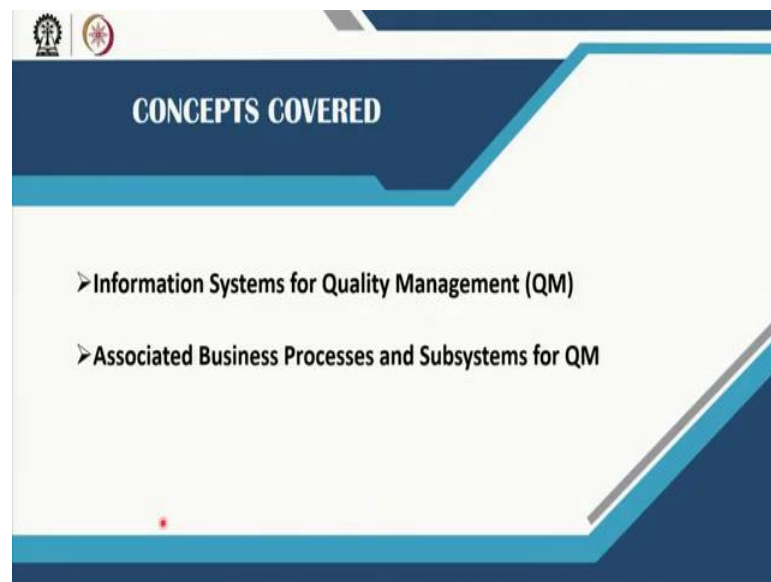**Management Information System**
Prof. Kunal Kanti Ghosh
Vinod Gupta School of Management
Indian Institute of Technology, Kharagpur

Week – 05
Module – 04
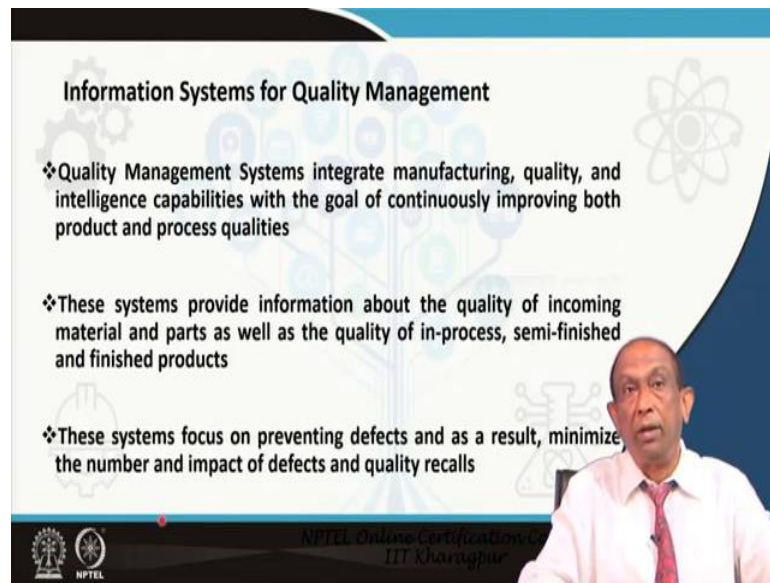**Lecture - 23**
Information System for Quality Management

Hi, welcome to module 4 of the 5th week on 'Management Information Systems'! In this module, we will be discussing about the 'Information Systems for Quality Management'.

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Like the earlier modules in QM which is Quality Management Information Systems for Quality Management, we will be discussing about the Associated Business Processes and Subsystems for supporting the Quality Management function.

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Quality Management Systems integrate manufacturing quality and intelligence capability with the goal of continuously improving both product and process qualities. These systems provide information about the quality of incoming material and parts as well as quality of in-process semi-finished and finished products are known from these systems.

So, these systems focus on preventing defects and as a result, minimize the number and impact of defects and quality recalls. So, very very important function is this quality management function and quality information systems provides full support to the quality control managers in order to enable them achieve their objectives in an efficient manner.

These systems record the results of all inspection activities and then, compare the actual results with the expected results that is the established metrics. Quality control data may be collected by sensors or radio frequency identification systems and then, interpreted in real time or they can be stored in a database for future analysis.

