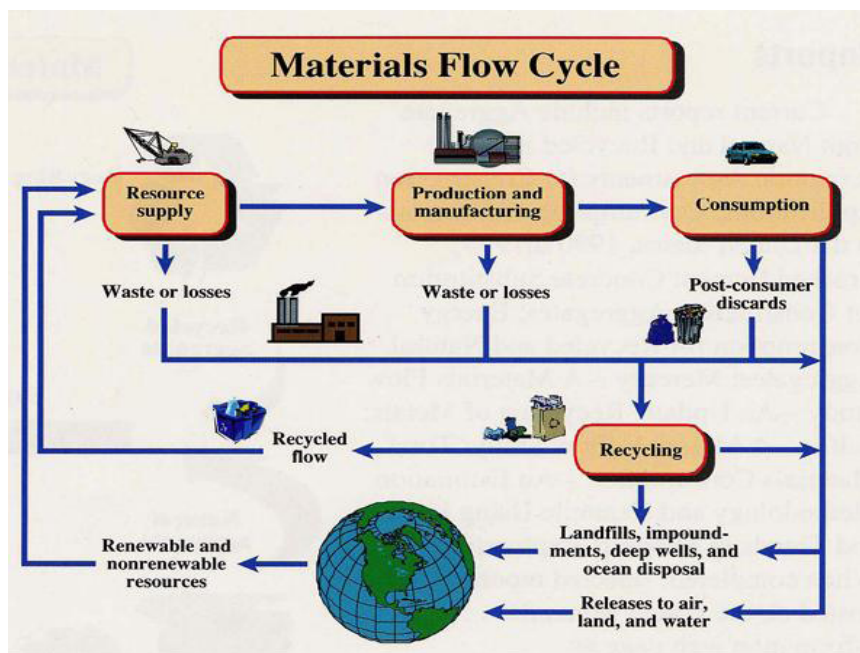


Materials Flow in Manufacturing Processes

Looking at materials flow in its broadest sense means understanding the entire lifecycle of substances; from the point it is extracted from the earth to when it becomes a final product we can use in our everyday lives, e.g. clothing, cars, food, etc. Below is a basic model demonstrating how materials flow occurs.



(USGS, 1998) Materials Flow in Industry

This article will look specifically at the flow of materials and information within manufacturing organisations and how Ad Esse has helped facilitate a more efficient materials flow system within this type of organisation. We will look at common problems faced when manufacturing goods and how specific tools and techniques can be used to overcome many of these issues.

WHAT IS MATERIALS FLOW?

Materials flow within manufacturing is the movement of materials through a defined process or a value stream within a factory or an industrial unit for the purpose of producing an end product.

The importance of a controlled and well-monitored materials flow is that it allows for a more robust and accurate understanding of the usage and waste of materials within a process, the cost to run the process, etc. This information is crucial when understanding and evaluating the value the organisation's process provides.

PROBLEMS OF MATERIAL FLOW WITHIN MANUFACTURING

As manufacturing organisations grow and their complexity increases, they become prone to losing their initial objectives of sustaining a simple process while taking on heavier and varied workloads.

For the majority of organisations, the most obvious solution for handling this is to take on more staff, buy more equipment, and make processes more complex in order to account for the additional work and higher set targets.

Although bigger plants mean potentially higher revenues, it also means a more complex value stream; and a lack of managing these streams of materials can result in any of the following:

- Increase in overhead costs (time, labour, etc)
- Increased waste
- Increased expenses
- Loss of potential profit
- Inaccuracies in monitoring and documenting materials flow (Enterprise Resource Planning (ERP) system)
- An evolving culture of mismanaged processing

Essentially an organisation's lack in vision of "what good looks like" is a common reason for why these issues arise. ERP systems help monitor information and allow for movement of that information within the factory to make day-to-day work easier to manage, and the presence of a well-designed ERP system provides the basis for an organisation to carry out best practice. However this is not always the case as a perfect process also means that the entire organisation must be integrated in a way that utilises the potential values of an ERP system, not just the flow of data. A key philosophy in achieving this is the application of Lean.

LEAN PROCESSES IN MANUFACTURING

Lean manufacturing is a generic process management philosophy known mostly from its use in the Toyota Production System but also from other sources. It is renowned for its focus on reduction of the 'seven wastes' in order to improve overall customer value.

