

**DEVELOPING THE FRAMEWORK OF INTEGRATED JUST-IN-TIME (JIT)  
APPROACH: A CONCEPTUAL STUDY**

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**ABSTRACT**

*The concept of Just-in-Time (JIT) has often been considered as a preserve of manufacturing and distribution tool or system. However, some researchers look to JIT as a philosophy which evolved to a strategic level where its concept can be applied throughout an organization. In particular, the cross-functional integration of JIT in various systems like production, supply chain, financial, marketing, human resource and knowledge management can provide continuous improvement and sustain a source of differential advantage for the organization.*

*The purpose of this paper is an attempt of developing a framework that applying Just-In-time system in a whole while of the organization across its functions, and express the system context that contribute to the effectiveness of the system works on the a whole of organization. The methodology of the study based on a review of studies and Literature review to build framework that the functional integration needed to implementation of JIT that leads to improve an organization's all over efficiency, quality, flexibility and innovativeness. Finally, the application such framework may helps the organization to achieve the potentially to the acquisition of competitive advantage, and perhaps, to world-class status.*

**Keywords - Just-In-Time (JIT); function; integration; framework**

## **INTRODUCTION**

Just-In-Time (JIT) in production activities has been implemented successfully for the past 30 years in Japanese leading organizations and later on all over the industrially leading countries. Its appeared as a philosophy as well as a technique that guides a manufacturing organizations in making business more effectively, and also in planning and controlling operations more efficiently. Kootanace,et al (2013) indicated that the Just-In-time (JIT) is a philosophy that applied in manufacturing activities and having the right items of the right quality and quantity in the right place at the right time. It has been widely reported that the proper use of JIT in manufacturing has resulted in increase in quality, productivity and efficiency, with improvement of communication and reduction in costs and wastes.

On another hand, APICS (American Production and Inventory Control Society) dictionary is defined Just-in-time (JIT) as “a philosophy of manufacturing based on planned elimination of all waste and on continuous improvement of productivity”. (Panchal at.el. 2013). It also has been described as an approach with the objective of producing the right part in the right place at the right time (in other words, “just in time”). Waste usually results from any activity that adds cost without adding value, like the unnecessary moving of materials, the accumulation of excess inventory, or the use of faulty production methods that create products requiring subsequent rework. JIT (also known as lean production or stockless production) should improve profits and return on investment by reducing inventory levels through increasing the inventory turnover rate, reducing variability of materials, improving product quality, reducing production and delivery lead times, and reducing other costs associated with machine setup and equipment breakdown.

For these reasons, Just-in-time (JIT) has become a very popular subject currently being investigated by many worldwide organizations. Just-In-Time management involves the application of classic management approaches; however, their adaptation to the modern manufacturing organization is a relatively new practice. Meanwhile, currently many organizations are developing and applying the JIT approach in response to a very

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complicated competitive environment. In order to remain competitive and experience economic achievements, the organizations have focused on increasing productivity, improving the quality their products and raising the standards of efficiency within their products and raising the standards of efficiency within their firms. The ability to achieve higher standards of productivity without sacrificing quality is also an important goal of a manufacturing firm. Over the long run, application of JIT manufacturing may assist these companies in achieving these goals of manufacturing excellence.

Meanwhile, Panchal et.al. (2013) introduced a simple definition of JIT to produce and deliver finished goods just in time to be sold, subassemblies just in time to be assembled into finished goods, fabricate parts just in time to go into subassemblies, purchase parts just in time to be transferred in to fabricated parts, and deliver products just in time to the market. In a JIT environment, a supplier needs to adjust the production schedule simultaneously with the buyer's demand. The high-tech industries can be successful by following the JIT policy and a super-effective supply chain management since the price of their products is decreasing continuously. Here, we indicate that the increasing in quality, productivity, and efficiency can be achieved through JIT delivery agreements. So, the JIT purchasing requires the buyers and suppliers coordinating their order and production policy. Moreover, the JIT is a system that produces the required items at the time and in the quantities needed. It is an approach that combines apparently conflicting objectives of low cost, high quality, manufacturing flexibility and delivery dependability. JIT is viewed as a level of perfection achieved by continuous elimination of the wasteful use of resources. The long term objectives of eliminating wastes in a manufacturing process that is so streamlined, cost efficient, quality oriented and responsive to the customer needs that JIT becomes a strategic weapon for productivity improvement.

In a JIT system, just-in-time can eliminate waste, which means any items of production or service only move through the production system when needed. More clearly, it refers to a production system that times movement of goods during production and delivery from suppliers together so that the batch arrives for processing nearly after completing the first batch. The JIT process results in no idle items, idle workers, and idle equipment wait to process. Krupp (1999) defined the concept behind JIT is similar to a pull system, where units of production or service pulled to market where just as needed. A pull system requests delivery and production from higher levels to satisfy the exact units necessary in

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lower levels. Moreover, with the pull system, inventory moves only as needed, and the ideal lot size is one piece. This method can cut excess inventory that hid production and quality problems. The hidden problems of production become clear and continuous improvement for quality then works.

### **LITERATURE REVIEW**

The application of Just-in-time (JIT) in the inventory system is not a simple method that an organization has to buy it and apply in to; it has a whole philosophy that the company must follow. The ideas of this philosophy come from many different disciplines and activities including; statistics, industrial engineering, operations management and behavioral science. In the JIT inventory philosophy there are views with respect to how inventory is looked upon, what it says about the management within the company, and the main principle behind JIT. Radisic (2012) has introduced the components of Just-in-time (JIT) system consisting of process design, suppliers, employees, decision- making and system improvement. On another hand, Gupta (2012) showed the JIT principles that can be integrated in these components and what benefits can be achieved in healthcare environment. He explained further that these components make JIT purchasing, labor intensiveness and JIT procedures, JIT functional (quality, suppliers and workers a factors that will help achieving the successful implementation of JIT in health care operations.

