

The impact of just in time system on Egyptian manufacturing companies. Applied study of manufacturing companies

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Keywords

Manufacturing Companies, Just in Time, production management, performance assessment.

Abstract

Manufacturing decision represents one of the available alternatives for managements as one of the strategic decisions by its effect on the company continuity and market share, especially in the current environment in Egypt which is characterized by severe competition, Technology developments and industrial changes on the long and short runs. This recommends that the management should adapt to these conditions, especially within limited resources to be able to get optimal utilization of production elements, increase performance rates, find enough ways to decrease costs, improve quality, deal with time as one element of distance and achieve flexibility on responding to these changes. This led to the emergence of the research's idea to apply and use the Just-In-Time (JIT) system in industrialization as one of the modern strategic alternatives in production for their good results and influences at the level of manufacturing cost and competition within limited resources.

In its different aspects, the research tackles production and cost systems with focusing on manufacturing system in the Just-In-Time (JIT) system, analyzing it and then studying its different profits in qualitative control and raising manufacturing process' performance efficiency which achieves ways of supporting modern production strategies as much as possible and giving a clearer view about performance assessment.

A questionnaire form has been designed to prove or reject hypotheses of the study as it was distributed on the community of the study that includes Egyptian agricultural sector with its sample consisting of 10 manufacturing companies. All questionnaires have been returned and analyzed according to SPSS program. The research resulted in a set of important conclusions and recommendations including that the JIT system leads to reduce leans in the production process through ignoring unnecessary activities that hinder production process and help decrease product's cost, improve operational performance and raise efficiency. As a result, this leads to improve product's quality and putting it in a good competitive situation which achieves continuity of the Company and keeping its market share in the current age's environment.

1. Introduction

Nowadays, world markets are witnessing severe competitiveness and rapid technological development. This makes the decision of choosing cost system that determines product's costs one of the important strategic decisions for the management in the light of the limited available resources and preparedness for all new variables. It was noticed that Egyptian manufacturing Companies lack the strategic vision in choosing cost and production system that corresponds to the nature of their activities and work environment, allow consistency, achieve competitive qualities in terms of price, quality and flexibility in responding to these changes along ages in addition to weakness in using available human and material abilities which led to reduction of their profits related to the rise in production

costs. Therefore, companies must have take procedures which help remove unnecessary activities which accompany the manufacturing process and help raise product's cost.

Accordingly, the JIT system was used as one of the systems that lead to optimal utilization of production elements, reducing costs, improve quality and raise production efficiency through depending on standards to be appropriate in production process with the Japanese who implemented (APM) Advanced Power Management system and then followed by other multiple Japanese firms.

2. Importance of the Study

The importance of the study came from being focusing on the JIT system which is appropriate to production cost systems in addition to highlight advanced performance assessment standards in time, which help take wise strategic decisions.

3. Objective of the Study

The study aims to present the effect of applying production costs system in time on reducing production costs through cancelling unnecessary activities that accompany production process and help increase product cost and this leads to enhance operational performance and optimum utilization of products.

4. Problem of the Study

Because of the technological developments that accompanied production process and the increased severe competitiveness in markets, companies were obliged to reduce their products' cost, enhance their quality and increase their production efficiency. In order for companies to accomplish this aim, it must have attempted to utilize production elements and their resources efficiently and overcome production obstacles and unnecessary activities which accompany production process. Accordingly, the problem of the study based on the following questions:

- 1) How far is the effect of applying the JIT system leads to reduce product's cost and enhance its quality?
- 2) How far is the effect of the JIT system on work to make the storage near the zero and reduce its cost as a result?
- 3) How far is the effect of the JIT system on giving a clearer image for the operational performance assessment process?
- 4) How far is the effect of the JIT system on the depending the institution on advanced performance standards that achieve strategic decisions for the management?

5. Hypotheses of the Study

The hypotheses of the study are:

- 1) It is expected that the JIT system reduces product's cost and enhances its quality.
- 2) It is expected that the JIT system will make the storage close to zero and reducing its cost as a result.
- 3) It is expected that the JIT system will give a clearer perception of the operational performance assessment process.
- 4) It is expected that the JIT system will offer advanced performance assessment standards that help take wise strategic decisions.

6. Study Boundaries

- 1) Place Boundaries:

A sample of Egyptian industrial firms in Alexandria was chosen by the researcher being the most suitable and the closer to achieve study objective and main hypothesis.

2) Time Boundaries:

The duration of the study started from determining its subjects, orientations and ended with achieving its goals starting from 1-5-2014 till 31-8-2014

7. Study Community & Sample

The study community consists of Egyptian industrial firms as 10 companies were approved to test study hypotheses, a questionnaire was distributed and was returned with a percentage of 100% and the statistic program SPSS was used to approve or reject study hypotheses.

