Designing Work Organization
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Lecture-39
Workplace Technology and Design-1

In this particular session on the Workplace Technology and Design, we will be talking about the core transformation process for a manufacturing company, then the pressure affecting the organization design, core organization manufacturing technology, then the contemporary applications, difference between the manufacturing and the service technologies, designing the service organizations, then as usual the case study, research papers and the book recommendations. Now, when we talk about the what new technology does is create the new opportunities to do a good job that customers want done. So, this is a team of releases statement and therefore, the workplace technology is to be designed accordingly to the modern time or the customer needs as keep on changing. So, technology refers to the work processes, techniques, machines and the actions used to transform the organizational inputs, then like for example, material, information, ideas into the outputs that your products and services are there. So, technology is an organization's production process and includes the work procedures as well as the machineries are concerned. Core technology influences the organization design, understanding core technology provides an insights into the how an organization can be designed for the efficient performance.

An organization's core technology is a work process that is directly related to the organization's mission, such as teaching in a high school medical services in a health clinic or the manufacturing are concerned. The following figure features an example of the core technologies for a manufacturing plant. Note how the core technology consists of the raw material inputs, the transformation work process, the example is milling, inspection, assembly and that changes and adds the value to the raw material and produces the ultimate product or services output that is the sold to the consumers in the environment is there. In today's larger complex organizations, core work processes vary widely and sometimes can be hard to pinpoint is there.

A core technology can be partly understood by examining the raw materials flowing into the organization. The availability of the worker activities, the degree to which the production process is mechanized, the extent to which one task depends on another in the workflow or the number of the new products or the service outputs are there. So, core transformation process for a manufacturing company it comes that starts with the organization's resources and specially with the human resources are there. So, in case of

these raw material which will be used by these human resources and then these material handling will be done with this complete process is there. So, non core departments will be the human resource department because the people those who are working behind the machine or technology, so they are the human resources and accounting will be there, there that is a cost of that particular technology is concerned.

This will give the core work processes, material handling, milling, core technology inspection and assembly is there and this input that will convert into the output will be product or services will be the output is there. And then when we talk about this product or services outputs, the R and D and the marketing department because this will be the customer oriented and therefore, that will be also involved. So, here we find it is the core transformation process for a manufacturing company, it starts from the input to output and involving the core work processes, then the departments which will be involved non core departments other than the production department will be the human resource accounting R and D and the marketing will be there. The features of the workplace technology design, so breakdown information silos and create a portal for all internal data and the communication is there and this will be increasing the operational efficiency and keep a company culturally relevant is there. So, these features of the workplace technology design which are making these under different silos and in these silos they will come out with the all internal data and the communications are there.

Here is the operational efficiency is there which is keeping this the culturally relevant issues are there of the organizations. Here the delivery more precise and accurate data to help leaders make refined strategic decisions are there and these connect and align an entire organization. These facilities are collaboration among the dispersed teams and the increase the innovation and the productivity is there. Now, in the workplace technology we find out that is the how technology trends are the affecting the workplace design. For example, when we are nowadays we are talking about the remote working, so it is becoming increasingly rare for the modern offices to employees to work only from the within their corporate office.

So therefore, in that case, other than their corporate office, they are working from the far places also. The wide availability of the high speed connections, secure corporate networking and the cloud systems enables today's office workers to perform their roles from the home public or co-working space or even while the travelling is there. How these technology trends are affecting the workplace design is the improvements this has made to business operation is the undeniable. With the higher employees job satisfaction and the productivity and thanks to the reduced stress and the increased flexibility of being able to work anywhere and anytime is there. So therefore, in that case we find out that is the these are these employees those who can work from the remote places and this

technology is helping them for these making these more productive and satisfactory at the workplace.

Workplace flexibility is also is another dimension when we talk about the technology trends. So right technology use employees additional flexibility in the way they work and the improves the collaboration and the overall productivity and efficient work environment accommodation the needs of the each role with their the required technologies rather than the everyone using the same technology which is imperfectly suited to any specific role is there. Now this workplace flexibility by providing the each of your teams with the tools they need to perform their roles. Effectively you can create a work culture that empower staff to be in control of the way they work. Now this employee mobility is also the another dimension because the employees need to be able to access, edit and share information and the assets from any location and this will often involve using a mobile phone or the tablet instead of a computer or so make sure your technology enables these and works seamlessly on the all devices.

