American Journal of Traffic and Transportation Engineering
2017; 2(5): 74-80
http://www.sciencepublishinggroup.com/j/ajtte
doi: 10.11648/j.ajtte.20170205.13

A Survey Study: Important Factors in Just-in-Time Implementation

Syed Abdul Rehman Khan, Dong Qianli, Yu Zhang*

School of Economics and Management, Chang'an University, Xi'an, China

Email address:
hinaabbas10201@gmail.com (Yu Zhang)
*Corresponding author

To cite this article:
Syed Abdul Rehman Khan, Dong Qianli, Yu Zhang. A Survey Study: Important Factors in Just-in-Time Implementation. *American Journal of Traffic and Transportation Engineering*. Vol. 2, No. 5, 2017, pp. 74-80. doi: 10.11648/j.ajtte.20170205.13

Received: August 11, 2017; **Accepted**: August 31, 2017; **Published**: September 29, 2017

Abstract: Just-in-time technique is used to enhance firms' performance, service level and reduce/eliminate waste from the end-to-end system. Undeniably, just-in-time is playing significant role in the today's world to achieve firms' objective in terms of high service level with minimum cost. This research' objective is to fill the gap by forming, organizing an complete picture of a Just-in-Time execution process from the opinions of both academicians and practitioners by comparing results based on different research methods. This research is based on secondary method used to collecting and summarize to the very relevant articles, which has been published. Uncountable studies including; said Just-in-Time education is a critical factor in JIT execution. The results show several factors involved in the just-in-time implementation such as, quality circle, reduction in set-up time, quality certificate of suppliers, cross-training, just-in-time education, relationship with supplier, schedule stability, top management commitment towards JIT project, in-house lot sizes etc. The researchers also discussed research implications in detailed.

Keywords: Just-in-Time, Supply Chain Management, Set-up Time, Top Management Commitment

1. Introduction

In today's manufacturer face several problems and hurdles including; dramatically minimizing the cost, making operations responsive & faster, higher customer service. To fulfil these challenges, several companies (US based) are finding for new ways to make effective & improve their ability to compete globally. One common techniques is JIT (just in time) concept. Just-in-Time is an approach to attaining excellence in a producing firm based on continuing elimination of waste as well continuous improvement in the productivity [1]. The understanding point of JIT is that "JIT is a continuous process – goal oriented- to minimize the waste and improve productivity of company as a whole.

If activities performed, and no productivity, value addition so then only waste will be occur. In a non JIT process, these no value added activities can be as much as almost 90% of total operations. Waste can be a physical form or no physical form like; excess lead time, down time, rework and lower space utilization as well over production. In the manufacturing firms of US, adopting the Just-in-Time philosophy to minimize these all wastes; JIT users, companies will be increases from 25% to 55% in the year of 1992 [2]. Nowadays, there are many JIT users in the year of 2015, and several fruitful benefits has been received by implementation of JIT system such as; reducing in excess inventory, increase quality, lead time minimization, increase in inventory turns, as well better utilization of labour and equipment.

While, if the concept of Just-in-Time is not executed properly, the necessary advantages are not obtained. Ref. [3] finds that in theory it is very easy to know and understand the JIT concepts, but these are very complex to execute because-off this concept JIT needs basic changes in a firm's structure. It involves changes in various basic elements of a firm like; procedure, people and processes.

2. Just-in-Time Causes Serious Changes in the Operations

There are some major issues, which should be understood whenever considering a switch towards JIT manufacturing

System. First of all, in a traditional system, employees are kept busy by letting machines run since an idle employee or an idle machine is considered a waste. But in the JIT system a machine running only for eliminating idle machine hours or men hours as a waste, Just-in-Time system are more focus towards the idea that nothing will manufactured until there is a need from the operation of downstream. Accordingly, idle employees are kept busy through running various machines. Since, every worker is well trained to a level where he may perform various jobs.