There are various tools and techniques within Lean which can help facilitate a process which is as close to perfection as possible e.g. Just in Time (JIT), Pull Systems, Pokayoke, etc. At Ad Esse, we have used these techniques and many more to help provide sustainable improvements to manufacturing systems and through our extensive experience have proved the effectiveness and success of these tools.

AD ESSE WORKING WITH MATERIALS FLOW

Ad Esse has recently worked with a client within manufacturing, where we were asked to audit a global manufacturing company who employed a number of ERP systems into their different factories across the world.

Essentially, the purpose of the project was to identify issues within their different plants which would explain the lack of accuracy in their ERP systems and the effect this has had on the company as a whole. This demanding project meant understanding the entire flow of data and materials through the plants and ultimately providing the information needed to design and implement a single ERP system which would govern the entire enterprise.

At the time, the ERP systems used in the various plants were affecting the finance areas of the organisation meaning accountants could not provide management with a true picture of the businesses performance. The audit conducted by Ad Esse highlighted the key areas of failure which helped in the understanding of what would be required in a successful ERP system.

In achieving this, the application of Lean principles would further the effectiveness of the ERP system and in turn, would provide the organisation with the best possible framework for a sustainable process of materials flow. This would result in:

- Lower overhead costs
- Minimisation of machinery usage
- Increased accuracy in monitoring materials flow
- Smoother processing of materials
- Increased profits
- Reduced waste
- A culture of continuous improvement

What is important to bear in mind when auditing a factory of this scale, is that the understanding of Lean philosophies play a valuable role in exposing wastes, unnecessary costs, bad habits, etc. Applying this expertise into our consultancy with staff and the analysis of the plants' different flows are imperative when considering the scale of the implications a global ERP system will have on the company's future.

There are various Lean techniques which can be adopted in order to achieve a better materials flow, some of which are JIT, Pull Systems, Reduced Batching, and SMED among others. These tools, used in combination, provide a framework for materials flow to be carried out in the most efficient way possible.

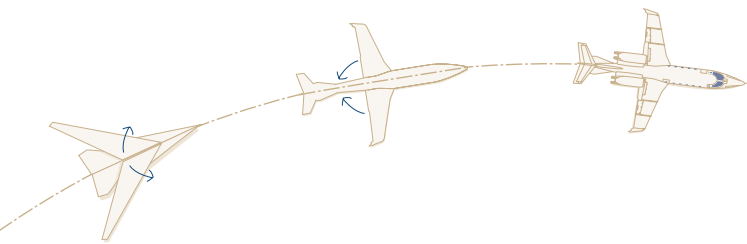
The theoretical understanding of these tools is one thing, but putting them into practice is quite another as there are so many considerations to take into account in each unique setting. This is where the element of change management understanding comes into play. Organisational change, staff resistance to change, training staff on new processes, and so on, must all be considered when aspiring for a better materials flow system.

Materials flow is not simply about understanding how materials get from one place to another. Some of the questions regarding materials that Ad Esse had to bear in mind were:

- Who pays for it?
- Who manages it?
- Are the costs recorded accurately?
- Are changes in costs accounted for?
- Are accountants receiving the right numbers?
- How well integrated are the systems?
- Are the current ERP providing the information required?
- Is the factory floor staff sufficiently trained?

An organisation's lack of understanding of some or all of the above factors, are often the reason for bad processes to occur. Without focus, factories tend to overcomplicate processes which although addressing some issues, end up creating others. As this article has highlighted, the vision of a better flow of materials has huge implications and impacts the organisation in a number of ways. Through the application of Lean techniques, the presence of the correct ERP system, and a clear definition of what perfection is to a company, the concept of making materials flow perfect can be increasingly close to reality.

Ad Esse's expertise lies in rapidly understanding specific settings and responding to organisational needs by identifying a blend of Lean tools to achieve the desired outcome. The experience and results Ad Esse has attained not only demonstrate the effectiveness of Lean in a manufacturing organisation but also its value and flexibility in any process driven environment.



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PHONE: +44 (0) 870 458 6162 EMAIL: seriousfun@ad-esse.com WEBSITE: www.ad-esse.com