This your technology around the need of the your employees and the how each team needs to collaborate and share information to prevent mobile working from the impacting your productivity is there. Most of his workers now expect mobile working opportunities from their employees also to keep a high level of job satisfaction and retain the best talent it is vital to empower your people work their way. Now here the pressure affecting the organization design are the first is the strategic design needs. So, there here we find out that is the whatever the design need will be there and then accordingly we will consider the environment and strategic directions. This strategic design needs that will be populate to the next level the optimum organization design will be there and on basis of this the operational design needs will be there.

So therefore, the work processes here you find this strategic design and these operational designs and they are creating the organization structure. Here we have to understand that is the this particular design of organization architecture is there. So, it means that it depends on the what is the strategy of the organization accordingly the environmental strategies and the strategic designs are concerned that will be decided the organization structure. Similarly, the operational processes the work productivity that will be also decided by the organization. The previous figure illustrated the forces affecting organization design come from both outside and inside the organization are there.

Additional strategic needs such as environmental conditions, strategic direction, organizational goals create the top down pressure for the designing the organization in such a way to fit the environment and accomplish the goals are there. However, the

decisions about the design should also take into the consideration the pressures from the bottom up from the work process that are performed to produce the organization's products or services are there. The operational work process will influence the structural design associated with both the core technology and the non-core departments. Thus, the subject with which the chapter or topic is concerned is how should the organization be designed to accommodate and facilitate in operational work processes are there. Accordingly, the organization design will be decided.

The first and most influential study of manufacturing technology was conducted by the John Woodward a British industrial sociologist. Her research began a field study of the management principles in South Essex. So the prevailing management wisdom of the time 1950s was contained in what were known as universal principles of management was there. These principles were one best way the prescriptions that effective organizations were expected to adopt. So, Woodward surveyed 100 manufacturing firms first hand to learn how they were organized.

She and her research team visited each firm, interviewed managers, examined the company records and observed the manufacturing operations and her data incident avoid a range of the structural or such characteristics dimensions of management and the type of the manufacturing processes are there. She also collected data that reflected the commercial success of the firm. Woodward developed a scale and organized the firm according to the technical complexity of the manufacturing process. The technical complexity represents the extent of mechanisms of the manufacturing process. High technical complexity means most of the work is performed by the machines and the low technical complexity means the workers play a larger role in the production process.

Woodward's scale of the technical complexity originally had 10 categories as summarized in the following figure and these categories were further consolidated the three basic technologies groups are there. Now here we talk about these all 10 technologies where the British firms have been classified. The group one is a small batch and unit production is there. In the small batch the technical complexity here it was low and here from the technical complexity which was very high. So first we will go by the group one, the small batch in the unit production and the production of the single pieces to customer orders are there and here because of the small batch unit productions are there is a production of the technically complex units one by one.

The fabrication of the large equipment in the stages are there and here production of the pieces in the small batches was done. Production of the components in the large batches subsequently assembled diversely. Now this is coming under the large batch and the mass production is concerned. So production of the large batches and assembly in the

pipeline that has created the technical complexity. Mass production was there and the continuous process production combined with the preparation of the product for sale by large batch or the mass production methods were there.

So accordingly the group one and group two you find that is that complexity of the technology was decided. In the group three where these continuous process production was there. So continuous process production combined with the preparation of a product for sale for the large batch or the mass production methods are concerned and the continuous process production of the chemicals in the batches. Mass flow production of liquids, gases and solid shapes were there. So therefore, in that case we find that is these woodwards', this particular classification was divided into the three parts, small batch, the large batch and the continuous process production was there.

Now in the years since Woodward's research new developments have occurred in the manufacturing technology. The factory of today is far different from the industrial items Woodward studied in the 1950s. In particular computers and the information technology have revolutionized all types of manufacturing small batch and the large batch and the continuous process is there. Two significant contemporary applications of the manufacturing technology are the digital factory and the lean manufacturing is there. Most of today's factories use a variety of the new factoring techniques including the robots, numerically controlled machine tools, RFID wireless technology and computerized software are for the product design, engineering analysis and the remote control of the machinery is there.

And the ultimate automated factories are the, they have been reframed so as to digital factories are there. The digital factory actually also called computer integrated manufacturing and the flexible manufacturing systems. Smart factors, advanced manufacturing technology are the agile manufacturing, digital factors link manufacturing components then that previously stood alone. And the robots, machine, product design and engineering analysis are the coordinated by a single computer system. The digital factory is typically then result of these several subcomponents.

