and service. Each of these primary activities is linked to support activities which help to improve their effectiveness or efficiency. There are four main areas of support activities: procurement, technology development (including R&D), human resource management, and infrastructure (systems for planning, finance, quality, information management etc.)

1.4. Theoretical Background for pharmaceutical process industries

Most modern arranging and booking approaches for the procedure business consider a settled time skyline and accept that all information is given at the season of utilization. In this commitment an arranging and booking approach for a nonstop and dynamic choice process where choices must be made before all information are accessible. As a motivation we have a true issue starting from an intricate pharmaceutical generation plant. The pharmaceutical business includes the creation of therapeutic supply, for example, medication, cream, and other restorative items. Consequently, there are a few items should have been created at one time. In this manner, a total generation arranging is very troublesome.(Zapfel G.2013)

In the pharmaceutical industry, certain standard such as GMP(Goods manufacturing practices) are applied and the production must strictly abide by various quality regulations. Therefore, the scheduling of production planning becomes harder. Thus, the problem cannot be easily solved without an aid of mathematical model to attain the optimal solution. In practice, there are more than over hundred products and ten machines to be considered at one time. Thus, this hard problem is impossible to over solve without the developed model. Research shows an attempt to apply an industrial engineering technique in pharmaceutical production. It is evident that the optimization technique is one of the potential and useful methods in solving problems. The contribution of this research considerably reduces operation cost of the organization. (Chaoleam.S et.al 2013)

The pharmaceutical industry has become a very competitive and unpredictable industry where customers constantly demand low prices as well as high service levels and flexibility. Flexible multi-product production processes have become commonly used as they help companies to respond to changing customer demand and increase plant utilization, but the greater complexity of these processes together with the altered market conditions have rendered the simple planning and scheduling techniques previously used insufficient. It is thus very important to improve

production plans and schedules in order to strive for superior utilization of resources, flexibility and response time at the same time as cutting down cost of production. (Stefansson H et al, 2015)

An Advanced Planning System has been considered comprising the modules net- work design, supply network planning, and detailed production scheduling. The decision problems related to the first two modules have been sketched briefly. The module of detailed production scheduling has been discussed in detail for batch production in process industries. A new approach to solving the corresponding optimization problem has been proposed, which consists of decomposing the problem into batching and batch scheduling. The batching problem can be reduced to a linear mixed–binary program of moderate size and solved by standard software. The batch scheduling problem can be modelled as a resource–constrained project scheduling problem and solved by an efficient beam search procedure. The new approach is markedly superior to the monolithic solution methods known thus far. This is also demonstrated by an experimental performance analysis based on a case study from chemical industry.

Important areas of future research are, for example, the development of an iterative solution procedure for detailed production scheduling, where the batching and the batch scheduling problems are solved alternately, and of efficient decomposition methods for (approximately) solving very large instances with thousands of operations. Moreover, new solution methods for the module of supply network planning should be developed whose performance is comparable to that of the new approach to detailed production scheduling presented. (Neumann Klaus et.al 2002).

An optimization-based approach has been presented to facilitate the product portfolio and investment decision-making process for the pharmaceutical industry. The model is capable of selecting both the optimal product portfolio and introduction scheme together with long-term manufacturing and capacity planning and investment strategy. Clinical trial outcomes were the only source of uncertainty taken into account in this work. The overall problem has been formulated as a multistage, multiperiod, stochastic problem, and reformulated as a multiscenario MILP model. The model takes account of the new information available at different periods (e.g. ending of clinical trials and their respective outcomes). The model easily solves the problem of three different stochastic products and one deterministic (64 scenarios) in four different stages. The model is also able to discriminate between different risk management alternatives. The applicability of the proposed model has been demonstrated by an illustrative case study. The assumption of only taking the outcomes of the clinical trials

at the end of the testing procedure is justified by the fact that only those products.(G.D. Eppen 1989).

The process specifications (e.g. overall line efficiency, operational and fixed costs, manufacturing rates, construction lead times, storage limits, etc.) and the commercial characteristics (e.g. demand forecast, price, marketing expenses, etc.) of each product, the approach developed must determine the decisions associated with multiple product pipelines. The problem must also consider the R&D cost associated with the development of potential new products. The decisions taken can be expressed as: when and where to install or expand capacity, which product to choose, how much and when to produce it in each site considering the available manufacturing time. The uncertainty given by the outcomes of the clinical trials is not considered explicitly. (Gatica G et.al, 2003)

The discussion of the pharmaceutical quality, design of the product and process controlling method the QbD for generic drugs(A generic drugs is a drug defined as "a drug product that is comparable to a brand/reference listed drug product in dosage form, strength, quality and performance characteristics, and intended use.), identifies its fundamental principles and elements, and discusses its utility in ensuring pharmaceutical quality with emphasis on solid oral dosage forms of small molecules. In contrast to the traditional regulatory system of quality by testing (QbT), pharmaceutical QbD is a systemic approach to pharmaceutical development that begins with predefined objectives and emphases product and processes understanding and process control. It means designing and developing formulations and manufacturing processes to ensure predefined product quality. Understanding and implementing QbD will enhance and modernize the regulation of pharmaceutical manufacturing and product quality. It will transform the Chemistry, Manufacturing, and Controls (CMC) regulatory review into a modern science-based pharmaceutical quality assessment. (Lawrence X. Yu, 2008)

Supply chain enhancement is currently a noteworthy research subject in process operations and administration. A lot of research has been attempted on office area and configuration, stock and dissemination arranging, limit and creation arranging and point by point planning. Just a little extent of this work straightforwardly addresses the issues confronted in the pharmaceutical segment. Then again, this division is particularly prepared for and needing modern store network improvement strategies.

At the supply chain configuration organize, a specific issue confronted by this industry is the need to adjust future limit with foreseen requests notwithstanding the exceptionally huge vulnerability that emerges out of clinical trials and contender action. Productive limit use arranges and hearty framework speculation choices will be essential as administrative weights increment and edges are dissolved. The capacity to find hubs of the production network in assessment asylums and improve exchanging and exchange value structures brings about fascinating degrees of opportunity in the inventory network plan issue. Earlier even to scope organization comes the issue of pipeline and testing arranging, where the choice of items for improvement and the booking of the advancement errands requires a watchful administration of hazard and potential prizes.(Beulens G. A,2000)

At the operation stage, it is often difficult to ensure responsiveness. Most pharmaceutical products involve primary active ingredient (AI) production (often multi-stage chemical synthesis or bioprocess) and secondary (formulation) production. Both of the stages are characterized by low manufacturing velocities and are hampered by the need for quality assurance activities at several points. It is not unusual for the overall supply chain cycle time to be 300 days. In this environment, supply chain debottlenecking and decoupling strategies together with coordinated inventory management are crucial for quick responses to changing market trends. A good understanding of what actually drives the supply chain dynamics is also required. As often as not, erratic dynamics are introduced by business processes rather than by external demand, and may be eliminated by the re-design of internal business processes or supplier/customer relationships. The pharmaceutical industry can be defined as a complex of processes, operations and organizations involved in the discovery, development and manufacture of drugs and medications.

The pharmaceutical supply chain used to be seen as a tool to supply products to market in an effective way, where the emphasis was on security of supply. Recent changes in the operating environment mean that companies are revisiting the components of their supply chains and identifying ways of extracting additional benefits from them.

In this sector in particular, the supply chain of interest is not simply the physical processes of conversion and distribution of materials. Equally important is the “value-chain” perspective of managing the innovation and development processes through to capacity and production planning. There are still several exciting research challenges in this value chain, many of which the process engineering/process systems engineering community are well placed to address. (Shah Nilay, 2004)

The quality of health care is very important to any society. The drugs obtained from the pharmacy prescribed by the physician are expected to cure the infection or relieve the pain and have its intended effect. People expect that the bottle of medicine has the specified number of tablets and that each tablet contains the specified quantity of the correct drug.

A number of unit processes are involved in making tablets, including particle size reduction and sizing, blending, granulation, drying, compaction, and (frequently) coating.

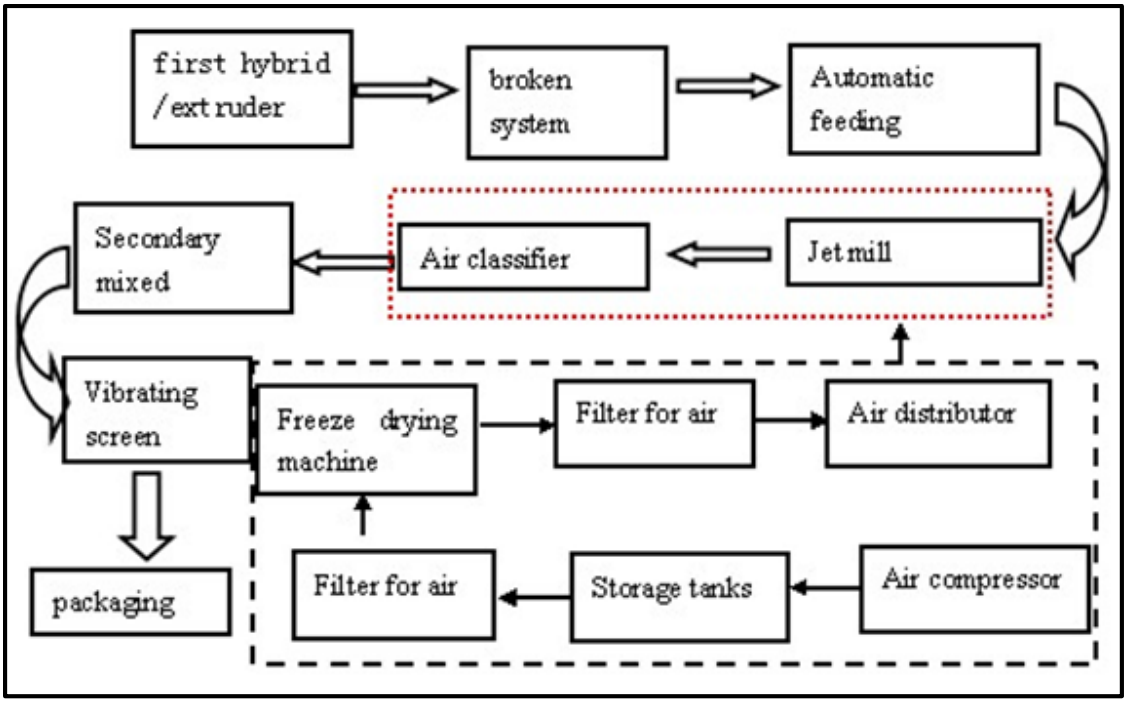


FIG-2 Basic Model for Production system

Source: *french.alibaba.com*

Various factors associated with these processes can seriously affect content uniformity, bioavailability, or stability. Factors affecting the production line effectiveness of pharmaceutical companies include the different processes, operators, batch size, transfer time etc. There are different productivity improvement opportunities for the company by altering the above factors.(Fredrik Carl,2009)

From the review directed at a pharmaceutical organization, it is clear that the creation line is practically flawless yet there exists a somewhat higher work in advance things (bigger numbers in line). A definitive target of this review is to diminish the work in advance by discovering the

improved levels of the basic variables. To distinguish the different enhanced strategies, the creation line is displayed utilizing Arena recreation programming and to additionally enhances the efficiency by limiting the work in advance, the generation line is improved utilizing Taguchi Design of Experiments.

Re-enactment, enhancement and generation change shape an incorporated some portion of present day designing and industry. A lot of research has been embraced on office area and configuration, stock and dispersion arranging, limit and generation arranging and point by point booking and straightforwardly addresses the issues confronted in the pharmaceutical part. Then again, this segment is especially prepared for and needing modern store network streamlining strategies. (Kumar Pramod et al, 2014)

Pharmaceutical organizations are experiencing significant changes to adapt to the new difficulties of the advanced economy. The globalization of the business the differing qualities and many-sided quality of new medications, the expanding snugness of capital, and the decreasing assurance given by licenses are a portion of the variables driving these progressions. All phases of the business esteem chain are influenced: from the advancement of new medications to the administration of the assembling and promoting systems. This paper portray a streamlining based application insect to choosing both an item improvement and presentation system a d a scope organization a d venture procedure.. This assesses both the specific elements of pharmaceutical dynamic fixing fabricating and the worldwide exchanging structures.

The principle goal was to apply numerical programming systems in order to encourage the vital store network basic leadership handle for pharmaceutical businesses. An enhancement based application cockroach has been exhibited to choose both the ideal item improvement and presentation methodology together with long haul scope organization and speculation system at various locales. (Lazaros G et al, 2001).