Kootanace, et al (2013) pointed out that JIT manufacturing consist of several components or elements which must be integrated together to functions in a harmony style to achieve the JIT goals. These elements essentially include the human resources, production, purchasing, manufacturing, planning and organizing functions of an organization. He adds three ways JIT can assist management in obtaining a competitive advantage. (1) Integrating and optimizing this involves reducing the operation and resources which do not facilitate production; (2) Improving continuously this involves continually trying to improve processes and systems; (3) Understanding the customer this entails reducing the cost of products and satisfying consumer needs. Whereas, Rachna & Peeter. (2007) defined the Lean production as an integrated socio-technical system whose main objective is to eliminate waste by concurrently reducing or minimizing supplier, customer, and internal variability. Indeed, going lean, improving organizational performance, seeing problems, solving them the rightll way, and in doing so continually

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increasing the intellectual capacity and skill of all members of the organization. (Michael and Marketa, 2012)

Lean implementation procedure need to combine the need to combine the “socio-technical systems”; that all work organizations combine a technical, i.e. technology, and a social system, i.e. people and organizational structures. Bhasin and Burcher (2005). However, JIT is a technique of production and service that developed out of the need to reach a defect free process (Cheng and Podolsky 1996).

Horngren and Forster (1987) identified four cardinal objectives of JIT as: (i) The elimination of all activities that do not add value to product or service. (ii) A commitment to a high level of quality (iii) A commitment to continuous improvement in the efficiency of an activity and (iv) An emphasis on simplification and increased visibility to identify activities that do not add value. According to Hirano (1988), JIT involves five conceptual steps that start with Awareness review (discarding old concepts and turning to JIT way of thinking). This step is followed by the ‘5 S’ for workplace improvement (*Seiri*-proper arrangement, *Seiton*-Orderliness, *Seiso*-Cleanliness, *Seiktsu*-Cleanup and *Shetsuke*-Discipline). The five ‘S’ leads to flow manufacturing which replaces lot production characterized with one piece production. The fourth step is that building products on equal quantity on each time levels production; this invariably leads to standard operation which is capable of maintaining flow.

### **IMPORTANCE AND OBJECTIVES OF THE STUDY**

Just-in-time (JIT) is a production and inventory control system in which materials are purchased and units are produced only as needed to meet actual customer demand. This system leads to the elimination of the inventory in all stages of the operations system and consequently to reduce the high storage costs. So, the basic benefit of this system is thus its ability to increase the organization’s ability to compete with others and remain relevant over the long run, since with JIT, they can develop a more optimal process for their firms. JIT also reduces production costs through increased efficiency within the production process; and it reduces waste of materials, time and effort. Thus give the importance of this study is an attempting to build a framework that contributes evolving the Just-in -time as an integrated approach dominating at organizational strategic level in competitive environment. Accordingly, the study aims to consider three points; a)

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clarifies the concept of the JIT as an integrated approach and the its application all over the organization; b) identify the context and content for applying this approach in organization; and c) build the framework the proposed JIT integrated approach to gain functional activities to reduce all kinds of waste and cost that achieve competitive advantage.

### **CONCEPTUAL FRAMEWORK**

Just in Time (JIT) production is an approach that eliminates waste all types associated with time, labor, and storage spaces. Basics of the concept are that the organization produces only what is needed, when it is needed and in the quantity that is needed. JIT can also be defined as producing the necessary outputs, with the required quality, in the necessary quantities, at the last safe moment. It means that organization can manage with their own resources and allocate them very easily. On the other hand, Gupta (2012) claimed JIT can be summarized as a system to eliminate waste and achieve excellence in an entire organization. Lim Cai (2013) indicated that the sole purpose of JIT is to eliminate all kinds of waste. Accordingly, Just-In Time (JIT) became a management strategy used to reduce the cost (all kinds) by reducing the in-process inventory since 20th century

Just-in- Time (JIT) method is generally in its application has two types of method in goods management inventory namely the push system and the pull system. Deviarti (2013) noted that difference between the two was just as the operational paradigm. In the push system, a machine undertook production process without having to await the demand from machine that would do next process. On other hand in the pull system, a machine did production process only if there was a demand from machine going to undertake another process. Also, the push and pull systems were associated with the information flow may define the push as an action to anticipate the needs, while the pull as an action to serve the demand.

### **THE GOALS OF JIT SYSTEM**

Kootanace,et al, (2013) investigated three main manufacturing objectives for JIT: Increasing the organization's ability to compete with rival firms and remain competitive over the long run. These goals generally can achieved through the waste elimination

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requited a broader interpretation of JIT as a concept, rather than as simply an activity or function, as it was quickly discovered that JIT could not be a stand-alone programme. It evolved into a philosophy of management excellence blending high quality, low cost, flexibility, delivery and dependability, and became associated with commitment to organization and supply chain-wide continuous improvement. Such policies also imply reducing inventory levels while tending to increase dependence on a narrower supplier base. This in turn has led to recognition of a need to stabilize customer-supplier relationships and to eliminate risks of sudden or unilateral strategic policy, product or market changes — any one of which could leave the customer or supplier vulnerable to external competition or to a loss of end-market attractiveness. On the other hand, such stability can easily give way to the inertia of complacency, which is counterproductive to the quest for enhanced competitiveness. (Arnold and Bernard 1989). The conceptualization of JTT as an element of corporate philosophy and a foundation for strategic development is thus a natural — albeit not inevitable — precursor to partnering and other forms of verdict strategic alliance. It needs to be handled continuously with the same levels of care and attention as are customarily devoted to the establishment of new agreements.

