

Toyota Production System
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Lecture - 30
Benchmarking

Welcome friends, so now we are coming to the end of week 6 and in last 5 weeks and in the 6th week we have discussed various principles of Toyota production system, we discussed about lean manufacturing, we discussed about agile manufacturing, we discussed about sustainable manufacturing, some of the important concepts related to sustainable manufacturing.

Like what is life cycle assessment, what is life cycle costing and then in our previous session we discussed about flexible manufacturing systems and we discussed these things that there is a strong synergy in all these concepts that these concepts, all these things are talking making your organisation efficient as well as effective.

When you are following the concept of efficiency you are becoming lean organisation because to have efficiency you need to eliminate waste from the organisation and when you want to become effective organisation you have to follow the concepts of agile manufacturing and flexible system manufacturing and therefore organisations want to become lean, agile, sustainable, flexible, all these things simultaneously.

Because you can actually capitalise on one another if you start these exercises as independent exercises then probably you may not be able to understand that how these things are related to each other, but when you do all these things as part of a single package then you understand that no all these things are related to one other and therefore we discuss all those concepts in a sequence one after another.

So that you can understand, you can appreciate the synergy between these concepts. Now in one of the discussions when we were discussing about Toyota production system and then lean manufacturing we mentioned that we need to eliminate waste. We mentioned that defects are waste and we need to eliminate those defects. Over processing is a defect, we need to eliminate that.

Waiting is a defect we need to eliminate that. Over production is a defect we need to eliminate that. So we discussed various types of defects and we also discussed that by having some kind of counter measures we will eliminate all these kind of defects, but how much of those defects, how much of those wastes can be eliminated. Can I achieve 0 defect? Can I achieve 0 inventory?

Can I achieve 0 over production, all these things are only possible when I know what is the standard available in these things and therefore in this particular session we are going to discuss that what are the standards available for these things and therefore the title of the session is benchmarking that we will see that what is happening best-in-class with respect to that particular parameter.

Right now just to give you an example US economy is around 18 trillion-dollar economy and that is the largest economy in the world. So that becomes a kind of benchmark for all other Nations. That if US can achieve that level of economy why cannot India, why cannot China, why cannot some other Nation can achieve that level of economy. So that is a very simple example to understand the benchmarking.

You are studying in a class and one of your friend he is able to score 100 out of 100 in mathematics so that becomes a benchmark that we can score 100% mark in this particular subject. So for others also it becomes a kind of yardstick that yes 100 out of 100 is possible in this subject. Like in subjects like Hindi it is very difficult to score out of 100, 70 marks. So nobody talks of benchmark of getting 100 out of 100 in Hindi.

You can talk of getting 100 out of 100 in Science, you can talk of getting 100 out of 100 in mathematics, but you will not speak getting 100 out of 100 in subjects like drawing. You will never speak 100 out of 100 in subject like English literature, Hindi literature, why? All these things are because of benchmarking, that you know that the best in class is able to achieve this much. So this is what is doable.

If you talk of 100 metre race another very interesting example. In 100 metre race what is the world record? What is the Olympic record? and based on that that become our first benchmark. If I am aspiring at my school level so my first benchmark is what is the best

performance in my school till date. If I have crossed that then I may go to the state level performance.

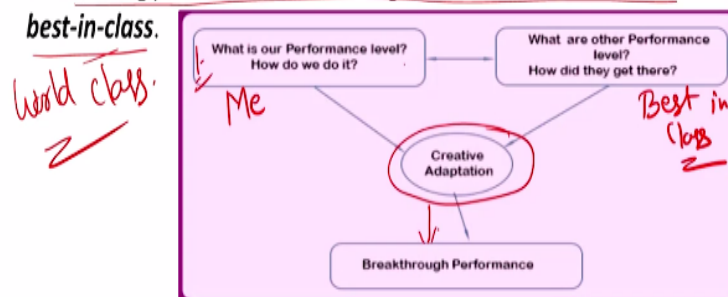
Then I go for the national level performance and if I am representing my country then I see what is the benchmark at the international level. So that is how we keep on improving our performance and therefore benchmarking is a tool for continuous improvement. It is a very important tool for continuous improvement once you have a measurable target then only you can achieve that.

