# **MGT 8803 SUPPLY CHAIN MODULE**

# **Week 8 TRANSCRIPTS**

## What is Supply Chain Management

>> Hello there, my name's Bob Myers. And I'll be your instructor for this section entitled supply chain management. Where I wanna start is talking at a high level about the objectives that we hope to accomplish through these series of videos, right? First and foremost is gonna be I want to describe to you what supply chain management is and then in the process also talk about some supply chain strategy, challenges, and then design considerations with supply chain, right?

And what we'll do after that is I'm gonna develop a framework around this. And really what this framework will be, which is our second learning objective, is to look at supply chain management in terms of short-term decisions, medium-term decisions, and long-term decisions, right? And then what we'll do is we go forward from there is we'll take those and do kind of a high level look at each of those three.

So we will examine in more detail long term or strategic decisions, and then look at issues and techniques around those with respect to supply chain management. Okay, from there we'll move into medium term or what you may also hear called operational decisions. And again, issues as well around those and techniques.

And then finally, we’ll conclude by looking at short term or tactical decisions and issues. So where I wanna start with this is I wanted to find what supply chain is. And I’m actually gonna take, and you’ll notice here it says operations and supply chain management, which is being abbreviated OSCM.

And the reason I'm expanding this here is if you go back, let's say 50 years or so. And you look at business historically, you'll see that there was some main functions typically identified. So there was finance, there was accounting, right, there was marketing and there was operations, right?

And operations was simply and strictly focused on a single company taking inputs, transforming those inputs and providing an output, whether it was a finished good or service. Then as time passed, some researchers began to realize, hey, you know what? What really matters to you is actually way more than just taking inputs and outputs.

It's actually looking at your inputs and who they come from and taking that company and looking at their inputs and where they come from. And you keep going what will be called upstream the supply chain and then also looking at downstream. So who you provide your product to and then what they do with it, cuz it would become an input to them, right?

So now you tend to hear this term, operations supply chain management, and I'll use both interchangeably as we go through here, right? And what I'm gonna do here is I wanna define it then initially in terms of an operation supply chain manager, right? And here's how we're going to define it, operation supply change managers focus on how to develop capabilities to design, produce, and deliver products and services in a competitive market.

And let's look at this a little bit here, okay? So first you'll notice is I'm defining it in terms of developing capabilities, okay? Capabilities to do what? To design, right, design things, make them, right, and then produce them, actually create them and then deliver them. And notice in here that it says products and services, cuz a misnomer that I often see with students and individuals new to operations and supply chain management.

Is they think that this is all about a factory and it's all about producing a physical product, okay? Notice in this definition it's both, products and services, right? And then as well we have on here it says to develop capabilities. Okay, so what capabilities are we talking about here, right?

Clearly these are capabilities around driving performance, which translates to, right, increasing the profitability of the company, if you think about that, right? And by the way, if you don't know if you haven't seen it already, right? You get the golden equation profit is revenue minus costs. So with that in mind, right, developing capabilities to drive performance.

Will include things like developing capabilities to provide new products and service features that in turn hopefully increase revenue, right? Capabilities to drive performance or to develop capabilities to decrease costs, that one's directly in the profit equation. And here we're talking about decreasing costs to design products to produce products and services to deliver them, right?

Developing capabilities to improve quality, whether that's quality of the product itself or actually quality and producing it, quality and delivering it, right? Developing capabilities to reduce time to market, right? One of the things that we see in business today, is that companies are earning more, and more total percentage of their profit from new products and services.

So it becomes critical to get to market as quickly as you can. And then the last one I have on here, is the ability to innovate, right? And innovate just means to come up with something new, right? Ideally, come up with a way to make or produce your product better, faster, cheaper, easier.

Taking a different view, right, there's a group called a Supply Chain Council and they see operation and supply change management as having six primary processes. So another way to look at this, right, is in terms of what processes are involved in supply chain. And in here they say hey, six of them, here's the first one.

Through processes, and the things around planning what you want to do. Then there are processes around sourcing where you will get your inputs. Then processes around actually making your product or service and then delivering your product or service. And then this fifth one's kind of interesting many people don't think about but you have to have a mechanism to handle returns.

So what happens when that customer says this doesn't fit me, I don't like this or it's broken, it's now got to go back. So what's the supply chain? What processes do we have in place to handle things that come back to us? And then for completeness, the last one they give is they call it engage, which just simply means to look at ways to innovate and improve in these other five, right?

So what might a supply chain look like? And so what I have up here now is a sample supply chain. And for this one, let's just pretend that that we are this company right here in the middle that makes that final product. So final product manufacturer and what I've done here is simplified this one, made it what I'll call a linear supply chain, okay?

But when we talk about supply chain we're literally talking about raw materials that come out of the Earth through all the companies through which it passes until it gets to the final consumer or customer, right? And so if you think about it, this final product manufacturer, let's say that they make cell phones, as an example, right?

Believe it or not, most cell phone companies don't make all of the pieces that go into the phone. And actually in many cases what they're doing is really assembling, so actually just putting together, right? And so they most likely buy the camera from somebody else, they buy the battery from somebody else, right?

They buy the case around the cell phone from somebody else. And this somebody else's a component manufacturers, right? Well, those component manufacturers, if you were going upstream and say, for example, look at the maker of the case, right? That component manufacturer who's making that case for the iPhone, or Samsung Galaxy or whatever, right?

They have inputs and those inputs are coming from here, form this raw material fabricator, right? They are probably getting cheap metal that they then are cutting and shaping into the form of the case. And if you go up stream once more in the supply chain that cheap metal fabricator is most likely getting iron ore or other metal or raw metal from a mining company, right?

So we go upstream in a supply chain and we also can go downstream in a supply chain, right? Our final product manufacturer doesn't always necessarily sell straight to a Walmart type of company. They may well sell to a wholesaler who then in turn sales to a Walmart retailer light company, then getting to the final customer, right?