Gupta (2010) shows JIT is an approach, which is a demand driven that encourages flow type of production. It is also described as a drive to simplify the manufacturing system in order to quickly detect the problems and force. Panchal (2013) listed several elements performance JIT system such as top management support, customer awareness, ergonomics design, employee training and development, Judoka (use of modern/automatic age), flexible and multifunction workforce, organization policies and strategies, standardization, job satisfaction, quality circles, storage space reduction, infrastructure (aesthetic values), lead time reduction, and value addition services (SDP). On the other hand, Jinglin (2015) reviewed six key elements of JIT which includes Kanban system, the management commitment and employee involvement, elimination of waste, small lots and quick setups, total quality management, and supplier relationships. The whole concept of the JIT is differentiated from traditional production systems using push vs. pull systems of production. The push system of production means pushing the materials to the next stage of the production irrespective of whether time and resources are needed at the next level. Meanwhile, the production system is creating a lot of

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inventories at each level of the production flow. The traditional manufacturing organizations adopt push system where they produce for inventory and work in progress.

However, Kootanace, et al (2013) described the pull production system as the materials that are pulling to the next level of the production operations just when are signaled or required by the next stage of production. This dramatically situation reduces the holding inventory on hand without remaining any work-in-process. So, the JIT concept is built based upon the concept of pull production which eliminates the total holding inventory. According to this definition, it can say that implementation of the JIT should be depend on a condition of stability of supplies from closed suppliers. A strong trustee relationship is the core factor of successfully implementing the JIT. Sometimes, the diversification of suppliers should be applied, so that the organizations have different vendors or a group of vendors providing the components, parts and raw materials continuously.

Moreover, the quality of the components, parts and raw materials should be delivering on time through the strategy of the outsourcing agreements. This strategy recognized as a first core principle which helps the buyer to avoid any unexpected poor quality of supplies. We can define the poor supplies as a waste of quality, which includes all kinds of quality defects, lack of inventories all kinds, extra time spent to move materials and extra time of setting up or change-over the machines. If the implications of managing the reduction in waste for the categories mentioned above are analyzed, it becomes obvious why JIT is involved in all aspects of the management of production Process. Another principle of JIT involves the management of people. JIT philosophy assumes that people are capable and willing to take of more responsibility on the work based on the providing the empowerment approach. If defective parts are being produced, any team work member can stop the production line and seeking for the causes, and all the entire team is sharing in solving this problem.

#### **METHODOLOGY OF THE STUDY**

As we pointed out that the concept of Just-in-Time (JIT) has often been considered a preserve of manufacturing and distribution functions. However, the philosophy has evolved to a strategic level where the concept can be applied throughout an organization. In particular, the cross-functional integration of JIT in production, purchasing and

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marketing can provide continuous improvement and sustain a source of differential advantages for organization. And, the core factors like cost, quality, customer satisfaction, and more are some important issues facing organizations. There are searching continuously for innovative ways to contain costs without sacrificing quality and meet the customers' needs. So, the methodology of this study based on a literature review to develop the proposed framework for applying Just-In-time as an integrated approach in the organization across all core functions. The components of proposed framework JIT integrated wheel are the internal and external environment of the organization and the core functions of the organization. These functions are operations, supply chain, finance, marketing, human resource, and knowledge management. Figure (1) demonstrates the proposed framework of JIT as an integrated approach.

**THE CORE FUNCTIONS OF THE ORGANIZATION:**

The variety of innovative products being manufactured, coupled with shortening product life cycles, means that production processes have to be flexible, responding quickly to immediate market needs, and have to be geared to the likelihood of future continuous change, Just-in-time is a component of time management, operating to meet market demand quickly; it is applicable to goods in-bond to plants in all sorts of industries as well as to goods out-bound.

Adoption of a JIT focus on "line" is no less important for new product development, where "time-to-market", timorousness and "being first" have long been recognized as critical elements in corporate success. Moreover, implementation of JIT strategies calls for major changes in areas of corporate operations beyond the immediate scope of this paper, such as cost accounting and information systems.

However, the JIT implementation requires systematic thinking and integration of the various functional activities of the organization and its suppliers. Using a simple "input conversion- output" flow, as outlined below, it can be shown that within each of the areas of procurement, production and marketing, JIT has an identifiable role to play, and the closer the integration of JIT within and between these functional areas and across the organization as a whole, the stronger the focus on achieving improved customer service, greater differentiation of quality and higher profitability.

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The potential for integration between these functional activities is illustrated in Figure (1), which details the characteristics/activities needed to close the gap between the six central functions.

**INTEGRATION JIT WITH OPERATIONS, SUPPLY CHAIN, AND  
MARKETING AREAS**

**INTEGRATION JIT WITH OPERATIONS SYSTEM:**

JIT in production/operations systems normally has to precede JIT in supply chain, in order to help to convince suppliers of the customer organization's commitment to improving quality and eliminating waste (so called quality on source), and in order to maximize the benefits derived from reductions in materials' inventories and the shipments should meet the requirements of Master Production Schedule (MPS). One of the criteria most commonly cited for the successful implementation of JIT is the support of the workforce, including management. Employees should be encouraged to uncover problems in order to allow actions to be prioritized and initiated by addressing the root causes, and implementing preventative measures, which may well involve cross-functional Quality Improvement Teams (QITs) and/ or Corrective Action Teams (CATs). As Gottesman (1991) noted, the three major objectives of JIT are to eliminate waste wherever it occurs, to add value at every step of the value chain, and to move material directly to where it is needed. Accordingly, crucial objective of JIT is, therefore, to attack obstacles to improving quality and efficiency.