Quality information systems can also generate periodic reports on the percentage of defects or percentage of rework needed to keep managers informed of the departmental performance or of performance among departments.
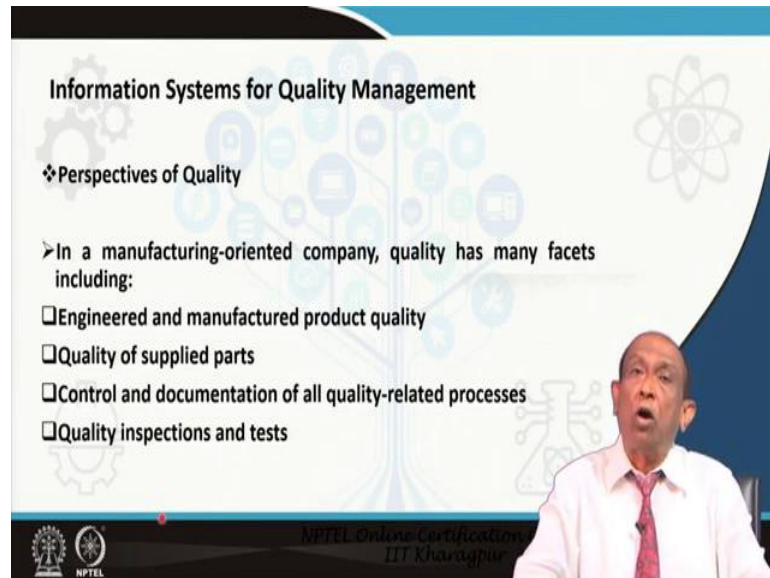
All people participating in the value adding processes can connect to these systems and benefit from high quality real time information about all elements of the supply chain.
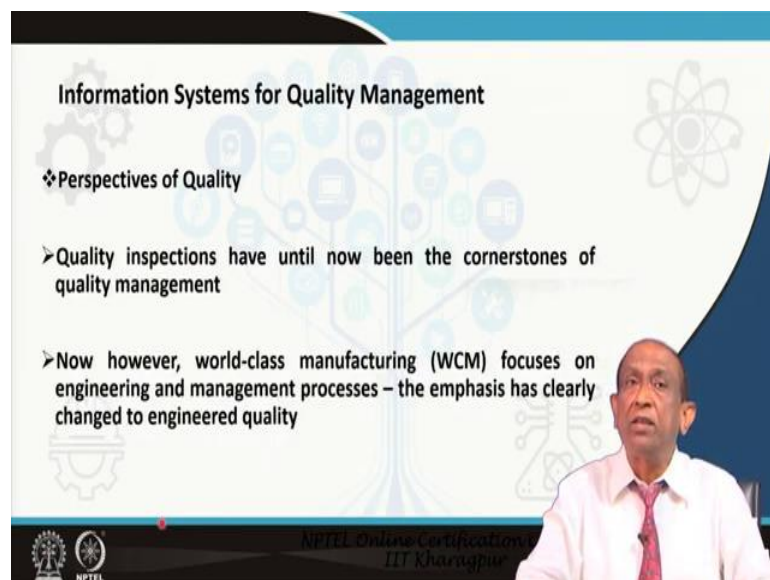
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In a manufacturing-oriented company, quality has many facets including engineered and manufactured product quality, quality of supplied parts, control and documentation of all quality related processes, quality inspections and tests.

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Quality inspections have until now been the cornerstones of quality management. Now however world class manufacturing focuses on engineering and management processes.

The emphasis has now clearly changed to engineered quality. Quality is inbuilt into the process where the assumption is that a quality process will necessarily generate quality products and services.

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Quality management system provides functionality for quality control throughout the supply chain. In here, you find a rich set of capabilities to plan and perform quality inspection of manufactured parts as well as of purchased parts or raw materials. Organizations can define inspection operations for in process inspections or they can use inspection orders to control purchased parts.

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Organizations may carry out inspections on a continual basis or periodically using statistical process control and quality management information system supports the quality personnel in carrying out those kind of instructions. All inspection data and quality information are available for online display.

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Quality management system uses the following basic data to control the tasks of quality management material, master containing the basic data for a material. In here in material master, all of you know starting from material identification number unit of measure the

ABC classification of the material, the dimensional data related to the material everything is captured, all the characteristics attribute pertaining to a material or a part is captured in the material master.

Then comes the inspection characteristics, the inspection methods to be followed for those kind of material, the sampling procedures for those material and the inspection catalogs.

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So, one must know what do we mean by inspection characteristics. Inspection characteristics in a plan contain a description of what is to be inspected, what is the inspection method that we need to follow, what is the sampling procedure and a dynamic modification rule for sample determination based on the quality history, the sample size might get changed, based on the quality history the sample acceptance number might changed. We may move from single sampling inspection to double sampling inspection plan depending on the history of quality of parts supplied by the supplier.

The inspection characteristics can be linked to a material specification which the quality information systems can use as an inspection specification.

