To Critically Evaluate Possible Production Scheduling Techniques In The Manufacturing Industry: A Case Study Of AMUL

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Abstract

The study in this dissertation attempts to critically evaluate possible production scheduling techniques in the manufacturing industry: a case study of AMUL. The main reason behind the selection of AMUL for the study is that it is one of the largest milk producers not only in India but also in the world. Just in Time inventory processes is being used by the AMUL. Just in Time inventory is to ensure production of goods and scheduling them for shipment to customers in the shortest time period feasible. The inventory is being effectively managed and monitored and also the cost of maintenance of inventory is low. The study also focuses on the scheduling the production system because it plays a significant part in the manufacturing and the service industries. The main purpose of the study is to examine and evaluate the production schedule and the how these can be improvised. The whole process of production scheduling is time and cost consuming. So an appropriate schedule has to be designed, so the complexity in the production process can be ruled out. The study also focuses on the scheduling the production system because it plays a significant part in the manufacturing and the service industries. Specialised scheduling technique has to be adopted by AMUL has been concluded by the researchers since the production scheduling of AMUL is weak.

Keywords: Production Scheduling Techniques, AMUL,

Introduction

Manufacturing companies are often dynamic and complex systems. Right from its origin the manufacturing facilities have tried to organize and control their production process by making use of practical and efficient methods Herrmann, 2004. Most of the manufacturing firms present their production schedule as a plan that outlines that when the activities that can be controlled should be carried out. The main function of production scheduling is the co-ordination of the functions of production and minimizing the costs associated with operation McKay, K.N., F.R. Safayeni, and J.A. Buzacott, 1995. However the process of production scheduling can consume a lot of time and its difficulty level is very high. Creation of a schedule that indicates when a job must be carried out is not sufficient. If a production facility aims at working cost effectively it must not only schedule plans but also generate quick responses to unexpected and unplanned event and revamp schedules to increase efficiency (Webster, 2001).

Background about the company: AMUL

AMUL was formed in 1946 and is the leading dairy co-operative of the Indian subcontinent. The name AMUL is derived from the Sanskrit word AMULYA meaning invaluable. The company is maintained by Gujarat Cooperative Milk Marketing Federation Limited (GCMMF). AMUL is based in Anand in Gujarat, India. The AMUL is an excellent display of success for co-operative firms. The first step before introducing AMUL was the formation under the name Kaira District Cooperative Milk Producers (KDCMP) by Varghese Kurien and Tribhovandas Patel. AMUL has an annual turnover of around 2.2 billion in terms of US dollars. It has been a classical example for developing the rural economy and thereby helping in the development of the farmers. More than 3 million farmers are benefitted from the operations of AMUL. AMUL has also penetrated foreign nations like Singapore, Bangladesh, USA, China, UAE, Australia and Hong Kong. AMUL consists of 47 depots, over 3500 distributors and more than 5 lacs retailers. The milk is transferred from area of surplus to deficit. The farmers are paid, subsidies are created and loans are provided to increase yield. The farmers are also supported by provision of education and health care of the animals. The AMUL makes use of a 3 tiered co-operative structure consisting of the farmers, the village collection points and the GCMMP.

Objectives Of The Study:

The objective of any study is to critically evaluate the possible production scheduling techniques in the manufacturing industry with respect to a case study on AMUL. The main objective of the study is to analyse how scheduling is currently done in AMUL and based on this analysis we object to provide recommendations to improve the current processes.

Research Hypothesis:

The research hypotheses are necessary for identification of cause effect analysis. In the process of analysing the research topic the researcher will try to prove whether the hypothesis stated in the research hold good or are false. The research is conducted to prove the hypothesis. The hypotheses for our research are
Hypothesis 1: Usage of Just in Time manufacturing will help in optimization of the production schedule.
Hypothesis 2: Production scheduling can help in elimination of uncertainty by planning effectively.
Hypothesis 3: The accuracy of the production scheduling plan is associated positively with the performance delivery.

