

# The Extent of Implementation Just-in-Time System on Hikma Pharmaceutical Company (Case Study)

Mohammad Turkey Bataineh  
Associated Professor, Business administration Department, Jerash University, Jordan

## Abstract

Implementation just-in-time system (JIT) play important role on organizations to be successful, so they must continuously ensure use and implement it, the aim of this study is to explore the extent of implementation Just-in-Time system through variables such as top management support, human resources efficiency, supplier's efficiency and elimination of waste , using sample of (195) managers in Hikma Pharmaceutical Company, Results were supported by previous researches revealing that top management support, human resources efficiency, and supplier's efficiency have significant positive influence on Implementation of JIT, but Elimination of waste hasn't significant influence on Implementation of JIT .

**Keywords:** Just-in-Time, Top management support, Human resources efficiency, Supplier's efficiency, Elimination of waste, Hikma Pharmaceutical Company.

## 1. Introduction

In the face of current economic, companies are looking for the ways to cope with the situation by opting for cost reduction and quality products at the same time. Referring back to Japanese manufacturing success in 1980s, companies find the TQM and just-in-time (JIT) inventory management systems are some of most popular Ways to have lower cost and high quality products (Daniel and Reitsperger 1996). Slack et al. (2007) defined JIT as an operations concept, which focuses on meeting the demand while offering the perfect quality and zero waste.

Just-In-Time (JIT) manufacturing is a Japanese management philosophy applied in manufacturing which involves having the right items of the right quality and quantity in the right place and the right time. It has been widely reported that the proper use of JIT manufacturing has resulted in increases in quality, productivity and efficiency, improved communication and decreases in costs and wastes (Akbar et el, 2013).

## 2. Literature Review

The 'Just in time' (JIT) approach is based on a lean manufacturing system which was developed to optimize and improve manufacturing efficiency by reducing manufacturing lead time through waste elimination. It was derived from the Toyota Production System as a purpose to minimize inventory and improve throughput. (Stump & Badurdeen,2012). Today JIT system is well known throughout the world. The reason why the system is so popular today is a result of its advantages realized by the manufacturing companies.

JIT production system is a system that enables companies to produce products in required amounts and just when demanded (Taniş, 1992:100; Yükcü, 2000: 19). Kaneko and Nojiri (2008) explained that for JIT to be successfully implemented both the manufacturer and supplier should share their information through a reliable electronic information network. Furthermore, successful implementation of JIT requires long term relationships between manufacturer and suppliers who have been selected according to the typical criteria such as quality, low-costs and punctual delivery.

### 2.1. Necessary Tools for JIT Implementation:

A JIT production system, as explained above, aims at minimizing work-in-process and finished-goods inventories, reducing lead-time, and increasing product quality. In order to achieve these by implementing a JIT manufacturing system, the following aspects and steps should be put into consideration and then operation (Hilton, 2000: 207, 462; Horngren. et.al. 1999:735)

#### a. Getting the Commitment of Top and Middle Managers

Top managers must support implement a JIT production system (Griffin and Harrell, 1991), their support must be obtained. all parts of the organization there must be a high level of cooperation among functional areas. That is why middle managers' commitment should also be obtained. Once this decision is made, the next step toward implementation is to gain an active support from the firm's middle managers and supervisors. Getting this support may not be very easy because these managers could be reluctant to support the implementation of JIT production system. (Lynn and Adrian, 1991:1).

#### b. Pull Method

As final products are produced only when they are demanded, operators will not put materials and components into production unless they are required. Therefore, parts and components that are produced by any operator should not be produced until the next operator demands them. When customer demands the product, production centers begin to produce the parts required by the following divisions in sequence. Under the pull method, goods

are produced in each manufacturing stage only as they are needed (Hilton, 2000:207).

c. Establishing Long-Lasting, Reliable Relationships With Few Suppliers

Supplier must be able to provide high-quality raw materials, because in JIT setting there is no allowance for the stoppage resulting from poor-quality work-in-process inventory (Atkinson et.al, 2001:242). If raw materials offered by the supplier are defective, there will be problems in the production process due to poor-quality raw materials. In case of any stoppage, company will not be able to offer the product to customers on time.

Therefore, successful JIT production depends largely on assembling a few cooperative and reliable suppliers. Just-in-Time purchasing is the purchase of goods and materials such that delivery immediately precedes demand for use (Horngren et.al, 1999:737).

