Introduction to Lean Construction
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Productivity Measurement and Improvement – Outline, Construction Productivity (1950-2012), Productivity Levels

Good afternoon everyone, what we are going to do today is start out on this module on Productivity Measurement and Improvement.

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So this is in two parts, in this part what we are going to do is basically here we will look at the overview of what productivity is and how it impacts a construction project. We look at definitions and units and we will spend a little bit of time understanding what is the difference between productivity and production.

So, this becomes important in the context of construction and in the context of what we are going to do in lean and going on with that those these ideas. We will look at a little bit on the cost and time impact of these factors and then we go to what are the factors that influence productivity, we will touch upon this. So, this is the outline for the session.

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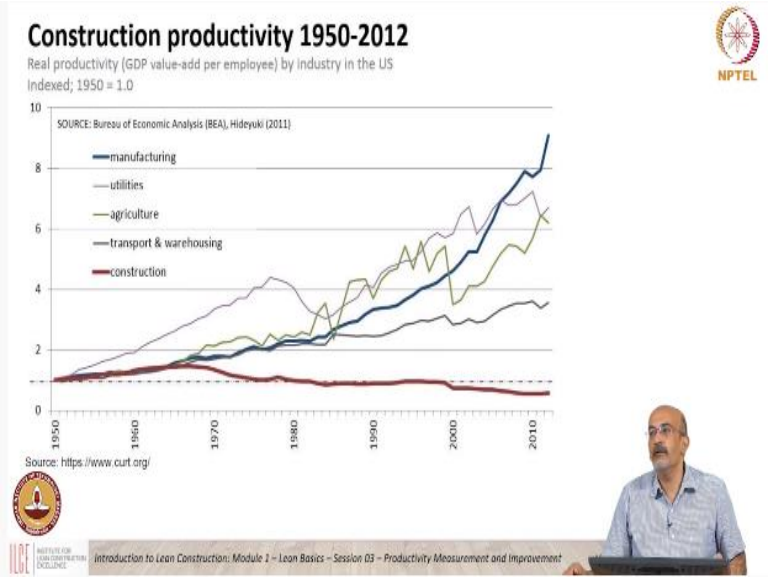

And when we start talking about the term productivity, so here is a graph this is a very popular graph, what can you interpret from this graph? Take a look at it, what is the interpretation you would make when you see a graph like this.

Student: Productivity in construction is very slow as compared to others.

Professor: Right, so you can see that productivity in construction has been declining over the decades almost you know it is increased a bit and then started declining, whereas productivity of all the other industries shown here whether its manufacturing, utilities, agriculture, transport has been increasing. Have we experienced this in our lives in any way?

Student: Kind of.

Professor: How do we kind of translate this into our experience?

Student: Like nowadays while manufacturing everything is manufacturing in a faster rate due to the new technology.

Professor: Right, but as a consumer how do you experience it?

Student: Transportation from moving from one place to another we now reach in lesser time.

Professor: We reach a lesser time, we do not necessarily spend so much money, or if you are going to buy, for example, if you are going to buy a car, 20, 30 years ago a car was a very a luxury item today a car is something which is affordable, so basically the productivity of the manufacturing industry has increased and so the car has become affordable. Whereas in construction can we say the same?

Student: No, the rate and the total price is increasing day by day.

Professor: The housing, housing is still a sought after item, we do not think that houses are and there is a lot of effort to make for example housing accessible to all but still we say housing is effective and this is expensive and this is not just in India but everywhere.

So globally, we find that construction industry, so one side you say that the industry has become more complicated the projects are more complex, the durations are more constrained, technology is more required, yes, those are some of the mega projects but if we still take housing and very basic construction which is required we are still not able to deliver like some of the other industries have done.

So, you cannot just look at this graph as a something which somebody has done, we can relate to this and we as civil and construction engineers say that we also understand that when you are on a site doing work we find productivity is not that, we find there is a lot of waste, we find that construction should be more efficient. So, take away from this graph do not just look at it as just something that someone has put, we are experiencing this day to day.