The hypothesis stated above will be analysed and inspected through the process of the research and a logical conclusion is arrived based on the proof of the hypothesis.

The research purpose is to understand how the various production scheduling tools that can be put into use by the manufacturing firm for reduction of costs and efficient management of the materials. The study tries to identify how AMUL has achieved success through effective scheduling of its production processes.

Literature Review
As the researcher has discussed in the chapter 1 the concept of the production is gradually conversation process of one form of material to another by mechanical or chemical process. According to Kumar (2006), “the production system of an organisation is that part, which produces products of an organisation.. Panneerselvam (2006) gives his views on production as “system is a collection of interrelated entities.

A good quality schedule is that which have competence of assessment making for the aforesaid function of scheduling in appropriate and high quality formed while at the same time maximising of the output, customer satisfaction and reducing operating cost of the production Morten et al (1993). According to Wight (1984), the two main problems in production scheduling are “capacity” and “priorities”. In other words “what kind of job ought to be done first?” and “who is supposed to do the particular job?” Wight (1984) defines scheduling as “establishing the timing for performing a task” and observes that in manufacturing firms, there are numerous types of scheduling, which include detailed scheduling of the shop order and at what time such an operation should start and finish.

It is also vital in order to keep track of activities and measure the time taken for completion of each task (McKay, Kenneth, and Vincent, 2006). These details can be used in future when the production scheduling demands a restructure in order to increase the efficiency and increase the cost effectiveness. Hence in this study emphasis is given to detailed scheduling and identifying how it helps in improving the production process. There are numerous companies who are involved in production of goods and shipping the produced goods to the customers but they do so by making use of a set production scheduling plans that are broken, not connected, and independent (Wiers, 1997). In some cases the production scheduling is done by using inputs from expeditors who keep running in between various crises (Herrmann, Jeffrey, and Linda, 2002). The most important reason for ineffectiveness of production scheduling is ad hoc formulation of production schedule by people to whom the entire system is not visible. A historical perspective about the various tools that support decision making has been put forward by Herrmann (2006a). Herrmann (2006a) provides information about all tools, from the Gantt charts to the tools for scheduling based on computers, which have been developed over the years in order to make the production scheduling an improved process. The computer software has aided the process of production scheduling in numerous instances.

According to Higgins, Roy and Tierney (1996): “The philosophical approach to manufacturing purposes to achieve idle situations where companies have zero defects, zero setup times, zero inventories, zero breakdown, zero lead times and lot sizes of one.

According to Mukhopadhyay (2007) “production planning referred to as production logistic, is the solution for production planning and control system. It provides quick response by reducing planning cycle and improving the productivity of work processes.

According to Mukhopadhyay (2007) Production resources/tools are movable operating resources used to form objects, such as tools and fixtures or to check size, structure and efficiency, such as measurement and inspection devices.

According to Uher (2003) “Primavera gives the planner an opportunity to accommodate different work patterns up to 31 calendars. It also helps to develop a hierarchy of work to be accomplished in the form of work breakdown structure with appropriate codes.” Continue with Uher’s (2003) argument: “Primavera also provides a complex system of projects and activity codes.

According to Uher (2003) “Resource can be assigned to activities either as lump-sum values or as rates per time-unit.

Research Methodology
The research strategy is the first thing to be determined as far as research methodology is concerned. It refers to a set of methods used and the execution of such methods for getting expected results at the end of the study. Research methodology is actually different from approaches applied for completion of a certain task, in contrast to popular belief. Initially, the chief research question is
viewed from a high level. Then the problem is subdivided into further segments whose sequences are, altered or shuffled if required or even merged together for creating an efficient way to collect data. Such data is considered suitable for further analysis and the researcher finds it easy to convert it into meaningful graphs, etc. for obtaining insightful conclusions. Research methodology can be specified by research objectives and aims.