For example, the CAD is there computer aided design. So computers are used to assist in the drafting design and engineering of the new parts. Designers guide their computers to draw specified configuration on the screen including the dimensions and component details. The second is the CAM that is a computer aided manufacturing. So computer aided design and computer aided manufacturing processes in materials handling, production, production and the assembly greatly increase the speed at which the items can be manufactured.

So CAM also permits a production line so shift rapidly from the production one product to any variety of other products by changing software codes in the computers are there. Now manufacturing processes management and it is the MPM. New software referred to as manufacturing process management gives the managers the ability to build an entire virtual factory with the manufacturing layout, robotics machines in the convenient lines before the beginning physical construction is there. These integrated information network, a computerized system that links all aspect of the firm including the accounting, purchasing, marketing, inventory, control, design, production and so forth. The system based on a common data and information based enables managers to make decisions and direct the manufacturing process in a truly integrated fashion.

And the product lifecycle manufacturing PLM is there. The PLM product lifecycle management software can manage a product from the idea through the development manufacturing, testing and even the maintenance of the field. This allows the activities of the manufacturers, suppliers and other partners to be tightly integrated and the coordinated. The lean manufacturing, the digital factory reaches to an ultimate level to improve the quality customer service and the cost cutting when all parts are used to interdependency and the combined with the flexible management proposes to in a system referred to as a lean manufacturing. Now, the lean manufacturing was used highly trained employees at every stage of the production processes who take a painstaking approach to detail and the problem solving to cut waste and improve the quality.

Lean manufacturing incorporates the technologies elements such as the CAD, CAM and PLM, but the heart of the lean manufacturing is not the machine or the software, but the people. So, this we have to keep in mind that is the we go for this use of the technology, but the main process that remains the common that is with the people are there. And the lean manufacturing requires changes in the organizational systems such as decision making processes and the management processes as well as an organization culture that supports the active employee participation, a quality perspective and the focus the customers are there. Now, in this diagram, we will find flexible manufacturing technologies versus the traditional technologies are there. So, in the case of these product flexibility is standardized are there and the customized are there and the batch size is the small and it is the unlimited is there.

So, here the product flexibility small batch and therefore, in that case it is becoming totally customized one is there. So, flexible manufacturing will be having the this type of the different products which will give you the mass that is the customization is there. While the traditional is the mass production, so all are same and the choices that has been created that is have been the continuous processes are there. So, therefore, in that case, whether it is batch size is small or the unlimited or the product flexibility is standardized

or the customized is there, but definitely the mid path that is the mass population that has been well appreciated. Core organization service technology, so another big change occurring in the technology of organizations is the growing service sector and the service firms.

So, whereas manufacturing organizations achieve their primary purpose through the production of the product, service and organizational accomplish their primary purpose through the production and the provision of the service, such as education, healthcare, transportation, banking and hospitalities are concerned. The studies of the service organization have focused on the unique dimensions of the service technologies. The characteristics of the service technology as compared to the those of the manufacturing technology and here we find in this comparison, the service technology. So, service technology is having the intangible output as compared to the manufacturing technology, which is having the tangible output is there. And the service technology is production and consumption take place simultaneously, while in case of the manufacturing products can be invented for the later consumption.

Labor and management is intensive, while it is a capital asset intensive is there. Customer interaction generally high, here the customer interaction is converted into the capital asset intensives are there. Customer interaction generally is high, little direct customer interaction are there in the manufacturing technologies. Human elements are very important, human elements may be less important as compared to the service industry. So, quality is pursued and difficult to measure, quality is directly is measured.

Then the rapid response time is usually necessary, longer response time is acceptable. And the last one is the size of facility is extremely important, the size of the facility is moderately important is there. So, here we find the differences between the manufacturing and the service industries are there. And for example, service industries airlines, hotels, consultants, healthcare and in case of this production, we find out that is a fast food outlets, then these soft drink companies, steel companies, automobile manufacturers, mining corporations, food process plants are there. So, products and services are the cosmetic real estate, stockholders and retail stores are there.

So, this is the framework for analyzing the customer service organizing in the manufacturing has been observed. The features of service technologies was a distinct influence on organizational structure and the control systems in the need for the technical core employees to be close to the customer. The difference between the service and product organization is initiated by the customer contact are summarized in the following figure. The structural characteristics are these separate boundary levels, geographical and dispersion decision making and the formalization is there, which is having the few much

and centralized lower is there. So, product is the separate boundary less roles are many, the geographical location are little, the decision making and decentralized is less and centralized is more.