Second, there is important difference in the timing of manufacturing among traditional system and Just-in-Time, like MRP (material requirements planning) system. This is, basically Just-in-Time is focused and based over pull system which means manufacturing is initiated by existence of demand or needs. Material requirement planning, on the other side, initiate manufacturing in anticipation and expectation of future needs. It seems clear that the time lag among manufacturing and needs from the next operation generates what is called WIP inventories (work in process inventories). In the last, the different views by the two systems also exist when dealing, negotiating with suppliers. In the JIT system single sourcing is more preferred then multiple sourcing. Because- off the quality of the service and the product is the vital role criterion in vendor selection process. In the system of JIT, suppliers selection is based on best price at a given quality level as opposite to a low cost selection condition. As per the Japanese companies, found that's it easy to create the "co-producer relationship" with their supplier, if single sourcing is used [4].

Ref. [5-6] when JIT was introducing, here was multiple and controversial questions about the applicability of Just-in-Time. As now answers of the question, how Just-in-Time can be executive successfully in a past MRP dominant environment are more significantly important. The requirement of adoption of JIT system is very clear. In japan, manufacturers have a competitive edge today majorly because they are in advance of us in the manufacturing industry; Because of their excellent management system [7]. The system of JIT execution has become an important point in the literature of JIT over the last couple of years. A several number of researches based on surveys as well case studies methodologies have published. However, the results to date are mixed.

3. Mixed Results on Just-in-Time Implementation Factors

Ref. [8] the determination of the JIT critical elements during implementation phase and 19 elements they have proposed. As well elements has been categorise into four groups. As per their findings, the top management commitment was not very critical to the implementation effort, shocks us. In the implementation of JIT also involves a firm wide change in the same, pervasive way as it does in TQM (total quality management) execution. According to the TQM theory, everyone should be involved in the quality assurance works of services and products, process starts from top to down. Therefore, it's believed that the execution of a latest concept or technology, which needs pervasive organizational changed has to start with support and involvement of top management. Ref. [9] conflicting conclusion can be an artefact of using a single respondent within a company same as a material manager to complete the assessment somewhat than a generalizable end. Ref. [10] indicate that "manager's materials could be expected to be well aware characteristics of Just-in-Time delivery but would have less detailed information over product design changes resulting from Just-in-Time execution".

Research Objective

This research' objective is to fill the gap by forming, organizing an complete picture of a Just-in-Time execution process from the opinions of both academicians and practitioners by comparing results based on different research methods. This research is based on secondary method used to collecting and summarize to the very relevant articles, which has been published. Uncountable studies including; said Just-in-Time education is a critical factor in JIT execution. The findings from this article will provide first-time concentrate on in planning their conversion to a Just-in-Time system. If, as per the research shows education of Just-in-Time is significantly critical to a successful implementation of Just-in-Time then the results will help practitioners to improve the likelihood of a successful execution.

4. Methodology

In this research, a secondary method has been used to collect the most relevant published research, from the 15 professional international journals, during the period of 1988 to 1995. Because mostly research about JIT implementation has been published during these period; as per our surveyed, a total 53 research papers were identified, which were most relevant with our research's objective (see Table 1).

Table 1. *Survey of Journals.*

Name of Journal	Number of Articles
Production and Inventory Management and	29
Review and APCIS News	6
International Journal of Operations & Production	3
Management	2
Decision Sciences	2
Journal of Small Business Management	2
Industrial Engineering	1
Industrial Management	1
Academy of Management Journal	1
Industrial Marketing Management	1
Entrepreneurship: Theory and Practice Interfaces	1
Manufacturing Systems	1
National Production Review	1
Journal of Management Development	1
Hospital Material Management Quarterly	1

Those research papers were read couple of times by author in term to reflect accurately the study' original ideas regarding what are the important factors in a Just-in-Time execution process. As well and different elements, factors identified by every research paper, and some relevant data has been collected during the reading process including; year of publication, authors affiliations, the name of journals, type of research methodology etc.

We have conducted that survey for the JIT execution published research papers in an attempt to address the given below questions:

a. How differently is a Just-in-Time execution process perceived by practitioner's vs. academicians?
b. Is there any important and vital difference in the conclusions about Just-in-Time execution from the studies based on different methods, like survey, case studies and discussions?
c. In these all research papers, which have been reviewed; which Just-in-Time implementation elements were mentioned most frequently?

