# Production Planning and Control Practices Influencing Consumer Satisfaction in Nigerian Manufacturing Industry

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**ABSTRACT** The study examined the influence of production planning and control practices on consumer satisfaction in the manufacturing industry. It specifically looked into the capacity utilization, short-term scheduling techniques, waiting time and processing, and quality control of the firms to enhance customer satisfaction. Twenty-two respondents that were directly concerned with production and were top officers were involved in the survey. The respondents were randomly selected from among the top corporation in the southwestern part of Nigeria. Primary and secondary sources of information were fully exploited. Structured questionnaire was designed using Likert scale to ferret pertinent information from the respondents. Data were analyzed using simple descriptive and parametric statistical tools to test the hypotheses. The results revealed that capacity planning practices of the firms lead to efficient use of facilities and equipments at computed 't' value –1.6862, reduction in waste and increased profit computed 't' value 0.7884. Short term scheduling, which is necessary in minimizing process and customer waiting time was revealed at 't' value 0.3942. The quality control was revealed at 't' value –0.25667 indicating consumer satisfaction. The study concluded that the production planning and control practices has impacted on the efficient utilization of the resources, waste reduction reduced waiting time and processing, thus contributing to the profitability of the industry. It is concluded further that effectives production planning and control practices contribute significantly to the consumer satisfaction.

## INTRODUCTION

In this conventional period one can rarely talk of manufacturing operations without consideration given to production planning and control regardless of the size of the organization. Production planning is the process of formulating a resource transformation system that will effectively and efficiently meet the forecasted demand for goods and services (Kreitnar, 1995). It is therefore inferred that production planning include making a demand forecast, estimating the resource needs of the factory that will help meet the forecasted future demand efficiently. Production planning and control are closely linked and interdependent (Wild, 1997). In fact the decisions reached during planning determines the problems and the nature of control, experiences during control influences future planning. Moreso, the essence of control is to ensure implementation of plans so that production objectives are realized with minimum resources. Thus the people involved in controlling seek to monitor activities with a view to ensuring that

these activities correspond to some intended situations.

Everybody will almost agree with me that business organizations are out to make profit and not on the basis of altruism. And in fact a company that is pursuing customer satisfaction will correspondingly make profit although it might not be able to maximize it, which is currently the goal of many business firms of today. However the manufacturing sector of the economy is faced with various challenges which management has to pay attention to in order to remain competitive in the business environment. Thus far, some of the prima problems facing the management are; market demand for the company products, the units of products to manufacture in order to meet the market demand, how to reduce cost of production and maximize profit while offering/providing affordable product; more so the management is also faced with an assessment of organizations capacity to respond to this opportunities. By determining how production facilities could be arranged for the manufacture of a given product. To cream it all, management cannot brush aside the decision on what type of production control techniques should be used to ensure consumer satisfaction. Apparently, customer satisfaction requires strategic planning and control of the manufacturing process in order

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to have a comparative advantage over the competitors. On these premises the study accentuated to address questions in order to achieve the following objectives:

i.   The extent on which capacity planning has contributed to the efficient use of facilities and equipments.
ii.  The extent to which production planning and control practices has enhanced waste reduction and increased profit.
iii. The extent to which short term scheduling techniques employed by industries has enabled them minimize customer waiting time and processing.

## FRAMEWORK FOR ANALYSIS

Organizations may be profit or non profit, are viable only if they provide satisfaction to the customers. This simple statement, of course, generates as many questions as it produces solutions, but what satisfies may be either physical or intangible or both. The strong quest for customer satisfaction brought about the concept of production management. Thus, production management referred to those activities necessary to manufacture products. The areas include such activities as purchasing, warehousing, transportation and other operations from the procurement of raw materials through various activities until a product is available to the buyer. Taylor (1981) focused their interest on improved productivity and to manufacture products most efficiently, while still recognizing, the importance of the human factor as an indispensable input.

Chase (1977) defines production planning as concerned with developing a specific course of activity for the production system over an extended time. More so the authors were of the view that production planning entails forecasting the demand for the firms product time and selecting that combination of human and non human resources that can produce the necessary output to meet that demand in the most efficient way. Banjoko (1994) is not left out, he was of the opinion that production planning is essentially concerned with making adequate plans for determining the aggregate level of production, it further helps the management to take appropriate decisions on products to produce, how, when and where to produce them.