Understand again, this is a simplified linear supply chain, right? You get that this final product manufacturer very likely has multiple component manufacturers. And each of those component manufacturers has multiple, right, potentially raw material fabricators. And those raw material fabricators may have multiple raw material extractors or miners that go into it, right?

So let's conclude this with looking at a more complex example. And for this example we'll look at Boeing and here's a picture 787 Dreamliner, right? Large body aircraft, and if you'll notice pretty quickly is most every component on here is made. There's a few exceptions, but most of these components are made by another company.

Which by the way, brings up some other topics that we'll get into later, such as globalization. Cuz if you look here, there's companies in Korea making wind tips, Italy making a horizontal stabilizer. We've got France represented here, Japan, England, in terms of United Kingdom, right? But all of these would represent what we saw on the prior slide as, right, component manufacturers, right?

23, just off this picture alone 23. So if you look at like the engine maker right here, right, Rolls Royce, General Electric, okay? They are supplying, right, a full engine to Boeing. Well, if you looked at that engine, there's literally thousands of parts in that engine. So that component manufacturer as well has multiple suppliers to it, right?

So there's companies probably providing fuel lines and oil lines and electrical cabling. And raw material, whether it's aluminum, or even in some sections of this engine, you'll find very exotic material like titanium and alloys. So to kind of conclude here, again, right, supply chain management looking end to end.

And we're gonna look at it in terms of types of decisions that an operations manager makes. And what we'll do in the next lesson is I wanna talk about why. Why should you care about supply chain management? Why is it important to you?

## Why is Supply Chain Management Important?

>> Welcome back, what I wanna do in this video lesson is talk about why operations supply chain management is important. So in terms of learning objectives quite simple, wanted to discuss with you why should you to motivate you, why should you care and why do you want to learn about Supply Chain Management?

So Deloitte did a survey back in 2014. And they looked at a bunch of companies asking them questions around Supply Chain and 79% of the companies that were identified as having high performing Supply Chains. Achieved revenue growth, superior to the average. Whereas only 8% of the less capable supply chain companies reported above average growth.

In terms of why should this topic in this subject matter be important to you, I often like to use the analogy. If you look at it, right, a company has multiple disciplines like we talked about finance, accounting, marketing, operations supply chain, right? Your body also has multiple systems, right?

You've got your respiratory system, your cardiovascular system and so on. And I always like to think of supply chain literally as the heart and the cardiovascular system. It's the operation supply chain literally is what is at the heart of every company, right? To me finance is maybe like the neurological system and HR maybe like the respiratory system, but operation supply chain is at the core, okay.

So what can happen then? If a supply chain is not managed properly. And by the way, you can find countless examples in the news, on an almost daily basis. And here's one such example, right. For those of you who haven't seen, this is Kentucky Fried Chicken, KFC. It is a fast food restaurant that serves chicken.

Notice the sorry we're closed piece of paper on the left side of this particular location, right. This happened in the United Kingdom. There it is. They brought a new delivery partner on board. They brought a new component manufacturer if you wanna use words from the last video. And they had some problems getting chicken out to all of these restaurants, getting them supplied, right.

They switch from one company to another and the bottom line is that they ran out of chicken at the stores and had to close the stores temporarily. Here's another example, Toyota, okay? There was an earthquake, rather large one that happened in Japan, okay? Result, here it is. Toyota, biggest automaker in the world said it was gonna have to suspend much of its production in Japan after these earthquakes.

Why, because the earthquakes caused damage to component manufacture plants, which in turn prevented new components, new inputs from coming in to the Toyota plants, and they flat out ran out of parts. And so if you think about this, right? If you're making cars, you only need one component to run out, right?

Say the steering wheel, I run out of steering wheels, I can't complete making cars. So what are some of the consequences then, of a poor supply chain? First and it clearly, you could see these in the two prior slides. All right, in the two prior examples, there's a lost of productivity, right?

If you don't have the inputs that you need, you are not producing. And if you're not producing, you're not generating revenue, right? But you incurring cost, you're incurring cost of building, of people, of warehouse, etc. These kind of issues will lead to customer complaints right? If I am just a customer of KFC Kentucky Fried Chicken and I know and I'm hungry and I show up and they're closed, all right, I'm likely thing.

I may not go there again in the future, I may look elsewhere because I don't want to be hungry, right? Increased costs, so, what do you think happened to Toyota once they did get the parts that they were backlogged on? They wanted to expedite, they wanted to finish making what they hadn't been able to make, in a normal course of a production day.

And then they had to expedite getting those vehicles to showrooms, right. And by the way, one of the common ways not in the case of the cars. But a common way is instead of maybe sending something by boat, which is the least expensive, or by truck, you have to send it by air freight, which costs the most.

Increased costs, right? I already brought of loss of revenue. The whole time that KFC was shut down, they're generating no revenue and you cannot get that missed revenue you can never get it back and then of course damage to the brand, right? Now you saw what are people gonna think of KFC now going forward?

What I wanna go to now next then, and in the next lesson is look at, so we've talked about now why does this whole thing of supplies chain operations, why does it matter? Okay, well, I wanna look at next is what are some of the challenges that companies are seeing today with managing supply chains?

## Supply Chain Challenges

>> So far, we've defined what supply chain management is. And then hopefully I've motivated you to some degree as to why you wanna learn about this. Now what I wanna do is I wanna talk about, and learning objectives for this video is gonna be to discuss, what kind of challenges are companies facing today?

And if you think about this, if you can understand some of those challenges that companies are facing, right. Then hopefully, in the broader context of this course being fundamentals of business under the umbrella of analytics, you can start to think about, hey, how can I use analytics to help solve some of these challenges that companies are facing.

So first, what I have here is an infograph from a report done by Forbes. In which they went out and surveyed multiple companies. And basically asked them the question, what are your top supply chain challenges? And they obviously kind of rank and bubble sized these according to the percentage of respondents that said each.