Research Approach
For this study, qualitative data has been collected by holding brief and formal interview conducted by interviewing two staff belonging to top level management, two staff belonging to marketing department and two staff belonging to the operations management in AMUL by the researcher. Such methods are well established ones. They might consist of various modes of approach such as direct observation. (Collis, 2003), and might or might not include respondents’ observation. Qualitative can thus be adopted for a better view regarding the perceptions of individuals belonging to organizations. Interviews conducted are usually qualitative in nature.

Research Strategy:
The objectives of any research study help researcher to come up with required strategy. By this means the research approach can be identified so as to conduct the research. The suitable strategy for research should be selected after careful consideration, so that the relevant factors are taken into consideration. The method selected must help the researcher to attain goals of the study.

Data Collection Methods
Data obtained via interviews and surveys are called primary data. (Weller, 1988) For the interviews, the sample size was 6, and consisted two staff belonging to top level management, two staff belonging to marketing department and two staff belonging to the operations management in AMUL. All attempts were made to maintain consistency in the data collection phase. Secondary data is that which is obtained from repositories such as internet, journals, books, newspapers, etc. The advantage of secondary data is that it can be obtained without undergoing much strain. Such data, when collected from reliable sources, might help to prevent deviations in research procedures and results.

Primary data On the other hand, is known as original data as its raw data which cannot be linked to an external source. It is collected by many ways, such as interviews and surveys using questionnaire. It needs to be collected in most of the studies as its necessary that researcher obtain exactly the data deemed relevant to the topic of study, though the data might be obtained from other sources as secondary data.

Data Analysis
In this section the selected data collection method is utilised as per methodology described by the researcher in the above section. They involve the use of a set of predetermined questions as well as highly standardised techniques of recording. On the other hand, the unstructured interviews are the ones characterised by a flexibility of approach to questioning. Unstructured interviews do not follow a system of predetermined questions and standardise techniques of recording information. In the unstructured interview the advantage is that it gives freedom to ask any question, as per the direction taken by interview and the interviewer can also alter the questions as required. While structured interviews are less confusing and easy to record, unstructured interviews give the researcher much needed freedom.

Production scheduling at AMUL
Production scheduling a very important factor in decision making in any company as it also has a valuable role in manufacturing and the service industries. Production Scheduling deals with the proper sequence of job, tasks, orders, and individual operations, etc., apart from allotting right people in the right places for completion of jobs, operations, tasks as well as orders. AMUL is a well-known and well organised manufacturing company, associated with manufacture and packaging of milk and milk products, to be delivered to commercial and domestic customers in a fresh and ready to use condition. In case of delays to the finished product or delays in the manufacturing line, it would cause major loss to the company and its reputation. AMUL, like other companies is aiming to become a technologically innovative company in the market so as to maintain a competitive edge with the changing times. To reduce these kinds of the delays and uncertainty in demand tracking and give the best of their service, AMUL uses SAP technique for planning and scheduling the production.

SAP inventory is a strategy for management of the inventory in a manner that aims at monitoring the inventory process in order to minimize the costs associated with controlling and maintaining the inventory. AMUL uses SAP inventory processes for efficiently monitoring the usage of materials in the production of goods and ordering replacement of goods that are delivered just before they are required. This is a simple technique though it aids AMUL in reduction of the costs incurred due to management of large inventories of raw materials. Another reason for using SAP inventory is to ensure that the production of goods and scheduling them for shipment to customers in the shortest time period feasible. SAP is focused on improving the production schedule of the overall business with the assistance of different modules. For maintaining production SAP has PP module to plan and control but SAP is not specialised software to
Interviews with AMUL managers

AMUL is one of the leading producers of milk in the world, not just in India. Analysis of the techniques used by AMUL for scheduling its production will not only improve one’s understanding about the importance of production schedules but will also help one in determining how the scheduling can be improved. The following is an overview of the interview conducted by interviewing 2 Managers, 2 Production Engineers, 2 Technicians and 2 Operators, all belonging to the production scheduling department of Amul by the researcher.

Question: 1 As AMUL is using SAP (Software) to schedule production at the moment, could you please explain is it better than your earlier technique? Why?