If you do not have any measurable target it is very difficult to improve, therefore benchmarking is more like a quantitative assessment of your performance and when you have this quantitative assessment of your performance it will help you in improving the performance further.

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What is Benchmarking?

- Benchmarking is the process of measuring an organization's internal processes then identifying, understanding, and adapting outstanding practices from other organizations considered to be best-in-class.



Benchmarking Framework

So now what is this benchmarking framework and some definition of benchmarking. So benchmarking is the process of measuring an organisations internal processes then identifying, understanding and adapting outstanding practices from other organisations considered to be best-in-class. So best in class or world-class you can use any word, but the meaning is that you compare your performance with one who is considered to be best.

And therefore this concept of benchmarking comes into. You are Virat Kohli, you are Sachin Tendulkar and then how many points you have earned in the ranking based on that you can benchmark your performance that if Virat Kohli at number #1 scores these many points in the

ranking where am I so that you can see that this is the gap between me and that player and therefore we need to work to fulfil that gap.

So that is how it helps in our improvement activity. So if you see this benchmarking framework what is our performance level and how do we do it. So what is our performance level that is one aspect that is the introspection reflection and what are other performance level? how did they get there? then this is me, this is best in class. So these are 2 things, 2 input I require.

And based on that I may adapt those things because how did they get there. So if it is doable, that I can adopt their activities in toto I may adapt, but we use a careful word that is creative adaptation. The creative adaptation means that I have to customise their processes so that these processes can suit my requirement. If Chinese companies can go for cost of production of a particular product let us say 10 rupees per unit.

I am producing that product at the rate of 15 rupees per product. Now that low cost becomes benchmark for me and then I see that how could they achieve that low cost. Now many things are there that I cannot copy in my organisation. I cannot copy in my country because of different kind of legal regulatory frameworks. So therefore we need to go for this creative adaptation where we see that how we can develop the process for our organisation.

And then we develop a breakthrough performance, we start improving our organisation. So right now I am producing at 15 per unit, Chinese company produces at 10 per unit and when I do this creative adaptation so this breakthrough performance resulted into 12 rupees 50 paisa per unit. I am able to reduce my costing by 2 rupees 50 paisa. Again I will do this exercise and maybe at that time I will further reduce my cost by 1 rupee.

So therefore, this benchmarking will help us in making some kind of breakthrough performance. So why to do benchmarking? Now to have this benchmarking what is the reason as already you have understood now.

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Why Benchmarking?

- To Obtain an External Perspective of What Is Possible
- To Assist in Setting Strategic Targets
- To Promote Improvements in Performance
- To Establish a Competitive Edge
- To Enhance Customer Satisfaction
- To Reduce Costs
- To Improve Employee Morale
- To Achieve Quality Awards

That to obtain an external perspective of what is possible. What best people have achieved, what is the most doable thing that is only possible to understand when you have some kind of external perspective and that benchmarking gives you. The second is to assist in setting strategic targets. So you have the specific targets, goals, you do this kind of benchmarking activities.

To promote improvements in the performance, time and again we discussed this issue. To establish a competitive edge, because you are now continuously improving your processes. Not only processes, but products, their performances, the green behaviour of the products. So you can do benchmarking with respect to any aspect and therefore whichever aspect you do that is going to lead you to provide some kind of competitiveness.

So that is another important reason that why should we go for benchmarking. With this you obviously achieve because you are offering better competitive products. So it will help in improving the customer satisfaction. It will reduce the cost. We just discussed with the help of this example. To improve employee morale. Another very interesting thing which benchmarking does because of benchmarking you becomes a learning organisation.

It is very important to understand that when you continuously benchmark your performance with respect to best people. So you are doing two things, one you are studying your problems and at the same time you are studying what is happening in the best organisations, their processes, their KIPs you are understanding and therefore this will help organisation, this will

help the people of the organisation, this will help the partner of your organisation to know what are the best practices.