And I want to kind of focus in on the bigger bubbles here, these top five, okay? And so in this one, companies are saying, hey, the biggest challenge we have, right, in getting product from the earth all the way down to that final customer, right. The biggest challenge we face is being flexible and being responsive to changes in demand or changes in the product mix that we offer.

So you can think about that and go okay, I wonder if I can use data to help there. And the answer of course, is yes. Second biggest challenge, companies are actually reporting, right is with their suppliers. Right? So in our first graph those component manufacturers, right supplier performance in terms of risk, right risk that like KFC, I'm not gonna have any chicken.

Risk like Toyota, I'm not gonna have any parts to build my car. And then supplier, and then they also add a reliability and quality, meaning do my parts actually work, right? Third big one here, ensuring that the supplier has sufficient capacity, interesting. Fourth, effectively supporting new product launches.

Now this one is interesting because when you have a new product, what is the demand for that new product? Do you know what the demand gonna be? Usually answer is no. It's a new product, I don't have any data with which to look back upon. This can make, how much then do I need to have?

So I don't have enough, I can be like a Nintendo, when they first came out with the Wii or the Nintendo Switch and demand is far greater and there's none on the store shelves. Last one on here, lack of a competitive cost structure. What's interesting, if you think about it, and we go back to that linear supply chain graph in the first video lesson, right?

Is that the price that that end consumers going to pay is going to be a function of the cost of the company that mined material out of the ground. It's going to be a cost that is incurred by that company that is next in line and then that component manufacturer.

And then you have example again that we use the cell phone maker, right? The cell phone company and their costs and then the wholesalers cost and retailers. All of those costs together added up. Right, here what we're seeing this company saying hey, my challenge, one of my top challenges is, if I look at my overall supply chain and all these companies in here, it's too much.

The cost is too high. Let's take a different look, okay. And this one top five challenges, again from companies from a survey done of companies by MHI, which is a trade association. Top five challenge and this one's a little bit different inserting hiring qualified workers, yep. Second top top five challenge, right?

Is rated extremely rare challenging was being able to respond to customer's demands for lower cost. There you go. My downstream supply chain customers want to pay less, right? My downstream customers also, by the way 54% here, want faster response times. They want the product or service quicker? Right, number four, they have on here rated is extremely are very challenging is increasing competitive intensity on in the sense or in the form of as well rising customers expectations.

They want more in the product and they want it, by the way, faster and they want it for less money. And the last one on here that is particularly interesting to me for us here is this one, which is forecasting. Predicting, trying to predict in this case in particular, trying to predict what demand will be in the future.

So that ideally we're our supply chain will match that demand with supply. So hopefully, what you've seen from this very quickly is that there are a lot of challenges that companies are facing today, right? And you'll also hopefully, what you've seen now from these first few is that we've talked about what does supply chain management, what it is, why do we care about it?

What kind of issues companies are facing? And what I want to do in the next video lesson then is move into and, kind of, lay out this framework in terms of types of decisions that a supply chain operations manager makes.

## Types of Decisions

>> So hopefully now in the in these earlier sessions I've kind of given you hopefully a little bit of motivation, and maybe even piqued your interest a little bit in trying to learn and dig deeper into supply chain management. In this session, what I wanna do in particular, is I wanna kind of give you a framework, if you will, and kind of set the stage of everything that we're gonna go through from now on.

And kind of look at it through the lens of supply chain being a set of decisions, a set of short term, long term, medium term decisions, a set of strategical, tactical and operational decisions. And before I get into talking about this particular slide, I'm gonna let you in on a little secret here, okay?

Cuz really when you think about supply chain management, if you literally go in to its core, right, it's really about one thing, one simple thing. It's literally about, right, supply chain is about matching supply of your product or service with demand for your product or service, okay? And with that, the kind of framework then I wanna present here is that matching supply with demand right, becomes a series of decisions that a company makes.

And at the highest level and it's labelledl here 01, right, or long term competitive types of decisions or a strategic type decisions that they will make. And I've put this at the top because the idea then becomes, is it these things at the top, these these high-level strategic decisions should, hopefully, push down and then guide the 2nd level, right?

Which are more tactical in nature and it does say the word operations planning, okay, but tactical planning. And then, those then can feed down into more short term or operational types of decisions. And again, they all align with each other. So, if I start here, highest level strategy, right?

So strategy, how you plan to compete against others in your industry and strategic decisions to mean are longer term in nature, right? So two years and that type of decision, and some common decisions or common areas and some of which we'll look at here, right? Are gonna be around, how do you want to configure, and how should you configure your network?

What type of supply chain operating model do you want to focus on? How do you want to make use of outsourcing? How do you want to handle offshoring? What about vertical integration? And by the way vertical integration, what I'm talking about here is do you as a company want to become an essential your own supplier?

Vertically means, do you wanna integrate up or down in your supply chain? So a good example of that is a couple years ago, Delta Airlines decided they were going to vertically integrate, they made a strategic decision to actually buy an oil refinery. So that they could use that all refinery to help produce jet fuel cuz it turns out right, the number one cost in airlines is jet fuel, so there's long term decisions.

You get the long term, again, two years or more not absolute but longer term decisions that are not easily changed. So then kind of in the middle, right, more of these tactical decisions, right, will be will come from goals that you find from your top level strategic kind of choices that one makes.

And so often, by the way, at the tactical level, what you end up trying to do is you're trying to optimize. And so in this range, we'll talk, by the way, in this module, we'll talk some about lean manufacturing. We'll talk about sales and operations planning, we'll look at inventory management techniques.

Medium term, if you want a time frame, a year-ish, tactical. And then at the bottom here, and by the way, you see hopefully what you need strategy and tactical to drop down this lowest level, which is really about scheduling people, scheduling equipment, scheduling product, and so I say scheduling product, that could be things like inventory control.

In here you can have possibly quality control, performance measurements, right, supplier evaluation, but these tend to be decisions that are more real time, weeks out days, the current day operational. And again, hopefully, the decisions that are being made are being guided by those tactical decisions, right, which you're trying to optimize, which are hopefully feeding and supporting that strategy in level one.