Answer: The respondents replied that as can be seen, there have come to be chiefly three prominent production scheduling tools in the market, such as SAP/R3 production scheduling tool, Just in Time production scheduling tool and Prima Vera production scheduling tool. Out of these, AMUL uses the SAP scheduling tool as the one suited for its purposes. One of the respondents said, though, that “here at AMUL we had settled well into the previous technique for production scheduling. Thus, adapting to SAP was admittedly tough at first.” Another respondent said “After proper adoption of SAP technique, it has actually helped us to schedule production in a more efficient manner.” 4 of the respondents specifically mentioned that there are several tools in the market for the purpose of planning of production scheduling these days. Till now, the scheduling technique in AMUL was manual in nature, till it was determined that the SAP tool will serve the purpose properly, since it is a dairy co-operative collaborating with at least 3 million rural people in Indian villages for sourcing milk and dairy products. For the purpose of running such an elaborate structure, the SAP scheduling tool was considered to be suitable and thus adopted.

Question: 2 As compare to the previous technique how often is new schedule generated and is there any need for rescheduling?

Answer: For this question, the responses were only slightly varied. Most of the respondents answered that with the new technique, scheduling is generated at proper intervals, like say once a quarter, with little or rare necessity for rescheduling. The previous technique, on the other hand, which was manual, called for frequent rescheduling and its scheduling generation was sometimes haphazard, and failed to be effective. Some respondents said that new schedules were now created generally on a quarterly basis, during which time the milk requirements for the next quarter was gauged with the help of reports and statistics obtained from dealers and retailers, whereas for milk products such as packaged cheese cubes, etc. the rescheduling was done even less frequently, like once in six months or so. Some revealed that there were two types of scheduling, one was the scheduling planned for the purpose of a few months, since mostly it was possible to plan the schedules based on the demand ascertained for a period of at least a few months. The other type of scheduling was to allow for last minute small changes in demand, which cannot be altogether anticipated every time, but can be adjusted nevertheless. Thus, scheduling in AMUL ideally takes place once every 2 to 3 months or based on products and on the changes observed in product requirement volume. The common sentiment among all respondents was that the need for rescheduling certainly had reduced due to adoption of the current technique, as compared to the previous one.

Question: 3 If AMUL faces any problem while doing rescheduling the question was asked to the staff whether he foresees any problem with rescheduling too often.

Answer: For this question the staff replied that rescheduling was something which they tried to prevent as far as possible, and plan the original schedules in a way as optimum as possible. The respondents mentioned that with the new technique, scheduling is generated at proper intervals, like say once a quarter, with little or rare necessity for rescheduling. Rescheduling too often did lead to undesirable situations, calling for last minute adjustments and changes in the operations process. Thus, rescheduling too often certainly was viewed as a hassle.

Question: 4 To find out the performance of the scheduling technique in AMUL, the question was asked how the manager would rate his scheduling system in terms of the company’s performance.

Answer: For this question, 4 respondents indicated that the scheduling technique used in AMUL, the SAP technique, served its purpose well, and was one of the convenient approaches towards scheduling, though it was necessary to become aware of the tools available currently in the market and make a good blend of traditional as well as modern techniques to arrive at a good scheduling system for AMUL.

2 respondents replied that though AMUL started out as a dairy cooperative in Anand, Gujarat, today the company had expanded a lot, penetrating foreign nations like Singapore, Bangladesh, USA, China, UAE, Australia and Hong Kong. AMUL consists of 47 depots, over 3500 distributors and more than 5 lac retailers. Thus, for such an elaborate system as this, there certainly was need for serious reconsideration of the scheduling system, so as to incorporate and make full use of the numerous useful
modern technological tools now available in the market. Though in terms of performance the company was doing very well, revamping the scheduling system with modern tools would do a lot more to improve the company’s efficiency and keep it in a ready state to cater to all sorts of needs, thus satisfying customers and providing them with utmost convenience. 2 of the respondents found the performance of SAP to be satisfactory to a huge extent, and were of the opinion that further improvements could be done steadily.