After the answer of above question, we believe it will be very helpful in making some decisions during the Just-in-Time implementations. Ref. [11] indicated just-in-time execution remains state of the art because just-in-time is a kind of "do it yourself" approach. As well as, the findings of various surveys and studies regarding Just-in-Time users reveal that few manufacturing companies used the published research as a source for their Just-in-Time education. Consequently, it is instrumental to give some statistics summarized from the published research as a source to show the existence of a variety of views regarding Just-in-Time execution factors.

5. Explanation of Factors / Elements

We started, with an explanation of the given below Just-in-Time execution factors, elements with help from published research papers and production management text books.

5.1. In-house Lot Size and Reduction of Set-up Time

Ref. [12] produce small lot size make enable just-in-time system to operate more effectively, so due to this action, the many fruitful benefits can get including; less space required, less WIP (work in process) inventories, as well increased flexibility in scheduling.

In a just-in-time system, reduction in set-up time of machine is needs to accomplish the ideal lot size of one unit. In execution of JIT practices, machines have to be set up regularly for manufacturing small lot sizes. Standardized set-up procedures need to be developed.

5.2. Group Technology and Cross Training

It is a technique of grouping machines, which do different tasks together into one work area so that this task can be performed without shifting a large number of WIP (work in process) inventories between different departments. This technology (group technology) differs by a traditional facility layout in that cross-trained employees might be needs to operate various machines within an area; cell and this technique minimize and eliminate the idle time of operators resulting by manufacturing smaller lot sizes and increase responsibility of operators for quality products produced [13].

It is necessary, when employees are encouraged to run multiple machines. Cross training operationalizes the concept of job enrichment that brings multiple responsibilities in quality of products to a person who is manufacturing them. However, quality can be improved, by involvement of worker in the process of production.

5.3. Vendor Lot Size and Preventive Maintenance

The vendors' willingness to deliver smaller lot sizes of parts and raw material on regular basis is very significant in execution of the Just-in-Time purchasing practices. The just-in-time that, such a delivery is making only when there is a required for the purchased materials by the next stage, area or operation at the same quantity needed [14].

In the just-in-time allows little WIP (work in process) inventory, machine breakdowns may be very big disruptive. The maintenance is required to keep a smooth flow of production. Maintenance and minor repairs are considered a part of line employees' job requirements. In the country of Japan, various JIT users need that employees be very responsible to operating their machines for minor repairs and preventive maintenance.

5.4. Vendor Lead Time and Single Sourcing

The lead time of vendor is an important element, when selecting a right vendor to build a long term co-producer relationship. In few cases, buyers might even allow vendors to set up manufacturing lines in their own area of plants so that will allow to shortened delivery time.

Traditionally, buyers regard price as a major element to choose a right vendor and tend to have various sourcing once a time to avoid locking themselves into sole sourcing. This strategy's downside is that it is very hard to sustain a relationship for long-term. While just-in-time depend a lot on vendor loyalty. In sole sourcing, purchasers intend to create trust with their supplier in delivering good materials at the required quantity and frequency.

5.5. Quality Certificate and Pilot Project

In the JIT, focuses is more over quality starting at the source of supply. Unlike a traditional production system, Just-in-Time views inspection of incoming lots as an inefficient activity. However, in the products it's not adding value. The certificates from vendors give authority to send materials directly from suppliers towards purchaser' production lines, by passing receiving as well inspection stages to reduce the disruption of the process of production due to the possible problems in delivering [15-17].

This is very common and popular approach to implementation a new system, which needs a lot of changes

in the structure of companies'; if the pilot project's results turn out to be very successful and good, the experience achieved from the pilot project will suggest a company-wide just-in-time executions. Ref. [18] 10 out of 14 studied plants they used pilot project first, before going to large scale implementation of JIT. The benefits of pilot project are the less disruption in production, the lower cost of failure during a process of implementation as compare with a large scale implementation in one a go.