The first methodological exploration in this series of literature reviews involves a mechanism known as the survey. Surveys, simply defined, are series of questions used to gain information (Ary, Jacobs, & Razavieh, et.al.2002; Fowler,et.al. 2002)

Surveys appear frequently in the lives of people as they read magazines, surf the internet, or sometimes through phone or mail solicitation . People are familiar with survey mechanisms,

and this makes them an easy research method to administer.(Baxter & Babbie, et.al.2004; Fraenkel & Wallen,et.al 2006)

After the purpose of surveys is reviewed, practical considerations of constructing surveys are described. This includes discussion of open and closed questions and why each may or many not be appropriate in a surveying situation (as well as considerations of what data analysis for each kind of survey entails). The utility of a given survey largely depends on the questions asked and how they are asked (Esposito & Rothgeb, et.al.1997;Cannell, & Kalton,et.al 1991)

These surveys are ideal for information that is to be used for a current project or to reflect current public opinion. Examples include political polls on how people plan to vote or surveys asking a customer to rate his or her satisfaction with a sale transaction. These differ from longitudinal surveys where information is collected at different points in time in order to study changes over time.(Billiet & Loosveldt, et.al.2009; Cialdini, & Couper, et.al 1999)

Review technique as a logical field looks to distinguish standards about the specimen plan, information gathering instruments, factual modification of information, and information handling, and last information examination that can make methodical and arbitrary overview blunders. Review blunders are some of the time investigated regarding study cost. Taken a toll imperatives are some of the time encircled as enhancing quality inside cost requirements, or on the other hand, diminishing expenses for a settled level of value. Overview approach is both a logical field and a calling, implying that a few experts in the field concentrate on study mistakes observationally and others configuration studies to diminish them. For study architects, the undertaking includes settling on a huge arrangement of choices around a great many individual components of an overview keeping in mind the end goal to enhance it..(Bruzzone, et.al.1999),

The study investigate configuration is an extremely important device for evaluating sentiments and patterns. Indeed, even on a little scale, for example, nearby government or private ventures, judging sentiment with painstakingly outlined studies can drastically change techniques. Directing exact and significant reviews is a standout amongst the most imperative features of statistical surveying in the buyer driven 21st century. Precise research can produce inconceivable measures of income; awful or off base research can cost millions, or notwithstanding cut down governments (Jobe & Mingay, et.al.1991).

The methods used for assessment included: use of data (routine and service specific), service based evaluations (visits and interviews with staff and patients), questionnaires (surveys, staff and patient questionnaires), As well as identifying the methods of assessment currently in use, a strong theme was found regarding the necessity and appropriate use of the patient‘s perspective in assessment.(Groves,et.al.1999).

The investigation of research techniques is not just a basic necessity for social researchers, it is likewise imperative for anybody hoping to prevail in business and administration The most well-known research strategies are: writing looks, conversing with individuals, center gatherings, individual meetings, phone studies, mail overviews, email studies, and web reviews. (Oksenberg,et.al.2001)

The study technique has dependably been utilized by scientists since the presentation of review research in 1930s. Paul Lazarsfeld directed a study on how the radio influences the arrangement of political supposition in the United States. Since the study was quantitative in nature, the quantitative branch of research has turned into a convention in the field of human science since the 1940s. It is a typical pattern that many individuals would question about the consequences of a review, unless they discover verification that the overview was done "logically". All things considered, leading a study requires the utilization of thescientific process, a course that is fundamentally trailed by a wide range of research. Having this at the top of the priority list, a review that has basically experienced the means of the logical procedure sets a higher rate ofvalidity and dependability of the outcomes.(explorable.commission)

One of the significant focal points frequently asserted for studies is the insignificant cost. Various analysts have proposed that email studies cost not as much as mail s the reality of the matter is that electronic overviews diminish paper squander. In any case, call attention to that difficult to-gauge human work expenses can without much of a stretch be neglected while ascertaining the genuine expenses of email reviews. (Parker, et.al.1992; Schaefer,et.al. 1998)

Despite some sub-optimal results for email response rates, recent trends in Internet demographics paint a positive future for the use of this channel in survey work. In recent Internet demographics released by CommerceNet and Media Metrix, McPhee and Lieb report that the female population of the Web has increased from 30% in 1995 to 46% in 1999. This normalization of the gender ratio on the Web is of critical importance (McPhee & Lieb,et.al.1999)

As is well known, with traditional survey methods multiple contacts improve response rates. Similarly, e-mail survey response rates may only reach 25% to 30% without follow-up e-mail. Many researchers have obtained relatively good response rates by using multiple e-mail contacts. For example, had a 5.3% higher response rate with e-mail when using multiple contacts. had a higher response rate with four contacts, and received more responses by increasing contact frequency.(Mehta and Sivadas,et.al.1995) , Schaefer and Dillman,et,al.1998).

A comprehensive, one-stop guide to identifying, reducing, and managing nonresponse surveys. Nonresponse and its impact on the sample selection mechanism of a survey is a common problem that often arises while collecting survey data. The authors begin with an introduction to the nonresponse problem along with basic concepts and definitions.(Bethlehem.et.al 2011).

One of the key attributes of a successful winner in today's highly competitive marketplace is the ability to respond rapidly to the end consumer demand. To maximize competitive advantage all members within the supply chain should "seamlessly" work together to serve the end consumer(D.R. Towill 1997).

It is attractive that a base changes be made after timetables are built up. This goal can be drawn closer if the measure of work planned for the manufacturing plant or division is equivalent or marginally more prominent than the generation cycle.(G.E.Viera.et.al 2005).

Production planning and control practices will differ broadly from plant to plant/association to association. In spite of the fact that no production control capacity can be completely killed, the slightest control that outcomes in viable operation of the processing plant is the best control.(V.D.R. Guide.et.al2000)

Under the increasing complexity and globalisation of manufacturing environment, production planning and control (PPC) plays a key role in linking strategic and operational levels by providing a number of tools and models.(Olhager.et.al2000)

Modelling approaches used to study PPC include conceptual models (safety stock, hedging and over planning), analytical models (mathematical programming, hierarchical process and Markov decision process), intelligence artificial-based models (neural network, fuzzy logic and multi-agent systems) and simulation models (discrete event, system dynamics (SDs) and agent based(J.P.García-Sabater.et.al2006)

The interactions of resources with processes, products and services result in large numbers of scenarios and outcomes that are impossible to understand and evaluate without the help of a simulation modelling technique (Gebus, S.et.al 2013)

For example, Smith reviewed the use of discrete event simulation (DES) in manufacturing system design and operations (Smith J. S. 2003).

However, they focused on manufacturing issues rather than simulation techniques for applications in manufacturing.(Seleim,A.A.et.al 2012).

As per the previous research implemented on the production planning process the main ideas was discovered for the manufacturing process so that we can reduce the production cost on various methods. There are many methods for the production planning method which is already discussed in the past by the other researcher. The future ideas is based on this research methods which can be useful for the improvement in the methods or for the propose model. According to the past research executed on the generation arranging process the fundamental thoughts was found for the assembling procedure with the goal that we can diminish the creation taken a toll on different strategies. There are numerous strategies for the generation arranging strategy which is as of now talked about in the past by the other specialist. The future thoughts depends on this examination techniques which can be valuable for the change in the strategies or for the propose demonstrate.

2. Research Methodology

2.1 Research Design

The present topic focuses exclusively on survey method, which is of descriptive type in nature. In social science researches many a time's beginning researchers as well as experienced researchers undertake survey studies. It is because; it allows the researcher to know and understand the field in a better manner. Survey studies conducted for different purposes, and based on it the types varies. The present unit discusses about different types of survey study and its relevance and use in the context of social science researches.

Survey practice covers an enormous range of interlocking technological, mathematical and the major survey planning steps and highlights issues such as planning the questionnaire, planning how to achieve good survey representativeness, survey scheduling, and budgeting considerations and scientific subjects..

The major survey planning steps and highlights issues such as planning the questionnaire, planning how to achieve good survey representativeness, survey scheduling, and budgeting considerations.

The field of survey methodology draws on theories and practices developed in such academic disciplines as mathematics, statistics, psychology, sociology, computer science, and economics.

2.2 Research Approach

2.2.1. Survey method

Survey technique as a logical field looks to recognize standards about the specimen plan, information gathering instruments, factual alteration of information, and information handling, and last information investigation that can make precise and arbitrary overview blunders. Review blunders are now and then examined regarding overview cost. Taken a toll limitations are once in a while confined as enhancing quality inside cost requirements, or then again, lessening costs for a settled level of value. Study system is both a logical field and a calling, implying that a few experts in the field concentrate on study blunders observationally and others configuration studies to decrease them. The study technique assembles quantitative information on those considerations, emotions, and practices. The study technique solicits an agent test from individual's similar inquiries concerning specific mentalities, sentiments, qualities and convictions. In the event that the specimen is really illustrative this enables the speculation of results to the population from which the example came. Survey can be utilized all alone or with other research strategies, for

example, the investigation, perception and the meeting. The review strategy imparts an essential element to the more organized of meetings and perceptions. This is simply the social affair of information report from a respondent or interviewee. Reviews modes see overviews directed by post, up close and personal, by phone, videophone and the Internet.

A decent study will be composed well, with standardised instructions and inquiries. A pilot review is regularly directed to enable this to happen. Overview inquiries can be either open or shut. Open inquiries offer ascent to open, elucidating answers, while shut inquiries limit respondents' decision of reply. Open inquiries can give you an excessive amount of subjective, expressive data in answers, which makes working out our normal or contrasting states of mind, sentiments and so on troublesome. Shut inquiries, which give quantitative or numerical answers, are helpful, particularly if a Likert size of estimation is utilized. Points of interest of the study technique for research are that it is shoddy, effortlessly managed; replicable, and a lot of information can be got from many people in a genuinely brief time. Above all an all around outlined review, if given to a delegate test, enables the specialist to sum up their outcomes to the populace from which this example came. Disservices incorporate poor plan, GIGO, unwavering quality and legitimacy, quiet submission reaction, a propensity to give socially attractive answers, and reaction and examining predisposition.

2.2.1.1 Types of survey method

There are various types of surveys you can choose from. Basically, the types of surveys are broadly categorized into two: according to instrumentation and according to the span of time involved. The types of surveys according to instrumentation include the questionnaire and the interview. On the other hand, the types of surveys according to the span of time used to conduct the survey are comprised of cross-sectional surveys and longitudinal surveys.

1. Questionnaires
2. Interviews
3. Cross-Sectional Surveys
4. Longitudinal Surveys
5. Face-to-Face Method
6. Telephone Survey
7. Online survey
8. Focus method.

Advantages of survey method:-

1. High Representativeness
2. Low Costs
3. Convenient Data Gathering
4. Good Statistical Significance
5. Little or No Observer Subjectivity
6. Precise Results
7. It uses the methods, materials and setting of the study of the real-life situation which is under investigation to ensure ecological validity.

Disadvantages of survey method:-

1. Inflexible Design
2. Not Ideal for Controversial Issues
3. Possible Inappropriateness of Questions
4. might not get careful feedback
5. can be hard to analyze and compare
6. not flexible means to get data; data restricted to what already exists
7. can influence behaviors of program participants -can be expensive.

2.2.2 Conception of the Research Method

In this research were used reviews of the theory and alternative internet source articles ,interviews with basic outsource company middle and high level managers discussion with pharmaceutical industries, close consultation with the pharmaceutical industries and high discussion with managers and employees through internet study, mailing focus groups, practical experience working with pharmaceutical industry. On the basis of the key performance indicators and the porter value chain the questionnaire was designed.

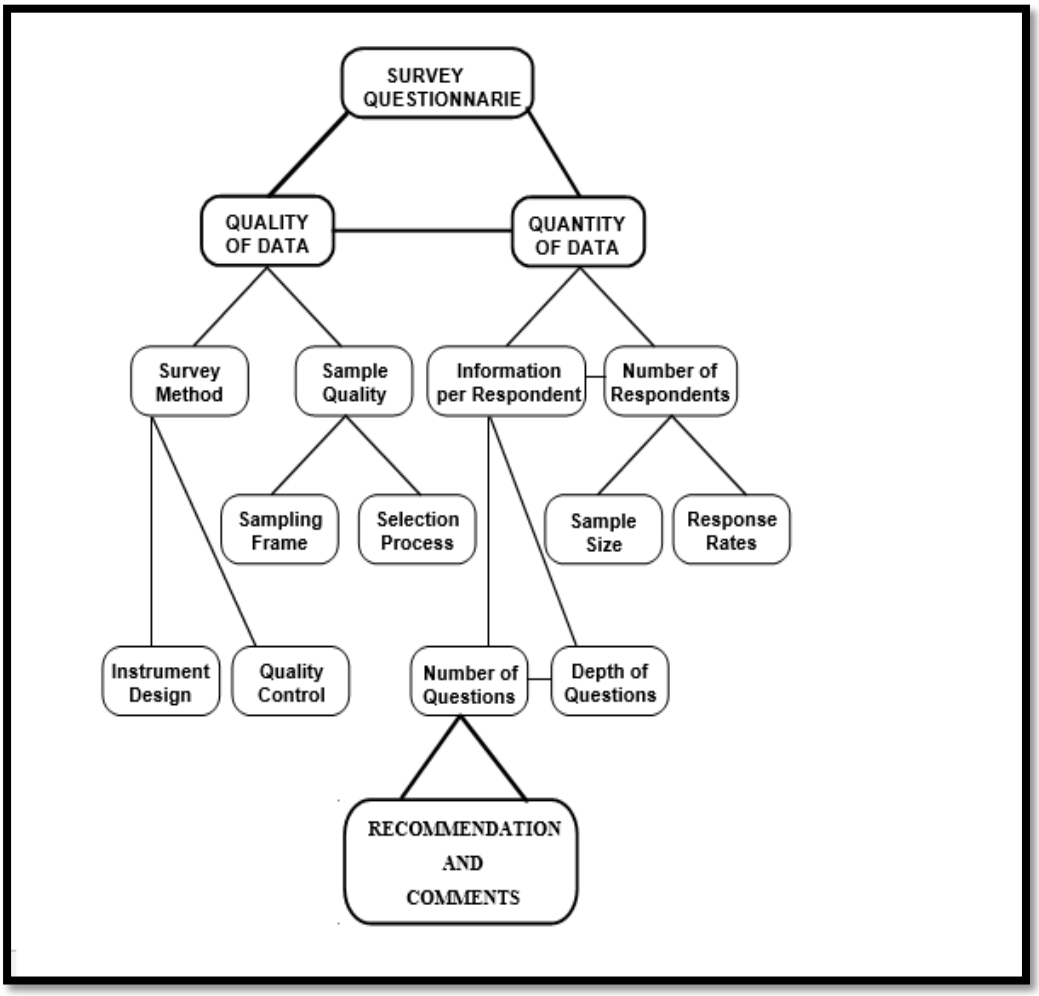


FIG-3 Questionnaire flow chart

Source: Prepared by author.