**Question:5 To explore the reasoning of the above question the question was asked, please describe reasoning for rating on performance measure of the company**

**Answer: For this question, 2 respondents were of the view that AMUL is a company which utilises the SAP tool for production scheduling. Though this is a well-established approach towards production scheduling, due to the high ambitions and expansions of the company, it is becoming difficult sometimes for the company to plan production schedules efficiently. One respondent mentioned that the company was facing numerous problems related to the scheduling such as rescheduling, no proper tracking of the running production, etc. Most respondents hoped that integrated Product Scheduling software might increase the competitive advantage for the firm. Milk and milk products are versatile and can be used for various purposes in domestic as well as commercial settings and thus sudden changes in demands always tend to occur due to specific demands by customers, and thus rescheduling needs to take place though it sometimes becomes difficult to cope with such rescheduling due to lack of exact suitable software. Thus, on those same lines, here the respondent replied that if the company aimed to maintain its efficiency at minimum production cost and satisfy its customers while itself undergoing rapid expansion, a proper and effective solution was the need of the hour for the scheduling system to be in place even in face of last minute demand fluctuations or other problems the company might face in real time scenarios.

**Question:6 To discover the importance of the production scheduling for the company the question was asked, is scheduling perceived as beneficial to the company? If yes, why (or why not)?**

**Answer: The response to this question was mostly positive. These respondents felt that production scheduling is beneficial for AMUL as it helps to improve the performance measure of the company. Production scheduling actually controls movement of the production on the floor. Thus production scheduling plays a chief role in improving the overall performance of any company in regards of increased output improved on time delivery and also improved balancing of the production line. This particular point of view of the respondents indirectly agrees with the researchers proposed hypothesis, i.e., effective production scheduling can improve productivity of the organisation and achieve competitive advantage as well. AMUL was probably one of the pioneers in India which took dairy cooperative and such concept to a national level and now has an international customer base as well, opined the respondents. Needless to say, such a success can only be attributed to proper planning and execution of various processes and thus, production scheduling is indeed important for the company and is certainly thought to play the role in influencing a company’s performance.**

**Question:7 What feature of your scheduling system do you use the most?**

**Answers:10 For this question the respondents replied that the scheduling system currently in use in AMUL was SAP system. SAP software has range of different module to support any business. SAP also have unique module to plan the production is called PP (Production Planning). The respondents uniformly replied that AMUL uses this module to plan the entire production. This is the most used feature of the scheduling system.**

**Question:8 To check the effect of production scheduling technique on other aspects such as marketing, the question was asked about whether production scheduling technique in AMUL had an effect on the marketing approach or vice versa, and hence on the sales of the company.**

**Answer: The respondents replied that though marketing approach considered various factors to build up the brand image of AMUL in India and elsewhere, demand showed tendencies to fluctuate nevertheless, increasing sharply during, for example, festival times, which are times when more sweetmeat is prepared in India. Thus, marketing could influence demand only to a certain extent, after which a proper tracking device was a necessity so as to track demand and thus help in production rescheduling.**

**Question:9 To check the opinion on production scheduling technique of operations personnel, the question asked was, do you find any apparent disadvantage in the production scheduling tool used by the company.**

**Answer: For this question two, the response given by the respondents was on a similar note. They noted that the production scheduling tool used by AMUL, the SAP tool, had by far proven to be mostly beneficial, enabling all departments to function more or less smoothly, though prevention of over production and under production was a matter of concern, especially since the products being dealt with fell under the food category, more precisely the dairy section. Thus, better and reliable tracking was something that could be focused on.
**Question:** To check some marketing steps taken by AMUL, the question asked was, what are some of the marketing steps taken by the company?

**Answer:** AMUL has managed to gain a very reputed position in dairy sector in the country. The marketing techniques involve increasing visibility of the brand as well as other aspects such as attractive and innovative packing techniques, such as distribution of milk in tetra packs so as to appeal to customers. AMUL also was involved in the recently ended season of popular television show Master Chef India.