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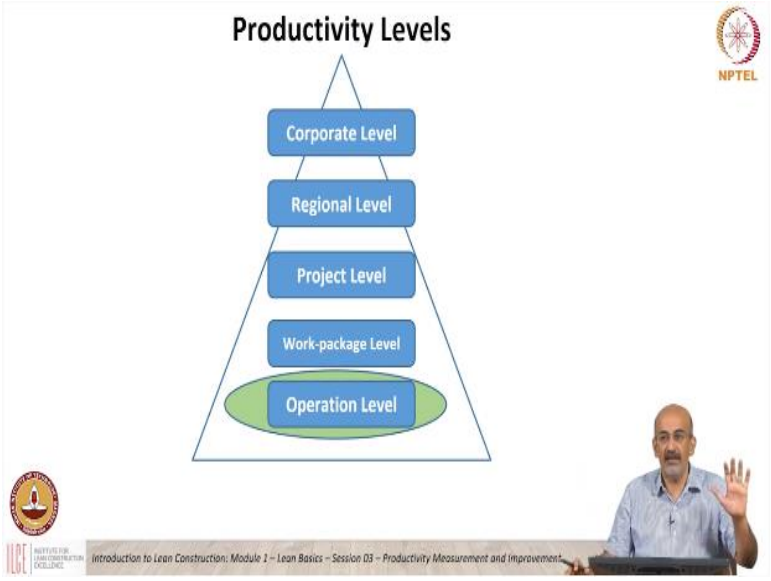

Now, when you go into productivity in a construction industry, we can look at it in many levels. At the operational level is the most basic level where we can say there is masonry, concreting, reinforcement is an construction operation we can look at productivity at that level.

We can look at it as a work package level foundation works or structural works or finishing works, we can look at it at that level. We can look at it as a whole project. Then, instead of being at a project, the region will have several projects that can you look at it at a regional level or ultimately even at a corporate level but as we just saw in the earlier graph this whole thing can be even at the industry level.

So, productivity can be at many levels and each level can have a different way of measuring productivity and it need not be one measure there can be several measures. For example, if I take say corporate level how would you measure a corporate level of productivity, what would be a potential benchmark?

Student: The cost versus the total sale.

Professor: You can look at total sales, you can look at earning per share, you can look at you know share, I mean there will be many benchmarks which accountants use to see this is corporate level productivity. If I look at project level?

Student: Profit margin.

Professor: Look at profit margin and you can even look at say sometimes they look at billing divided by number of people I am having these are rough measures but so there are many different measures that can be used in these for these and we should understand there is no single measure which can be accurate measure of productivity, you have to define your measure and then understand the limitations, assumptions and what is there in that measure.

Now as far as we are concerned we are primarily looking for this course at the operational level which is at the work phase level masonry, concreting that is a level we are looking at and that is where our definitions and our focus will be for looking at productivity.

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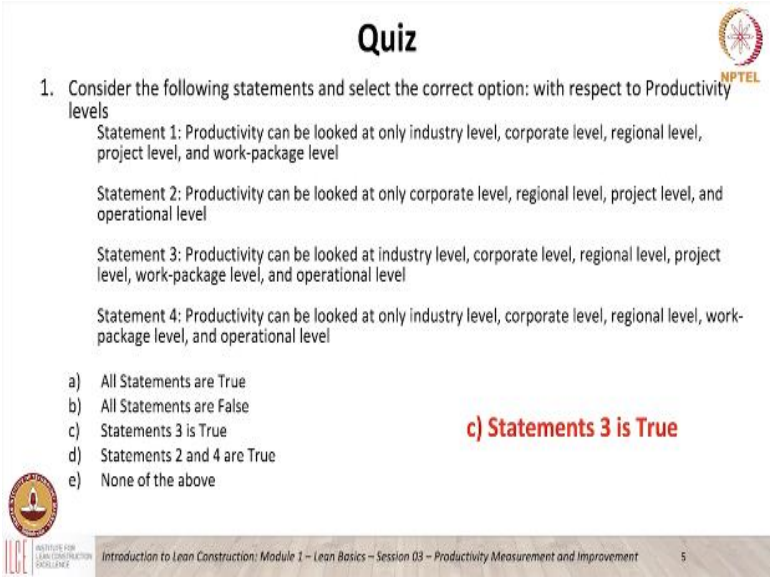

Supplementary Module

Link (to read and contribute)

https://tinyurl.com/yfmkc8ba

Topics to be Covered Slide