3. Empirical Research for production planning process in pharmaceutical industries

Empirical research for production planning processes in pharmaceutical industries. The questionnaire was prepared and distributed to pharmaceutical companies in different areas. More over 26 companies given the good answers of the question which can be utilise for the results and the evalution.Since we required the most successful answer from questionnaire. Companies have historically invested in large research and development departments to drive innovation and provide sustainable growth where companies recognize that not all good ideas will come from inside the organization and not all good ideas created within the organization can be successfully marketed internally. To date Open Innovation concepts have been regarded as relevant primarily to high-technology industries.

More than third of respondents/companies worked in pharmaceutical area longer than 7 years (36%), also near the third of companies just begin their activities and work in research area less than 1 year. Quarter of respondents answered that they work in this area more than year and less than 4 years. And only 8% companies work in this area 5 to 7 years. Therefore, it could be concluded that many companies which participated in survey working nearly equally (see Fig. 4)

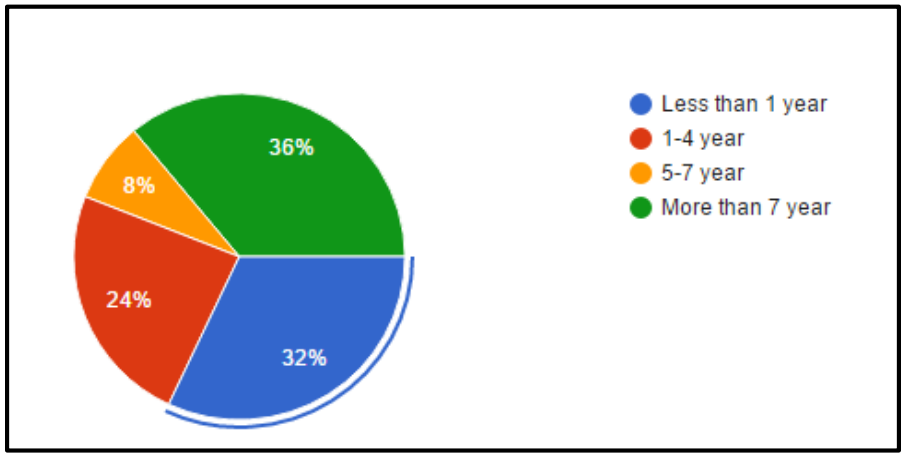


Fig. 4. Number of years operating in pharmaceutical industry

Since we realize that we have small, medium and large industries it can be broke down that more than 50 percent are having little businesses since they having less production yet 24 % are medium and large ventures are similarly dispersed. (see Fig. 5)

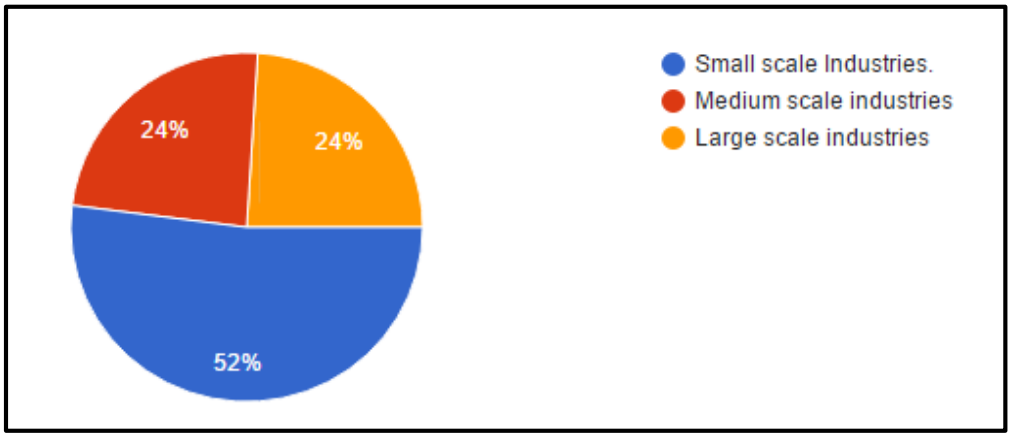


Fig. 5.Types of industries for pharmaceutical companies

We realize that there are numerous little organization there the quantity of the workers is to be less and according to the overview information they have been similarly distributed most of the organizations having under half representatives and between 50-249 representatives having just 25 % yet the organizations having less number of workers is 20.8%.(see Fig. 6)

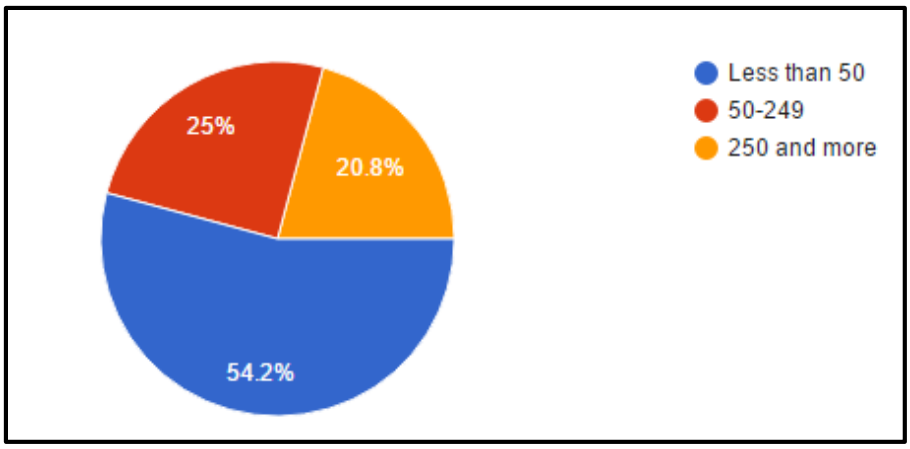


Fig. 6. No. of employees working in companies

There are probably the most vital sorts of production technique utilized as a part of pharmaceutical businesses: (i) Job Production (ii) Batch generation and (iii) Continuous production. The real procedures ought to meet up in the planning of an item or service. Product outline and advancement to take a gander at various methods for delivering a decent or administration. A ultimate conclusion with respect to a specific strategy for generation is especially influenced by the way of the items and the amount to be produced. (see Fig. 7)

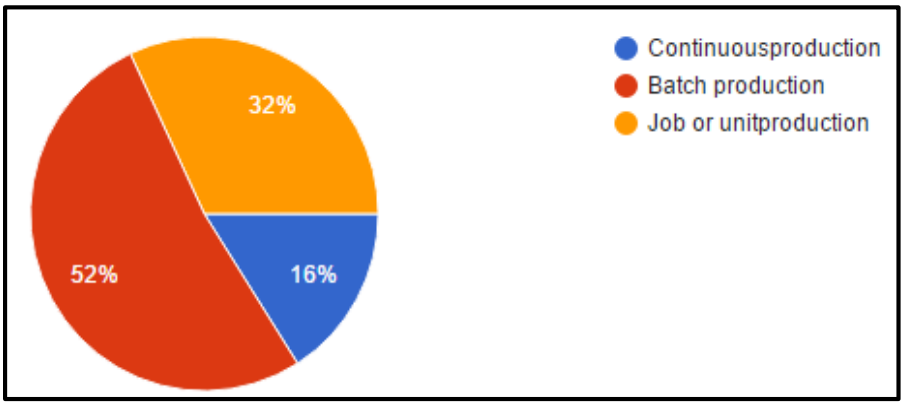
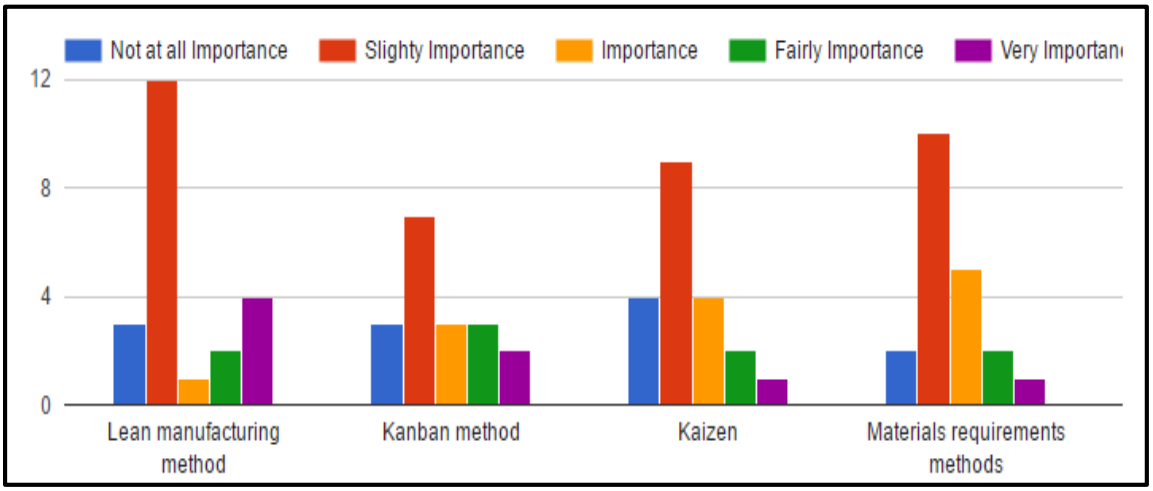


Fig. 7.Production method used in pharmaceutical industries

Keeping in mind the end goal to utilize this kind of advancement, a few capabilities must be met. To start with, we should have an outline issue is the most essential stride in streamlining. Database improvement methods you can really utilize. Adding more than one target to an advancement issue includes many-sided quality. For instance, to improve a basic outline, one would crave a plan. Enhancement issues are regularly multi-modular; that is, they have various great arrangements. They could all be all inclusive great (same cost work esteem) or there could be a blend of all around great and locally great arrangements from the above lean and JIT strategy it will be recipient to enhancement. (see Fig. 8)



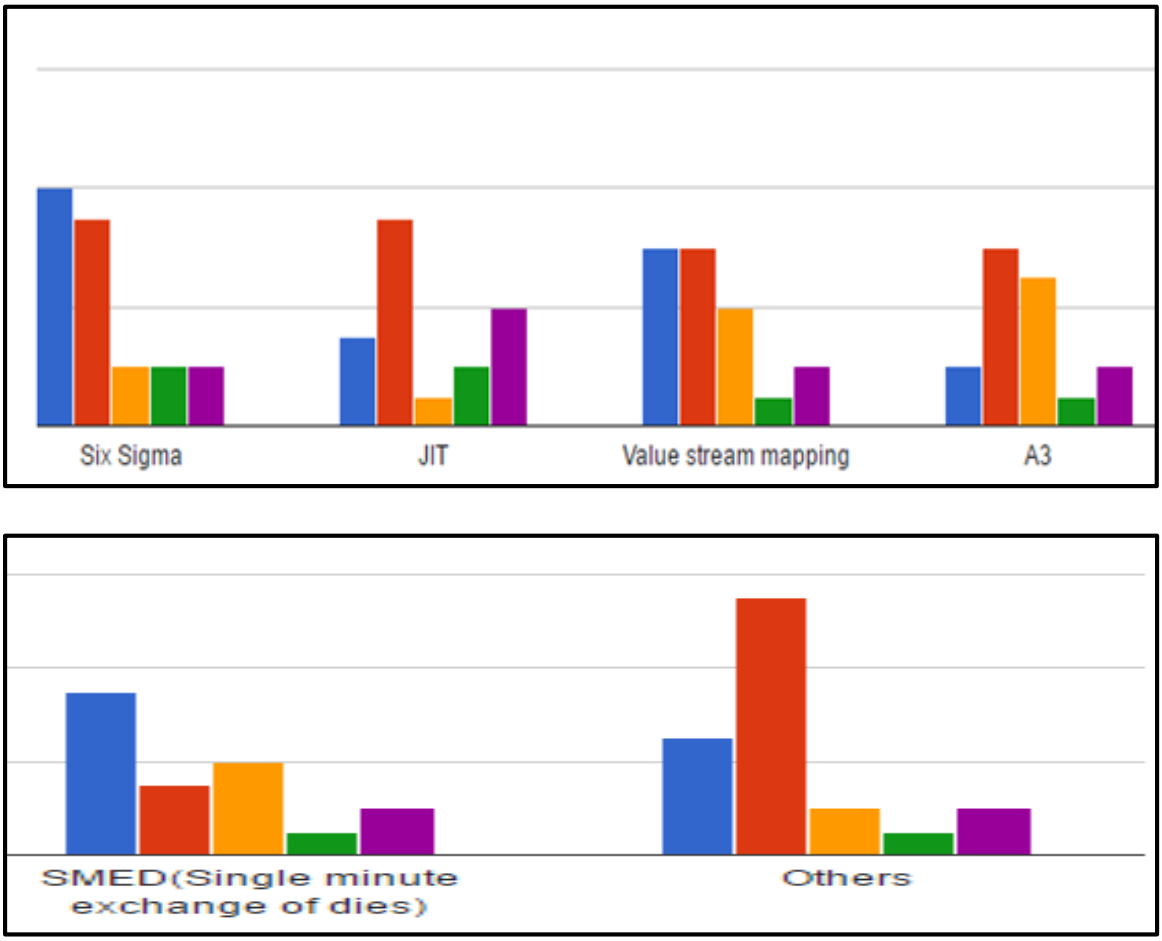


Fig. 8.Types of optimization method are important for industries

All production frameworks, when seen and no more dynamic level, may be said to be change processes that change assets into valuable products and enterprises. At the point when seen as a procedure, a creation framework might be additionally portrayed by streams in the process. As per the given data the best response to build the production system will cost the accessibility of the raw materials. (see Fig. 9)