Buxxey (1989) in his study indicated that production planning involves forecasting future demand for a company product and estimating the medium to long term resources needs of the factory, that is aimed at meeting the forecasted future demand. Chase et al. (1977) were of the opinion that two roles could be adopted in planning for production; both are viewed as "passive" and active". The former role holds that firm simply responds to and tries to satisfy product demand while the latter attempts to influence demand. Since the production planning aims at attaining the production of the quantities of a given product, forecasting cannot be brushed aside, its role must be emphasized in production planning and control. Broom (1959) regarded, forecasting as a technique for translating past experience into productions of things to come. It requires making estimate of the magnitude and significance, both are relative and absolute of forces that will influence future operating conditions. Moreso demand forecasting is an important prerequisite for proper and efficient production planning as it enables an organization to estimate an expected level of demand.

Gilon (1962) emphasized that the purpose of forecasting in continuous production, is to provide management with factual information about future sales. Oxenfeldt (1957) is not left out in the race, he postulated that a good forecast is bound to be based on both micro and statistical approaches, in the sense that in the final analysis, a compromise is reached between the two. In the similar vein Brown (1959) suggested that if a forecast is to be usable by production, it must meet up with the following conditions:

❖ *the forecast must define expected demand in physical units.*
❖ *the forecast should also include an indication of the probable variation around the expected demand.*
❖ *it should be available in time to schedule all task required to achieve the necessary output.*
❖ *the forecast must be made repeatedly during the future periods to permit necessary adjustments in production and lastly*
❖ *it must be reliable because forecast errors can cost considerable amount of money.*

Forecasting is a harbinger of successful production planning and control, so the forecaster must be fully equipped with a profound knowledge of the series of economic indices, in order to make an accurate forecasting. Leonard

et al. (1973) buttressed the concept of accuracy of forecasting by stating that the accuracy of any forecast depends on the following:

❖ *the method or methods used in forecasting.*
❖ *the type and quality of data made available for forecasting and adequacy of such data.*
❖ *the expertise of the forecaster or the forecasting team either within the organization or outside it.*

As aforementioned, a business organization is out to deliver quality product to its customers. Hence, in the quest of the organization to achieve this laudable objective and be in the race, the infinitesimal role of production control cannot be overlooked. Production control is concerned with monitoring the progress of jobs and priority or making any necessary modification to master production schedule and material requirement planning.

Charles (1949) in his study looked at production control as the coordination of a series of function according to a plan, which will economically utilize the plant facilities and regulate the orderly movement of goods through their entire manufacturing cycle; from the procurement of all materials to the shipping of finished goods at a predetermined rate. Moore (1951) argued that the nature of the industry and the size of the company will affect the way production control is done, but the fundamental functions which have to be done are almost identical in all manufacturing plants".

According to Garvett (1973), production planning is a process "specifying how the production resources of the firm are to be employed over some time period" in a manner that would support either the intermediate or long term sales forecast of an organization. It simply implies that once an organization has made reliable demand forecast for its products, it can realistically make long term planning in terms of human and material resources required to meet the forecast demand level. Hence an organization stands a better chance in using demand forecast to determine optimum work force required, adequate machine capacity, optimum inventory level to keep the operation.

Gaither (1980) in his study pointed out emphatically two important reasons why planning could be a useful production management tool. Hence, the bases, he gave include: * facilitation of long term and efficient allocation of production facilities with a view to avoiding overloading and under utilization of capacity and

* enhancing orderly and systematic transition of productive capacity to meet peaks and valley of consumers expected demand.

However, Dervitsities (1987) perceived quality as "tangible and intangible attributes inherent in the design of product or service and its perfor-mance under normal use" and that organization can achieve this through effective quality control system.

## METHODOLOGY

The study was carried out in the south-western part of Nigeria. Following the multistage sampling technique, twelve companies that belong to the top twenty corporations were randomly selected and from each company 2 productions officers were likewise selected who have served as the respondents of the study. The study extensively explored both the primary and secondary sources of information. Pertinent information was gathered from the respondents using a structured questionnaire. Likert scaling method was used in measuring the variables of the study. The structured questionnaire has two sections. The first segment covered the variables characterizing the various production planning and control practices such as demand forecasting, inventory, capacity utilization, and scheduling techniques while the last segment is purely on quality control practices. Unstructured personal interview was also conducted with the aid of an interview guide in order to augment the responses that were not explicitly cleared in the questionnaire.

The data gathered for the study were analyzed using simple, arithmetic means and percentages. Parametric statistical tool (t-test) was employed to analyze the postulated hypotheses.