5.6. Just-in-Time Team and Education of IT

JIT team is an experts' group, who are very educated and specialized in different functional areas within a company and work as a team during implementation of JIT process. Various researches indicate that teams of JIT were used by many users during the execution for smooth implementation of JIT process. Ref. [19] the implementation of JIT be initiated from the top management. However, JIT implementation pushes a lot of changes in a company's structure, it is very critical to know that the change may needs people to think and view things a in a totally different ways. The training of JIT concentrate on fundamental knowhow of the technical aspects of just-in-time and the impact of that will have on the operating environment. Usually the major mistakes, which firms do during implementation, they ignore to education, training and interpersonal skills [20].

5.7. Outside Consultant and JIT Champion

A traditional method to implement new technology is not application for a Just-in-time execution process, such as the use of a vendor. Hence, firms, especially small firms, find outside consultants as their basic source for guiding to their implementation of JIT.

This is a person, who initiates implementation of JIT. The champion will be responsible for leadership role in whole process of JIT implementation.

5.8. Other Factors

In the implementation of JIT involves an important organizational change, and commitment of employees is very critical and crucial for the successful implementations. As well suggestions from employees' side should be welcome and rewarded while keeping both informal and formal lines of communication open. The Jidoka concept initiated by Taiichi Ohno, which means stop everything when something goes wrong; the application of these concept advice that all individual is responsible for the products' quality or components produced by he or she. If anything going in wrong side, the operation hast the full authority to stop the production. However, the whole line is stopped, the other employees will do their housekeeping and machine maintenance work.

The quality circle is a team of employees, who fulfil the quality requirement. The possible solutions and optimum solutions to be problems are then discussed and proposed to the senior management [21]. The schedule, which is usually updated and prepared on weekly buckets, can be converted into the MRP (material requirement plan) in daily buckets so that the standard small lots can be manufactured repeatedly during the day. It might be compulsory to adjust the product mix from lot to lot in term to accomplish the required quantities of the products being manufactured.

The new system implementation cannot be successful without serious commitment from leadership, and JIT need it. Senior management must be willing to devote the resources which are required to support JIT system implementation including; training and basic education. A just-in-time manufacturing needs small lot sizes, high quality, and regular delivery of raw material. A good and smooth relationship with suppliers is very important to achieve these requirements. Such as, the Japanese make their vendors seem like the next level below the start of their manufacturing.

Just-in-Time tends to flatten out the bill of materials and eliminate, minimize levels of subassembly by redesigning products structures so that the preassembled components are used to create a large number of end items to customer orders. A bill of materials (two-level) might be made by treating a customer order as an end item and producing items from standard parts and materials to a level below the end item [22]. In the Just-in-Time, interdependence between co-workers is much emphasized since various JIT practices, such as authority to stop production lines and group technology needs employees to work together. It is very crucial to build congenial environment between the co-workers.

It is might be considered as the manufacturer system' ability to produce a variety of items, it also means being able to quickly responds to customers' requirements. This is play very critical role in any developmental and structural change in a firm as mentioned in many studies. The impact of such a change to a formal system is usually totally underestimated, because-off people at all levels in the firm might be resistant to new change due to bring out from comfort zones or fears of failure, misunderstanding. All possible channels of communication must be strengthened when Just-in-Time execution takes place.

6. Data Analysis

The analysis procedure has been used for the data collected from the published research papers in the journals, involves two steps. First step, is as illustrate in Table 2, a frequency distribution of all the Just-in-Time execution factors mentioned by the research papers surveyed exposes that more than half of the research papers consider quality circle, cross-training and reduction in set-up time as the key factors during the execution process.

