

Work System Design
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Lecture – 07
Causes of Low Productivity

Namaskar friends, welcome to session 7 in our course on work system design, we are currently in the second week of our discussion in the course and we are focusing our attention on the word productivity. Why it is important? I think I have highlighted in the previous week also and in this week also, in the very first session we have covered the factors affecting productivity. Now, if you take into account all these factors, we will definitely get headway or a lead that how we can improve the productivity of our organisation.

So, if we are able to concentrate on these factors, we will certainly be able to pinpoint the areas of improvement. In today's class, we will be having a discussion on causes of low productivity because once we know the factors affecting productivity, we know that what can be the probable causes of low productivity, then we can attack these causes, we can attack these factors and try to improve the productivity of our organisation.

So, if you know the factors and causes, they are certainly going to help us identify the areas of improvement, we can see that what areas of improvement do exist in the organisation where we can put concerted efforts, we can put pinpointed effort and realise our overall objective of productivity improvement, efficiency improvement leading to the profitability of our organisation. So, we will today try to identify common causes, why common I am saying?

Because each industry is different, each organisation is different, some of the organisations may be weak in a particular area, the all successful organisations are good at most of the areas and excellent in some of the respective areas of their influence or of their organisation but there are organisations which are different, so they may be weak in one particular area, the areas that are identified here are common in nature.

So, maybe that some organisations are doing poorly or are not able to generate good resources or good output because they are poor in a specific area, some other organisation may be poor in some other specific area, so this is our combination or we can say a summary of the reasons that lead to low productivity among the various organisations. So, a company and organisation and industry or an enterprise, they can focus on these causes.

And see that we are good out of 6 causes or 5 causes, we are good in 4, so we are lacking in these 2, so these 2 can be identified and then they can put efforts in order to improve or improvise on these 2 causes and try to be successful or try to be more productive, more efficient, more effective, more profitable, so that is the overall objective of every organisation to be economically well or to be performing economically well.

So, today we will try to identify these causes and then maybe in the subsequent session, we will try to see that how we can improve the productivity, so then we will see certain guidelines, certain areas in which we can put efforts and try to improve over productivity or try to improve our profitability. So, let us now quickly run through this presentation, so we can see causes of low productivity.

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Causes of Low Productivity

- **Wastage of resources** during manufacturing/consumption.
- Increase in **wages and incentives** without considering increase in productivity.
- **Delays and backlogs** caused by strikes, maintenance breakdowns, slowdowns, scarcities and bureaucratic structures.

First is wastage of resources during manufacturing or consumption, so if we have not able to check the wastage of materials, our productivity will be less, which means that all the input

material that we are giving into the system is not getting transformed into the output or sometimes, the output that we are producing may not be of the desired quality. So, if you know by now I think it must be clear to all the learners that productivity is a ratio of output to input.

So, wherever the wastage is there, we are using more materials, less getting converted into the final product, so automatically productivity will be low, so the input becomes more, the output is low, so the overall productivity will be less also, the increase in wages and incentives without considering increase in productivity. So, if you remember in our productivity improvement models, we have seen in one specific model, I leave it as an assignment to you to go, cross check and verify in which model we have used wages and incentives and benefits in the denominator.

So, which means that wages and incentives are also an input that goes into the calculation or measurement of productivity, so our input is increasing when we are increasing the wages and incentives, the output if remains same, our productivity is bound to decrease. So, therefore while increasing the wages and incentives, we must also ensure that this may lead to increase in the output of the organisation.

So that when the output will increase, a proportionate change in the input in terms of increase in wages and incentives will not offset our productivity at least, the productivity will remain same and if by chance or if by design, we are able to increase the output at a much higher rate as compared to the input that we are increasing in terms of wage and incentive, our overall productivity may also increase.

But we sometimes, in most of the companies we say when we increase the salaries, when we increase the incentives, we do not try to correlate it with the increase in the output and therefore, our productivity becomes less. Then the delays and backlogs caused by strikes, maintenance, breakdowns, slowdowns, scarcities and bureaucratic structures. So, many times all these reasons may also be leading to poor utilisation of time.