So, let's put it all back together, there it is, again, all together, all one and again, this will kind of set the stage for the subsequent sessions that we're gonna talk about. So this is our framework, this is how we're gonna talk about operation supply chain, as a set in a hierarchy as well of decisions that operations were supply chain managers make.

So let me kinda summarize this now with an analogy to go with this different types of decisions that are made. So here I am, and I have some goals, I have a strategy, the strategy for me is, right, is to work hard, play hard, have fun. So I decide one of my goals for the year is I wanna go to Disney World, love Disney World, it's great stuff, right?

So my strategy, my high level, right, is to go to Disney next summer, that's my strategic level decision. Then as we drop down to level two in what I just showed, right, tactical decisions. I've gotta decide now, how am I gonna get to Disney? Take a plane? Am I gonna take a car?

Am I gonna take the train, right? What day am I gonna leave? Roughly when am I gonna leave, right? So tactical, and I'm trying to optimize and trying to balance, right, the cost maybe of a flight versus the cost of driving, or the cost of a flight versus the cost of a train.

Tactical type of decisions, right? And then when the day actually comes next year that I'm going to actually travel to Disney, we now then get into those operational type decisions, right. Now I've left, okay? I've gotta decide, I've got a route mapped out, am I gonna stay on that route?

As I'm driving down the highway, let's say, toward Orlando, Florida, and there's a wreck, okay? Now I've gotta make a real time decision right there, how am I gonna go around that wreck? At what point am I gonna stop and get gas? And when am I gonna stop and eat?

Where am I gonna stop? What am I gonna eat, right? Those are all operational level decisions but you get ideally those decisions I'm making down there at that operational level, right, are aligned with that second level which were those tactical decisions, which is aligned with that higher level goal which is to go to Disney.

Thanks

## Responsive vs. Efficient

>> Hello everyone, welcome back to our module on supply chain management. In this particular session, what I wanna do is I wanna take a look at two of the classic operating or supply chain models called responsive and efficient supply chains. And then we'll compare and contrast those two, try to fit them and see how they fit in in terms of strategic objectives for a company.

So when it comes to matching supply with demand, supply chains, they tend to focus on one of two ways of meeting demand. They either try to focus on being very cost conscious, or you may hear the word efficient, or they look at being very fast. So we use the word responsive, right?

And supply chains that are focused on cost, right, tend to look at things like how much they are utilizing their assets. How efficient they are getting the job done with minimal resources and waste, right? How productive they are, ratio, by the way, of output over input, right? What kind of scale, etc.

On the other side of the house, responsive supply chains are more about how can I quickly get products to the customer? And if you think about this further and you think about this notion of having one or the other operating model, you can see how these models then in turn, can, in a sense, cascade down to other strategic types of decisions that you would want to make.

So for example, if you talk about capacity for a particular company. And so to me capacity, right, is the rate at which your company can producer the rate. How many people you can serve, right? If your model from a supply chain standpoint is to have a strong focus on cost, right, whatever the amount of capacity you have, you are going to want to utilize it as much as possible.

Meaning maintain a high average utilization rate. By the way, utilization is a measure of how much, really it's a percentage of how much of your capacity you are using, okay? On the flip side, if my model is one of being responsive, then I'm probably gonna wanna build in a cushion.

Meaning I wanna have some excess capacity that's not allocated. I don't want that high utilization rate because I wanna have this buffer to be able to meet quickly speedily changes, right? Take that same thought process and go down to inventory, right? Keeping stock of something for future use, right?

An efficient supply chain is gonna wanna generate what's called high inventory turns. Which means replace inventory more times, if you will, throughout the year, right? And they will want to minimize how much pipeline inventory exists, right? In contrast, a speedy supply chain will probably keep a lot of safety stock, or extra inventory, not only of finished goods but perhaps work in process and even raw materials.

But keep significant amounts of excess inventory, again, so that the supply chain can respond quickly to demand. When it comes to lead time, and I'm gonna define lead time here as how much time elapses from when somebody places an order with you to when they receive that order, right?

A cost focus is interested in reducing lead time naturally as long as, I say naturally, but really only as long as it doesn't increase cost, right? Response to supply chain, which is all about speed, right, is really into any kind of ways to reduce lead time. And is willing to pay for that lead time reduction if it will allow them to respond quicker.

When it comes to look at your suppliers, right, the efficient supply chain will tend to pick suppliers based on cost and to some degree, quality. The response of supply chain model or company will tend to look more at speed. How quickly, how flexible is my supplier with changes in orders, right?

And then lastly, if you look at logistics, so actually transporting something from one location to another, right? The efficient supply chain is gonna wanna use low cost modes, okay? Those are gonna be things like boat, right, cheap boat, train. Whereas, a responsive supply chain you may see a greater reliance on things like air much quicker.

And we tried to delineate these two and show clear differences to these operating models. So what might lead a company to decide say, hey, I think I wanna be more cost-focused versus I wanna be more responsive? And the answer is gonna lie in what type of product it is that you are selling or service that you are providing, right?

So for example, if what you have and what you offer is what I'm gonna call more functional, meaning demand is more stable, less uncertain. Your product has a long life cycle, longer life cycle. Hauling inventories relatively low lower profit margins, right? Lower stock out costs, right? You're gonna be more functional and I'm gonna come back to this in a second.

Let me give you the other one. Okay, in contrast you may have a product that's more innovative, right? By the way you could think newer. So by innovative means it's something new, right? And you get that new products, new services, demand for them tends to be more uncertain, right?

And it's harder to predict or forecast demand because hey, it hasn't been out. You don't know, right, how your customer's gonna react to it. It may well have a shorter product life, right? Higher inventory cost. But here's the other interesting thing. Innovative products tend to have higher profit margins.