So when we are exposed to new knowledge our learning quotient increases and that is keeping the employee morale higher. So we want to learn every time and human being loves learning and therefore if your organisation can provide learning opportunities, we discussed in Toyota production system principles that each error is an opportunity of learning. You learn from your errors.

But here we say that even benchmarking is also an opportunity of learning. When you see that what other people are doing. When we see commentary on television. When we see that somebody has done some exceptional work. There are many things which you can learn from them and it is not simply knowing the story, but it is more important to learn from them and since we have this external perspective in benchmarking.

So this external perspective help us in learning and your organisation may become a learning organisation because of this particular aspect and then it is not so important but it is also there nowadays organisations look for having new quality awards, Deming prize, the prize of Golden Peacock, the price of MBNQA. So all these are becoming very prestigious things in the corporate success.

So to achieve the quality awards benchmarking may help you for that particular issue also. Now, when to benchmark, so why to benchmark, we discussed now when to benchmark? When to benchmark means.

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When Benchmarking?

- If the company's QMS is not properly developed, documented and implemented.
- If company's great strength areas are not measured.
- If company's great weakness areas are not measured.
- If company's great opportunities are not measured.
- If customer needs are not assessed and rectified .

What are the ideal conditions for benchmarking. If the company's quality management system QMS stands for quality management system is not properly developed, documented and implemented. Because the objective of QMS is also very much similar to benchmarking. So in QMS you give a detailed description about your various quality standards you are going to follow.

You give detailed description about your processes and the idea behind quality management system is that you will continuously improve your QMS, you will continuously improve your standards. So therefore it is a tool for continuous improvement. So if that QMS is not properly available in your organisation you can use benchmarking for your help and then when company's strength, weakness, opportunities, these things are not properly measured.

When these things are not properly measured then also you need to go for benchmarking. If you know exactly where I am standing? What are my good points? What are my weak points? then suddenly you can improve on your weak points, but when you do not know many a times when we do not have any external perspective we feel that we are the best, but we know that there is so many mythological stories that you will always find a better person than you.

And therefore these things when you are not able to access your properly strength, weaknesses these things then benchmarking is a very usable tool. Then if customer needs are also not properly assessed and rectified. So these things are with respect to your company, but

many a time there are companies which are able to understand the needs of the customer in a better way.

So if you are not able to understand, if you are not able to take corrective actions on the needs of the customer then also you will have to go for benchmarking that how other companies are doing it, how they are able to predict better forecast those things are become you can say that essential requirements for the benchmarking. Then where it is used, benchmarking, where it is used?

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Where It is Used?

- Benchmarking is used extensively by both manufacturing and service organizations, including Xerox, AT&T, Motorola, Ford, and Toyota.

Benchmarking is used not only in manufacturing, but it is also used extensively in the service organisations. Some of the notable names like Xerox, AT&T, Motorola, Ford, Toyota, these are the companies pioneered the use of benchmarking and all these companies we know are one of the top companies in their own field in the world. So there is a requirement for large number of Indian organisations to go for benchmarking.

We are living presently in LPG era, liberalization, privatisation, globalisation era. So when we are living in LPG era we are directly competing with all these global players. So unless until you properly benchmark your organisations with best-in-class organisations then only you can improve or grow. So it is also important to discuss benchmarking in the context of Total Quality Management.

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Benchmarking in the Context of TQM

TQM Key principles include:

- Comparisons with best practice.
- A Strong emphasis on meeting the needs of the customer (internal and external).
- The importance of efficient, effective business processes.
- The need for continuous improvement .
- Enhances a TQM program .

TQM that is total quality management. Now TQM principles, what are the TQM principles let us quickly go through them that comparisons with best that what are the best practices available and that is what we do in case of benchmarking also. A strong emphasis on meeting the needs of the customer, internal as well as external. Internal customers mostly your employees et cetera.