To ensure that supplier provides high-quality raw materials, long-term and reliable relationships must be established with few suppliers.

d. Standard Work Concepts

Standardization is achieved when all the tasks necessary to perform the production process are made uniform. In other words, if the same tasks are performed every time a process is carried out, it means that the production process is standardized. Once the procedure is standardized, there will be no variation in the process, a work procedure must define every detail as clearly as possible. Standard work is one of the most comprehensive and powerful tools found in JIT (DeLuzio, 1993:15).

e. Creating a Clean, Orderly Work Environment

JIT work environment production flow must be smooth. Production should be done in a standardized way without variation. Also, work-in-process inventory should be moved smoothly in the production area because it is desired the production process be completed on time. In this sense, tools used in production should be put in order, machinery and the work place should be clean (Hayes, 1981:59). In a JIT environment, materials move through the factory very quickly in response to signals from the pull control system. Therefore, the work environment should be organized in a way that allows the movement of materials without any difficulty. Also, the workers should be able to reach the tools and other materials easily in the shortest time available.

f. Quick and Inexpensive Machine Setups

As company applies JIT aiming at producing in small lots when demanded, operators should be able to setup the machinery in a very short time so that there is no wasted time while switching from one lot to another, manufacturing facilities must be able to produce different kinds of products without wasting time. Otherwise, if too much time is spent on setting up the machinery there will be delay in offering the product on time. Therefore, JIT production system must be based on advanced computer-controlled machines that are able to produce several product types without requiring a set-up.

g. High-quality finished products

In a JIT system, finished-goods inventory is kept at minimum level, to achieve this products that are produced in the system must be of uniform quality and a total quality control program should be applied in the JIT setting. So that everybody should be responsible for the quality of the final product and seek ways to continuously improve the production system. (Banker and Potter, 1993). Everybody focuses on continuous improvement in order to prevent problems from taking place, and shutting down the production line that may then cause delay in offering the product on time.

h. Flexible Facilities and Multi- Skilled Workers

Facilities in a JIT setting must be flexible so that they can produce various kinds of products without requiring frequent setups, facilities must be able to produce different kinds in small lots.

Multi-skilled workers are also required in this environment to respond quickly to changes in demand and product mix. In addition to these, in a JIT setting workers must have multiple skills because in case of absence of an employee, one of the others must replace him so that there will be no stoppage and delay in offering the final product to customers on time. In other words, operators may be required to move among different machines, functions and areas. If they are not able to be flexible to work in different areas, company cannot be responsive to different demands on time. The JIT production system, therefore, requires highly skilled and highly dedicated workers and well maintained equipment (Martin et.al., 1992:10; Hilton et.al., 2000:463).

Hira R.& Khan, Mirza A(2015) The research aims to develop the consensus between different operational improvement strategies, to address the relationship between the operational characteristics (lean) and operational performance of the organization. Variables from which the extraction of the outcomes has been established include operational performance, daily schedule adherence, repeat production and flow oriented layout. The technique of data analysis is selected to be Correlation and multiple regressions. The aim for performing these tests is to highlight association of lean strategy with the operational performance. Results and conclusions: The positive association is being established amongst the operational performance and the daily schedule adherence, flow oriented layout and the repeat production. It is suggested to the supply chain management that they must entail their production team for having repetition in their work and become efficient

in their production. They must be reached to their optimization level, where they have to extract less waste and have high level of the production.

A. S. Aradhye & S. P. Kallurkar (2014) Waiting in lines are experienced in our daily schedule. Waiting lines or queues cause inconvenience to customers. Just-In-Time (JIT), the dignified process of waste reduction and has been a very popular operational strategy because of its success in the manufacturing and production industry over many years. Various benefits like, improved operational efficiency, waste reduction, and faster response have been widely observed by previous researchers. Services are much like manufacturing. Therefore, successful implementation of JIT is vital to manufacturing as well as service industries. JIT focuses on the process, not on product. Therefore it can be applied to every process within manufacturing or service industry. The main objective of this research is to make use of a case study to present various issues regarding implementation of JIT for a service industry. This case study also shows the benefits of reduction in waiting period by employing JIT. The conclusion of this research indicates that JIT system is successful and operating JIT system leads to many advantages to the case industry.