The variety of innovative products being manufactured, coupled with shortening product life cycles, means that operation processes have to be flexible, responding quickly to immediate market needs, and have to be geared to the likelihood of future continuous change. Just-in-Time is a component of time management, operating to meet market demand quickly; it thus is applicable to goods in-bound to plants in all sorts of industries as well as to goods out-bound. Adoption of a JIT focus on "Time" is no less important for new product development, where "time-to-market", timorousness and "being first" have long been recognized as critical elements in corporate success. Moreover, implementation of JIT strategies calls for major changes in areas of corporate operations beyond, such as cost accounting (Tatikonda 1988) and information systems (Malley and Ruthann 1988).

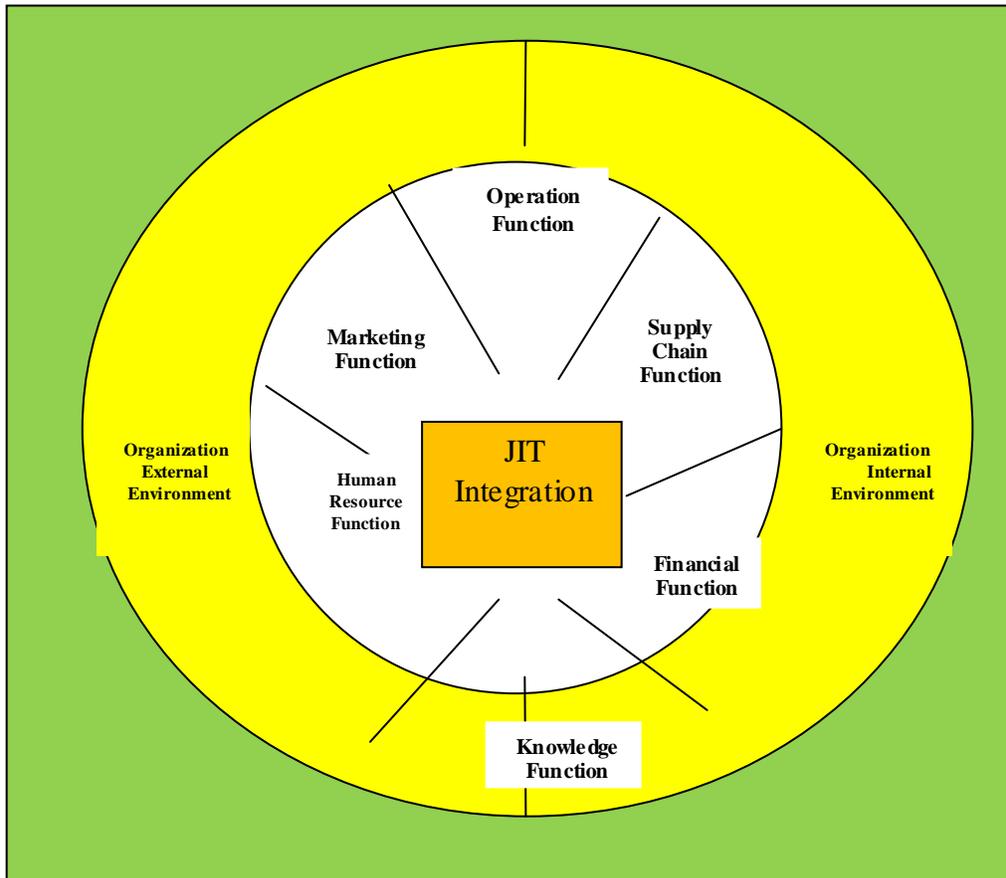


Figure (1): The framework JIT as an integrated

Meanwhile, we summarize the integration of the JIT with the operation functions as:

- Master production schedule (MPS) and define rough cut capacity requirements,
- Total quality management (TQM),
- Value analysis,
- Group technology and computerization,
- Product design,

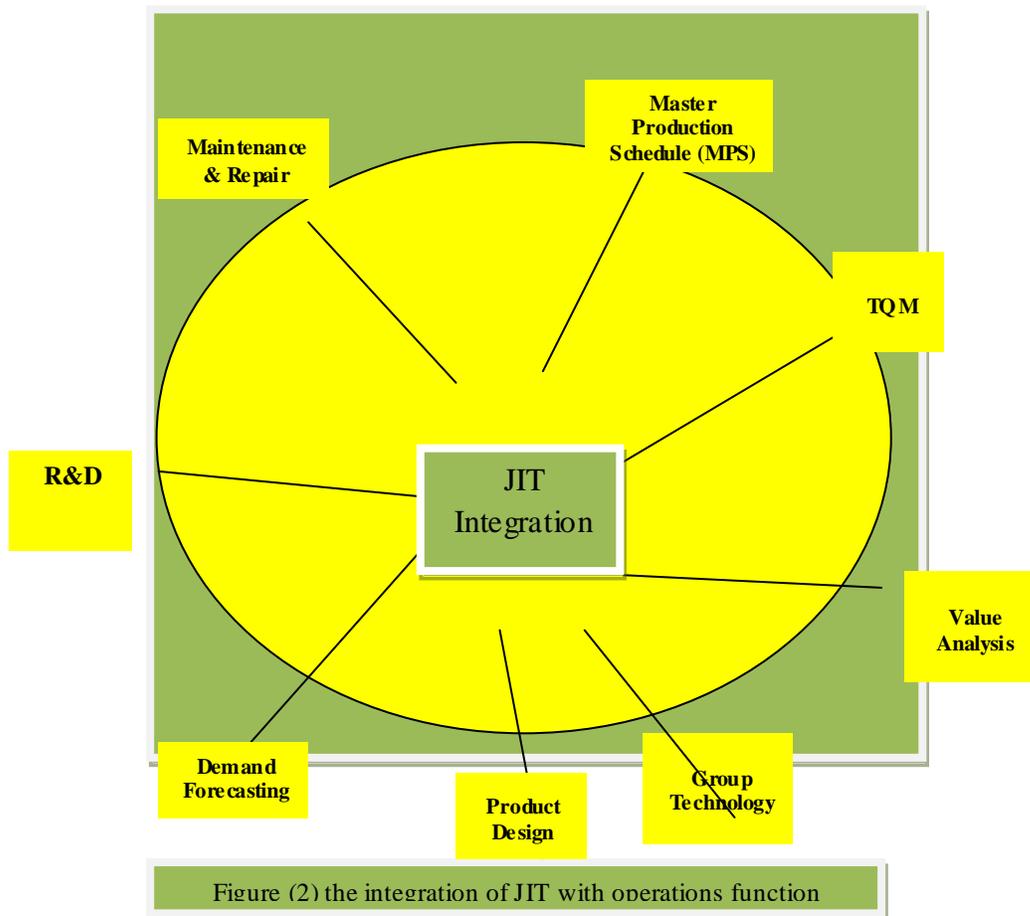
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- Demand forecasting,
- Research & development (R&D),
- Maintenance management system (maintenance & repair)