## RESULTS AND DISCUSSION

The objectives of the study were to determine the significance and magnitude of association that exist between variables of interest. That is, the strength and direction of linear relationship existing among the variables as well as the amount of variation. The results in Table 1 and 2 show that the calculated 't' value on the basis of a two tailed test at a 0.05 level of significance and at 46 degree of freedom, is –1.6862. Since the computed 't' value falls within the range of the table 't' value, it can be inferred that capacity planning

**Table 1: Distribution of respondents on the use of master schedule**

| Variables | Assigned Value (E) | Frequency (f) | FE | FE² |
|---|---|---|---|---|
| Very often | 5 | 1 | 5 | 25 |
| Often | 4 | 6 | 24 | 96 |
| Averagely | 3 | 2 | 6 | 18 |
| Not often | 2 | 5 | 10 | 20 |
| Rarely | 1 | 8 | 8 | 8 |
| Total | - | 22 | 53 | 167 |

*Source:* Survey 2001.

$$\overline{\chi} = \frac{\Sigma fE}{\Sigma f} = \frac{53}{22} = 2.409$$

$$\theta = \sqrt{\left\{\frac{167}{22} - (2.409)^2\right\}} = 1.3370$$

**Table 2: Distribution of the respondents as to machine IDLE time.**

| Variables | Assigned Value (E) | Frequency (f) | FE | FE² |
|---|---|---|---|---|
| Very often | 5 | 6 | 30 | 150 |
| Often | 4 | 4 | 16 | 64 |
| Averagely | 3 | 4 | 12 | 36 |
| Not often | 2 | 3 | 6 | 12 |
| Rarely | 1 | 5 | 5 | 5 |
| Total | - | 22 | 69 | 267 |

*Source:* Survey 2001.

$$\overline{\chi} = \frac{\Sigma fE}{\Sigma f} = \frac{69}{22} = 3.136$$

$$\theta = \sqrt{\left\{\frac{267}{22} - (3.136)^2\right\}} = 1.51718$$

$$t = \frac{2.409 - 3.136}{\sqrt{\frac{1.337^2}{22} + \frac{1.51718^2}{22}}} = -1.6862$$

leads to the efficient use of facilities and equipments.

The results of a two tailed test in Tables 3 and 4 at 5% level of significance and 40 degree of freedom show a computed 't' value of 0.7884, which could be inferred that the production planning and control practices of the firms contributed to the reduction in waste and corresponding increase in the profit level. It is germane to say that production planning and control practices resulted in the reduction in waste and increase profit

The analysis of the data in Tables 5 and 6

using a two tailed test analysis at 5% level of significance of which the degree of freedom is 19, the results show that the computed 't' value 0.394 remains within the range of table value 't' = 1.96. This is a clear indication that production planning and control practices influenced the scheduling techniques and the process time. This could be inferred that short-time scheduling is paramount in minimizing process and customer waiting time.

The study based on a two tailed test at 5%

**Table 3: Distribution of respondents perception on cost of production**

| Variables | Assigned Value (E) | Frequency (f) | FE | FE² |
|---|---|---|---|---|
| Strongly Agree | 5 | 8 | 40 | 200 |
| Agree | 4 | 10 | 40 | 160 |
| Undecided | 3 | 2 | 6 | 18 |
| Disagree | 2 | 1 | 2 | 4 |
| Strongly Disagree | 1 | - | - | - |
| Total | - | 21 | 88 | 382 |

*Source:* Survey 2001.

$$\chi = \frac{\Sigma fE}{\Sigma f} = \frac{88}{21} = 4.19042$$

$$\theta = \sqrt{\left\{\frac{382}{21} - (4.19042^2)\right\}} = 0.7940$$

**Table 4: Distribution of respondents on perception of profit margin**

| Variables | Assigned Value (E) | Frequency (f) | FE | FE² |
|---|---|---|---|---|
| Strongly Agree | 5 | 8 | 40 | 200 |
| Agree | 4 | 8 | 32 | 128 |
| Undecided | 3 | 2 | 6 | 18 |
| Disagree | 2 | 2 | 4 | 8 |
| Strongly Disagree | 1 | - | 1 | 1 |
| Total | - | 21 | 83 | 355 |

*Source:* Survey 2001.

$$\chi = \frac{\Sigma fE}{\Sigma f} = \frac{83}{21} = 3.95238$$

$$\theta = \sqrt{\left\{\frac{355}{21} - (3.95238)^2\right\}}$$

$$t = \frac{4.1904 - 3.95238}{\sqrt{\left\{\frac{0.794^2}{21} + \frac{1.13289^2}{21}\right\}}} = +0.7884$$

level of significance and 42 degree of freedom, revealed a computed value of 't' = 0.25667 as shown in Tables 7 and 8. This could be inferred that production planning and control practices of the firms indicate that products and customers complaints are handled effectively by their practices specifically on product quality. In other words it is inferred that product quality control played a vital role in customer satisfaction.