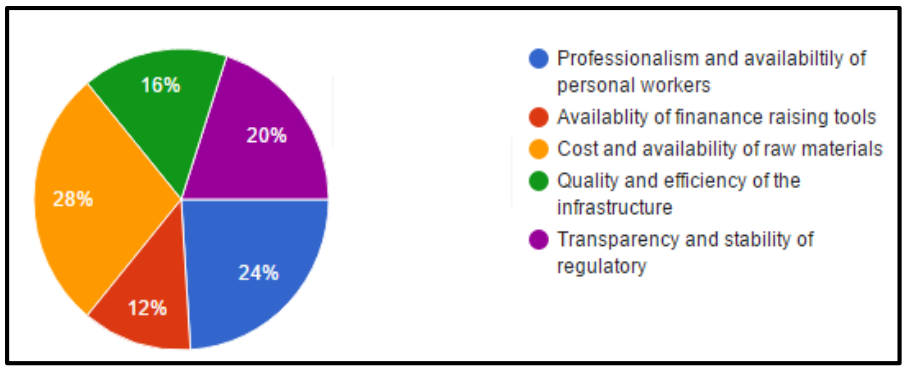


Fig. 9. Factors affecting to increase the production system

Production productivity framework is a financial level at which the level of production framework can no longer deliver extra measures of a decent without bringing down the production level of another item, This happens when an economy is working along its production probability wilderness. Effective generation is accomplished when an item is made at its least normal aggregate cost; production productivity measures whether the economy is delivering however much as could reasonably be expected without squandering precious resources. By the given data the level of production framework is very incredible. (see Fig. 10)

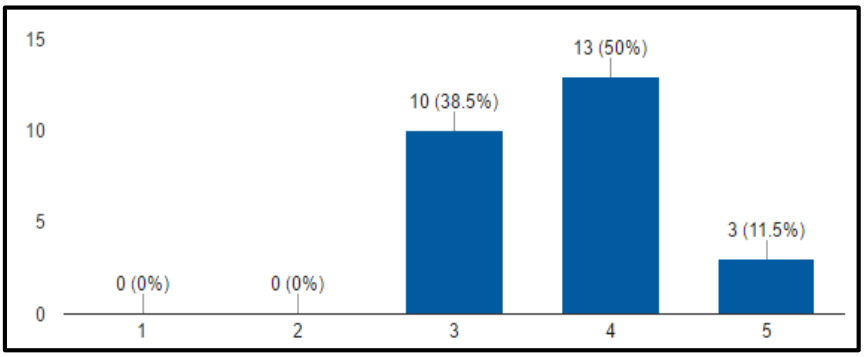


Fig.10. Level of production system for industries

Capacity is the most extreme sum your assembling operation can deliver. Capacity is expanded either to meet a real (quick) increment in client request or a foreseen (future) increment in client request. The need to secure a procedure as quickly as time permits limits open doors for streamlining. As an outcome, handle streamlining and limit upgrades are regularly post launch exercises performed when the extent of market request and the aggressive business condition are both better understood. From the above relevant data we had analysed that to increase the production we have to optimized the management structure and the production extension periods. (see Fig.11)

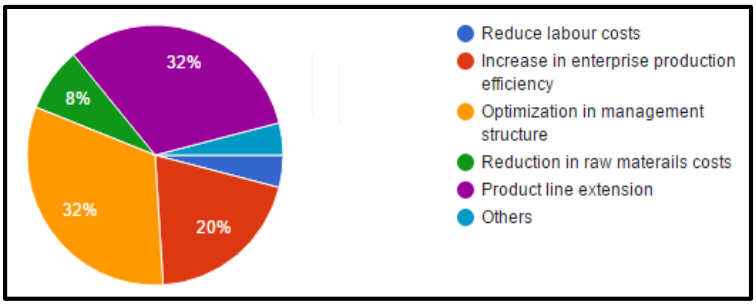


Fig.11. Optimize process to increase the capacity of production

Production planning basically speaks to the centre of the way toward assembling. Any assembling procedure may achieve its maximum capacity when it has the best generation arranging operation available to its. the created scope organization prerequisites to decide work and machine asset needs required to finish the greater part of the undertakings of generation. Be that as it may, compelling arranging is a mind boggling process that covers a wide assortment of exercises to guarantee that materials, gear and HR are accessible when and where they are needed. Here we can see the absolute best response for this is to upgrade the equipment usage and expanded the capacity level. (see Fig.12)

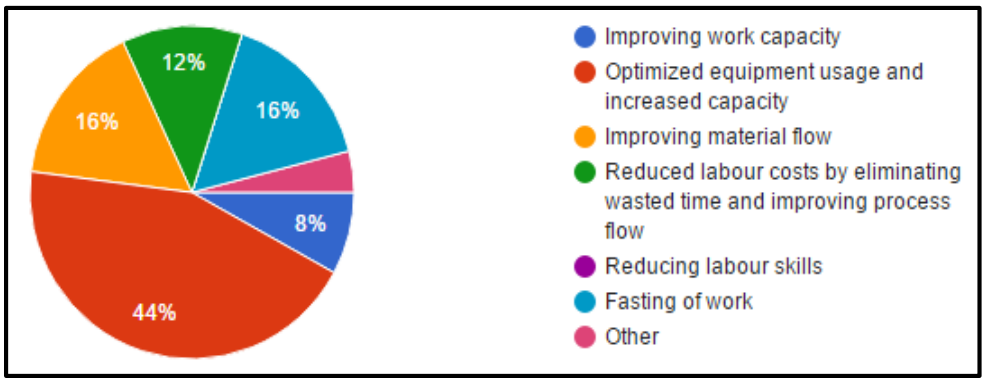


Fig.12.Various ways to improvement in production planning process

There are many real keys to actualizing for the planning of the process, but we have few dissected by the review information a large portion of the reactions had given to lessen the generation endeavour about 32 % of the general population saying, but deliberately we can see the chart the best response for executing the arranging is to diminish the imperfections in the item and have some enhance better detective technologies (see Fig.13)

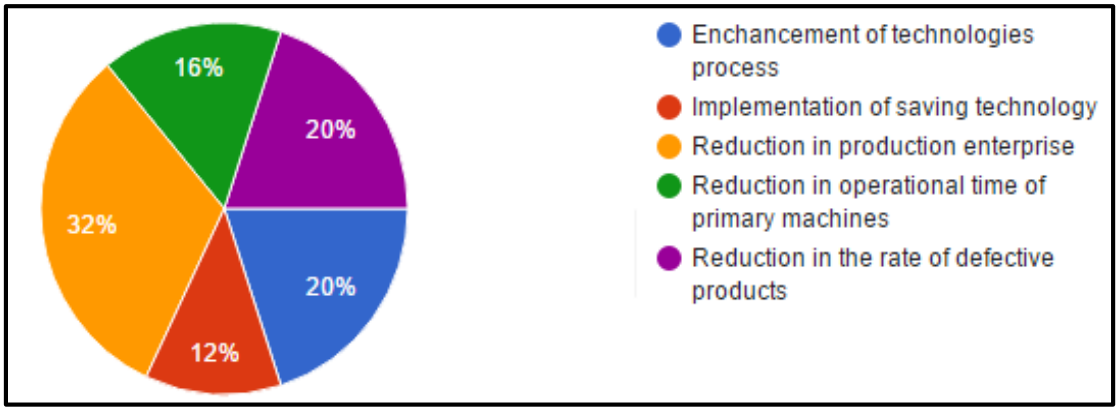


Fig.13. Major principles for implementation in process planning

Here we had seen that the choices are nearly equally distributed the main answer from the given information is that if we try to increase the capabilities in developing the product and increase the services level than we can easily encountered in the localization of management. (see Fig.14)

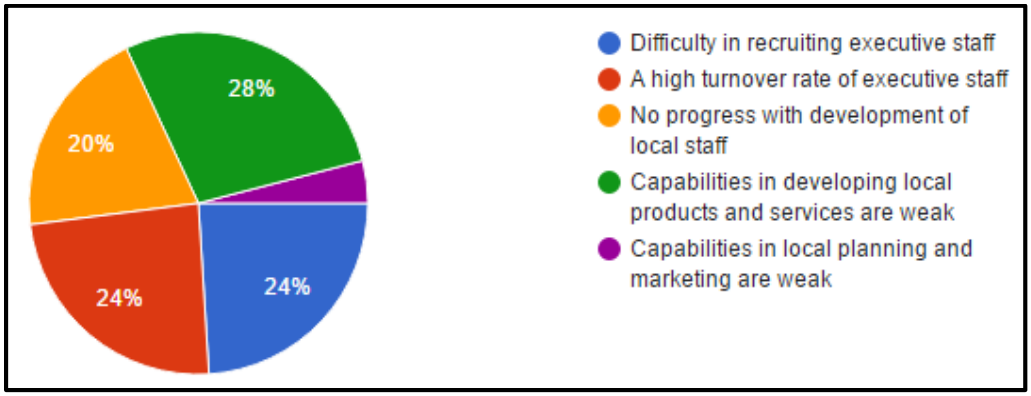


Fig.14.Problems faced by the companies during the localization of management

Rapid growth in emerging markets is causing a dramatic increase in demand for resources, and supplies of many raw materials have become more difficult to secure. Raw material and the parts contribute the cost of the production in nearly 28% by the responded is approximately more 50% and less than 60% of the production costs. (see Fig.15)

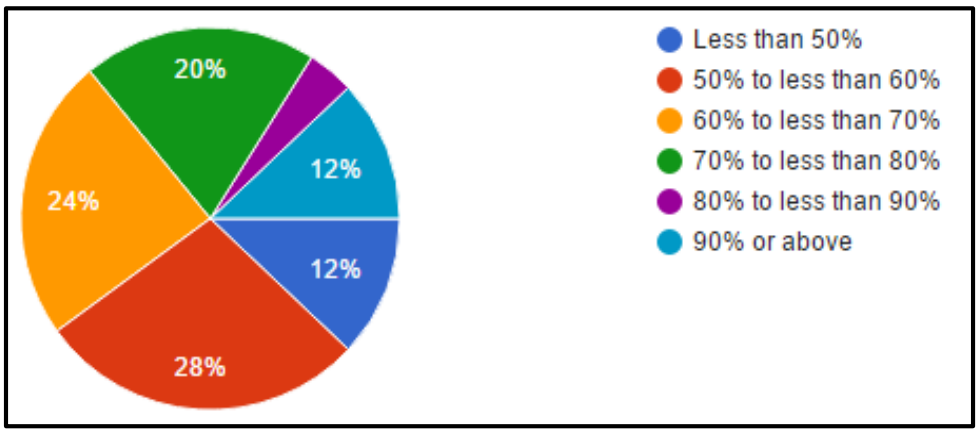


Fig.15.percentage of production costs is attributable to raw material and parts

When planning and implementing a quality management system or quality management methodology, there is nobody answer for each circumstance. Every organization is one of a kind regarding the way of life, administration hones, and the procedures used to make and convey its items and administrations. The quality administration technique will then change from association to organization. The hierarchical structure, procedures, strategies and assets expected to actualize, keep up and ceaselessly enhance the administration of value and yes it will be work in the

organization. Nearly 56% is having exceptionally well quality management,28% is having normal quality management up to some degree.(see Fig.16)

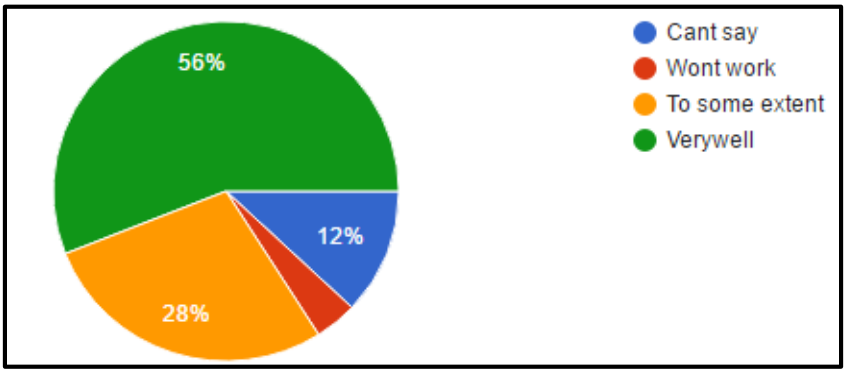


Fig.16.Quality management working in pharmaceutical organization

The significance of value, be it in product or service, can't be overemphasized. Overseeing quality is vital for private ventures. Quality items help to keep up consumer loyalty and dependability and lessen the hazard and cost of supplanting broken merchandise. Low quality or an item disappointment that outcomes in an item. Low quality builds costs. In the event that you don't have a powerful quality control framework set up, you may insure the cost of analyzing. Since the rating of the item and the administrations is almost 42 % so it is very great in quality. (see Fig.17)