And it's also more costly if you don't have it when somebody wants it, okay? So again, kinda just boiling this data a bit simpler term, functional-type products have relatively stable, or have a relatively stable environment. Whereas, innovative products have a more unpredictable, unstable environment. So now, hopefully what you're seeing is here maybe is why companies need different operating models.

It depends on the type of product they have, right? And you can see that then functional products, it's more idea to have an efficient or low cost supply chain. There is low profit margins there, right? Demand is more stable. On the flip side, innovative products, I'm not as certain what demand's gonna be, right?

But I know that I can make a lot of money at this point, right? So I wanna be able to respond quickly. So in the other sessions, well, where we talked about, hey, you know what, we're gonna look at supply chain as a set of decisions. Long term, medium term, short term or strategic to tactical to operational, right?

And so what I wanna show you here is to kinda tie the strategic to the tactical and then actually really even down almost to the operational, okay? So here's the deal. Let's say that you're a company, I don't care who it is. Maybe it's retail most likely, right?

And you decide the operating model that's going to best support your company's strategy is to be efficient, and to have a low cost supply chain, okay? So tactically then that means here's what we need to do. We know we need to have low operating costs, right? We need to have high asset utilization or return on assets.

And then what happens is then from a practical standpoint, some of the things that you will probably do again, to support a line with that model is you will look to do something called VMI, which is vendor managed inventory. I don't know if everybody's seen, but literally what this is is think of a grocery store.

And you go into the grocery store early in the morning. And you notice as you walk down the beverage aisle that there's a guy, or a lady there, with a Coke jacket on, or a shirt on. And that individual, who's clearly a Coke employee, is actually putting product on the shelf, putting Coke, putting Diet Coke, putting Sprite on the shelves, right?

Literally Coke, the vendor Coke is responsible for managing the inventory in the grocery store, right? Other practices that support this low-cost focus, direct store delivery, meaning bypassing warehouses. And then of course, having what's called full truckloads. So a lot of effort you'll find inefficient supply chains comes around when I'm moving something from point A to point B and I'm putting it in a truck.

I want the truck to be packed, literally packed front to back. So to kinda bring all this back together again, right, is in operation supply chain management, right? Again, what you're trying to do with the core, if you cut it down to the core, you're trying to match supply of your product with demand for that product, right?

And depending on what type of product you have in supply here, right, whether it's one that's more functional, or one that's more innovative, right? The ideal supply chain model can vary, right? Now, some of you may be asking yourself, what if I wanna have combination of both? Is it possible that some companies want a little bit, in some quality or have some qualities, a product that has qualities of each?

And the answer is yes. In those cases what you're actually talking about is maybe what you want is more of an agile supply chain. Thank you.

## Network Configuration

>> All right, in this session, I wanna take a look at something called network configuration. So in the prior session, we talked about responsive versus efficient supply chains, okay? Very high level. Now I wanna talk about, hey, literally, you've got warehouses, you got suppliers, you've got customers and markets, okay?

And by the way, in today's environment, there are many cases they're global, right? So the question then becomes is, how might you configure your quote supply chain network to meet different markets? Where will you have warehouses? Where will you have facilities? And so our own objective here is going to be to look at more centralized network configurations, versus more decentralized network configurations.

And to set the stage here, right, I wanna take an example and let's say, I'm gonna continue on with the theme of using Coca Cola, they're a great local here home town partner of ours, right? But let's say that you're Coca Cola and you literally, you sell products in three regions around the globe.

They can be any three regions, I don't care what they are. They can be the Americas, they can be European Union and Asia. But you have key customers in all three of these regions. The question becomes, where should you put warehouses to supply those markets and where should you manufacture in this case bottle I guess, right?

And where should your suppliers be? So suppliers, right, for water, carbonated water, sugar, all the ingredients that go into making your product. Where should you have all of these located with respect to your key markets and your key customers, right? One common solution and one that many companies start with, is they say, yeah, I'm gonna make my product in one location.

All right, I'm gonna have suppliers and that same one location. In this picture, I'm using Region 2 as the example of that one location and then we'll have warehouse in Region 2. And what we'll do is we'll distribute in this case globally, right? So we will have centralized manufacturing, right?

Well actually, really if you go back to the beginning, centralized sourcing, right? Centralized manufacturing, centralized distribution to all of the markets. Another common network configuration is, yeah, I'm strongly gonna have one place where I manufacture, so my manufacturing is centralized, but I'm gonna source from all of these regions.

And I'm gonna put warehouses and all these regions, all right? And I'm actually use all three of those regions to supply each other as needed. A third option, may be to go totally localized or really decentralized. So in each region, I will source locally, I'll have my own manufacturing facility in that region, then will send to my my warehouse in that region, to then feed that particular regions market, right?

So here decentralized sourcing, decentralized manufacturing, decentralized distribution. Finally, I can choose much like that where it's decentralized just as before, but with one slight caveat here, which is I will source globally. And so if you take these four and you look at all these four you can see that, right?

Some of these configurations are more centralized in nature than others. Which to me then brings to me the question, okay, what's what do I gain by being more centralized? What do I gain by being more decentralized? Look at these two choices, okay? And here is kind of what you will typically see.

If you decide to have a more centralized or single, all right, supply chain, then it turns out overall your total inventory ends up being less than, if you think about this, if I have just one warehouse, right? The inventory in that one warehouse would likely be less than if I had three different warehouses, one warehouse in each location.

If I took, say for example, in our example three regions, if I had a warehouse in each of the three and I took the inventory in region one warehouse, added the inventory in region two warehouse and then the region three warehouse and put those together to get a total amount.

It would be higher than if I just had a single warehouse in region two, right? And the reason for that is because there's something known as the pulling effect. Meaning some of these regions demand would be a little bit more than I expected, some would be a little bit less, overall though, I would not need to keep as much safety stock and I wont need to keep as much inventory to meet the aggregate demand across all three regions, okay?