They are your internal customer and external customer means who is going to finally consume the product. So you need to fulfil the needs of your internal as well as external customers that is what TQM says, the importance of efficient, effective business process. You should have low cost and usability. These are both things which are required in a TQM environment.

The need for continuous improvement, Kaizen and you need to have the enhancement of TQM program. Enhancement of TQM program because the literature of TQM says that it is a philosophy and you need to develop that kind of organization, that kind of setup where you can propagate this philosophy that how to build quality into your processes. So that is you need to go for enhancement of TQM culture in the organization.

Now let us quickly see what are the levels of benchmarking in the competitive environment.

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Levels Of Benchmarking In Competitive Environment

- **Internal benchmarking** - Within one's org.
- **Competitive benchmarking** - Analysis the performance and practices of best in class companies.
- **Non-competitive benchmarking** - Is learning something about a process a company wants to improve by benchmarking.
- **World class benchmarking** -Ambitious and looking towards recognized leader.

Now level there are 4 levels of benchmarking. Now the first level which is very simple to understand that is the internal benchmarking, within your own organization. If I am talking of IIT Roorkee, so there is a department of mechanical engineering, there is a department of civil engineering, department of electrical engineering. So we can do benchmarking of one department with another department.

So that is internal benchmarking that is one level of benchmarking. The second is competitive benchmarking. Analysis the performance and practices of best-in-class companies. So where I am IIT Roorkee if I start comparing the performance of IIT Roorkee with MIT with Stanford, that is a kind of competitive benchmarking. How many papers a faculty is publishing in Harvard and how many papers a faculty is publishing at IIT Roorkee per year in top ranking journals so that is one parameter of competitive benchmarking.

Then third is non-competitive benchmarking. It is learning something about a process a company wants to improve by benchmarking. For an example there is Six Sigma which is developed by auto company which is practiced in manufacturing organisations. Now how can I implement that Six Sigma to improve the performance of IIT Roorkee.

Maybe in my hostels when everyday there is a lunch time or to have the dinner time to minimise the waste of wrongly cooked food I want to apply Six Sigma. So that is something like non-competitive benchmarking, because you are using some technique, technology which is being developed by some other industry which is not in your direct competition so that is the non-competitive benchmarking.

And then world class benchmarking. Ambitious and looking towards recognised leaders. I want to become like the Toyota company, they have championed the art of manufacturing. Before Toyota everybody was looking to become like Ford company. So when in totality we want to imitate we want that this is a leader kind of organisation. May be I am into education sector, but I think that IIT should be like Apple.

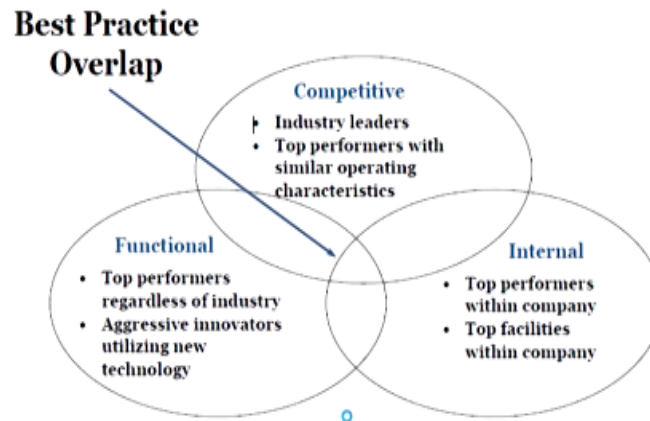
Where employees have freedom where lot of innovativeness is there, lot of flexibility is there, so that is an idea of world class benchmarking. So it is not necessary that world class are available in your own industry. They may be in any industry, but you want to imitate them because there are some very ambitious things in those organisations. Like if I talk IIT Roorkee and then can I take an example which is totally from a different field.

That is the market in the space. Now company known as Space X that has captured around 50% of the market of launching the satellites. In India Company like ISRO which we consider as a world-class organisation has a very minimal share in the space market, but Space X which is just 10-11 years old company has tremendous more than 50% of the market share in the satellite launching.