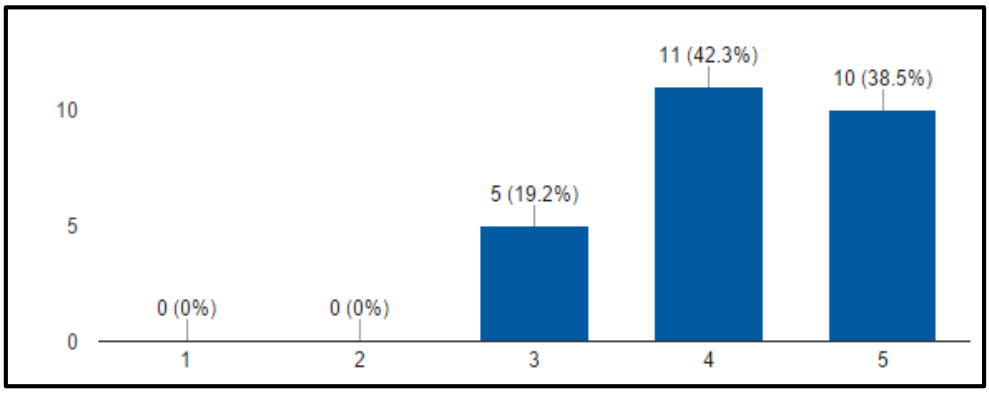


Fig.17.Level of importance of product / services in quality in companies

Quality improvement program comprises of deliberate and ceaseless activities that prompt quantifiable change. To make upgrades, an association needs to comprehend its own conveyance framework and key processes. We have diverse quality change program in various ranges and about 32 % of the organization is having the quality improvement program, and other 28 % as of late actualized and under thought. (see Fig.18)

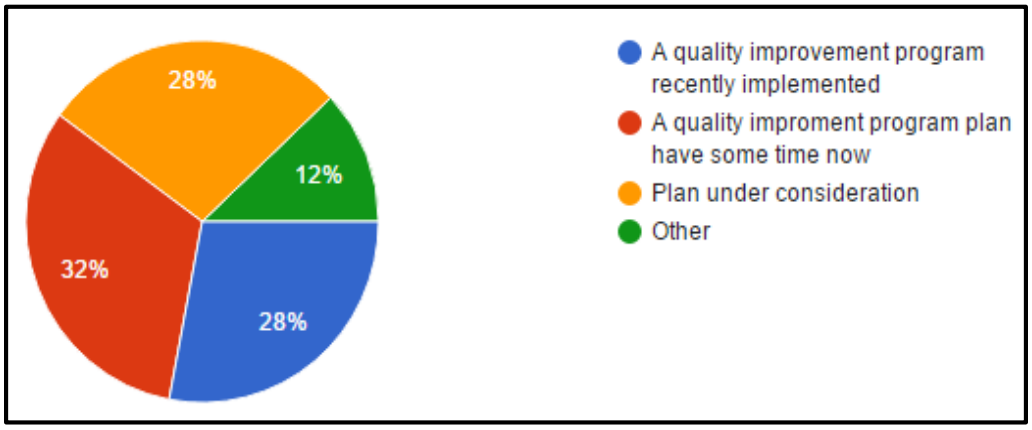


Fig.18.Quality improvement program in pharmaceutical industries

Here we have many strides for quality enhancements plans. Like we had given the detailing of the new group and quality circles just 12 % of the outcomes for that, data gathering for measuring operation and the procedure we got 20 % of the outcomes and for the quality issue recognizable proof we got all the more results, nearly 60% of association take after this means and the rest is having bench check change.(see Fig.19)

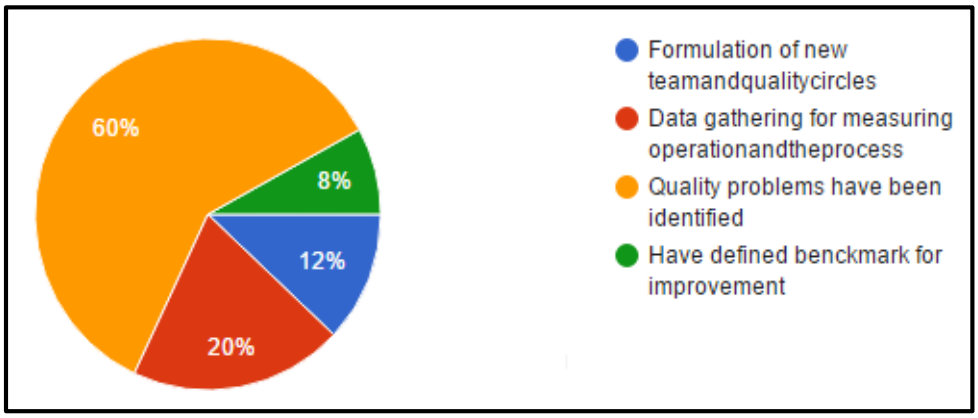


Fig.19.Quality improvement plans includes various steps for production process

Before you can make an improvement it is critical to see how your present procedure functions. An incredible approach to fulfil this is to lead an observational stroll by going to where the work is finished. It is vital to watch the procedure (and stream) with the goal that you can perceive how the procedure is really performed versus how you think it is performed. When you have examined the procedure, the time has come to distinguish open doors for development. Concentrate your change endeavours on disposing of non-esteem included exercises and decreasing non-esteem included however vital exercises in the wake of seeing to the review we had actualized the change program and as we see that it is definitely enhanced in the generation system.76% of the quality

has been improved, less number of percent is radically enhanced almost 12% while different organizations had continues as before. (see Fig.20)

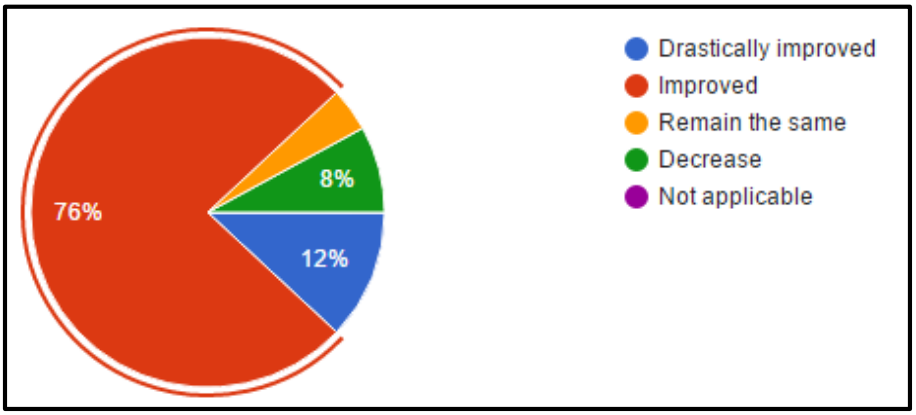


Fig.20.Implementation of quality improvement program for quality in the production system

By evaluating present association with most basic providers this expects you have successfully separated supply base and recognized most basic suppliers. More than 42.3 % of the relationship is better ensuing to executing of nature of the program yet only 38.5% the relationship with customer and suppliers are less for the creation technique. The productive repair of a customer supplier relationship will seriously depend on upon the relationship of the specialist gatherings and the commitment of both sides to the procedure. The relationship organization practices that have been created from19 % to 42% address specific issues into a formalized program supporting continued with change. To upgrade the likelihood of advance, certification that there is activity bolster from both customer and provider. After execution of significant worth program the level of the customer and the suppliers are exceptionally incredible. (see Fig.21)

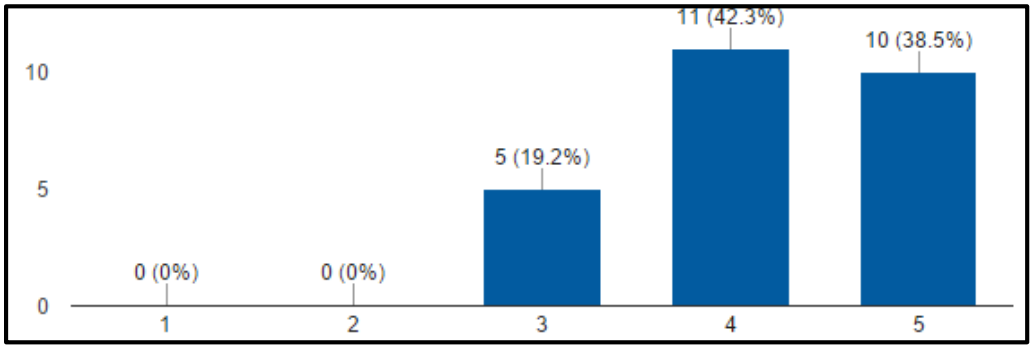


Fig.21.Relationship with the customers and the suppliers after implementing quality improvement program

An action Plan is to be created which will sort out and plan the undertakings to be finished in actualizing the arrangement. It ought to accommodate controls and criticism to guarantee that about 56% organizations is having development an unmistakable heading for the organization. Control over the planning of the arrangement's usage is basic. The proportion of the development begin from 16% and it is come to 56% just 28% of companies having same development. The path in which you execute your arrangement will convey home to your staff the way that the arrangement has meaning and that you are not kidding about accomplishing your targets. The arrangement depicts what you need to happen. The execution program guarantees that something is going to happen. As we seen information the timetables for the organization development is about 56% which is very better outcomes we got. (see Fig.22)

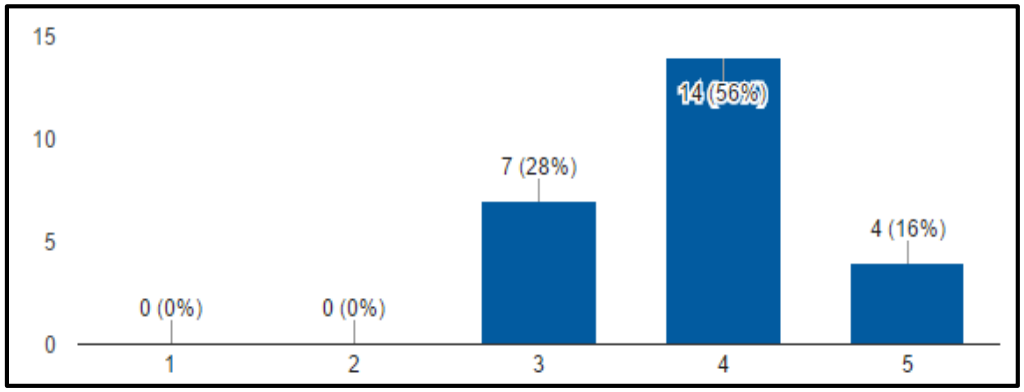


Fig.22.Planning schedules for the company growth

A marketable strategy assumes a key part in designating assets all through a business. It is an instrument that can help you draw in new subsidizes or that you can use as a system report. A strategy for success can be utilized as an instrument to recognize where you are presently and in which bearing you wish your business to develop. All apparatuses are similarly disseminated in there organizations a large portion of the organizations respondent concentrate on quality 28% of the organizations is having this business arrange 20% of the organizations requires building up an advertising arrangement and practical sales,12% of the organizations respondent required put resources into talent, verify your streams and concentrate on marking A strategy for success will likewise guarantee that you meet certain key targets and oversee business needs. On the off chance that you consistently evaluate your execution against the arrangements and targets you have set, you will probably meet your goals. Targets help everybody inside a business comprehend what they have to accomplish and when they have to accomplish it. (see Fig.23)

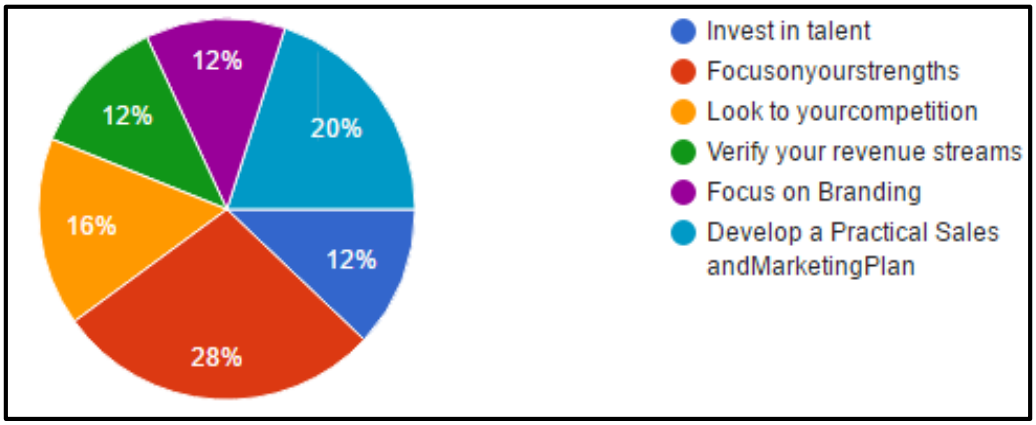


Fig.23.Bussiness planning use for company growth

The things your business burns through cash on are your expenses. These incorporate things like materials, compensations, administrations, postage, lease, charges and the various costs expected to make the business run. The opposite side of your business accounts is income the measure of cash your business takes in from offers of your items or administrations. I figure overall revenues are not a matter of decision in focused markets. At this salary figure or more the net overall revenue has quit dropping quickly. This is the place benchmark net overall revenues can be expressed. (see Fig.24)