Sometimes, because of a unnecessary bureaucratic movement of files from one place to another place may also lead to loss of time, effective man hours are lost and when man hours are lost that

also leads to decrease in the input where that is may be the person is spending time in the industry but the time is not a constructive input into our calculation and therefore the productivity may reduce.

The other causes are also highlighted here, outdated systems can be another cause because we may be relying on some technologies which are not prevalent or better technologies are available and we have not adopted to those technologies, so that is also a reason of low productivity, low motivation levels in the organisation, so as we have already discussed one of the important factors is the human resource factor in defining the productivity of an organisation.

So, if the motivation levels among the employees are very, very low, so they will be less productive, labour productivity will be less and also the total productivity of the organisation will also not be very high, it will also be low. Then the exhaustive work which employees do not find satisfaction, so an employee is overloaded with a lot of work, he is not enjoying his work so his productivity will automatically be less.

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Causes of Low Productivity

- **Outdated Systems**
- **Low motivation levels** in the organization.
- **Exhaustive work** which employees do not find satisfaction with.
- **Uncertain market** conditions.

Then uncertain market conditions, so if the demand is certain, we know that this much product will be sold in the market, we have used our sales forecasting methodology or sales forecasting techniques for accurately forecasting the demand in the market, we will utilise our resources in the most optimal manner but if the demand is uncertain, we do not know then we have to keep a

lot of inventory, we have to keep a lot of raw material, we have to keep people ready to meet the demand, so we may have some people on bench for whom we have no work.

But we have kept them on bench, so that whenever the demand will be there, we will have the people to satisfy your meet that demand, so uncertain demand may also sometimes lead to non-optimal utilisation of resources that means that we are wasting some of our resources and those resources are adding into the inputs that are going into the system but are not translating into a tangible output thereby leading to low productivity of the organisation.

So, these are some of the points I have tried to outline and try to explain very briefly with emphasis on certain examples, now we will try to understand each one of these in a slightly more detailed and may be suggest that this may seem too theoretical to understand but these are going to form maybe a thought process in our minds, while we look at organisation, when we work for organisation, we have to suppose improve the productivity of our operations immediately a structured approach will come or occur into our brain or will come to our mind that these can be the reasons which are leading to low productivity.

Then, how we can increase the productivity that we will try to address in the next session, so it is theoretical but I advise that all learners must at least try to frame 1 or 2 examples of each one of these or may look for case studies, which are readily available in most of the books regarding these points that for example, the outdated systems, you can put it in any search engine and try to find out how outdated systems have led to low productivity of an organisation.

Also, you can try to look for a case study where you can put how the uncertain demand conditions have led to low productivity, how the employee morale has led to low productivity, how the; we can say non optimal utilisation of resources have led to low productivity or how the wastage has led to low productivity, so we; each one of you must try to understand these points with the help of certain examples.

So, once you remember the example, you remember a case study the point will always be ingrained in your mind and whenever maybe you join a particular organisation, the

administration gives you a task of improving the productivity of its operations are structural may be thought process will be initiated in your brain or in your mind that we must focus on a specific set of parameter, specific set of causes and try to improvise on those causes, find out remedies for those causes and improve the productivity of our organisation.

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Wastage of Resources During Manufacturing/Consumption:

- An increase in the input for the fixed output is always going to affect the productivity.
- Wastage of resources often lead to increase in the input subsequently affecting the productivity.
- Concepts of lean manufacturing should be employed to avoid wastage.

So, with this background now quickly we will try to highlight each one of these points and try to understand the intricacies involved that why this particular reason lead to low productivity. First one is wastage of resources during manufacturing and consumption and increase in the input for the fixed output is always going to affect the productivity. So, if you know productivity is the ratio of output to input.

Mathematically, we can say productivity is inversely proportional to the input, so if our input is going to increase, the productivity is going to go down or it is going to decrease, so if we say that an increase in input for the fixed output, I have already emphasised, output remains constant our input is increasing because the material; more material we are using, it less material is getting transformed into the tangible output.