Now can we understand can we apply what Space X has done uniquely to grow such fast and its private organisation, so therefore some of the things can be considered and we can imitate those things into our organisation that is known as world class benchmarking. That the way they are moving the progress path they are following, how they are able to attract new customers, new markets and becoming a world leader in their own field that is actually the world class benchmarking. Now benchmarking methodologies if we talk.

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Benchmarking Methodology



So there is you can say best practice overlap here and that best practice overlap says that we have a competitive benchmarking, internal benchmarking and functional benchmarking. So like first we start with the help of functional benchmarking. So in that let us say the energy consumption is one particular thing. Now for making my product what is the energy consumption per unit and for making your product what is the energy consumption per product.

So we do this kind of comparison and please remember that it may be from different industries also. So for the same function different industries may be involved and we do this kind of comparison across industries, that internal is we see within the company which particular department which particular activity is creating a benchmark is becoming a something milestone which can be imitated by others.

And then competitive benchmarking that is the industry leaders that we already discuss that some organisations in a particular industry are becoming the leader in their own field and there are some organisation which are known as world class, they have in totally everything to the best. So that is competitive benchmarking. So these are the different methodologies and here you see that there is a overlap also.

And it is where we all want to go that you should be able to functional benchmarking you should do for internal benchmarking and you should be able to have competitive benchmarking, but it is not so easy to go into that common zone.

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Types Of Benchmarking

- **Performance or operational benchmarking:** It involves pricing, technical quality, features and other quality.
- **Process or functional benchmarking:** It involves processes such as billing, order entry or employee training.
- **Strategic benchmarking:** It examines how companies compete and seeks the winning strategies that have led to competitive advantage and market success.

So the types of benchmarking are one is performance or operational benchmarking, it involves pricing, technical quality, features and other quality, so that is you can say the benchmarking at a lower level. Then the second level of benchmarking is the process or functional benchmarking. It involves processes such as billing, order entry or employee training et cetera.

It is also a relatively lower level of benchmarking. Then the most important rather the higher level of benchmarking is strategic benchmarking. It examines how companies compete and seeks the winning strategies that have led to competitive advantage and market success. So how, what are those specific things like the uses of data for voice communication also by Jio is an example of strategic benchmarking.

Because they only followed that they gave data to their customers and data was used for your voice communication also so this became a very unique competitive example and now they have created the benchmark in that and with that benchmark other companies will also try to imitate them that can we also shift our entire mobile operations from voice to data and through data only we are able to do these things.

So strategic benchmarking are a higher level activity performance and process benchmarking are relatively lower level benchmarking.

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Areas of Benchmarking

Operational Strategies: <ul style="list-style-type: none">• Inventory management• Inventory control	Supply chain management: <ul style="list-style-type: none">• Warehousing and distribution• Transportation
Marketing management: <ul style="list-style-type: none">• Customer service levels• Purchasing• Billing and collection• Purchasing practices	H.R. Practices: <ul style="list-style-type: none">• Talent Acquisition / Search• Training and Development• Compensation management etc.

Now the slide can explain you different areas of benchmarking. In different areas of benchmarking like in operational strategies, inventory management is one very important thing where we talk of inventory turn. We have companies like Walmart which is known for highest level of inventory turn and that people say is reason of their tremendous success that they are able to achieve around 11 to 12 inventory turns in a year.

And their competitors are able to achieve only 5 to 6 inventory turns in a year therefore they are able to move their cash cycles very fast and that is precisely one reason of their success. You can benchmark your supply chain activities, you can benchmark HR, you can benchmark marketing, the point is that benchmarking is possible in all functional areas. It is not limited only to production or operation activities.

We just saw that it is applicable everywhere. Now how to do benchmarking? We discussed one framework of benchmarking that we require inputs from two sides. One, where are we and how do we get here and the second is where is the best in class people and how did they get there and on the basis of that we go for benchmarking activities. Now for the implementation purpose of benchmarking you can have this 5 phase, you can say methodology of benchmarking.