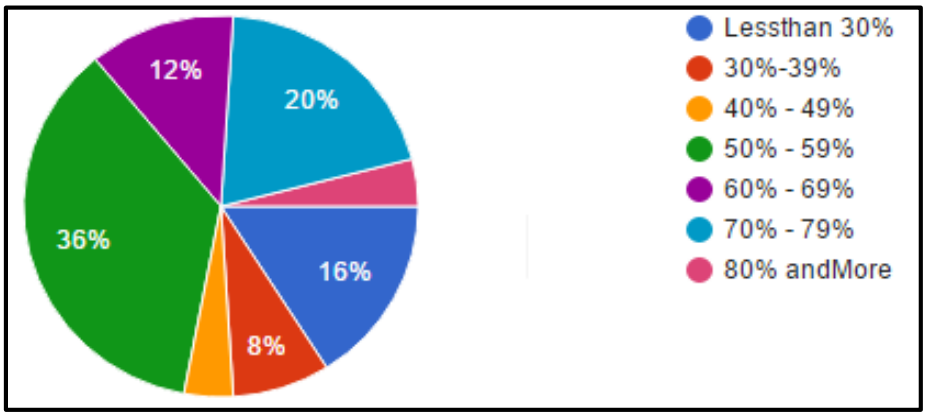


Fig.24.Average profit margin in per annum

Due to shorter product-life-cycles innovations in production planning process have to keep pace with today's technologies. Moreover, technologies are part of the production process that is created by a series of technologies. Hence, a planning process has to ensure that the positive aspects of a new technology are not negated by arrangements to protect the technology chain against failure due to immature technologies.92% people thinks that new innovation methods for production planning can be better for the future aspects. (see Fig.25)

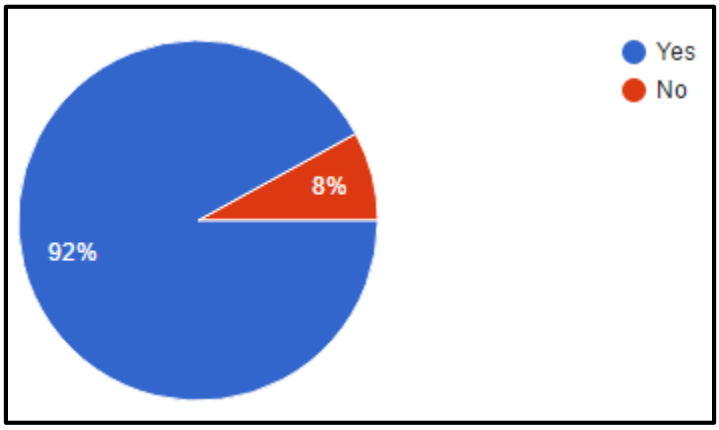


Fig.25.New innovation method for future aspects for production planning process

On the open question with respect to without bounds objectives of the organization for creation arranging process which we had become surmised 13 quantities of respondent here we found some new great solution from the organization. Key organizers create methodologies that give a system to proactively addressing future difficulties as opposed to responding after troubles emerge. Creation targets are the quantifiable objectives and rule that guide producing forms. Creation targets incorporate actualizing lean assembling procedures to lessen costs, clean assembling forms. Fabricating organizations rely on upon repeatable and unsurprising generation procedures to keep up gainfulness Strategic heading arranges. On the basis of various suggestion it be can concluded that:-

To reach on the higher stage on the market.

To improve production efficiency, quality and the development in new product.

To launching of the new products.

To make project and benefits to the people.

To implementing new technologies in machineries and to reduce the manual work.

To establish new venture with new production and planning process which gives boost to implementation quality of product.

To maintain the higher sales and achieve the goals.

Become more efficient and become a quality producer of drugs.

4. Analysis and Proposed Model for production planning process in pharmaceutical industries

For the collective model to be appropriately developed, facets from the pharmaceutical process of the companies, the theoretical framework and the empirical conclusions must all be weighted together. The model is built, to a large degree, on the prevailing entry models selected in this thesis but adapted to be adjusted for pharmaceutical companies keeping in mind of Indian companies perspective. It is imperative to summon up that the models in the theoretical frameworks are only replicas and portray a beginner's picture of truth. This is also the circumstance for the suggested model in this research. Firms are living organizations in the sense that they fine-tune faster to representativeness than theoretical models do. Consequently, it is probable that businesses develop their own strategies that are applicable for the daily tasks that they conduct. The models presented can provide recommendations for the quality, business or time saving during the production system when they develop their individual successful strategies. This is also what we expect that this model will help to do.

There are numerous methods to enter a market and it is highly reliant on the company and the condition they are in. Though, the developed model intents to create an understanding of in what way the pharmaceutical production process might appear in companies. This optimistically implies that the outcomes found from the model analysis are more dependable than if companies who are market and quality followers were examined.

From the progression of the pharmaceutical companies and the notion of cooperation and strategic alliances found in this research, it is obvious that the company management, affects the selection of markets to enter. It is imperative to understand the nature of cooperation and the business perspective in pharmaceutical industries. In addition, one important aspect is that companies are that they standardize their goods because they are every so often focused on quality and the time saving.

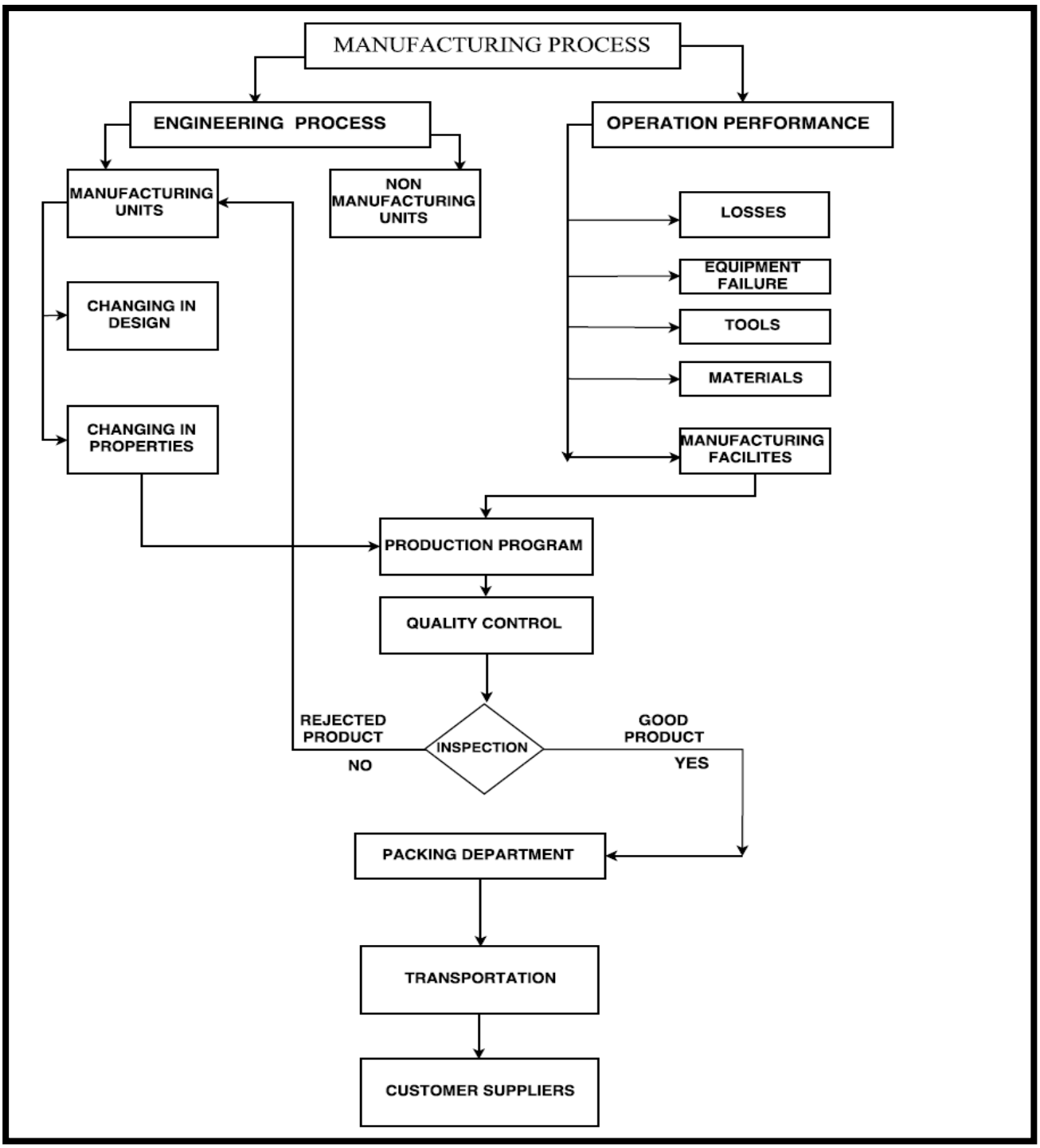


Fig.26. Proposed Model for production planning process in pharmaceutical industries

Source: prepared by author.

The theoretical model of the production planning process of pharmaceutical industries is focuses on the activities and advantages of pharmaceutical firms while the other part focuses on the quality control and the implementation of the technical methods. Technology, Near Shoring and Off shoring options, Production cost and Quality control based views are the qualifying factors of this strategic alliance.

Technology

The success of every company depends on certain aspects. Some of which are precise analysis, selecting the right technology and the future idea. Investigation from the last two decade has shown that those organizations that do invest in technology and select the path of innovation surge their market share, financial figures and whole competitiveness. Production planning technology in the pharmaceutical industries is the only technology which offers you the chance to analyze specific data and plan your business expedition accordingly. It also offers you many implementations which can solve complex problems and plan the scalability (future growth) of your company business. As per our empirical findings from the comparative analysis of pharmaceutical companies we find that pharmaceutical companies are better equipped with the technology.

Production Cost

In production cost theory, the amount of investment precise to the ‘‘specificity’’ is considered as the key determinant of the cost. While the intent of transaction-specific investments is to bring down production costs, high specific investments generate significant dependency between the companies. Since an investment has been complete, the company cannot change transaction partners without experiencing losses, and it must be ready to renegotiate terms with the current partner. The scale of production costs are also affected by factors like as the degree of uncertainty related with the transaction, the occurrence, the strategic importance, and the environment in which it is conducted. A pharmaceutical company will only conduct business with a pharmaceutical company in India, for instance, if the lower development costs resultant from substantial wage differentials are not entirely offset, and more, by greater transaction costs. Many aspects can raise transaction costs, stretching from the greater effort necessary to develop production specifications and create modifications, to the supplementary costs related with supervising the company. Hence to decide for the alliance the cost of production should be low as compared to the benefits of the strategic alliance.

Strategic alliance

Strategic alliances are a kind of cooperative approach whereby independent companies work together in a mutually advantageous manner. Partners contribute assets such as products, distribution networks, project finance and knowledge concerning their common goals. Companies form alliances for motives such as creating economies of scale, venturing into new markets and sharing risk. Vertical and horizontal alliances are business alliances intended at targeting competitive advantage. Pharmaceutical companies could form the strategic alliance as they both have unique set of strengths and competence. Together they can achieve a sustainable competitive advantage.

Focus on Research and development

Research and development refers to the investigative undertakings a business performs to improve prevailing products and processes or to move towards to the development of new products and processes. As pharmaceutical companies possess superior technological expertise, they could use this expertise to focus on research and development. The pharmaceutical company's which struggle or the superior technology for their own research and development projects could rely on their counterparts.

Product Development Program

The pharmaceutical firms could focus their abilities on core product development. As these companies have less number of resources they could offshore the product maintenance and support to counterpart as the expertise in the product support and maintenance. This will also help to offload their work.

Focus on Core activities for quality control

The core activities for quality control such as marketing and business development could be executed more profoundly by the pharmaceutical firms as the weight of other important business activities is shared .This will help is expansion of business of pharmaceutical firms and in turn also benefit their alliance pharmaceutical companies.

.

Increase Risk Sharing and Flexibility in production planning process

Risk sharing refers to the company's realization that the company may not ever need the full in-house ownership of particular activity. In pharmaceutical companies need to reply faster to the demands of the industry, adjust to the changes in the regulations, adapt to the increasing business competition and also respond to the changes in the customer behaviour. This means that the firms should remain flexible. Pharmaceutical companies can achieve this risk sharing and flexibility by forming a strategic alliance with other companies.

Product Support and Maintenance

The pharmaceutical industry is known for providing high quality of services which includes product development and services. The pharmaceutical companies have the large labour pool to provide round the clock support and maintenance services to any production product. While working exclusively on product support and maintenance it must be answered in order to decide if the company is suitable for the collaboration on Product Support and maintenance

Proper use of man power utilization

Efficiency of industrial production lines is crucial as it results in an improved production and utilization of available resources. Elements adding to production line proficiency are labour usage what's more, machine proficiency. Measuring the machine proficiency and labour usage ought to be on-line, precise and honest. The management should able to look have the capacity to search for production information and to precisely translate these information with a specific end goal to distinguish the different deficiencies at production level and to instantly make moves to enhance proficiency. In any case, shortcomings are overwritten and reports are modified with off base data. An precise and on line information framework can guarantee that these issues are overcome.

Better Relationship between customer and supplier in market accessibility

A number of analysts have forecasted the demise of long-term supply chain relationships because of increased competition from the supply chains for thinner slices of the margin pie. Their premise: As markets become tighter, energy and raw materials prices increase, and as working capital become harder to procure, supply chain collaboration will suffer in a Darwinian struggle for profitability scraps However two consoling advancements are undermining that preface. To start with, most supply chains are finding gigantic measures of waste, which they are trimming endlessly to continue working edges. Second, store network accomplices are finding creative approaches to make coordinated effort work for shared advantage in beforehand unexplored ways. Therefore, while various store network organizations have weakened in the course of the last eight

business quarters or somewhere in the vicinity, most have survived. Actually, many organizations credit their own particular survival to a great extent to their working associations with purchasers and providers Why is this the case? Because successful supply chain relationships mean much more than cost efficiencies and economic conveniences.