Figure (2) summarizes the components of integration JIT with operations function.

**Integration of JIT with Supply Chain**

Just-in-Time has a dominant influence on the supply chain function because of its long-term focus on continuous improvements, enhanced quality and the elimination of waste. This prominence has perhaps been accentuated by the general perception of procurement's position at the "beginning" of the "operations process chain". This, in turn, has contributed to the transformation of supply from being a reactive service function to being one of creative, strategic importance which can assist the company to attain a competitive advantage.



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As organizations developed their core competencies and included them in their business processes, the tools and concepts of TQM and JIT were applied to developing new product development and managing supply chains, and they typically involved multiple organizations. Generally, they first incorporated JIT between suppliers and production units, then moved to optimized logistics (including efficient consumer response (ECR)) between producers and distributors, then to customer relationship management (CRM), and finally to global fulfillment architecture and risk management. These supply-chain-focused trends inspired similar trends at the corporate level as companies moved from lean operations to lean enterprises and now to lean consumption (Womack and Jones 2003). These trends are:

- Buyer-supplier relationship (BSR),
- Shipments' size (lot size, delivered quantity, scheduling & delivery timing, ect.),
- Supply lead time (frequent deliveries, supply lead time, delivery timing, ect.),
- Supply quality (product quality, delivery quality, perfect quality, source commitment)
- Financial relationships (prices, supply costs, ect.)

For JIT sourcing to work, the suppliers and buyers must have compatible goals and objectives with respect to the product. On the one hand, the supplier must be willing to make frequent deliveries of high quality products in small lot sizes on time. On the other hand, the buyer must be willing to give the supplier long-term high volume contracts to make it worthwhile and develop a closer buyer-supplier relationship, which, for the JIT system to function properly, "must be extremely tight, both behaviourally and logistically\* (O'Neal 1987).

For JIT sourcing to work, Bernard (1996) indicated that the suppliers and purchasers must have compatible goals and objectives with respect to the product. On the one hand, the supplier must be willing to make frequent deliveries of high quality products in small lot sizes on time. On the other hand, the buyer must be willing to give the supplier long-term high volume contracts to make it worthwhile and develop a closer buyer-supplier relationship, which, for the JIT system to function properly, "must be extremely tight, both behaviorally and logistically. Figure (3) shows the integration of JIT with the supply chain function.

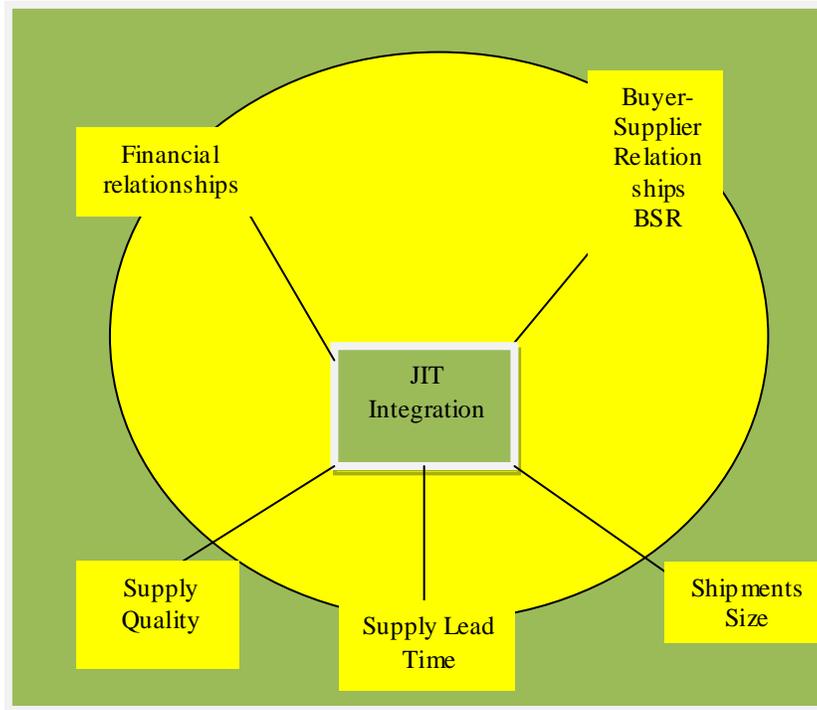


Figure (3) the integration of JIT with supply chain function

### **INTEGRATION OF JIT WITH THE MARKETING:**

Kotler (2008) defined the marketing management is the art and science of choosing target markets and getting, keeping and growing customers through creating, delivering and communicating superior customer value. However, the concept of just-in-time marketing is slightly different, but it's still about reducing waste and inefficiency, but