**Table 5: Distribution of respondents perception on process techniques**

| Variables | Assigned Value (E) | Frequency (f) | FE | FE$^2$ |
|---|---|---|---|---|
| Very Highly | 5 | 2 | 10 | 56 |
| Highly | 4 | 6 | 24 | 96 |
| Averagely | 3 | 3 | 9 | 27 |
| Partially | 2 | - | - | - |
| Very Slightly | 1 | - | - | - |
| Total | - | 11 | 43 | 173 |

*Source:* Survey 2001.

$$\chi = \frac{\Sigma fE}{\Sigma f} = \frac{43}{11} = 3.909$$

$$\theta = \sqrt{\left\{ \frac{173}{11} - (3.90909)^2 \right\}}$$

**Table 6: Distribution of respondents perception on the process time**

| Variables | Assigned Value (E) | Frequency (f) | FE | FE$^2$ |
|---|---|---|---|---|
| Very Highly | 5 | 1 | 5 | 25 |
| Highly | 4 | 6 | 24 | 96 |
| Averagely | 3 | 3 | 9 | 27 |
| Partially | 2 | - | - | - |
| Very Slightly | 1 | - | - | - |
| Total | - | 10 | 38 | 148 |

*Source:* Survey 2001.

$$\chi = \frac{\Sigma fE}{\Sigma f} = \frac{38}{11} = 3.8$$

$$\theta = \sqrt{\left\{ \frac{148}{10} - (3.8)^2 \right\}} = 0.6$$

$$t = \frac{3.909 - 3.8}{\sqrt{\left\{ \frac{0.6679^2}{21} + \frac{0.6^2}{10} \right\}}}$$

$$= +0.394$$

**Table 7: Distribution of respondents perception on defective products**

| Variables | Assigned Value (E) | Frequency (f) | FE | FE$^2$ |
|---|---|---|---|---|
| Very often | 5 | - | - | - |
| Often | 4 | - | - | - |
| Averagely | 3 | 1 | 3 | 9 |
| Not often | 2 | 13 | 26 | 52 |
| Rarely | 1 | 8 | 8 | 8 |
| Total | - | 22 | 37 | 69 |

*Source:* Survey 2001.

$$\chi = \frac{\Sigma fE}{\Sigma f} = \frac{37}{22} = 1.6818$$

$$\theta = \sqrt{\left\{ \frac{69}{22} - (1.6818)^2 \right\}}$$

**Table 8: Distribution of respondents perception on customer complaints.**

| Variables | Assigned Value (E) | Frequency (f) | FE | FE$^2$ |
|---|---|---|---|---|
| Very often | 5 | - | - | - |
| Often | 4 | - | - | - |
| Averagely | 3 | 2 | 6 | 18 |
| Not often | 2 | 12 | 24 | 48 |
| Rarely | 1 | 8 | 8 | 8 |
| Total | - | 22 | 38 | 74 |

*Source:* Survey 2001.

$$\chi = \frac{\Sigma fE}{\Sigma f} = \frac{38}{22} = 1.7272$$

$$\theta = \sqrt{\left\{ \frac{74}{22} - (1.7272)^2 \right\}}$$

$$t = \frac{1.6818 - 1.7272}{\sqrt{\left\{ \frac{0.55489^2}{22} + \frac{0.6167^2}{22} \right\}}}$$

**CONCLUSION**

From the field work it was noted that there are various factors that hinder the capacity utilization of the manufacturing companies, but the common thread is the epileptic power supply from NEPA. The erratic power supply constitutes a serious problem for the manufacturing sector of the economy, since it halts their operations most of the time. However, for the business organization to stay put in the business environment they were forced to rely on power from fuel driving generating sets. Moreso, the cost of running power generating sets are so high that made this

alternative not to be cost effective as it adds substantially to the cost of production. On this premise, it is recommended that another alter-native source of power for manufacturing organi-zation should be researched upon. Furthermore, privatizing NEPA should be considered as an option since this may ginger NEPA to be more accountable and efficient in their services to the nation as a whole.

Another predicament that limits the capacity utilization although with less frequency is equip-ment breakdown; which contributed to labour and equipment idle time, vis-à-vis the productive hours. Therefore the management should embrace preventive breakdown mainte-nance. Apparently, scheduling maintenance of machines should be carried out before the machines are likely to breakdown.

Conventionally, ensuring quality product has been the primal concern of the production department, but with the inception of total quality marketing, quality has been the watch dog of all members of the organization. Even the customers and consumers associations are being very vocal in demanding for better product quality. Consequently, the workers should be accorded better working context in order to aim at greater heights in product quality improvement. Above all it is strongly recommended that the policy makers should enact a by law that will imbibe the concept of total quality management in the organization. As quality in every decision is necessary to enhancing the growth and survival of the organization.

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