Ahmad N. Bin Adnan et al (2013) Uncertainties brought about by fluctuations in demand and customers' requirements have led many established companies to improve their manufacturing process by adopting the Kanban system. By doing so, they are able to manufacture and supply the right product, in the right quantity, at the right place and time. Implementation of the Kanban system resulted in reduction of inventory to minimum levels besides increasing flexibility of manufacturing. Successful implementation of the Kanban system furthermore reduces operational costs, consequently increases market competitiveness. The Kanban system is basically an inventory stock control system that triggers production signals for product based on actual customers' requirements and demand. The system is controlled by the Kanban card which dictates the optimum production parameters. It is used to authorize production of any product to replenish those already consumed by the customer or subsequent process. This study covers pre-requisite activities in establishing a Kanban system, starting from designing Kanban flow, gathering manufacturing data, calculating optimum Kanbans in the systems, establishing pull mechanism and rule and finally evaluating Kanban performance using lean parameter. This paper studied the implementation of the Kanban system at a local auto-component company in Malaysia. The scope of implementation was focused at BLM Cylinder Head Cover assembly process. This paper concludes that implementation of the Kanban system reduced lead time, minimized inventory on floor and optimized storage area. The objective of this study is to show that Kanban system improves a manufacturing system as well as achieving Just In Time practice.

Muhammad Imran Qureshi et al (2013) In recent years, inventory management is continuous challenge for all organizations not only due to heavy cost associated with inventory holding, but also it has a great deal to do with the organizations production process. Cement industry is a growing sector of Pakistan's economy which is now facing problems in capacity utilization of their plants. This study attempts to identify the key strategies for successful implementation of just-in-time (JIT) management philosophy on the cement industry of Pakistan. The study uses survey responses from four hundred operations' managers of cement industry in order to know about the advantages and benefits that cement industry have experienced by Just in time (JIT) adoption. The results show that implementing the quality, product design, inventory management, supply chain and production plans embodied through the JIT philosophy which infect enhances cement industry competitiveness in Pakistan. JIT implementation increases performance by lower level of inventory, reduced operations & inventory costs was reduced eliminates wastage from the processes and reduced unnecessary production which is a big challenge for the manufacturer who are trying to maintain the continuous flow processes. JIT implementation is a vital manufacturing strategy that reaches capacity utilization and minimizes the rate of defect in continuous flow processes. The study emphasize the need for top management commitment in order to incorporate the necessary changes that need to take place in cement industry so that JIT implementation can take place in an effective manner.

Ignatio Madanhire et al (2013) this research study investigates the use of Just in time (JIT) concept for the aluminium foundry industry. It explores the adaptation of the manufacturing approach to metal foundry, where raw materials are imported in a highly unstable economy. JIT is applied to improve cost effectiveness of operations, quality and to achieve world class benchmarks on all facets of the engineering entity as competitiveness in product delivery is getting to be mandatory for business survival.

Akbar J. Kootanaee et al (2013) JIT production system identifies the hidden problems in the value chain and reduces the production waste of the system while increasing the throughput (Sales-Raw Material Cost). Even though the JIT system seems to be interesting and less complicated it requires lot of coordination with supply chain to avoid delays in the production schedule. This article discusses in depth the implementation of JIT manufacturing. The objectives are twofold. The first objective is to acquaint the reader with the overall JIT concept and the factors necessary for its implementation; the concepts presented here represent the ideal principles and methods of implementation

### 3. Objectives of the Study

The aim of this study is to identify the extent for successful implementation of JIT on Hikma Pharmaceutical Company. More specifically this research has four objectives:

- To explore the effect of top management support on implementation of JIT.
- To explore the effect of human resources efficiency on implementation of JIT.
- To explore the effect of suppliers efficiency on implementation of JIT.
- To explore the effect of elimination of waste on implementation of JIT.

### 4. Data and Methodology

To examine the effect of top management support, human resources efficiency. Supplier's efficiency, and elimination of waste on implementation of JIT.

I selected Hikma Pharmaceutical Company to be my case study in this research.

#### 4.1. Data

Several data collection methods used in research. A questionnaire or sample survey is the primary tools of data collection. That was divided into five sections. Section 1 measured the respondents' demographic background. Sections 2 through 6 measured the respondents' views toward the impact of top management support (7 items), term human resources efficiency (7 items), Supplier's efficiency (7 items), elimination of waste (7 items), and implementation of JIT (8 items). Each item was measured in terms of a five point rating scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

#### 4.2. Methodology

The sample was drawn from three management levels within **Hikma Pharmaceutical Company**, around (195) questionnaires were randomly distributed to managers in these three levels. The returned suitable questionnaires were (183) with (94%) response rate.