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around buyer interactions. For Marketing, inventory is essentially the message, offer, or content. The marketing campaign process is step-wise assembly of content that's delivered to the buyer through any number of channels to a (hopefully) strategically selected segment of the customer or prospect database. Traditionally, marketing would build an inventory of marketing messages to deliver in batches to prospective buyers and customers. Meanwhile, Bernard (1996) has indicated that the market-driven firms are committed to their external customers, working together in design, development, manufacturing, delivery and service. To market JIT, there must also be an internal customer orientation — that is, an application of the customer satisfaction/marketing concept inside the organization. However, the concept of just-in-time marketing is slightly different, but it's still about reducing waste and inefficiency, but around buyer interactions. For Marketing, inventory is essentially the message, offer, or content. The marketing campaign process is step-wise assembly of content that's delivered to the buyer through any number of channels to a (hopefully) strategically selected segment of the customer or prospect database. Traditionally, marketing would build an inventory of marketing messages to deliver in batches to prospective buyers and customers.

Accordingly, we see that the Just-in-time marketing means that organizations spend only what is needed, when it's needed, introducing a customized message or offer to target customers in ways that can quickly close a sale. It does away with the expensive inventories of surplus offer that mass marketing creates, replacing advertising clutter and promotional waste with effective message attuned to the needs of interested people exactly when they are in the buying mood. So, the JIT marketing targets distinctive customer segments whose interests span many products categories. It then enlists cross-functional teams of "creatives" – programmers, data experts and quality assurance specialists – who work together to cut costs and improve the effectiveness of marketing investments. Also, we can define the just-in-time marketing as Just- in- time marketing applies innovative thinking to the discipline of marketing to help companies get noticed, sell more and grow their business.

In developing a JIT marketing strategy, it is essential to research market requirements to carry the "voice of the customer" backwards through the organization and into the fundamental product design. O'Neal (1987) and Bertrand (1996) identified several procedures which help to maximize the design's value in the customer's eyes while

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maintaining quality, efficiency and flexibility. These are commonly regarded as being fundamentally "production" activities, but their justification lines in their contribution to the provision of customer satisfaction. There are four common threads linking the three JIT functions: the level of quality required; the provision of maximum customer satisfaction; reduction and/or optimization of costs to all parties and effective development and introduction of new products essential to maintain a competitive edge. Just-in-time production helps by reducing work-in-progress inventories to facilitate flexibility in manufacturing; Procurement by reducing purchased inventories to further facilitate flexibility and production efficiency; and Marketing by gathering together all the necessary employees and activities at the right times to ensure efficiency and flexibility are maintained from idea generation to product delivery.

Meanwhile, to make a clear vision for the role of integration the JIT with the marketing in the organization, we provide the following areas that would be the most important.

These core areas are:

- Quality Function Deployment (QFD),
- External customer orientation,
- Internal customer orientation,
- Marketing research,
- Product quality,
- After sale services, and
- Delivery timing

Figure (4) presents the core areas of integration of JIT with marketing.

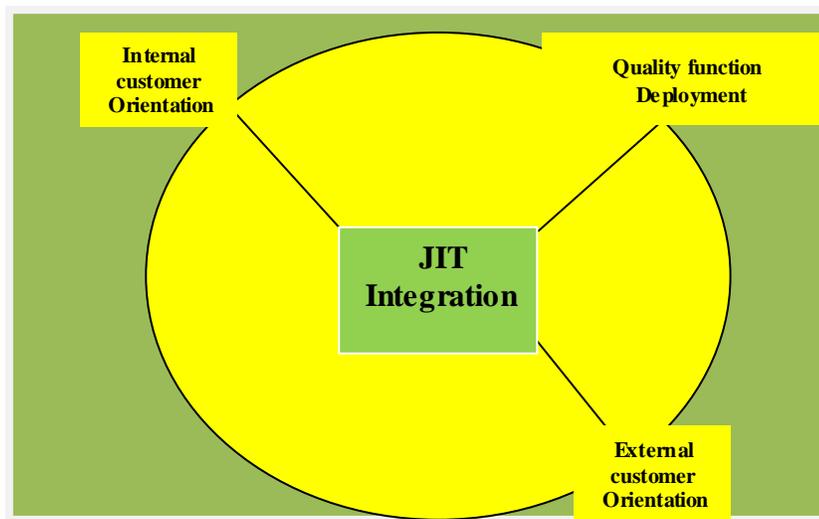


Figure (4) Integration JIT of marketing function

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**Integration JIT with Financial Function:**

Finance is that function in a business responsible for acquiring funds for the firm, managing funds within the firm and planning for the expenditure of funds on various assets. The most common financial problems are: undercapitalization, poor control over cash flow and inadequate expense control. (Nickels et al, 2005)

As Ross et al (2008) point out corporate finance has three main areas of concern: capital budgeting what long-term investments should the firm take? Capital structure: where will the firm get the long-term financing to pay for its investments? And working capital management: how should the firm manage its everyday financial activities? In the Nickels et al (2005) investigation, key areas that need for operating funds are managing day-by day needs of the business, controlling credit operations, acquiring needed inventory and making capital expenditures.

Figure (5) presents the core areas of integration JIT with Financing.