So, an increase in input at fixed output is going to lead to low productivity, now wastage of resources often leads to increase in the input subsequently, affecting the productivity. So, what I have already explained that output by input anything if it increases in the input, this definitely

going to adversely affect the productivity. Then, if our input is increasing suppose and in the same rate our output is also increasing, then the productivity will remain constant.

And on the other side on the better side that if input is increasing, now for example, somebody is studying, so he studies for 2 hours every day and scores a CGPA of 7, may be the subsequent semester, he studies for 3 hours a day and his CGPA becomes a 9.5, so we can say with a 1 hour of additional study every day, the student has been able to increase his CGPA from 7 to 9.5, so we can say the proportionate change in CGPA is good as compared to 1 hour of extra time that he has given.

So, the input is increasing, the time he is spending is increasing, whereas the output in term of CGPA is also increasing, so we say that the he has become more productive by putting a little extra input he has been able to get an extra output in terms of higher CGPA, the example may not be that relevant but it emphasises the point that an increase in input if it leads to a very high proportionate change in the output, still the productivity will increase.

But we are talking in the positive sense, our topic today is slightly on the negative sense that what are the causes for low productivity, so if the input is increasing, output is not changing, the productivity will automatically be less. The concepts of lean manufacturing must be employed to avoid wastage, so lean manufacturing tries to eliminate all kinds of waste, so we can take the example maybe I am slightly fat, so we can see how I can become lean.

So, whatever extra fat is there on the body that may be reduced by running or jogging or by playing games or by reducing the input that I am taking the food, the fatty oils, fatty foods can be avoided, so become lean. Lean means, we should shut away all the extra things only whatever is required must be taken into account, so the concepts of lean manufacturing can avoid the wastage of materials, wastage of time, wastage of resources.

So, it will lead to a good utilisation of the input in transforming it into the output, this is just one concept which has been introduced. The lean manufacturing can help us to minimise the wastage, there are other terms also like Agile manufacturing, then there is a legality, so different

terms different concepts have been developed by persons, researchers, engineers, scientist working in the area of manufacturing science and engineering.

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Increase in Wages and Incentives

- The organizations are often not successful in correlating the salary hikes every year with the improvement in productivity.
- This imbalance of increase in the input (salaries) often affects the total productivity equation.

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And they have developed tools and techniques which focus on minimising the waste, so this is the first you can say cause of low productivity that is wastage of resources or materials. The next that we have seen is the increase in the wages and incentives. I have already explained it I think in detail that if you increase the wages and incentives and in one of the production, sorry; productivity measurement models we have seen that wages and incentives are in the input.

And input in case of productivity measurement is inversely proportional to the productivity, so if input is increasing without any change in the output automatically, the productivity is going to go down and that is basic reason for one of the causes for low productivity, when we increase the wages, benefits, bonus etc. of the employees without any change in the output automatically, the productivity is going to go down.

The organisations are often not successful in correlating the salary hikes every year with the improvement in productivity, so the salary hike will be there every year but the output in terms of products or in terms of processes or in terms of the volume of products, volume that we are producing is not changing. So, the output remaining constant, input is increasing the productivity goes down.

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Delays and Backlogs

- The external factors such as the ones mentioned above also result in non-value added time and resources are wasted leading to low productivity.
- Every organization should focus on these exigencies and should always be ready with the contingency plans for maintaining high productivity. ◦

The imbalance of increase in input that is the salaries often affects the total productivity equation, which I have already explained. Then there is this concept of delays and backlogs, so the time is an important input in the productivity measurement and if time is getting wasted again, the productivity is going to go down. The external factors such as the one mentioned above also result in non-value added time and resources are wasted leading to low productivity.

So, there are number of factors like we are not able to get our raw material in time, so it may cause a delay, there is a unscheduled breakdown of a machine which is causing the delay, there is a strike among the employees, so that also, there can be fight among the employees, there can be a fire in the workplace because of non-adherence of fire safety rules and regulations, so there can be number of parameters which can lead to delays and backlogs.