CONCLUSION AND PROPOSALS

- The aim of this study was to develop a conceptual model for production planning process for pharmaceutical companies with respect to business development. In a directive to do this, assessed into the process of companies and based on entry models and strategies I formed conceptual model.
- By analysis the theoretical parts from the previous research which is already implemented some method for production planning process to check the quality in the production system. It has been discussed in the theoretical parts that for the production system the main ideas was generated to maintain the quality control and the relationship between the customer and the suppliers. I have analysed from the past scientific reviews paper it has been discussed to reduce the production cost in the production system.
- By the theoretical point of view the research included many different methods to get optimal solution from the method which has been using in the pharmaceutical industries. I have found the different strategies for the betterment in the technologies wise such as save time on operation duration reduce production costs, identify the main problem based on the technologies.
- On the basis of the problems and ideas which I had been discussed from the research paper I had survey based on questionnaire for the main problem which is facing the pharmaceutical industries and to get proper results.
- As per the analysis of the survey questionnaire I have found the problem from the research results. More than 50% of the pharmaceutical industries are facing the problem based on the quality control. I have also found that many methods is not suitable for the quality control on time during the production cycle, that's might affect on the production cost and also affects the relations for the supply chain.
- As per the survey questionnaire asked to the pharmaceutical industries they have given the best answers for the question which is based on the technologies, methods, market, business growth, planning, routing and quality control.
- By suggesting the empirical research on the question asked I had found the very good answer for the improvement in the methods by strategies wise and by the technologies wise. Because more than 50% of the pharmaceutical companies having lean manufacturing process for their production system and they have implemented improvement program plans for the business growth so they can have good relationship in supply chain.

- By analysing of the whole empirical results of the survey questionnaire which was asked to the pharmaceutical industries I have been came on one suggestion to improve the production system like methodology, technology, or by the business growth I have constructed a model which will be beneficiary to the companies.
- By constructing a Model, I had covered the many technical aspect which is good for the industries. This technical factor I have covered from the combination of the theoretical parts and from the empirical research:
  - Technology
  - Production Cost
  - Strategic alliance
  - Focus on Research and development
  - Product Development Program
  - Focus on Core activities for quality control
  - Increase Risk Sharing and Flexibility in production planning process
  - Product Support and Maintenance
  - Proper use of man power utilization
  - Better Relationship between customer and supplier in market accessibility
- Based on the proposed model and the empirical results my proposal is that if the pharmaceutical industries use the lean manufacturing method on this suggested factors to improvement in the production planning process for the future profit in the companies it might be chances to get reduce less number of losses like technical aspects, business growth or to form a market accessibility.
- The main findings in this study are that there are certain characteristics within the selected entry models, such as production planning methods, quality control and relationships between customer and suppliers, that can be appropriate between pharmaceutical companies.
- When it derives to the earlier research done concerning process of the companies, compared to the outcomes from the empirical study in this study differences are obvious. Based on the differences and similarities between the model scenario, the new model was developed. All this placed together attaches to and fulfils the aim of this research.
- The outcomes in this study have delivered information that the selected entry models and cooperation strategy are, to some degree, applicable for pharmaceutical companies. This suggests that the proposed model optimistically can be used when bearing in mind and

entering Indian markets. Though, there are aspects that need to be deliberated that are outside the proposed model.

- A solo model cannot define the intricate behaviour behind the production planning process of the companies. It might therefore utilize the model in conjunction with firm specific aspects. A reason for the variances between our results and the earlier research done can be that the earlier research is based on global companies, and not specifically on pharmaceutical companies.
- Reactive and proactive motives for pharmaceutical industries as well as endogenous and exogenous barricades for market entry have been investigated in the theoretical part of the study as well. Lastly, the main selection approaches in connection to the entry methods have been analyzed and the decision making procedure of pharmaceutical industries explained exploring the aspects of acquired technical knowledge, strategic information management and risk tolerance.
- My propositions are that future research should continue this procedure of mapping for pharmaceutical companies should cooperation for the development. This could be done by merging more theoretical and empirical research to get a wider perception. It would also be fascinating to see research concerning the production planning process for pharmaceutical industries because their characteristics are not completely the same as those possessed by other companies.
- The outcomes in this study are based on empirical parts and the model which develop for pharmaceutical companies which propose that future research should include more strong data from different companies. This might be prepared through a survey so that the research can be reinforced empirically to a greater degree. To see if the proposed model can be accepted by other companies it needs to be supplementary tested both theoretically and empirically for further research.

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Annexures

Questionnaire

1)Since from how many years your company is in pharmaceutical industries?

- Less than 1 year
- 1-4 year
- 5-7 year
- More than 7 year

2)What type of industries do you have?

- Small scale Industries.
- Medium scale industries
- Large scale industries.

3)How many employees do you have?

- Less than 50
- 50-249
- 250 and more

4)Which types of production method do you have?

- Continuous production
- Batch production
- Job or unit production

5)Which types of optimization method do you have?

Tools / Methods.	Ranking in terms of importance fators.				
	Not at all Importance	Slighty Importance	Importance	Fairly Importance	Very Importance
Lean manufacturing method	◎	◎	◎	◎	◎
Kanban method	◎	◎	◎	◎	◎
Kaizen	◎	◎	◎	◎	◎
Materials requirements methods	◎	◎	◎	◎	◎
Six Sigma	◎	◎	◎	◎	◎
JIT	◎	◎	◎	◎	◎
Value stream mapping	◎	◎	◎	◎	◎
A3	◎	◎	◎	◎	◎
SMED (Single minute exchange of dies)	◎	◎	◎	◎	◎
Others	◎	◎	◎	◎	◎

6)Select the three factors that you feel are most necessary to increase the production system?

- Professionalism and availabiltily of personal workers
- Availablity of finanance raising tools
- Cost and availability of raw material
- Quality and efficiency of the infrastructure
- Transparency and stability of regulatory

7) How satsified are you with the level of production system?

1	2	3	4	5
Bad	Not good	Good	Very Good	Excellent
○	○	○	○	○

8) How will you optimize the process to increase the capacity of production?

- Reduce labour costs
- Increase in enterprise production efficiency
- Optimization in management structure
- Reduction in raw materials costs
- Product line extension
- Others

9) How will you improve the production planning process?

- Improving work capacity
- Optimized equipment usage and increased capacity
- Improving material flow
- Reduced labor costs by eliminating wasted time and improving process flow
- Reducing labour skills
- Fasting of work
- Other

10) What are the major principal do you have to implement in the planning for process?

- Enhancement of technologies process
- Implementation of saving technology
- Reduction in production enterprise

- Reduction in operational time of primary machines
- Reduction in the rate of defective products

11) What problems have your company encountered in the localization of management?

- Difficulty in recruiting executive staff
- A high turnover rate of executive staff
- No progress with development of local staff
- Capabilities in developing local products and services are weak
- Capabilities in local planning and marketing are weak

12) What percentage of production costs is attributable to raw material and parts?

- Less than 50%
- 50% to less than 60%
- 60% to less than 70%
- 70% to less than 80%
- 80% to less than 90%
- 90% or above

13) Do you think Quality management will work in your organization?

- Can’t say
- Won’t work
- To some extent
- Very well

14) How would you rate the importance of product / services in quality?

15) Does your organisation have quality improvement program?

- A quality improvement program recently implemented
- A quality improvement program plan have some time now
- Plan under consideration
- Other

16) Your quality improvement plan includes which steps?

- Formulation of new team and quality circles
- Data gathering for measuring operation and the process
- Quality problems have been identified
- Have defined benchmark for improvement

17) After implementation of quality improvement program what would be your quality in the production?

- Drastically improved
- Improved
- Remain the same
- Decrease
- Not applicable

18) After implementation of quality improvement program what would be your relationship with the customers and the suppliers?

1	2	3	4	5
Bad	Not good	Good	Very Good	Excellent
○	○	○	○	○

19) How is your planning schedules for the company growth?

1	2	3	4	5
Bad	Not good	Good	Very Good	Excellent
○	○	○	○	○

20) Which types of Business planning do you use for company growth?

- Invest in talent
- Focus on your strengths
- Look to your competition
- Verify your revenue streams
- Focus on Branding
- Develop a Practical Sales and Marketing Plan

21) What is your average profit margin in per annumum?

- Less than 30%
- 30% -39%
- 40% - 49%
- 50% - 59%
- 60% - 69%
- 70% - 79%
- 80% and More

22) Do you think some new innovation method for future aspects for production planning process?

- Yes
- No

23) What are the future goals of your company for production planning process?(OPEN QUESTION).?

PRODUCTION PLANNING PROCESS ACROSS PHARMACEUTICAL INDUSTRIES

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Abstract

This article reports the results on production planning process for proper quality performance,time saving during supplying the product and various method implemented in pharmaceutical industries. The production method characterized by complex and diverse technologies, alternative solutions and combined modes of workpiece movement in the manufacturing process This article describes the original approach to production process on the grounds of investigations of manufacturing capacity utilization levels and causes of loss in quality level , in order to measure their effects and to reduce the flow coefficient to an optimum level. The main ideas of the article to cover production methods, planning and the quality control and how to be satisfied the customer needs by proper time.

Key words: Production process, methods in production system, Planning, Routing, Scheduling, Dispatching, Quality control.

Introduction

The word production means the processes and methods used to transform tangible inputs (raw materials, semi-finished goods, subassemblies) and intangible inputs (ideas, information, knowledge) into goods or services. Resources are used in this process to create an output that is suitable for use or has exchange value. The administrative process that takes place within a manufacturing business and which involves making sure that sufficient raw materials, staff and other necessary items are procured and ready to create finished products according to the schedule specified. Production function encompasses the activities of procurement, allocation and utilization of resources. The main objective of production function is to produce the goods and services demanded by the customers in the most efficient and economical way. Therefore efficient management of the production function is of utmost importance in order to achieve this objective.

The main ideas of my article to analyse of the new methods which is already implemented by some industries and to compare the production methods, and how to be modified after comparison, and how to reduce the cost, which will be give suggestion for proper utilization of man power and finally improvement in that. The major survey planning steps and highlights issues such as planning the questionnaire, planning how to achieve good survey representativeness, survey scheduling, and budgeting considerations.

This research studied on the aspect of the relations between planning of the production system used with different methods.

The main aim of the research is to identify the optimization method in the production cost, labour and proper utilization of man power and to reduce life cycle in production area and how to achieve the market business strategies by using fast supply chain management system by maintaining the quality level in order to place as per customer requirements.

In this research, several processes of production planning are studied and their practical application in the real life it has been successfully implemented in some of the pharmaceuticals companies.

Theoretical part for production planning process in pharmaceutical industries.

General Principles of Production Planning Process in Pharmaceutical industries.

Production planning is the planning of production and manufacturing processes in a company or industry. It utilizes there source allocation of activities of employees, materials and production capacity, in order to serve different customers. Elements such as controls, job management, defined and well managed processes performance and integrity criteria, and identification of records, competence, such as knowledge, skills, experience, and qualifications. Soft elements, such as personnel, integrity, confidence, organizational culture, motivation, team spirit, and quality relationships. Controls include product inspection, where every product is examined visually, and often using a stereo microscope for fine detail before the product is sold into the external market. Inspectors will be provided with lists and descriptions of unacceptable product defects such as cracks or surface blemishes for example. The quality of the outputs is at risk if any of these three aspects is deficient in any way

Background for pharmaceutical process industries

Most sophisticated planning and scheduling approaches for the process industry consider a fixed time horizon and assume that all data is given at the time of application. In this contribution a planning and scheduling approach for a continuous and dynamic decision process where decisions have to be made before all data are available. In the pharmaceutical industry, certain standard such as GMP(Goods manufacturing practices) are applied and the production must strictly abide by various quality regulations. Therefore, the scheduling of production planning becomes harder. In practice, there are more than over hundred products and ten machines to be considered at one time. The pharmaceutical industry has become a very competitive and unpredictable industry where customers constantly demand low prices as well as high service levels and flexibility. Flexible multi-product production processes have become commonly used as they help companies to respond to changing customer demand and increase plant utilization, but the greater complexity of these processes together with the altered market conditions have rendered the simple planning and scheduling techniques previously used insufficient.

Emprical Research for production planning process in pharmaceutical industries

The questionnarie was prepared and distributed to pharmaceutical companies in different areas.In India more over 26 companies given the good answers of the question which can be utilise for the results and the evalution.Since I requried the most successful answer from questionnarie. Companies have historically invested in large research and development departments to drive innovation and provide sustainable growth where companies recognize that not all good ideas will come from inside the organization and not all good ideas created within the organization can be successfully marketed internally. To date Open Innovation concepts have been regarded as relevant primarily to high-technology industries.More than third of respondents/companies worked in pharmaceutical area longer than 7 years (36%), also near the third of companies just begin their activities and work in research area less than 1 year. Quater of respondents answered that they work in this area more than year and less than 4 years. And only 8% companies work in this area 5 to 7 years. Therefore, it could be concluded that many companies which participated in survey working nearly equally (see Fig. 1)

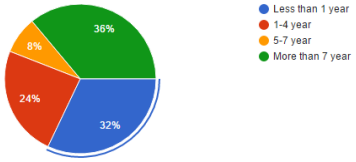

Fig. 1. Number of years operating in pharmaceutical industry
Source: Prepared by Author

Since we know that we have small,medium and large industries.It can be analysed that more than 50 percent are having small industries and only 24 % are medium and large industries are equally distributed. (see Fig. 2)

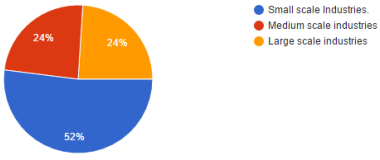

Fig. 2.Types of industries for pharmaceutical companies Source : Prepared by Author

Most of the companies having less than 50% employees and between 50-249 employees having only 25 % but the companies having less number of employees is 20.8%.(see Fig. 3)

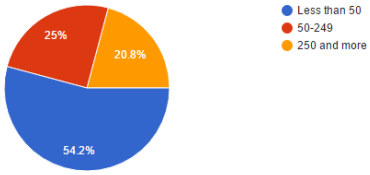

Fig. 3. No.of employees working in companies
Source: Prepared by Author

Some of the most important types of production are: (i) Job Production (ii) Batch production and (iii) Continuous production.The major processes should come together in the preparation of a product or service.Product design and development to look at different ways of producing a good or service.(see Fig.4)

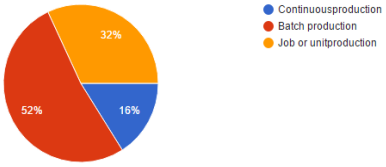

Fig. 4. Production method used in pharmaceutical industries Source: Prepared by Author

In order to employ this *type of optimization*, several qualifications must be met. First, we must have a design problem is the most *important* step in *optimization* (see Fig. 5).

