

Achieving operational excellence with jit (just in time)



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The main method used in the race to gain Operational Excellence is JIT (Just in Time). JIT is an inventory strategy that Slack (1998) describes as 'producing goods and services exactly when they are needed'

The introduction of JIT (Just in Time) in Japan in the 1950s and early 1960s proved successful for the Toyota Motor Company and rapidly spread to further manufacturing plants. This report will explore JIT in further detail and evaluate the advantages and disadvantages of employing such techniques in a range of manufacturing plants however there will be a large focus on Nissan Manufacturing UK.

There is a range of planning and control techniques that can be implemented along side JIT to enhance the approach and can be fundamental to the overall success of JIT. They all stem from similar philosophical views of JIT. The author will be conducting research into the following methods some of which fall under the umbrella term 'Lean Manufacturing'. This will also be explored in further detail in this report:

MRPI (Materials Requirement Planning) or as it is now known as MRP II (Manufacturing Resource Planning). MRP is a system that oversees planning and inventory control. It ensures materials and resources are available when needed for production. It calculates the rate of end productivity being created from the line. Through the employment of JIT delivery of materials and interlinked delivery schedules, the MRP system manages the stock level so there is the lowest amount of inventory possible.

Total Quality Management (JIT/TQM) is a method that emphasises the importance of quality management in all process in the organisation. Flynn
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(1995) believes the ' use of TQM practices leads to improved JIT performance by reducing manufacturing process variance.'

Total Productive Maintenance (TPM) refers to the reduction of unplanned breakdowns by careful maintenance. It focuses on carefully structured maintenance procedures that reduce the possibility of down time due to malfunctioning of machinery. Cua (2001) states that ' TPM has...an indirect relationship through JIT with low cost, high levels of quality and strong delivery performance'

Setup Reduction (SUR) has a purpose of reducing ' the time, effort, and cost associated with changing a process from one activity to another' Slack (1998). This involves reviewing the simple mechanical changes carried out on the line and making them more efficient using an array of methods that will be discussed in this report.

Kanban is Japanese for card or signal. It is known for being pull-based planning of inventory control in comparison to the push-based planning of MRP. Slack (1998) describes Kanban in it's simplest terms ' is a card used by a customer stage to instruct its supplier stage to send more materials' This report will go into detail about the different types of Kanban and how they work along side JIT.

The Author's Background

Whilst working in the IT department at Nissan Sunderland during a placement year the author became very interested in the logistics and operational side of the company. Before Nissan, the author had no concept

of how a company would go about implementing procedures and methods that would be operating in the factory to obtain optimum end results.

The methods Nissan use to promote Operational Excellence were especially apparent during the year of 2008 which has been one of the most difficult and challenging years for all involved due to the economic climate, however it proved especially demanding for car manufacturers. The author was witness to redundancy, cut backs, and labour flexibility all of which were emergency policies in response to the economic climate to ensure the company's future.

JIT was especially imperative during this time period as car sales severely declined. As Nissan had taken the JIT approach to their manufacturing it meant they did not have a large amount of stock that had been paid for but could not be utilised in the manufacturing of cars due to very few orders.

Nissan utilises JIT and many of the methods mentioned in the introduction which will all be investigated to allow the author to evaluate how they enable a company to obtain operational excellence.

Literature review

Duggan (2007) describes Operational Excellence at operationalemployee level as being ' when each and every employee can see the flow of value to the customer, and fix that flow when it breaks down".

However Glass (2008) describes Operational Excellence in wider context and believes it involves the company ' establishing a business-wide vision,

measuring process performance against ideal and involving cross-sections of people in developing and implementing solutions.'

Accenture define Operational Excellence as sustaining ' operational performance...through continuous improvement '

Continuous improvement can also be known as the Japanese word ' Kaizen' which directly translated stands for " Change" and " Good".

The philosophy of Kaizen believes in ' continuing improvement involving everyone' Kaizen Institution (2009). Companies need to take a Kaizen approach if they wish to pursue their end goal of achieving operational excellence.

Smith (2002) believes that taking a Kaizen approach has ' helped many firms all across the globe to achieve better operational excellence and improve their productivity.'

Through the introduction of Kaizen in Nissan factories Nissan believe ' Failure is no longer viewed as a negative but as an opportunity for reflection, re-evaluation and the foundation for improvement' NMUK (2009) and the improvements now highlighted in the company are the ' result of very small Kaizen activities rather than huge company wide activities.' NMUK (2009)

Kaizen however can also be viewed in a negative light; Corrigan (2005) believes ' it fails to reach the right diagnosis about the nature of the problem'

Nick Rich who held Toyota's Elite Scholarship in Japan and is now a Director of the innovative manufacturing research centre based at Cardiff University, also holds a negative stance on the philosophy of Kaizen stating ' Kaizen just pushes the problem around the plant never getting the source of the issue and upsetting most people who come to work to do a good job'".

Mackle (2009) believes to use Kaizen ' may have a part to play in the implementation of change: it is not the right tool for analysing what to change or designing what to change to'".

Lean Manufacturing is a common method of improving manufacturing operations. It is described as being " A systematic approach to identifying and eliminating waste through continuous improvement by flowing the product at the demand of the customer." ProcessPro Software (2009)

Strategos Consultancy (2009) believes Lean Manufacturing also refers to " manufacturing without waste."