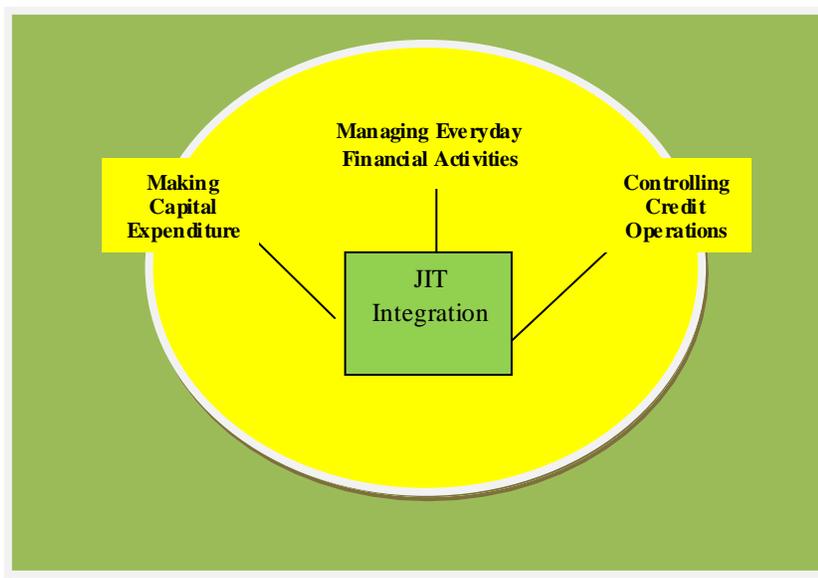


Figure (5) Core areas of integration JIT with finance

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The components of the Figure (5) are:

**a. Managing Everyday Financial Activities: These financial activities means:**

- Capital budgeting means long-term investments or projects should the business take on during the future period,
- Capital structure means how should we pay for our assets by using debt or equity,
- Working capital management means how we manage the day-to-day finances of the firm to keep business activities go successfully.

**b. Controlling Credit Operations:** A strategy employed by manufacturers, suppliers and retailers to promote good credit among the creditworthy and deny it to delinquent borrowers. This will both increase sales and decrease bad debts, thus improving a company's cash flow. Credit control is an important component in the overall profitability of many organizations. A problem with selling on credit is that as much as 25% or more of the business's assets could be tied up in its credit accounts (accounts receivable), meaning the organization needs to use some of its available funds to pay for the goods or services already sold to customers who bought on credit . A firm's credit policy reflects its financial position and its desire to expand into new markets. To decrease time and expense in collecting accounts receivable is to accept bank credit cards as fees are not excessive and the bank issuing the credit card has already established the creditworthiness of the customer.

**c. Making Capital Expenditure:** Capital expenditure, are funds used by a company to acquire or upgrade physical assets such as property, industrial buildings or equipment. It is often used to undertake new projects or investments by the firm. This type of outlay is also made by companies to maintain or increase the scope of their operations. These expenditures can include everything from repairing a roof to building, to purchasing a piece of a equipment, or building a brand new factory.

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**Integration JIT with Human Resource Function:**

According to the Luis et.al (2012) the major HR challenges facing management today divided into three categories: environmental challenges, organizational challenges, and individual challenges.

- The environmental challenges include rapid change, rise of internet, workforce diversity, economic globalization, legation, skill shortages, and evolving work and family roles.
- Organizational challenges are choosing a competitive position, organizational restructuring, the rise of self – managed work teams, organizational culture, advances in technology, and the rise of outsourcing
- Individual challenges are increasing individual productivity, empower employees, involve matching people with the organization.

The actual outcome of downstream HR management is influenced by an enormous variety of forces interacting in a dynamic and complex way, potentially compounded by any lack of direct involvement in strategic formulation. Forrester (1995) shown there are several key responses are necessary for such changes to be successful. First, in terms of a highly skilled, flexible, coordinated committed workforce; second, a lean, flat, flexible and innovative management; third, the ability to retain experienced people; and finally, a strong relationship between management and union. Hines (2010) noted that require a commitment everywhere in the organization to improve and to eliminate those obstacles that delay prevent or inhibit improvements. Also, he indicated that lean behaviors include trust, honesty, openness, consistency, respect, reflection, observation, objectivity and listening play a great role in implementing the JIT approach in HRM. Wasteful behaviors include blame, ego, distrust, cynicism, sarcasm, ambiguity, subjectivity, insincerity, self-imposed barriers and negativity.

Some Japanese manufacturers two decades ago have set up multi-functional new product development teams, including members from product design, production engineering and marketing, making a cars' design not only to meet the requirements of the marketplace, but also for easy manufacturability. The key to the Toyota Way and what makes Toyota stand out is not any of the individual elements, but what is important is having all the elements together as a system. It must be practiced every day in a very consistent manner not in spurts.

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Figure (6) presents the core areas of integration of JIT with marketing.