We cannot list all the reasons that can lead to delays and backlogs but delays and backlogs will definitely affect the optimal utilisation of time and time is one of the most precious commodities for any organisation. So, if the things are getting delayed, there are backlog of orders, automatically the productivity will come down. We will try to make up for this time by expediting some of our operations and processes and in the process of this speeding up the operations, there may be errors.

And these errors may further, may be affecting, further affect the productivity of our operations, so the process of expediting our operations also sometimes may not be able to catch up with the lost time, which is there because of these delays and backlogs are unnecessary delays and backlogs, so every organisation must focus on these exigencies and must always be ready with their contingency plans for maintaining high productivity.

So, the manufacturing process is dynamic scenarios, so each and every time something or the other may happen, there may be a breakdown of a machine, there may be a breakdown of a whole system of machines, there can be power off or there can be unscheduled breakdown of a machine, so there can be n number of reasons which may lead to delay. Second point emphasises the company must be ready; the organisation must be ready to take into account all these contingencies.

There must be plan B, plan C must be ready with the organisation that if there is a unscheduled breakdown or if there is a accidental breakdown of the line, how to cope with it, how to have a second line running, how to start the manufacturing in the minimum possible time, how to rectify the default, so one of the reasons that we have is the unscheduled delays or the backlogs. So, this is also one cause for low productivity.

This cause if it is identified, then the company maybe next time they will try to keep themselves ready with systems, procedures, policies to start the manufacturing at the same time or maybe minimum stopgap must be there between the stopping of the process and the restarting of the process, so the time is very, very important commodity.

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Outdated Systems

- When a company uses outdated and clunky methods to carry out its desired goals, its productivity significantly decreases.
- **For example**, if one company uses software to automatically record and track data, while another collects it by hand, the second company's productivity will be much lower because the person collecting and tracking data can't do much else.
- Companies can increase their productivity by streamlining and automating processes to decrease the work needed to complete tasks.

The next cause for low productivity is outdated systems, so 3 causes we have already seen; one is related to time that is delays and backlogs, the other one is related to the wages and incentives, the other one is related to the wastage of resources. So, you see all these 3 things are in the denominator only, so we are focusing more on the inputs that are going into the system, the fourth one is outdated systems.

So, when a company uses outdated and clunky methods to carry out its desire goals, its productivity significantly decreases and if you remember in the previous session, I have talked about our conventional lathe machine and a CNC lathe machine, so CNC lathe machine although may be costly, maybe at the first time when you purchase a CNC machine, its cost may be higher but the life cycle cost will certainly be lower.

So, we must try to adopt the latest technology that is available because it is going to be more productive in terms of the more number of products processed per hour or in terms of more number of service; more number of customers serviced per hour, so maybe the criteria may different; may be different, if you remember in our second or third session in week 1, we have listed down that for different segments or for different business environments, we have different criteria.

In a hospital, may be 100 bed hospital is there, the occupancy rate of the beds per day can be one of the criteria, if a assembly line is assembling the cars, the number of cars produced per week can be a criteria for comparing the productivity among various periods, so the criteria may vary but the essence remains the same that the organisations will definitely like to have highly productive systems in place.

So, when a company is using an outdated technology, the productivity may not be that higher and if a competitive company has procured or purchased or acquired a new technology, they are certainly going to be more productive as compared to a company using the outdated technology, I will again suggest that each one of you must try to have a find a case study related to this that how an outdated technology has led to the closure of a company or has led to large scale losses for a company or an organisation.

For example, here an example is given, if one company uses software to automatically record and track data, while the another collects it by manually or by hand, the second company's productivity will be much lower because the person collecting and tracking the data cannot do much else, so you have dedicated persons to collect the data, so the productivity is dependent upon the efficiency, effectiveness of these workers were manually going and collecting the data.

On the contrary, the data may be collected centrally in a central server, a person sitting on his system whatever he is working whatever data he is using can automatically be seen at the central server, so the technology; such technologies are already available and if you remember in operations management course, we have seen that enterprise resource planning is one such platform which is a central platform.