This waste or " muda" as it is known in Japan can be measure by various factors: obsolete inventory, preventable processing steps, unnecessary transportation of goods or people, time delays and poor quality of good. Most companies waste 70%-90% of their available resources. Even the best Lean Manufacturers probably waste 30%. TimeCompression. com (2004)

' Lean production is the name given to a group of highly efficient manufacturing techniques developed (mainly by large Japanese companies) in the 1980s and early 1990s. Lean production was seen as the third step in an historical progression, which took industry from the age of the craftsman

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through the methods of mass production and into an era that combined the best of both. It has been described as “ the most fundamental change to occur since mass production was brought to full development by Henry Ford early in the 20th century”.’ Economist. com (2009)

Manufacturing companies are using the fall in sales due economic downturn as a chance to reassess their manufacturing procedures and look for opportunities to improve their Lean Manufacturing methods.

Operational Excellence can be measured by a variety of KPIs (Key Performance Indicators) that are dependant on the company striving to meet all the agreed best practises.

- Traditional measures of lead time, on-time delivery, and quality are all good because they will support flow. To help build operational excellence, here are a few new ones:
- The amount of suppliers on a formal connections (as a percentage – higher is better)
- The amount of suppliers with a formal alert system (as a percentage – higher is better)
- The number of alerts that occur (at first, higher is better, as the problems are being made visible)
- The number of customer impacts from the supply chain (as a percentage – lower is better) Duggan K (2006).
- Quality in delivery – All our deliveries will be of the predefined quality and will always cover the full scope.

- Cost-efficiency – All our assignments and undertakings will always be as cost-efficient as possible. We will proactively suggest measures to cut costs and use efficient tools and methods to deliver at the required cost.
- Commitment to delivery – All our deliveries will be on time.

Sigma Kudos (2009)

THE HISTORY OF LEAN MANUFACTURING QUOTES JAMES P WOMACK

JIT is the most common pull manufacturing process. The basic method is that production at one level only happens when triggered by a request at the higher level, for example components are pulled onto the production line when activated by a customer order on a website.

Hutchins (1999) explains JIT as being ‘ The term used to indicate that a process is capable of instant response to demand without the need for any overstocking, either in expectation of the demand being forthcoming or as a result of inefficiencies in the process’

How does the implementation of JIT meet Operational Excellence?

What other methods can be used alongside JIT to achieve Operational Excellence?

Aim of the project

This aim of this report is to research and evaluate how manufacturing plants use JIT and other lean manufacturing techniques to achieve ‘ Operational Excellence’.

Objectives of this Report:

- * To identify what ' Lean Manufacturing' is.
- * To determine the methods used in ' Lean Manufacturing'.
- * To evaluate and assess the methods used in ' Lean Manufacturing'.
- * To identify how JIT assists manufacturing plants achieve ' Operational Excellence'.
- * To identify how manufacturing plants measure ' Operational Excellence'.

Methodology

The author will be conducting secondary research to explore how operational excellence is obtained by implementing lean manufacturing techniques such as JIT. The research found will be investigated to confirm they are from a reputable source and reflect current procedures.

Choosing to use secondary research data over primary research data is a wildly debated topic however I feel in this report secondary research is advantageous as the research process can be completed efficiently by the author. Primary research on this topic would be very hard to obtain as it is a specialist topic and is usually overseen by the management of a company based on their private statistics such as profit margins, down time and productivity. Therefore an unobtrusive approach is need for researching this subject area.

As qualitative research is an ' entire research conducted within the boundaries of trustworthiness, transferability, credibility, dependability and confirmability' Pickard (2007), the author will be evaluating the source of information for all the aforementioned aspects.

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The author will be mainly using books and journals for her secondary research. It is important to evaluate the books for possible out dated information as they can sometimes take years to reach publication. It is also imperative to be wary of ' theoretical slants... aimed at the academic market' Saunders (2007)

Journals may also be written with a bias slant, and ' not all academic journals are refereed' Saunders (2007) therefore the relevance and usefulness will vary. The author will take this into account when conducting her research.

This report will be compiled by carrying out qualitative research in order to determine the nature of the issue. The reasoning behind taking this approach is this method allows for ' multiple perspectives on the phenomena under study.' Pickard (2007).

It is also because companies can interpret Operational Excellence in various ways dependant on the business' end product and the area of focus detailed in their individual policy for Operational Excellence. Therefore specific facts and figures are only relevant to each individual company and cannot be used in comparisons with other manufacturing plants.

The aim of this report is to provide a complete, detailed description and evaluation of Operational Excellence and the methods used to achieve this. It is not looking at interpreting low level data and deriving information regarding the subject area.

The advantage of using qualitative research is that it seeks to understand other people's interpretations of the topic and the author will formulate a conclusion from further investigation.

It can be a very subjective method of research due to the competitive nature of the manufacturing world and each company claiming to be the leader in the race for Operational Excellence. However through diligent cross examination of books, journals and websites the author will be able to filter out bias views and formulate an objective view.

Nissan will be the main case study due to the author's previous work experience position within the company. Nissan will be supplying the author with some of their in-house documents and policies that are used to brief employees, supplier and customer.

The author will use cross-case comparisons to support their secondary research findings and the Nissan documentation.

In carrying out this comparison the author believes it will provide a solid foundation of knowledge to the topic by identifying similarities and differences. After the author completes careful analytical generalisations based on the cross-case findings this will then provide a broad understanding and insight into the topic.