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Various kinds of inspection plans are generated from the Quality Management Information System. Inspection plans contain inspection operations, inspection characteristics and the test equipment that need to be used. Inspection plans can be created using data on master inspection characteristics. Inspection plans can be assigned to the materials to be inspected.

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Now, we talk about quality inspection at goods receipt. Based on the settings in the materials database or materials master, the system creates an inspection lot at goods

receipt and this specifies how a material is to be inspected. The system facilitates the creation of an inspection lot automatically or manually. After the inspection, the results of this inspection are recorded in the system and based on this usage decision is taken.

Usage decisions mean whether to accept the material or not to accept that material. For a certified vendor, there is no need of inspection lot during goods receipt and all this information whether is a certified vendor or not is captured from the supplier database which is interfaced with the quality management information system.

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One of the important support that is derived from you know quality management information system is supplier evaluation, the vendor evaluation.

In some companies, of course vendor evaluation is provided by the MM subsystems or the materials management subsystem. In some company, the QM takes it over. Based on the usage decision of the material or parts that is depending on the quality of the material that is being sent by the supplier whether a particular lot of material is accepted or rejected, a vendor's quality score can be calculated that is the quality rating.

This quality score along with other criteria like the price quoted by the supplier which is basically determining the vendors price performance, delivery performance, whether the supplier is adhering to the specified delivery schedule. That means if the supplier is asked to send a lot of material on the 15th of the month, whether is able to deliver the

material within say, plus minus 1 of the 15 that means in between 14th to 16th of the month.

If the supplier is able to do that on delivery performance, he gets a full marks. Sometimes the supplier might be late in delivering the supply of that material, then his delivery performance he will get less marks on that particular category. Sometimes the supplier might dump the material much earlier than what is needed, then also he will be penalized. Another criteria like service performance, all these are important to find out the reliability of the supplier and which is also a very important component of a vendor's overall score.

Weightage is given to each criteria like vendors quality performance, vendors price performance, vendors delivery performance and some weightage is given to its service performance and then, a composite index which is the weighted average of all this performance is computed by the system in evaluating the vendor.

Of course, the criteria that are used may differ by organizations depending on the organizational objective and the type and product of type of product and service that the organization is buying. However, in most cases it has been found that quality price delivery and service performance are the most common criteria which is used across all industries.
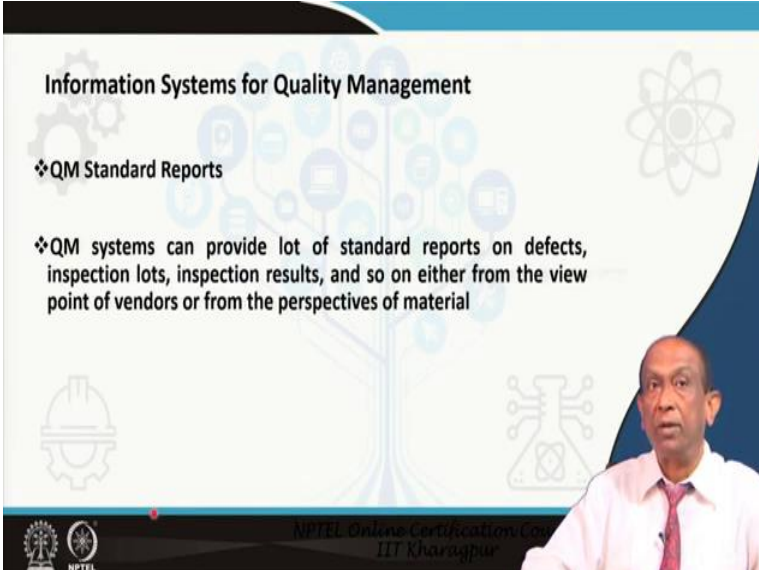
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Quality management information systems also provides support to quality managers, also materials managers in terms of blocking of invoices and sometimes blocking of vendors itself based on quality inspection.

The invoice sent by a supplier can be blocked as a result of quality inspection as and when an inspection lot is rejected. The supplier has sent an invoice, it has come to accounts department, but on the other hand when the quality personnel they have inspected a lot, they have found that the quality of supply is not good, they have rejected that lot. So, that invoice should not be paid.

So, the quality management information system will capture that quality of supply and automatically they will block the vendor's invoice and thereby organization will not pay for that particular invoice.

The quality management information systems also keeps track of the quality of supply of each and every vendor over a period of time and if there is continuous rejection from the same vendor, that vendor itself can be blocked by the quality information system.

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Quality management information systems may provide lot of standard reports on defects, inspection lots, inspection results and so on either from the viewpoint of vendors or from the perspectives of materials managers.