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Five Phases Of Benchmarking

- **Planning:** Identify the product, service or process to be benchmarked
- **Analysis:** Determine the gap between the firm's current performance and that of the firms' benchmarked and identify the causes of significant gaps.
- **Integration:** Establish goals and obtain the support of managers who must provide the resources for accomplishing the goals.
- **Action:** Develop action plans, and team assignment, implement the plans, monitor progress and recalibrate benchmark as improvements are made.
- **Maturity:** Leadership position attended, best practices fully integrated into process.

One is planning, analysis, integration, action and maturity. Now you have to identify product, service, process, which needs to be benchmarked. Then do the analysis, determine the gap between the firm's current performance and that of the firms benchmarked and identify the causes of significant caps. That you identify which thing to be benchmarked and then you identify gap.

So this is what is to be benchmarked then the second thing is you identify gap between your performance and the performance of your best-in-class company. Then integration, establish goals and obtain the support of managers who must provide the resources for accomplishing the goals. So now this exercise you did, but without involving others you cannot go for implementation of this benchmarking research.

So that is the third level of activity that you start developing your team and then take action, team assignments, implement the plans, monitor progress, recalibrate benchmark as improvement are made. So you noted to see that with this exercise how much improvement you have done and finally leadership position attended best practices fully integrated into the process.

So once these best practices are fully implemented into the system that means the maturity of your benchmarking, but every time you will have new processes, new products to be benchmarked, therefore we go for continuous improvement using the concept of benchmarking.

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Benchmarking Strategy

- Decide what to benchmark. ✓
- Select companies to benchmark.
- Obtain data and collect information.
- Analyze data and forms action plans.
- Recalibrate and start the process again.
- Benchmarking

And this is the simple way of just what we said that what is to be benchmarked, need to select the companies, identified data, collect the information and on the basis of that identify the gaps and form your action plan and then you have to recalibrate. Recalibrate means just to have a feedback that where have you reached and again start the process and this is how benchmarking keeps on growing.

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The Seven Step Benchmarking Model (Continued)

Step 4: Collect data	<ul style="list-style-type: none">➤ Use a questionnaire➤ Conduct a benchmark site visit
Step 5: Analyze data and determine the gap	<ul style="list-style-type: none">➤ Quantitative data➤ Qualitative analysis
Step 6: Set goals and develop an "Action Plan"	<ul style="list-style-type: none">➤ Set performance goals➤ Develop an action plan
Step 7: Monitor the process	<ul style="list-style-type: none">➤ Track the changes➤ Make benchmarking a habit

So that is what we have just discussed this 7 step process of benchmarking.

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Factors For Success of Benchmarking

- Benchmarking must have the full support of senior management and they should actively involve with this process.
- For Benchmarking, team and process training is very important.
- Benchmarking should be a team activity.
- Benchmarking is an ongoing process.
- Benchmarking efforts must be organized, planned, and carefully managed.
- Correct use of benchmarking can lead you to the competitive edge in today's business market place.

And factors for success of benchmarking that if we see that benchmarking must have the full support of senior management and they should be actively involved with this process. So without top management nothing is possible. We discussed this in the TQM also, so top management commitment is very much necessary. Teams and process training is very important.

Because of integration if we see in our 5 phase system of benchmarking, implementation, third is integration and that integration is only possible when you have a well-designed cohesive team. Benchmarking is a team activity, it is ongoing process, you benchmark today something, tomorrow you have to benchmark something else, so therefore it leads to continuous improvement.

Benchmarking efforts must be organised, planned and carefully managed. Correct use of benchmarking can lead you to the competitive edge in today's business marketplace. So finally we see that benchmarking is something which can take you to the competitive advantage and with the help of benchmarking you are able to understand that what is the ultimate level of progress.

What is the ultimate level of achievement which is possible with these initiatives? So in the line of lean manufacturing we also need to club this benchmarking discussion that we should know that what are the targets in front of us and we should be able to working for achieving those targets because without targets it is very difficult to move into air, so therefore benchmarking discussion becomes very important. Thank you very much.