Table 2. *Just-in-Time Implementation Factors.*

Elements	By Type of Research Method				By Type of Authors	
	Frequency	Survey	Case Study	Discussion	Academic	Practitioners
Quality Circle	26	9	4	13	15	11
Reduction in Set-up Time	23	6	4	13	13	10
Cross-Training	22	7	5	10	13	9
Quality Certificate of Suppliers	19	5	5	9	10	9
Group Technology	18	6	4	8	10	8
In-house Lot Sizes	18	4	2	12	12	6
Vendor Lead Time	18	5	5	8	12	6
JIT Education	17	6	2	9	11	6
Relationship with Supplier	17	7	4	6	11	6
Vendor Lot Sizes	16	6	4	6	12	4
Communication	13	3	1	9	9	4
Preventive Maintenance	12	2	4	6	4	8
JIT Team	12	1	3	8	5	7
Schedule Stability	11	4	2	5	7	4
Top Management Commitment	10	3	2	5	6	4
Fatten Bill of Material	10	3	1	6	4	6
Authority to Stop Lines	10	5	2	3	7	3
Co-Worker Relations	9	5	0	4	7	2
Investigate Suggestions	9	4	2	3	6	3
Pilot Project	7	2	3	2	5	2
Outside Consultant	7	2	3	2	5	2
Sole Sourcing	6	2	2	2	5	1
Flexibility	4	1	0	3	2	2
JIT Champion	4	1	0	3	2	2

Other elements like group technology, certified suppliers, vendor lead time, and in-house lot size, relationship with supplier's education of Just-in-Time, Communication, vendor lot sizes, preventive maintenance and JIT team stability were found in more than 10 out of the 53 research papers.

The second phase was to break down those frequencies into two main categories:

a. The type of research methods used
b. The types of authors affiliation

A non-parametric test has been performed in term to represent differences on the Just-in-Time execution elements concluded from these studies. However, the data collected are frequencies and can be ranked, the Kruskal-Wallis test was employed for examining the assumption that the distributions of frequencies for dissimilar groups of papers are shaped identically. The findings from the non-parametric tests shows important and vital differences with respect to Just-in-Time execution factors between the studies using dissimilar approaches like; surveys, case study, and discussion as well the research conducted by the practitioners and academicians were reported at a significance level of 0.0002 and 0.0035 respectively. Now it has been much cleared from our research that, variety of differences and views exists about the implementation of JIT process.

Researches have represented that the causes the Japanese firms are doing an outstanding job in the industry of manufacturing todays is that they are and they have better management system. The basic idea of the philosophy to which they are committed is to challenge everything. The Just-in-Time is goal oriented objective and need, should be executed on a contingency basis.

Table 3. *List of 10 Most Frequently Mentioned Factor,*

Survey	Case Study	Discussion
Quality Circle	Cross-Training	Quality Circle
Cross-training	Quality Certificate from Vendor	Reduction in Set-up Time
Relationships with Supplier	Vendor Lead Time	In-house Lot Sizes
Group Technology	Quality Circle	Cross-Training
JIT Education	Reduction in Set-up Time	Quality Certificate
Reduction in Set-up Time	Group Technology	JIT Education
Vendor Lot Sizes	Relationship with Supplier	Communication
Quality Certificate from Vendor	Vendor Lot Sizes	Group Technology
Vendor Lead Time	Preventive Maintenance	Vendor Lead Time
Authority to Stop Lines	JIT Team	JIT Team

Practitioner	Academic
Quality Circle	Quality Circle
Reduction in Set-up Time	Cross-Training
Quality Certificate from Supplier	In-house Lot Sizes
Cross-Training	Vendor Lead Times
Group Technology	Vendor Lot Sizes
Preventive Maintenance	Reduction in Set-up Time
In-house Lot Sizes	JIT education
Vendor Lead Time	Quality Certificate
Relationship with Supplier	Group Technology
JIT Team	Relationship with Supplier