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If you see the role of Quality Management Information Systems in production, you will observe that the following quality management processes are supported during production. The first one is inspection during production, the second one is statistical process control and the third one is test equipment calibration. For all these, we require information and that is being provided by the quality information System.

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During production, the system uses statistical process control techniques to monitor and control the production process. This process involves the use of control charts like X-bar,

R chart, p chart, c chart to display the mean value and the standard deviation of those measured values, so that you can really understand the dispersion of those attributes.

Control charts are basically graphical tools that are used to determine whether or not a process is under statistical control and to detect external impacts on these processes and this is being supported by quality information system.

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And if the upper or lower limits of a control chart are exceeded, then the quality manager can infer that the process is out of control and the concerned process owner can take appropriate corrective action.

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Quality information system also helps sales and service personnel in delivering material as per customers' quality specification. Quality information systems can generate quality certificate which can be sent along with the delivery to the customer.

Batch tracking, batch determination and quality inspection for delivery, all these are supported by quality information system.

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The system QIS, quality information system provides support in delivering material as per customers' quality specification in a make-to-order scenario. The characteristics

required by the customer are specified in the sales order and these characteristics need to be inspected during production. QIS helps in achieving that.

Quality information systems generates quality certificate. When goods are shipped, a certificate can be produced by the system and can be included to document that the goods comply with the customer specification.
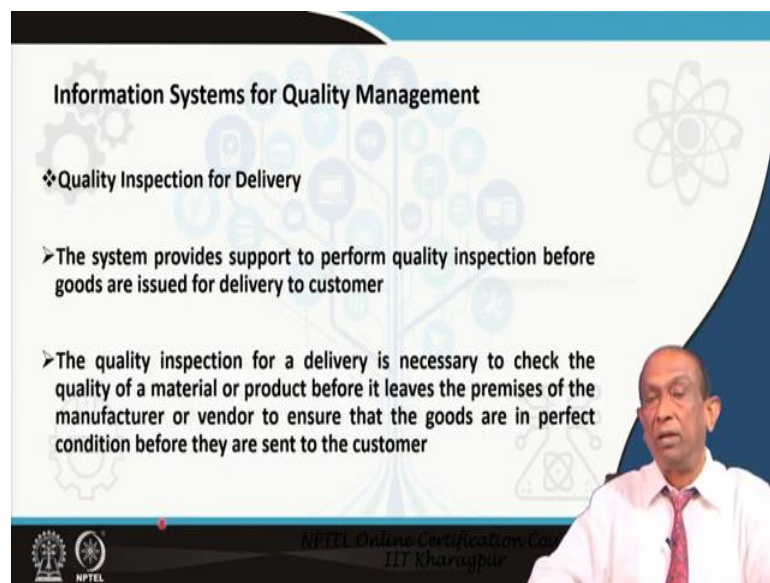
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Quality information system provides support to perform quality inspection before goods are issued for delivery to customer. The quality inspection for a delivery is necessary to check the quality of a material or a product before it leaves the premises of the manufacturer or vendor to ensure that the goods are in perfect condition before they are sent to the customers.

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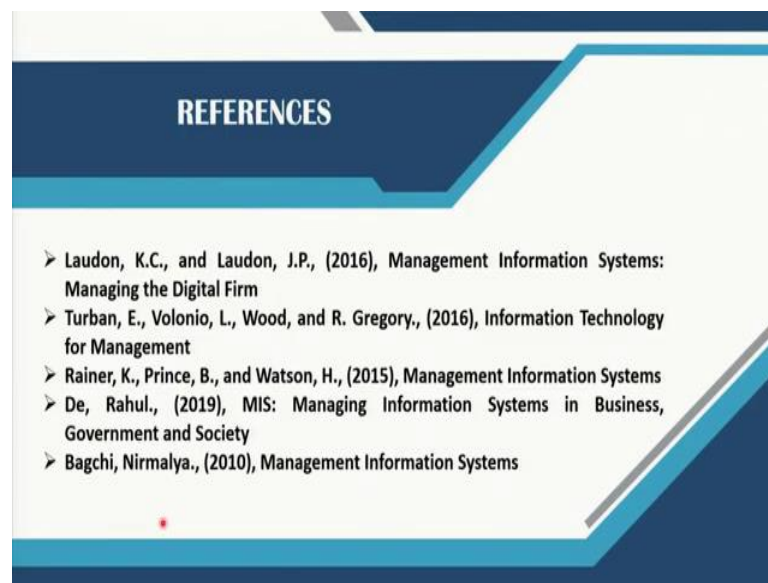
These are the references that I have used for preparing this particular module. You can go through these references to get a more detailed understanding of the role that is being played by quality information systems.

Thank you all for your patience!