8. Definition of the JIT system

The JIT system works on lean system in all activities and processes related to a certain production process in a project which hinders its development and reduces its costs. Schroeder (1989) thinks that the JIT system helps receive materials today and use them tomorrow through accurate materials receiving times while starting using them in production and on time of delivery or shipment to clients directly. Accordingly, the JIT system is a revolution in the field of commodity storage control which leads to time control in order to reduce production costs as a result of supply periods reduction, so we notice that the JIT system has a set of important goals including:

- 1) Disposal of all types of storage or reducing it to the least possible amount.
- 2) Limiting wastage in time and resources in the production process.
- 3) Purchase in suitable amount and time to respond consumers' needs in time and with suitable quality.
- 4) Develop trust and relation between the company and its organizers through setting goals on the long run leading to shared confidence.

The implementation of the JIT system makes the decision maker in manufacturing companies facing the problem of choosing the optimal production system to face developments that influence scientific and industrial environment as manufacturing is considered a competitive weapon for managements being integrated and interactive with other systems. In addition, the JIT system is a set of integrated parts and activities linked logically to achieve integration and coordination among each other and transform inputs from being primitive materials, labor and capital into a set of outputs in the form of commodities, services and information working to approve following procedures and performance (with the needed level) and this interaction and integration requires communication systems and information database that help in information flow covering all parts of the company in order to ensure its presence and keep its market share (Evan, 1993, P: Ritz man & Krajewsk, 1993).

9. Development of Strategic Management Performance Conceptions in the JIT System

Performance measuring and assessment process for any system are main elements to identify its different aspects. Performance standards are influenced by development in production systems. Moving towards atomization, the used standards for performance assessment, such as budgets and standard costs, do not respond to cost and strategic management which led to search for more advanced and developed standards to cope with these variables and requirements and help take wise strategic decisions. The labor became

less important as it uses consistent trend as a result of focusing on automatic production. Accordingly, moving toward quality enhancement and cost reduction has become of a great importance for the strategic management in order to follow, control and assess it.

10. Disadvantages and Problems of the JIT System

Despite this system's qualities, the JIT system faces a lot of problems referred to by many studies as the current study discusses reasons of not implementing the JIT system including:

- The JIT system is inappropriate companies in which it operates.
- This system needs more work and procedures which are difficult to apply.
- This system represents a pressure on managers' interests.
- There is a lack in the available information about this system inside the company.

The study also referred that reasons behind not using this system are summed up, as managers see them, in the following:

- Uncertainty of the system's quickness and efficiency.
- Difficulty of following-up raw materials during processes.
- No support of the company's suppliers to change into this system.
- Convincing the management with the current traditional methods and not needing to change.
- The system is not economical in small size companies

From the previous illustration, we can sum up problems and disadvantages of the JIT system in the following points:

- 1- Difficulty in achieving some hypotheses such as not finding production defects and reaching zero level for the defected units and storage and this means that there is a difficulty in achieving this in big size or seasonal activity companies .
- 2- This system needs great cooperation between management and workers and between management and suppliers. It cannot be applied without comprehensive cooperation among these parties.
- 3- This system requires the necessity of developing accounting systems in general, costs in particular and conceptions on which the costs system is based in general.
- 4- Some companies do not conceive the idea of the JIT system because of the high cost at the beginning of preparing administrators and workers and for suppliers and clients.
- 5- The management is not satisfied with changing from the current systems into the JIT system fearing that its implementation results are not ensured.

11. Field Study Results

In this section, the researcher presents analysis for the data obtained from the questionnaire designed and distributed on the study sample and was returned in a 100% percentage. The researcher has used the SPSS system for data analysis and standard indications. In order to approve or reject the study hypotheses, the researcher used arithmetic means and standard deviations for responses of sample members via the questionnaire. Results were as follows:

a. Study results for the First Hypothesis

The JIT system reduces product's costs and enhances its quality.

Hypothesis	Questions Number	Mean	Standard Deviation	Average standard errors
H1	10	0.7	0.48305	0.15275

Table (1): Means and standard deviations for the study sample members' response to questionnaire costs to enhance its quality

First hypothesis

The previous table shows means and standard deviations for questionnaire sections related to the third hypothesis (5 sections) and the researcher concluded that trends of members of this sample were positive in these sections. The researcher used (ONE SAMPLE T - TEST) and table no. 2 to show the counted value of T, freedom degree and Significance level SIG:

Hypothesis	Counted T	Freedom degree	SIG	Means variation
H1	4.583	19	0.001	0.7

Table (2): Results of the One Sample T - Test related to the first hypothesis

By the result of statistical analysis, the counted T value was 4.583, freedom degree was 19 and significance level was 0.001. Accordingly, using the JIT system leads to reduction of cost and improvement in quality.

b. Study Results Related to Second Hypothesis:

The JIT system leads to make storage near the zero and this reduces cost.