### 5. Hypotheses

Based on the objectives of the study, the following hypotheses will be tested.

Hypothesis 1: **Top management support** will have a significant positive influence on implementation of JIT.

Hypothesis 2: **Human resources efficiency** will have a significant positive influence on implementation of JIT.

Hypothesis 3: **Supplier's efficiency** will have a significant positive effect on implementation of JIT.

Hypothesis 4: **Elimination of waste** will have a significant positive effect on implementation of JIT.

### 6. Case and Data Analysis:

Tables one to four present the descriptive statistics for the four study variables (**Top management support, Human resources efficiency, Supplier's efficiency, Elimination of waste, and Implementation of JIT**). statement (1-7) represent Top management support as independent variable, statement (8-14) represent Human resources efficiency as independent variable, statement (15-21) represent Supplier's efficiency as independent variable, statement (22-28) represent Elimination of waste as independent variable, and statement (29-36) represent Implementation of JIT as dependent variable.

#### 6.1. Top Management Support:

The following tables show the results of the empirical test. Table 1 through Table 5 is outputs of SPSS Statistics software. As shown in table (1) the highest mean was item #6 "Top management gives preference to vendors who have long-term track records of reliability" (4.25) with (1.13) Standard deviation (Std), while item #5 "Top management makes sure workers fully informed about what JIT is and why it is desirable" scored the lowest mean (3.07) with (1.09) Std.

Table (1) Top management support (n=97)

No.	Statement	Mean	Std
1	Top management is committed to the conversion and they know what will be required.	3.59	0.68
2	Top management involved in the process and knows what it will cost.	4.01	0.96
3	Top management obtains the support and cooperation of works.	3.78	0.78
4	Top management obtains the support and cooperation of suppliers.	3.23	0.98
5	Top management makes sure workers fully informed about what JIT is and why it is desirable.	3.07	1.09
6	Top management gives preference to vendors who have long-term track records of reliability.	4.25	1.13
7	Top management resists because JIT shifts some of the Responsibility from management to worker.	3.96	0.53

#### 6.2. Human Resources Efficiency:

The findings presented in table (2) as shown. Item #12: "Employee accept decision or goals change with their supervisors" scored the highest mean (4.34) with (0.91) Std, while the item #10: "Employee handle criticism of their work by themselves" came last and scored lower mean (2.51) with (0.54) Std.

Table (2) Human Resources Efficiency Descriptive statistics (n=97)

No.	Statement	Mean	Std
8	Employee do there work together as a team	3.96	0.82
9	Employee solve problems independently	4.08	1.17
10	Employee handle criticism of their work by themselves	2.51	0.54
11	Employee interact with their supervisor as each other	3.63	1.05
12	Employee accept decision or goals change with their supervisors	4.34	0.91
13	Your supervisor making company more comfortable phase to work	3.82	0.63
14	You try do the tasks assigned to you by your supervisor efficiently	4.13	0.58

#### 6-3. Supplier's Efficiency:

Table (3) shows the results of the Supplier's Efficiency. Again, the means for all items were either high or very high thus assuring the importance of Supplier's Efficiency on JIT. Statement #16 that says "Suppliers introduce information about their work such as leader times from order" came first with high mean (4.30) with (0.96) std, while statement #18 that says "Suppliers have an internal and external audit programs" came last with average mean (3.17) with (0.65) std.

Table (3) Supplier's Efficiency Descriptive statistics (n=97)

No.	Statement	Mean	Std
15	Suppliers are meeting the performance criteria, e.g. service levels, quality, laid down in the contract	3.22	0.85
16	Suppliers introduce information about their work such as leader times from order	4.30	0.96
17	Suppliers experience of working with the buying organizations give them handling unnecessary obstecals	3.98	1.08
18	Suppliers have an internal and external audit programs	3.17	0.65
19	Suppliers have their documented procedures for inspection and testing of the products provided	3.87	0.48
20	There incoming products and raw material inspected upon receipt	3.46	1.12
21	Suppliers have procedure for controlling change to customer product	4.08	0.77

#### 6.4. Elimination of Waste:

Table (4) reflects the results of the fourth variable of the study. Statement #24 that says "Company reduce waste from transportation " came first with high mean (4.62) with (1.08) std, while statement #23 that says Company reduce waste from waiting" came last with average mean (3.13) with (0.93).