It might be very helpful and interesting to view at the top 10 factors, elements showed most frequently by every category of the Just-in-Time research as shown in Table 3. Ref. [23] suggested 19 factors of JIT and combined them into

four groups by a confirmatory factor analysis. These groups are Just-in-Time production strategy, JIT education strategy, JIT vendor strategy as well management commitment. Ref. [24] it is difficult to recognize a general execution pattern and further they classified all JIT practices into three main groups: process related practices, quality related practices and planning related practices. In the light of JIT classification practices, the top 10 factors shown by the case study and survey types of research are fundamentally similar if the ranks of those factors are ignored. And these 10 factors are mostly vendor related practices, they quality related practices and the production related practices. However, these discussion kinds of research papers seen to put more focus over some companies' structure related issues like JIT team and communication. There is as such no significant difference exists in the top 10 factors perceived by practitioners and academicians except that JIT (Just-in-Time) education is replaced by preventive maintenance in the list of Practitioners. If significant of factors is truly reflected by frequency of factors showed (see Table 4), then a difference can be found in that the factors viewed very importantly through practitioners are received with less focus in academicians' thoughts perchance that difference truly shows the complicated nature of the implementation process of Just-in-Time.

Table 4. *Frequency of Research Methodology by Author's Type.*

Methodology	Practitioner	Academic
Case Study	11	1
Survey	6	4
Discussion	15	16

7. Conclusion

In this research, all perspective on Just-in-Time has not been considered. Such as the relationship of Just-in-Time execution to other managerial systems like TQM (Total Quality Management) has not been explored. Ref. [25] their case study supports the argument that Total quality management (TQM) should be implemented by suppliers concurrent with implementation of JIT by buyers to prevent carryover problems of quality. In a different perspective, our research's result shows only information over qualitative dimensions of the Just-in-Time system. Remaining points, whether this is sufficient; such as in a research [Ref. 26] call for more attention to correlation among the significant and crucial factors in Just-in-Time execution from a qualitative perspective. Identifying these limitations, our research still reveals various interesting dimensions and points. Top management, if interested in JIT implementation effectively; should be both relieved and concerned.

8. Managerial Concerned

First of all, based on the few number of the relevant published research, the implementation of JIT process has been viewed differently between the cast study, discussion and survey of research, we believe, shown 3 mainly vehicles in studying implementation of Just-in-Time. This will strongly support the conclusion made by other studies that an implementation of JIT process is contingent in nature. Managers should be concerned. There is no "stock" answer on how to execute Just-in-Time system. It needs planning and detailed analysis to coalign system of JIT principles with every firm's culture.

Managerial Concerns Relieved

Second, even with a great diversity of factors shown in the implementation of JIT' research, managers need to be relieved to seek that quality-related, production related and vendor related practices seem to play an vital and significant role in the implementation of JIT as evidenced by their popularity between the practitioners and academicians. Third, they should also feel relieved to find that there is an increasing number of research, which talk particularly with the practices of human-related such as; co-worker relationships and communications. We find that the new technology needs managers to consider the reactions of human-side from the line workers to be vital and significant important aspect of a successful implementation of JIT process. Therefore, employees' commitment to the process of implementation should be reinforced through education (for example, knowhow what Just-in-Time is all about and why it has to be Just-in-Time) and by responsibility (such as, what are their role and contribution to a successful implementation of JIT).

References

[1] Wallace, T. F., "MRP II and JIT work together in plan and practice", Automation, Vol. 37 No. 3, March 1990, pp. 40-2.

[2] Bockerstette, J. A., "Misconceptions abound concerning just-in-time operating philosophy", Industrial Engineering, Vol. 20 No. 9, September 1988, pp. 54-8.

[3] Brown, K. A. and Mitchell, T. R., "A Comparison of Just-in-Time and batch manufacturing: the role of performance obstacles", Academy of Management Journal, Vol. 34 No. 4, December 1991, pp. 906-17.

[4] Billesbach, T. J., "A Study of the implementation of Just-in-Time in the United States", Production and Inventory Management Journal, Vol. 32 No. 3, 1991, pp. 1-4.

[5] Im, J. H. and Lee, S. M., "Implementation of Just-in-Time in US manufacturing Firms", International Journal of Operations and Production Management, Vol. 9 No. 1, 1989, pp. 5-14.

[6] Inman, A. R. and Satish, M., "The transferability of Just-in-Time Concepts to American small business", Interfaces, Vol. 20, March-April 1990, pp. 30-7.

[7] Helms, M. M., "Communications: the key to JIT success", Production and Inventory Management Journal, Vol. 31 No. 2, 1990, pp. 18-21.