So, in that platform all information is centrally available, so here we can see that if we use the technology may be the persons who are just manually collecting the data, they can be done away with and their man hours can be used for some other purpose or some other value added purpose, some other constructive purpose, some other productive purpose instead of collecting the data which can be done centrally using a technology or the concepts of information technology.

The companies can increase their productivity by streamlining and automating the processes to decrease the work needed to complete the tasks, so basically, the keywords here are streamlining and automating the processes, so we can try to automate the processes, we can try to streamline our procedures and save effective man hours and use those man hours for some constructive activity.

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Low Motivation Levels in the Organization

- The organizations are run by **people** and not by the machines. Therefore, efforts are required on part of the organizations to keep the morale of the employees high.
- It can be achieved by giving recognition to employees, organizing motivating sessions, cultural and sports activities etc.

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Now, this is very important in the last session also, I have used the same sentence again, we have highlighted the same sentence here, low motivation levels in the organisation. So, if the employees are not feeling motivated, working for a particular organisation, the organisation can never achieve its target of being profitable and productive. The organisations are run by people and not by the machines; therefore, efforts are required on part of the organisations to keep the morale of the employees high.

So, the low morale, low motivation levels of the employees is a key reason for low productivity of any organisation, it can be achieved by giving recognition to employees, organising motivating sessions for them, cultural and sports activities, so you can keep the employees involved, they must be given recognition, they must be given incentives, the wages must commence your rate with the amount the skill they are using for conducting their work.

So, basically if employees are happy or the organisation is able to make the employees happy, it will definitely lead to our productive organisation a profitable organisation.

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Exhaustive Work

- **Job enlargement** and **enrichment** would help in reducing the monotony of the job and would lead to higher motivation levels in employees resulting in high productivity.

Then, the exhaustive work; job enlargement and enrichment, these are important terms and we will try to understand these terms, when we study the concepts of work study but here I will just like to quickly pinpoint what is job enlargement. So, job enlargement basically means that a worker is given a variety of tasks, so if he is given only a single task, his job becomes monotonous.

So, enlargement means at the same level he is given a variety of tasks and enrichment means that he also participates in the decision making processes within the organisation, so if an employee is given a variety of tasks, he is involved in the decision making process within the organisation, it will help in reducing the monotony of the job and would lead to higher motivation levels in employees resulting in high productivity.

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Uncertain Market Conditions

- **Uncertainty** in demand is also a reason for low productivity.
- Continuous demand often lead to optimal utilization of time and resources whereas uncertain demand trends lead to wastage of resources leading to low productivity.

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So, maybe this type of a job enlargement and enrichment will definitely improve the morale and motivation of the employee. So, the last point that we want to discuss today are the uncertain market conditions which also lead to low productivity. Now, uncertainty in demand is also a reason of low productivity, continuous demand often leads to optimal utilisation of time and resources.

Whereas, uncertain demand trends lead to wastage of resources leading to low productivity, which I have already explained, if we have a certain demand we know this much products we have to produce, our procurement process, our materials management process, our line balancing, our workforce hiring, everything will be systematic, well planned and we will optimally utilise the time, the resources, the manpower for converting our raw material into the final product.

On the contrary, if we do not know how much is that going to be the demand, how much we are going to produce it will lead to unnecessary wastage of useful man hours, unnecessary you can say, wastage of materials lying in our inventory, unnecessary time can will go in doing the calculations by managing how to manage these resources, so a certainty in demand is certainly going to help us make better decisions.

In operations management, in our chapter on sales forecasting, I have is spoken in detail that how a good demand forecast is going to help organisation and how if you do not have the right demand data available with your demand forecast available with you, how you will waste most of the resources that we have discussed in detail there but here again the same aspect is coming into picture that uncertain demand is a reason for the low productivity.

Because we waste a lot of material and man hours, so with this, I conclude the today's session, in our next session, we will try to see that what areas we must focus, how we can improve the productivity of an organisation. So, if we keep in mind all these reasons of or all these causes of low productivity, we can definitely identify the areas of improvement within our organisation. Thank you.