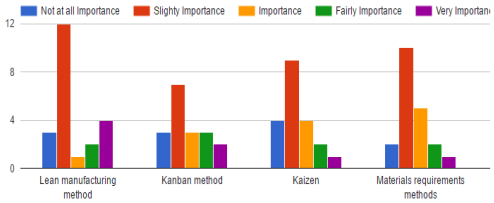

Fig. 5. Types of optimization method are important for industries Source: Prepared by Author

When viewed as a process, a production system may be further characterized by flows in the process. As per the given information the best answer to increase the production system will cost the availability of the raw materials. (see Fig. 6)

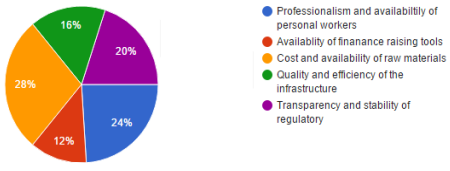

Fig. 6. Factors affecting to increase the production system

Source: Prepared by Author

Efficient production is achieved when a product is created at its lowest average total cost; production efficiency measures whether the economy is producing as much as possible without wasting preciousresources.By the given information the level of production system is quite excellent. (see Fig. 7)

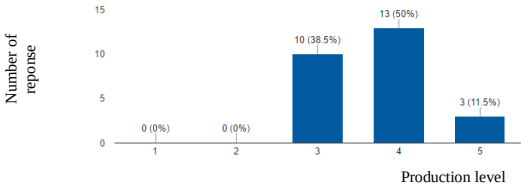

Fig.7. Level of production system for industries

Source : Prepared by Author

Capacity is the maximum amount your manufacturing operation can produce. Capacity is increased either to meet an actual (immediate) increase in customer demand or an anticipated (future) increase in customer demand. (see Fig.8)

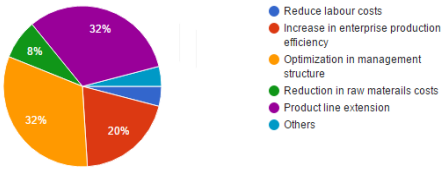

Fig.8. Optimize process to increase the capacity of production
Source: Prepared by Author

Production planning essentially represents the core of the process of manufacturing. Any manufacturing process may reach its full potential when it has the most effective production-planning operation at its disposal. the developed capacity-planning requirements to determine labour and machine resource needs required to accomplish all of the tasks of production (see Fig.9)

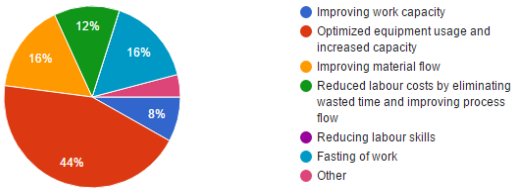

Fig.9.Various ways to improvement in production planning process

Source: Prepared by Author

There are many major principal to implement for the planning of the process but we have few analysed by the survey data most of the responses had given to reduce the production enterprise nearly 32 % of the people saying but carefully we can see the graph the best answer for implementing the planning is to reduce the defects in the product and have some enhance better technologies(see Fig.10)

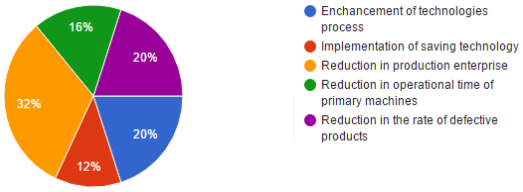

Fig.10. Major principles for implementation in process planning Source: Prepared by Author

Here we had seen that the choices are nearly equally distributed the main answer from the given information is that if we try to increase the capabilities in developing the product and increase the services level than we can easily encountered in the localization of management. (see Fig.11)

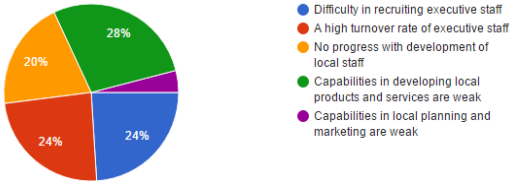

Fig.11.Problems faced by the companies during the localization of management Source: Prepared by Author

Raw material and the parts contribute the cost of the production in nearly 28% by the responded is approximately more 50% and less than 60% of the production costs. (see Fig.12)

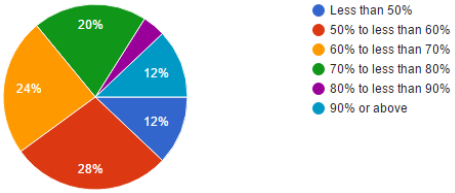

Fig.12.percentage of production costs is attributable to raw material and parts Source: Prepared by Author

The organizational structure, processes, procedures and resources needed to implement, maintain and continually improve the management of quality and yes it will be work in the organization Nearly 56% is having very well quality management 28% is having normal quality management upto some extent.(see Fig.13)

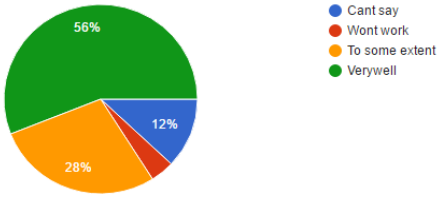

Fig.13.Quality management working in pharmaceutical organization Source: Prepared by Author

The level of importance of the product and services are shown 42% is quite good in quality (see Fig.14)

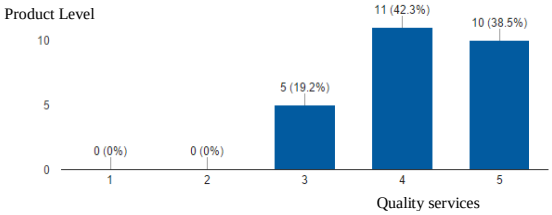

Fig.14.Level of importance of product / services in quality in companies Source: Prepared by Author

Quality improvement program consists of systematic and continuous actions that lead to measurable improvement nearly 32 % of the organization is having the quality improvement program and other 28 % recently implemented and under consideration. (see Fig.15)

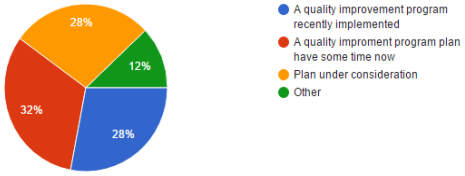

Fig.15.Quality improvement program in pharmaceutical industries Source: Prepared by Author

The various ways to implementing the new Quality improvement plans includes various steps for production process which can be successful applied for the pharmaceutical industries (see Fig.16)

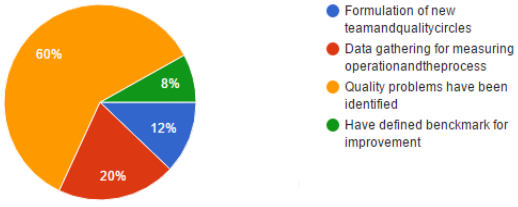

Fig.16.Quality improvement plans includes various steps for production process Source : Prepared by Author

Before implementation we have to see carefully how

can make an improvement can be done in which areas it is important to understand how your current process works. A great way to accomplish this is to conduct an observational walk by going to where the work is done see Fig.17)

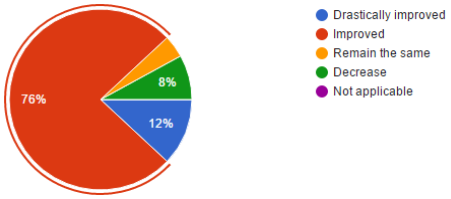

Fig.17.Implementation of quality improvement program for quality in the production system
Source: Prepared by Author

Relationship with the customers and the suppliers after implementing quality improvement program. The relationship management activities that have been developed from 19 % to 42% address specific problems into a formalized program supporting continued improvement. (see Fig.18)

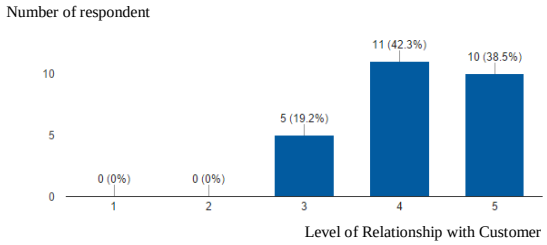

Fig.18.Relationship with the customers and the suppliers after implementing quality improvement program

Source: Prepared by Author

The plan describes what you want to happen. The implementation program ensures that something is going to happen as we seen data the schedules for the company growth is nearly 56% which is quite better results we got. (see Fig.19)

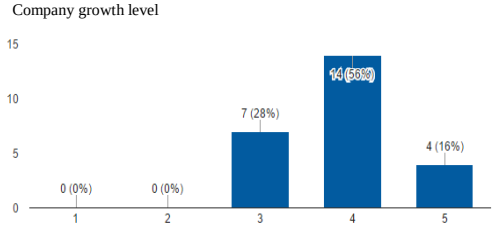

Fig.19.Planning schedules for the company growth

Source: Prepared by Author

Due to shorter product-life-cycles innovations in production planning process have to keep pace with today's technologies. Moreover, technologies are part of the production process that is created by a series of technologies(see Fig.20)

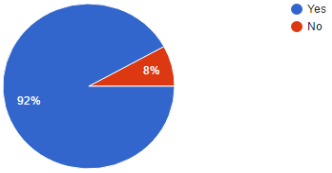

Fig.20.New innovation method for future aspects for production planning process

Source: Prepared by Author

Recommendation

Based on the survey questionnaire it is suggested that the company make some changes in its approach towards promotion of design thinking and innovation. Pharmaceuticals will have an increasingly prominent role in the future. In the future, pharmaceutical manufacturing will need to employ innovation, cutting edge scientific and engineering knowledge, and the best principles of quality management to respond to the challenges of new discoveries. Continuous improvement is an essential element in a modern quality system that aims at improving efficiency by optimizing a process and eliminating wasted efforts in production. Improvement efforts are carried out in a structured manner with appropriate pre-defined protocol and oversight. These efforts are primarily directed towards reducing variability in process and product quality characteristics and are not for changing the fundamental design of a manufacturing process

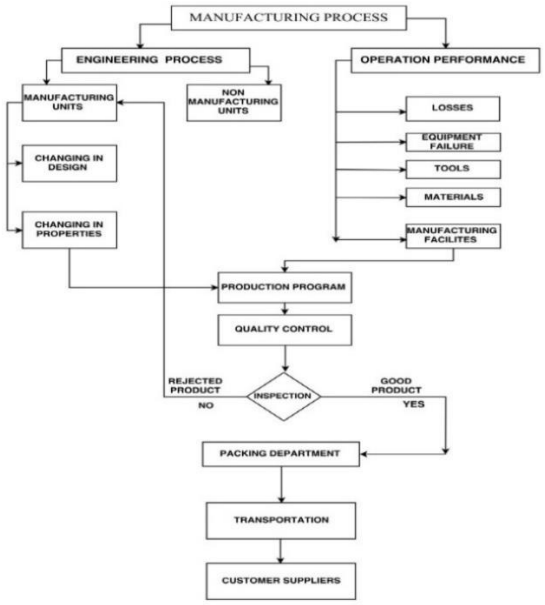

Fig21:Source: Prepared by Author

Based on the old model and we had compared with the modified model so we had shown some improvement in the modified model. How quality and the transportation is more important to meets the customer's needs. To maintain the quality level in the manufacturing process following factors should be consider.

- Make the employees fully aware of the manufacturing process
- Make design thinking and creativity as one of the important factor during the production process.
- To make Continuous improvement needs higher level of process understanding.
- Product quality and performance achieved and assured by design of effective and efficient manufacturing process

Conclusion and proposals

The goal of the original approach is to demonstrate the work to reduce the manufacturing process time which leads taking more time during production system and to be characterized into there suitable methods by discontinuity the production process. The main findings in this study are that there are certain characteristics within the selected entry models, such as Quality control and relationships between the customers and the supplier. When it derives to the earlier research done concerning the process of the companies, compared to the outcomes from the model based. This might be prepared through a survey so that the research can be reinforced empirically to a greater degree the main market selection approaches in connection to the entry methods have been analysed and the decision making procedure of the companies explained exploring the aspects of acquired business knowledge, strategic information management and risk tolerance. Therefore, the conclusions and the proposal in this study and the developed model have shaped a better understanding Finally it leads to useful of getting the right quality and quantity of supplies at right time having good control adopting the best methods and more important is the efficiency of the products.

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