[8] Inman, A. R. and Satish, M., "Potential Union Conflict in JIT Implementation?", Production and Inventory Management Journal, Vol. 30 No. 4, 1989, pp. 19-21.

[9] Freeland, J. R., "A Survey of Just-in-Time Purchasing Practices in the United States", Production d Inventory management Journal, Vol. 32 No. 2, 2002 pp. 43-50.

[10] Belt, B., "MRP and Kanban: a possible Synergy", Production and Inventory Management Journal, Vol. 28 No. 1, 1987, pp. 71-80.

[11] Im, J. H., "How does Kanban work in American Companies?" Production and Inventory Management Journal, Vol. 30 No. 4, 1989, pp. 22-4.

[12] Hay, E. J., "Implementing JIT Purchasing: Phase I-Top Management's Commitment", Production and Inventory Management Review and APCIS News, Vol. 10 No. 1, January 1990, pp. 30-2.

[13] Mehra, S. and Inman, A. R., "Determining the Critical Elements of Just-in-Time Implementation", Decision Science, Vol. 23 No. 1, January/February 1992, pp. 160-74.

[14] Dion, P. A., Banting, P. M. and Hasey, L. M., "The Impact of JIT on Industrial Marketers", Industrial Marketing Management, Vol. 19 No. 1, February 1990, pp. 41-6.

[15] Adair-Heeley, C. B., "Team for Success with Just-in-Time", Production and Inventory Management Review and APCIS News, Vol. 9 No. 6, June 1989, pp. 26-7.

[16] Adair-Heeley, C. B. and Garwood, R. D., "Helping teams be the best they can be: the message in the milk bottle", Production and Inventory Management Review and APCIS News, Vol. 9 No. 7, July 1989, pp. 22-5.

[17] Byrd, J. Jr and Carter, D. M., "A Just-in-Time implementation Strategy at work", Industrial Management, Vol. 30 No. 2, March/April 1988, pp. 8-10.

[18] Faella, G. L., "JIT: Technique or Philosophy", Production and Inventory Management Review and APCIS News, Vol. 10 No. 7, July 1990, pp. 37-8.

[19] Helms, M. M., Thibudoux, G. M., Haynes, P. J. and Pauley, P., "Meeting the Human Resource Challenges of JIT Through Management Development", Journal of Management Development, Vol. 9 No. 3, 1990, pp. 28-34.

[20] Hotchkiss, P., "JIT: Where to Start", Production and Inventory Management Review and APCIS News, Vol. 11 No. 1, January 1991, pp. 28-9.

[21] Inglesby, T., "A model method for achieving just in time" manufacturing system, Vol. 7 No. 5, May 1989, pp. 54-6.

[22] Saad, G. H. and Salam, A. W., "Fitting Organizational Design to JIT", National Productivity Review, Vol. 11 No. 1, 1991/1992, pp. 97-104.

[23] Swenson, D., Malley, J. and Balsmeier, P., "General Living System Theory and Just-in-Time manufacturing: a framework for change", Industrial Management, Vol. 33 No. 5, September/October 1991, pp. 12-14.

[24] Khan, S. A. R., Dong, Q. L., & Yu, Z. (2016). Research on the Measuring Performance of Green Supply Chain Management: In the Perspective of China. International Journal of Engineering Research in Africa, 27, 167–178. https://doi.org/10.4028/www.scientific.net/JERA.27.167

[25] Khan, S. A. R., & Qianli, D. (2017). Impact of green supply chain management practices on firms' performance: an empirical study from the perspective of Pakistan. Environmental Science and Pollution Research. https://doi.org/10.1007/s11356-017-9172-5

[26] Khan, S. A. R., Qianli, D., SongBo, W., Zaman, K., & Zhang, Y. (2017). Environmental logistics performance indicators affecting per capita income and sectoral growth: evidence from a panel of selected global ranked logistics countries. Environmental Science and Pollution Research, 24(2), 1518–1531. https://doi.org/10.1007/s11356-016-7916.