Table (4) Elimination of waste Descriptive statistics (n=97)

No.	Statement	Mean	Std
22	Company reduce waste from over production	3.82	0.56
23	Company reduce waste from waiting	3.13	0.93
24	Company reduce waste from transportation	4.62	1.08
25	Company reduce waste from processing	4.32	0.73
26	Company reduce waste from Inventory	3.28	0.79
27	Company reduce waste from motion	3.99	1.12
28	Company reduce waste from defective parts	3.18	1.01

#### 6.5. Implementation of JIT:

As shown in table (5) the statistical means and standard deviations of Implementation of JIT are shown, Statement #34 that says " Company has high quality standards" came first with high mean (4.71) with (0.89) std, while statement #29 that says "Your company try to do how finished goods inventory" came last with average mean (3.12) with (0.71) std.

Table (5) JIT Descriptive statistics (n=97)

No.	Statement	Mean	Std
29	Your company try to do how finished goods inventory	3.12	0.71
30	Your company arrive raw materials as soon as needed	3.92	1.26
31	Company make good relationship with suppliers	3.74	0.91
32	Company product small lot sizing	4.02	0.47
33	Company has flexible production system	3.16	1.02
34	Company has high quality standards	4.71	0.89
35	Company has good information system	4.26	0.95
36	Company always makes continuous improvement	3.54	1.03

#### 6.6. Correlations among Variables

Table (6) presents the zero-order correlations and for all of the study variables. **Top management support, Human resources efficiency, and Supplier's efficiency**, were significantly and positively correlated ( $r > 0.512$ ,  $p < .01$ ) with Top management support. Similarly, the *Human resources efficiency* variable was also correlated with ( $r = 0.741$ ,  $p < .01$ )., *Supplier's efficiency* is also correlated with Implementation of JIT ( $r=0.686$ ,  $p < .01$ ) but, Elimination of waste wasn't significantly correlated with Implementation of JIT ( $r=0.354$ ,  $p < .01$ ).

Table (6) Descriptive Statistics and Correlations

		Implementation of JIT	Top management support	Human resources efficiency	Supplier's efficiency	Elimination of waste
<b>Implementation of JIT</b>	Correlation	1.00				
	Sig	0.00				
<b>Top management support</b>	Correlation	<b>0.512**</b>	1.00			
	Sig	0.01				
<i>Human resources efficiency</i>	Correlation	<b>0.741**</b>	<b>0.254**</b>	1.00		
	Sig	0.04	0.02			
<i>Supplier's efficiency</i>	Correlation	<b>0.686**</b>	<b>0.847**</b>	<b>0.254**</b>	1.00	
	Sig	0.01	0.01	0.02		
<b>Elimination of waste</b>	Correlation	<b>0.354**</b>	<b>0.369**</b>	<b>0.598**</b>	<b>0.457**</b>	1.00
	Sig	0.07	0.03	0.01		

Notes:

- Scale: 5-point Likert-type scale.
- \*\* Correlation is significant at the 0.05 level..

With regard to the specific hypotheses, we found:

- Hypothesis 1, Top management support has significant positive influence on Implementation of JIT was supported.
- Hypotheses 2, *Human resources efficiency* has significant positive influence on Implementation of JIT were also supported.
- Hypothesis 3, *Supplier's efficiency* has significant positive influence on Implementation of JIT was supported.

- Hypotheses 4, Elimination of waste hasn't significant influence on Implementation of JIT was supported.

## 7. Conclusion and Recommendations

According to data analysis I found that there were many results, the most important were;

1. There is appositve relationship between (Top management support, Human resources efficiency, and Supplier's efficiency) and Implementation of JIT.
2. There isn't relationship between (Elimination of waste) and Implementation of JIT.
3. Workers fully informed about what JIT is and why it is desirable with lower mean (3.07).
4. Employee handle criticisms of their work by themselves with lower mean (2.51).
5. Suppliers have an internal and external audit programs" came last with average mean (3.17).
6. Company reduces waste from waiting" came last with average mean (3.13).

The following recommendations are suggested:

1. *Concentrate on elimination of waste and try to reduce waste as possible as can.*
2. *Top management support workers to fully inform about what JIT is and why it is desirable.*
3. *Top management encourages employee handle criticisms of their work by themselves.*
4. *Encourage Suppliers have an internal and external audit programs.*

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