Hypothesis	Questions Number	Mean	Standard Deviation	Average standard errors
H2	10	0.7	0.48305	0.15275

Table (3): Questionnaire on a sample to collect standard responses and standard deviations of related means

Second hypothesis

The previous table shows means and standard deviations for questionnaire sections related to the third hypothesis (5 sections) and the researcher concluded that trends of members of this sample were positive in these sections. The researcher used (ONE SAMPLE T - TEST) and table no. 4 to show the counted value of T, freedom degree and Significance level SIG:

Hypothesis	Counted T	Freedom degree	SIG	Means variation
H2	4.583	19	0.001	0.7

Table (4): Results of the One Sample T - Test related to the second hypothesis

By the result of statistical analysis, the counted T value was 4.583, freedom degree was 19 and significance level was 0.001. Accordingly, using the JIT system gives a value near zero and thus cost reduction.

c. Study Results Related to Third Hypothesis

The JIT system gives a clearer perception on operational performance assessment process.

Hypothesis	Questions Number	Mean	Standard Deviation	Average standard errors
H3	10	0.7	0.48305	0.15275

Table (5): Means and standard deviations for sample members' responses on the questionnaire sections related to this hypothesis.

Third hypothesis

The previous table shows means and standard deviations for questionnaire sections related to the fourth hypothesis (5 sections) and the researcher concluded that trends of members of this sample were positive in these sections. Researcher used (ONE SAMPLET - TEST) and table no. 6 to show the counted value of T, freedom degree and Significance level SIG:

Hypothesis	Counted T	Freedom degree	SIG	Means variation
H3	4.583	19	0.001	0.7

Table (6): Results of the One Sample T - Test related to the second hypothesis

By the result of statistical analysis, the counted T value was 4.583, freedom degree was 19 and significance level was 0.001. Accordingly, using the JIT system gives a clearer perception on operational performance assessment process.

d. Study Results Related to Fourth Hypothesis:

The JIT system gives advanced performance standards that help take wise strategic decisions.

Hypothesis	Questions Number	Mean	Standard Deviation	Average standard errors
H4	10	0.7	0.48305	0.15275

Table (7): Questionnaire on sample members for standard responses, standard deviations and related means

Fourth hypothesis

The previous table shows means and standard deviations for questionnaire sections related to the third & fourth hypothesis (5 sections) and the researcher concluded that trends of members of this sample were positive in these sections. The researcher used (ONE SAMPLE T - TEST) and table no. 4 to show the counted value of T, freedom degree and Significance level SIG:

Hypothesis	Counted T	Freedom degree	SIG	Means variation
H4	4.583	19	0.001	0.7

Table (8): Results of the One Sample T - Test related to the second hypothesis

By the result of statistical analysis, the counted T value was 4.583, freedom degree was 19 and significance level was 0.001. Accordingly, using the JIT system gives advanced performance standards that help take wise strategic decisions.

12. Conclusions

Through its theoretical and practical aspects, the research found a set of important conclusions including:

- 1- The (JIT) system leads to production cost reduction and this improves its quality, removes the damaged ones and makes it competitive;
- 2- The (JIT) system shows that there is a direct relation between storage level and cost and this makes it near zero and reducing its cost as a result;
- 3- The study showed that the (JIT) system leads to enhance and improve operational performance through increasing investment rate, marginal profits rate increase and storage turnover rate; and
- 4- The study showed that modern developments in the business environment require advanced commercial production and costs in the perceptions of the surrounding environment to help present advanced performance standards that serve the company's management to take its wise strategic decisions.

13. Recommendations

- 1- The necessity to move from the current applied cost and production system in the Egyptian manufacturing companies into the (JIT) system for its various benefits at the level of profitability, competitiveness and continuity;
- 2- Companies' managements should use advanced performance standards (APM) in addition to standard cost systems in order to increase wise various administrative decisions and selecting the best available alternatives;
- 3- The necessity to do without activities which are void of the added value that help increase product's cost and weaken company's continuity and sustainability through the application of the (JIT) system and retain its market share in the current age environment; and
- 4- Companies' managements should train their employee to understand and know all requirements of this system to ensure quality and efficiency of its application and benefiting from experiences of companies which apply this system.

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