The formalization that is lower and then that is higher is there. So, human resources are the employee skill level, it is the higher level is required in the service industry, while in the case of the manufacturing it is lower level is required. Skill emphasize on the interpersonal skill emphasize on the termination between the employer and employees relationships are concerned. So, designing the work organization service from deals in the information and intangible outputs and does not need to be large. Its greatest economies are achieved through the dysregulations into the small units that can be located close to the customers.

The other workers, doctors, clinic, consultant firms and the bank, so disperse their facilities into regional and local offices. Manufacturing firms on the other hand tend to agree operations in a single area that has raw material and then an available workforce is there. A large manufacturing firm can be take advantage of the economies derived from the expensive machinery and the long production runs are there. Service technology also influences internal organization characteristics used to direct and control the organization. For one thing the skills of the technical core employees typically need to be figured higher and these employees need enough knowledge and the awareness to handle the customer problems rather than the just enough to perform the mechanical tasks are there.

So, employees need the social and interpersonal skills as well as the technical skills because of the higher skills and structural dispersion decisions making often leads to the decentralized in service firms and the formalization tends to be low. Although some service organizations such as the many food chains have set the rules and procedures for the customer services, but the employees in the service organizations typically have more freedom and discretion on the job is there. Here I would like to mention this particular case study the Jugnu was an application based service offered the residents of the city of Indore. A wide variety of the household service such as a delivery of the groceries, plumbers, carpenters, electricians etcetera. It allowed the customers to book whatever service they required through the application.

Thus the Jugnu gained the popularity due to the diverse background of its employees who had the ability to offer their customers a wide range of services. Owing to its flexible working conditions, Jugnu enabled the workers to take up the independent projects as well as in the time that they would not be catering to any of the organizations' customer. Irrespective of the number of the cleaners workers booked, his trade was faced

in the case of an exceptional service. A bonus was awarded over and above the base salary. However, after its initial success, the organization is ordered to increase its profit, manage the login to took into part of the cutting cost cutting is there.

They started off by making the changes into the employees contract instead of having a minimum salary. The organization now started paying at workers based on the clients they managed to attract. As a result of working for the occupation lost its the appeal for a lot of these the workers for whom it used to be a stable source of the income and the more upon once upon a time. Since there were the often times when they went on these days without getting any work, they saw no benefit in putting into the such energy and efforts in that travelling all around the city just to serve the organization's customers. They felt that the focusing on their independent clients who were the usually concerned in the one region was less enthusiastic while the workers were being paid less, the customers were being charged more than before for the same of the services.

Thus with the time the service organization started losing its customers as well who restarted the offline system of the home service providers. So here we find that is these concepts of these separating complex choice in a series of small jobs and exploiting the economies of scale is a cornerstone of the traditional manufacturing but the researchers have found that applying is to service organization often does not work so well. So some service firms have redesigned jobs to separate how and the high the technical customer contacts activities with more rules and strategies in the low contact jobs. Higher service jobs like the junior need more freedom and can be contacted in the safety customers are there. So here we finally come to the research paper and this is using the visualization technologies for design and planning of a healthy construction workplace is there and the purpose of this paper is to investigate how health and safety gains and improvements of the construction workplace can be made through the use of the 3 dimension, 3D and 4 dimensions, 4D visualizing the technologies are there.

So this paper will be talking about it is how this adoption of technology that is making the difference and which have affected the working style of these the organization. This is a book recommended for the software by design shaping the technology in the workplace author are the Harold Salzman and Stephen R. Rosenthals is there. Now this book provides a general examination of the critical role played by the software and the computer technology in the workplace and the authors assess the key social factors that contribute to the workplace technology design including the organization structure, the workplace relations in the market conditions are there. So here from this book you can understand that is how the technology is designed and address the issue both the theoretical and practical level and given an insight for the software designers, managers and computers, engineers are there.

These are the references which you can refer for your further studies. These references will be helping you to get the more database about these thinking process that is how the technology with the current time changes with the manufacturing and service industries. These are the references you can refer for the further details which will be helping you to identify that what is and how it is the technology is used for the small, medium and large enterprises. Thank you. Thank you very much.