**Summary of the Interviews**

<table>
<thead>
<tr>
<th>Topic of investigation</th>
<th>Question asked</th>
<th>AMUL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>What do you produce?</td>
<td>Dairy products</td>
</tr>
<tr>
<td>Production type</td>
<td>Which type of production exists in your company?</td>
<td>Continuous</td>
</tr>
<tr>
<td>Production planning</td>
<td>Is production scheduling existing?</td>
<td>Yes</td>
</tr>
<tr>
<td>Production planning technique</td>
<td>Which production scheduling technique do you use?</td>
<td>SAP</td>
</tr>
<tr>
<td>Specialise technique</td>
<td>Is your production scheduling technique specialised to do so?</td>
<td>No</td>
</tr>
<tr>
<td>New schedule</td>
<td>How often do you schedule?</td>
<td>On a regular basis (say, quarterly)</td>
</tr>
<tr>
<td>Reschedule</td>
<td>Do you foresee problems while rescheduling?</td>
<td>At least half respondents foresaw rescheduling as a risk</td>
</tr>
<tr>
<td>Performance of existing technique</td>
<td>Are you satisfied with performance of scheduling technique?</td>
<td>Not fully</td>
</tr>
<tr>
<td>Important of scheduling technique</td>
<td>Is production scheduling important for company?</td>
<td>Vital, for supporting the huge production operations of the company</td>
</tr>
<tr>
<td>Problem in scheduling technique</td>
<td>What is the biggest challenge company facing with scheduling technique?</td>
<td>Not able to track and trace demand fluctuations</td>
</tr>
<tr>
<td>Overall performance of production</td>
<td>How do you rate the overall performance of your production?</td>
<td>Moderately satisfied</td>
</tr>
</tbody>
</table>

As per the interview with the personnel of AMUL, the motive of the interview was achieved because the responses were expected and were in favour of the proposed hypotheses. The following section will explain how AMUL plans and control of the production by using SAP as production scheduling technique. Such data have been collected by the researcher from the informal conversation with the production planning management at AMUL.

**Findings From The Interview:**

The interview with the AMUL indicates clearly the apparent ineffectiveness of the production scheduling of the company, based on the responses obtained from the respondents. The company is facing issues, and over-production or under-production have been cited by the interviewees to be the biggest challenge and threat for the company, apart from maintenance of hygienic manufacturing environment for optimum manufacture of quality milk and milk based products. The respondents opine that this may be due to the ineffectiveness of the scheduling or even lack of some support features in an otherwise flawless scheduling technique. AMUL uses SAP tool to support overall business of the company. As mentioned in the literature review SAP tool is focused on entrepreneurial resource planning. Considering only the manufacturing portion of a business, waste can be defined as anything that does not add value to a production. (Gill and Krar, 2003) SAP is focused on improving the production schedule of the overall business with the assistance of different modules. For maintaining production SAP has PP module to plan and control but SAP is not specialised software to plan and control for the production so it is not appropriate tool to be used in all situations. As mentioned in the interview SAP does not show any graphical representation of the current production situation and also does not have the ability to track and trace current running production. Thus it has been considered that the production scheduling in the AMUL is not wholly effective.

As mentioned in the interview the respondents feel that what is needed to enhance the SAP tool is a software which can show dynamic graphical representation of the current production situation and track and trace current running production and indicate their relation to the current demand for milk and milk products of AMUL so as to make scheduling changes accordingly, thereby elimi-
nating the possibility of over production or under production, which is the least wanted occurrence in the company, since milk products are such that they need to be delivered to the customer as soon as they are produced, with minimum or zero shelf life in between, in order to minimise losses for the company as well as product wastage. Thus it has been considered that the production scheduling in the AMUL, though effective, can further be improved.

Conclusion

The data gathered from AMUL shows the company experiences problems through the scheduling technique and it leads to the threats to the company such as over production and under production. The data collected from AMUL also shows that the production of the milk and milk products is running smoothly. This can be attributed to the long years of experience that comes with this company the data indicates that the main reason of the smooth production is because of the Just in Time production, scheduling, planning and controlling techniques.