I'll also see if I'm using a single centralized network configuration that'll have a lot higher shipping volumes. Which hopefully will allow me to get a better quantity discount with my third-party logistic companies, that's 3PL. It's less complex, it's easier to coordinate. It's centralized. It's well what happening is if I want to standardize practices or if I can find little ways to make things better, I've got a lot higher economies of scale if you will.

But it's not totally certain if its cost is actually minimal, we're not sure, or less. Now, of course there's downsides to centralized, right? And among those, is your transportation cost for one centralized supply chain network configuration is gonna be higher. I've got a ship from region one to both region one and three, right?

And what that means then is that my responsiveness and look at here. I just put in a word from the last session, right? Think about this, if I have a centralized network configuration, all right, it's gonna take me a little bit longer to supply those other regions. Decentralized, by and large, for the most part has the opposite, right?

Is the opposite in terms of advantages and disadvantages. And I've got them all listed here. I won't go back through them all again. But if you think about it, with a decentralized network configuration. So think again of the picture I had up that had literally supplier, manufacturer, warehouse for each customer segment, in each of the three regions you had that same structure, all right?

Being able to respond to changes in demand in region one, by using suppliers, manufacturers and wholesalers in region one, is going to be quicker usually, than having a centralized network configuration. Right, so carrying on with what we've just talked about here, this is gonna be like a quiz for you now, okay?

And my questions are gonna be around, when is a centralized network configuration more appropriate than decentralized? So question one, is centralized more appropriate for a stable demand environment, or an unstable, unpredictable demand environment? And the answer would be more stable, more predictable. You already can kinda see where we're going at the bottom, right?

Let's keep going. High velocity or low velocity environment? And this means with, right? Think of velocity, right, is how quickly you're moving things. Answer here is low velocity, right? When we need a higher or a lower product availability. Think back to the other slide. Where do we show availability as being higher?

And the answer was centralized. Is centralized better do you think when you have many, or few points of sale, or delivery points, right? The answer is gonna be fewer. One thing that folks will often look at is the cost per weight of moving something, right? If the cost per weight is low, then centralized is more appropriate than decentralized.

Cuz remember, with a centralized strategy, you're going to have higher transportation costs. You're going to move things farther than you would if you had a decentralized environment. You will also, by the way because and already getting to it, you're gonna have a low cost focus. You want a high volume per shipment.

And because there's a single centralized supply chain, it's lower complexity. But again, what's kinda neat here is you notice now what we've done, is we've tied, right, centralized versus decentralized together with the prior session, which was efficient or responsive supply chains. So when is a decentralized, then, supply chain more beneficial?

When demand is more uncertain or more unpredictable, when I have fast moving products, when I need to get it there quickly and reduce lead times, right? When I need more responsiveness, I probably have more points of sale. Maybe it costs me more per weight to move stuff, all right?

I need a more responsive supply chain. So putting this then back together, right, what we see now here is that when you need a more centralized supply chain, then it tends to lend itself to a more cost or efficient focus, operating model. And then in contrast, decentralized supply chains, right, tend to align themselves better with a responsive operating model.

## Outsourcing

>> So in this session, we want to take a look and talk a little bit about outsourcing. So not surprising, our learning objectives here is gonna be to discuss it, and then in particular, kind of hopefully tie in to its importance in a global supply chain. And so where I want to start is I'm just gonna give a simple definition here of what is outsourcing, right, simple definition, here it is.

Outsourcing is obtaining of any resource or process external to your company. So in essence, you're getting raw material or a component or some resource or item, or you have somebody else doing a piece or a process for you. That's considered outsourcing. So let's take a second here then and let's go through, right, why should you outsource?

Okay, cuz in some, I will just tell you in some countries and in some cultures, I don't know if culture's the right word. But certainly in some countries, they've gone through periods of time where the word outsourcing has had a negative connotation to it, as though you're giving away jobs for employees.

But really, it turns out, from a business standpoint, there are some real strategic reasons why a company may choose to outsource. And the first one I've got up here is the one that by the way usually intends to lead to reductions in jobs in a company. And that's the desire to reduce and control costs, right?

So the classic example, at least in the United States that we've seen over the years, is this outflow of manufacturing jobs from the United States to other more developing countries. And it's been because the labor rate is significantly cheaper. To give you an example, right, I worked for a company at one point where we outsourced work to the Philippines.

And in this particular instance, the people in the Philippines who were performing these tasks were literally getting paid $20 a day. Now, I will just tell you, the minimum wage, at least in the United States is around seven and a half dollars, right? These particular jobs, by the way, that got moved to the Philippines were paying about $20 an hour.

So they went from $20 an hour to $20 a day, for somebody, okay. That's a reason to consider outsourcing. Other reasons to outsource, right, is to give you more flexibility, right, or give you more responsiveness. Outsourcing can allow you to decrease your lead times. Again, time from when somebody places an order with you to when they receive that order.

You may look to an external company for a particular resource or process, because it will allow you to be more innovative, coming up with new things, which by the way can be new product features or new process. Another very common reason it makes sense to outsource is so that you can focus in on what your company's core capabilities are.

I mean, think about this, I'm a young startup company. I'm trying hard to get this company viable, right, to start to make a profit. Do I want to have to worry about handling maybe, let's say HR type functions, or accounting type functions, payroll, for example, right? The answer is probably not.

No, I want to focus on getting customers, developing my product. And I want somebody else to handle payroll, okay. I wanna focus on my core. Other reasons to outsource in this day and age is to gain access to world class capabilities. Maybe in some other region of the world, right, there are skills and there's innovation happening that's not the same as where I am, right?

If I'm resource constrained internally, outsourcing particular tasks can allow me to free up those internal resources to do other things, and ideally, other things that are more valuable with their time, right? Or it may just be that I flat out don't have the resources I need internally, so I've got to look somewhere else, okay?

Finally, another reason to outsource is to share that risk, sharing a risk with some other company. All right, so then this leads then to another question, right? And by the way, you're also noticing by now that a lot of this discussion in these sessions that we're having are around asking questions.