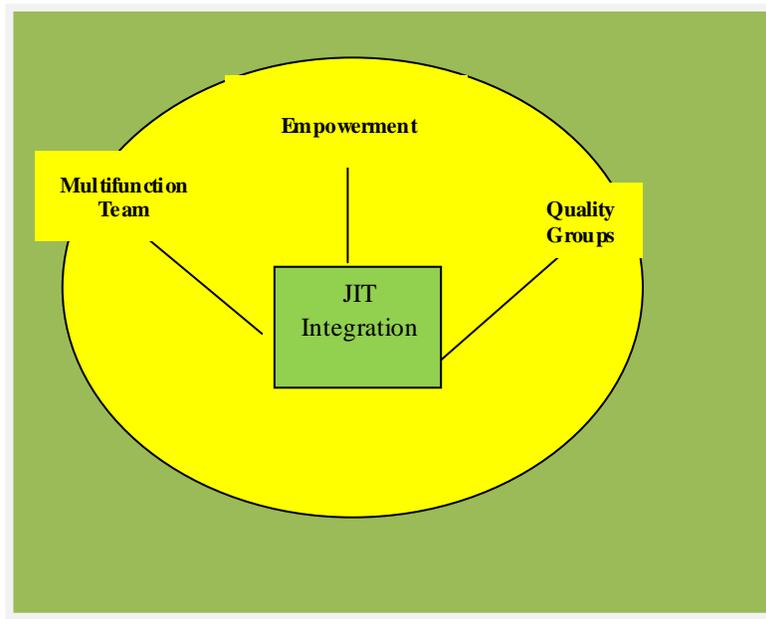


Figure (6) the core areas of integration JIT with human Resource

**Integration JIT with Knowledge Management Function:**

Laudon (2007) defined knowledge management (KM) as a set of process to create, store, transfer, and apply knowledge in the organization. Meanwhile, knowledge management promotes organizational learning by increasing the ability of the organization to learn from its environment and to incorporate knowledge into its business processes. Accordingly, the leader's real challenge is having the long-term vision of knowing what to do, the knowledge of how to do it, and the ability to develop people so they can understand and do their job excellently. The payoff for this dedication is more profound and lasting to a company's. Lawrence (2005) investigated the featuring of the Team

Manager/Coach approach which has the following characteristics :

1. Assign process responsibility

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2. Develop problem solving skills and encourage
3. Develop and encourage individuals and teams
4. Assure information flow to teams
5. Reward continuous improvement
6. Create collective wisdom
7. Pride in team achievement

Later on Wany (2011) pointed out the need to combine or at least to achieve the balance between learning through exploitation and learning through exploration. Further, exploitation includes processes captured by conditions such as efficiency, refinement, production, implementation and execution, whereas exploration concerns the acquisition of new behavioral capacities as a response to existing insights, incorporating terms such as search, variation, risk taking, experimentation, play, flexibility, discovery and innovation. On the other side, Shaofeng (2013) proposed a decision-focused knowledge framework including a multi-layer knowledge model (to capture know-why and know-with together with know-what and know-how), a knowledge matrix for knowledge elicitation, and a decision tree for the design of the knowledge base.

Hence, we indicate that the more important than the actual improvements where work force contributes the true value of continuous improvement in creating an atmosphere of continuous learning and an environment that not only accepts, but actually embraces change. Such environment can only be created where there is respect for workers.

According to the framework developed by Liker (1998) there are three key factors for success in the implementation of a lean effort: preparation and motivation of people, roles in the change process, and methodologies for change and environment for change. (Diego, Leonardo, 2007) . Later on Braley and David (2011) maintained that possibility of making lean on knowledge jobs if the organizations based on six principles: (1) continually root out all waste, (2) strive to make tacit knowledge explicit, (3) specify how workers should communicate, (4) using the scientific method to solve problems quickly, (5) recognize that a lean system is a work in progress, and (6) have leaders blaze the trail. Lean manufacturing is generally accompanied by a shift towards the exposure and solving of problems, both at the incremental improvements level for existing systems and processes, and to generate new methods and systems. This transition calls for a new

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approach in problem solving, putting the burden on teams and requiring the careful management of controversy and conflict in a way which does not affect ideas generation. Research into how to improve both the outcomes and the process of ideas management in teams is currently limited. (Forrester, 1995)

Figure (7) the core areas of integration of JIT with Knowledge management.

**Conclusion:**

The whole system essentially changes the roles of everyone in both manufacturing and support processes. In personnel terms, it offers a major paradigm shift through changing the role of departments and people at all levels in the organization. Changes in production process have also been accompanied by technical advances which herald further changes in the role of people in the operation.

This study aimed to development a framework in applying a Just-In-time system in the organization as a unique system across its core functions and presenting the context and content of the organizational system that contribute the effectiveness, efficiency, quality, flexibility, and innovativeness. Furthermore, all these achievements lead to reach the potentially of organization's competitive advantage.

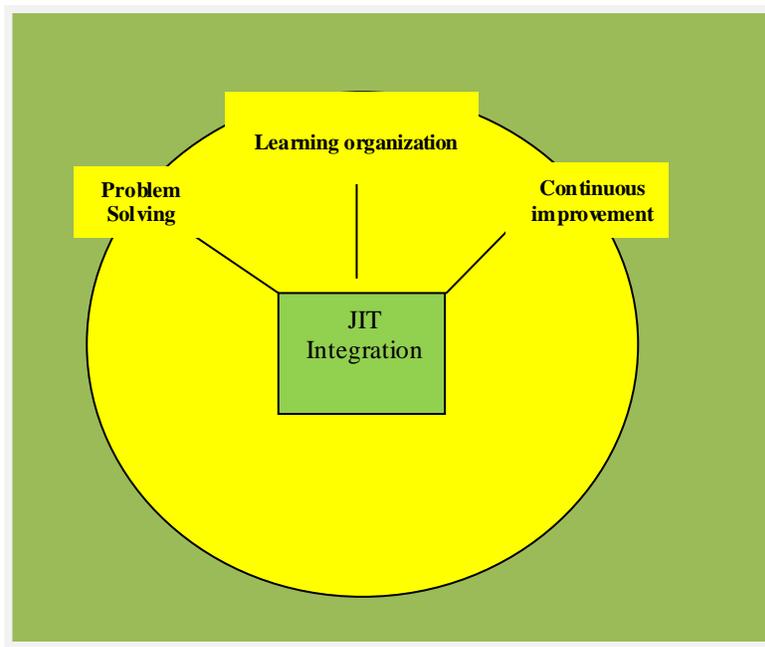


Figure (7) the core areas of integration of JIT with Knowledge

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