Production scheduling is a vital and necessary part in all types industries. Production scheduling includes the major part of production management, and also needs much expertise for handling it. The manufacturing industries produce plenty of products at the end of the production system. The manufacturing units are also working with different product lines at a time. So the proper planning and development planning and scheduling system are to be built up for dealing with different processes. For this study, the researcher is focusing on a dairy-co-operative company which chiefly focuses only manufacture and packaging of milk based products.

Production or operation is the main concern of an organisation, because it actually deals with the process of production. The production type of the AMUL is batch production and it has to produce milk production as per demands and requirements and dispose of finished goods as and when they get produced.

India is also very advantageous for the manufacturing companies. The growth of the manufacturing industries also depends on the economic condition of the existing country. The country and manufacturing industries are both related to each other and dependent for economic progress and growth. From the past few decades India is emerging and developing country in the world. So the overall success of the any industry also boosts the existing economy of the country.

AMUL was formed in 1946 and is the leading dairy co-operative of the Indian subcontinent. The name AMUL is derived from the Sanskrit word AMULYA meaning invaluable. The company is maintained by Gujarat Co-operative Milk Marketing Federation Limited (GCMMF). AMUL is based in Anand in Gujarat, India. The AMUL is an excellent display of success for co-operative firms. The first step before introducing AMUL was the formation under the name Kaira District Co-operative Milk Producers (KDCMP) by Varghese Kurien and Tribhovandas Patel. The AMUL (Anand Milk Union Limited) was initiated to make the farmers aware about the available opportunities and caused revolution of the entire dairy industry in India making India the largest in the world in the sale of milk and milk products. Hence it also referred to as the White revolution.

The data gathered from the AMUL gives potential to implementing of the effective production scheduling technique as well as it supports the hypotheses of the research, namely the implementation of complete Production Scheduling techniques for better increase in productivity, efficiency and effectiveness of the company. On the other hand, interview also confirms the initial hypothesis. AMUL is using the Just In Time as scheduling tool. It is purely specialised to do so. Lastly it can be said that in today’s global manufacturing environment the organisations are under a great pressure to provide high quality in a very competitive price and it’s not only about maintaining the good quality but also delivering the material faster than the competitors. And this can only be achieved if the organisation has the optimum production & scheduling system in place. So the planning for the production & scheduling of the organisation is very important. There are so many organisations which are not independent for the full process. They are dependent other bodies for may be the shipping or other processes’. And majority of the plans in the organisation are usually ignored frequently. The main reason behind this problem is lack of communication between the different heads of the department. There is huge gap which is always found between the top management & the lower management. This can only be improved with the employees training in the organisation, which is very important. The production manager has to provide proper training to the production department, so that their no failure of the products. There has to be transparency in the system in the organisation so that everything is visible to the management. The best suggestions can be provided from the internal staff itself. Because the staff is dealing with each & everything in the organisation so it is very important for them to understand the system & at the same time know the pros & cons of the system. One who can identify is the right person for the department. There are so many complaints in the production department. It is the duty of the production department itself to find out the reason behind it. The workers who are working full day in the company can fetch a better decision than an expert who is visiting the organisation for inspection. So one who is thinking for
the betterment of AMUL will be attentively enough to know the current problem in the production department & at the same time also help the organisation with a solution. Finally one can say that the best way where in AMUL can utilise its resources are the latest techniques which the organisation will be using in order to improve the production department.

**Recommendation to AMUL**

Following are some recommendations that can be made to AMUL:

- **Programs should be conducted to make all production process monitoring personnel fully aware of the latest changes adopted by the company in production scheduling techniques.**

- **The company management should be constantly aware of and open to the latest technology on offer in the market for production scheduling purpose, since some technologies prove to be certainly useful.**

- **Traditional techniques for production scheduling, though useful, should be combined with latest technological advantages so as to make the most of production scheduling tools in today’s scenario.**

- **Good, dynamic software for demand tracking purpose would serve the company well in managing and rescheduling production plans efficiently.**

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