To me, it's just a great way to kinda get your brain and those gears in your brain turning. So now, let's think for a second why, we've talked about reason to it, but I'm sorry, we've talked about why. But let's talk about now what? What resource? What process should I consider outsourcing?

Is it everything, right? It's probably not, is it? So how can I be, since we're talking about a strategic level, how can I be strategic about what I outsource? And one way to do that is to kind of look at the things that you do as a company, all of the activities that go on, right?

And ask yourself, is this activity or is this product, right, is it core to what we as a company do, right? Is there strategic value behind it? Is it helping us develop best-in-class capability? Or is it something that's not really core to us, but it is important? That's number 2 here.

Or is it just simply not core to what we do at all? Again, for most companies, I'll use the example of paying people. And you may argue, well, hold on, paying people for most companies, let's say you're a technology company is not core, but it is important. They get kind of upset if they don't get paid, that's fine.

But you can then start to look at, where do I think this process lives? And then you can take that further. And another way to begin to look this is okay, let me ask two more questions about a given process or a given resource, okay. And the question we'll ask is, what kind of potential does this particular process give me for competitive advantage?

And what's the strategic risk of outsourcing? And what this does is, it makes a nice kind of if you want, nine by nine. By the way, no means absolute, but what it really leads is to kind of I'll call it three areas to consider. And the first area I've got here is kind of down here in the lower left.

So we'll call this kind of area right here, right? And this, by the way, this area, and what I've got here denotes where the risk of outsourcing, the risk of outsourcing is relatively low to moderate, right? But the potential to gain a competitive advantage from outsourcing is relatively high.

Think about that. I've got the potential if I outsource my payroll, that I can get some technology that I don't have today. So instead of doing it by hand and writing checks by hand, I can go to a company that specializes in payroll, that has this stuff automated.

Maybe even ties in to some sort of time and attendance system that I have, so it can get the hours. And it handles vacation and it handles all kinds of other stuff really nice. So it can give me potentially a competitive advantage. And there's really low risk to outsourcing.

I mean, what is somebody gonna learn from my company if I give them the payroll? I mean, they'll learn the salaries, but they're not gonna learn anything that's core to what I do. So the argument is it processes resources that fall in this range, right? Those are ones that you should consider outsourcing.

It may make a lot of sense, okay? On the flip side, in the upper right of what we've got here is this kind of we'll call it a region of processes or resources that probably are not a good idea to outsource, right? And you can see here these are the ones where the strategic risk of outsourcing is high, and the gain from outsourcing I would get is relatively low, right?

If there's risk, meaning people can learn what I'm doing and replicate and use it against me, right, this is a high risk. And really, if I give this particular resource or process to somebody else, I'm not gonna gain anything new. Why would you do it? Does that really make sense?

And then there's this kind of middle of the road thing, right? And again, not absolute, but middle of the road. So we'll look at one here, we've got, well what do you do if you got low risk and really not a lot of competitive advantage? You'd probably buy off the shelf, and that one, by the way, is probably the best example, like outsourcing payroll.

All right, you're not gonna gain any advantage probably, and really no risk, right? As you kind of move down this way and get more medium, maybe it's some kind of special contractual arrangement. And then you go the bottom down here, you probably still consider producing internally. So in summary here, I hope I've given you, right, some things to think about with respect to outsourcing, to having another company external to you provide resource or provide a service, right?

And so, we've talked and we've touched on several reasons why a company would wanna outsource. And then we looked at considering, okay, from a strategic standpoint, what would be good or viable or candidate processes or resources to outsource. Thank you.

## Offshoring

>> So in our last session, we look at outsourcing. Here were gonna look at a slightly different word, some similarities some crossover. But I wanna talk about offshoring. So I wanna object this two-fold. One, explain offshoring. Right, just purely as a supply chain strategic decision. And then I wanna make sure you get the differences between offshoring and outsourcing.

So I'll start out with just a nice pretty picture of a shore, right and kinda give you a definition of offshoring. So here it is. Offshoring is obtaining of any resource or process external to the company, which by the way sounds like outsourcing, but I'll add a caveat.

That that obtaining is done across an ocean. If you're a US company, across the Atlantic, across the Pacific, okay? Now the other and probably the big key distinguishing thing here, is you can actually offshore to yourself. Think about that for a second. I'm saying you can actually offshore to yourself, right?

And by the way, a lot of companies do this, right and have done this, right? A simple example is companies have said, hey, I do a lot of IT work here in the United States and I've decided for various reasons, many of them labor costs, I would like to open up a location in, let's say India.

Maybe I'm Disney not to pick on anybody, right? And I will open it offshore Disney IT shop in India, okay? It's owned by me, Disney, okay? That is still offshoring. You've taken a process, IT, programming, whatever it was, network admin and you've moved it from being done in the US, you're a US company and you moved it across the ocean.

Hence, we used the word here captive offshore. Now there are also some other terms that are used with offshore. It's great offshoring word keeps getting added to. There's this notion of nearshoring. If I'm in the US and I decided to send something to say Canada or Mexico, that's considered nearshoring.

And now over time, we've had instances of say where something has gone, across the ocean, say to India, so it's been offshored, but then for a variety of reasons, it's come back and that's called re-shoring. That's great, we got all kinda names for all kinda stuff, okay? But again, offshoring is simply getting the resource done, but it's across the ocean.

So if you're a company, then, that's looking, right, to offshore a particular activity, right? One of the things and I should have put this as a question, but nonetheless, right, what are some supplier and location factors of interest that I should consider, right? And so from a supplier standpoint, one of the things that's gonna be interesting or I'm gonna wanna look at to consider in using another supplier, right, is how much innovative capability they have?

How well do they tend to meet or exceed the expectations of their customers? That's quality. How much capacity do they have to perform a task, right? How long does it take time for when I place an order to when I receive an order, lead time? Right, what are they cost?

How dependable are they, right? What supply chain capability do they bring? Then I also have some country or location related factors that I wanna consider And for this country and location, I kinda will take this at another direction and really we'll talk about offshoring, which is across the ocean.

And really what's driving this, is this term that I know you've heard called globalization, right? The notion of markets going global, right? And there's been I think several things that have contributed to this notion of going more global and hence this desire for companies to offshore, right? And I've got four of them up here.

And at the top what I have here are market drivers, okay? It's been kind of interesting, if you've looked over time what's happened, right and again I'm using US companies but here I am, I'm a US company, okay? And I'm selling products here in the US. I've been doing it for decades.

And all of a sudden, there's this foreign Japanese company that begins to come to the US and sell product, that competes directly with me. The result of that becomes, right, from that increased foreign competition here in the US, is that the quantity of product that I'm selling here, has going down, right?

And by the way, coupled with that, just in general what we see is that product lifecycle, so the time for when a product is first introduced to when it finally becomes obsolete no longer bide, that time is getting shorter. And companies spend money researching and developing a product and when its lifecycle gets smaller, they happen to, right, start a new research and development cycle quicker, more often and thus, incurring more R&D costs.

We also see that it is critically important to be close to you customers. To truly be able to respond and to truly be able to customize products to local needs, you gotta be there, you just do, okay? So you see all these things here called market drivers, these in themselves are leading companies, right, to go more global.

And I'll let you read some of these, you can hit the pause button here, right? But there's been technology drivers also, driving this globalization, meaning there's technology that companies in other countries have, right? So forming joint ventures with them becomes important, right? Being able, from a technology standpoint, to have disbursed R&D facilities is much more possible now.

There's been great improvements in communication, in Internet connectivity and capability. We've already touched by the way on the left side, quite a bit here, right? In terms of cost drivers, right? Not every country has the same labor rate. Some of them have much lower labor rates. In fact, some countries have lower costs for raw materials.

And on the bottom here, right? There's also political we'll call macro economic drivers, that are causing companies to want to go global. Truth is, kind of in summary, is over the years, a lot of tariffs and other kind of barriers to entering other countries has gone down, making the ability to go global much more possible.

Now, when we talk about offshoring and let's say, in particular, that we are offshoring manufacture of a particular product. And we plan to bring that product back. So again, I'll use US as an example, I'm a US company and I've decided to move manufacturing to China, right? This has happened quite a bit.

So I now make my product in China, cuz the labor rate's lower and I'm gonna bring it back and sell in the US, right? You understand that there's other cost elements that I will incur beyond just the pure labor cost, right? That by the way one should consider, when deciding if offshore is correct.

Now, those other elements, there is what is called FOB, or free on board. That's the price to get it to the shore, at let's say, China. Companies are gonna incur export taxes to get a product out of there. You will incur a cost to put it on an ocean carrier, like a CMA CGM, or Maersk, or one of these other ones, to take it on those huge, mammoth ocean freights, right?

You're gonna have to spend money for insurance. You may have to pay tariffs, right? We've got brokerage cost on here, letters of credit, right? There's a cost to money. Another biggie here is exchange rate exposure. What's the exchange rate between here and China? As that goes up and down, that can cost you more, right?

And then once you get the products here to the US, you're gonna have a cost associated with putting it on a truck, to send it to your distribution center in the US. There's other, as well, cost elements that you can have in having, say, products sold overseas like in China and shipped here.

And one of those and I've got up here asthe first one is the risk of obsolescence, right? And by the way, products that come on a ship, they don't arrive on that ship the next day, right? While ships are the cheapest method of moving product, they're also the slowest, right?

Other costs elements are cost of rejects or rework. If this particular facility in China, right, doesn't have high quality, makes mistakes, you may not find that out until weeks later when it arrives here. You also have the possibility to have damage occur along the way. I didn't even put on here, but it does happen those those big containers that you put on the ships to go across the ocean, yeah, sometimes the ocean rocks, guess what happens to the container?

It falls in the ocean and it's just gone. You will, by the way, have increased holding cost, because you'll have what's called pipeline inventory, right? So when it's taking a long period of time to get product from this offshore location to here, where you want it, you're gonna have some inventory along the way, right?

You're also gonna have to pay for some support. And you're gonna incur cost to send some of your employees overseas, right? So the other piece here to look at is, what are some of the pitfalls around offshore? Cuz offshoring's been something that a lot of companies have used as a way to improve profitability or performance of their company, right?

So some things that can make it less attractive or not as good. Exchange rate volatility, quite simply. I offshore to a particular location and the exchange rate between it and where I'm at becomes highly unfavorable. I could get to the point I'm losing money. Here's some other things to consider, right?

Is depending on what process or resource you offshore, right? It can have a negative effect on your core competencies. Particularly, right, you get if what you're moving offshore is a core competency. Naturally, as I just described, deliver lead times tend to get longer, they do, if something's coming from a long way off.

By the way, if what you offshore, right, is to somebody else, it's not you doing a capital offshore, you've literally outsourced offshore, you've done both. You've taken it external and you send it offshore, right? If you're not careful and this has happened to companies, all of a sudden one day they look up in that supplier in say China, is all of a sudden now selling the same product that they were making for you.

And then they decided they will start to sell that product in your home location. So you basically, right, one of the one of the concerns you can have with offshoring, is you can actually be incubating and creating global competition, right? Another thing to consider with offshoring is in some cases, companies don't get a true cost to offshoring, so they get an inaccurate number.

I.e., they get a number that makes them think it is much better than it is, okay? By the way, anytime you have somebody else do something for you, right? You are, by definition, giving up some control over quality. If your suppliers don't act ethically, you can have issues with them, right?

And then other pitfalls is, by the way, by offshoring in this greater distance, you can introduce other risks in your supply chain. So to kinda pull all this back together, cuz I've given you a lot in this session, right? Offshoring as a strategy, right, or a strategic choice really, I should say.

And by the way, high level strategic choice, has a lot of benefits and it makes a lot of sense. And companies have been successful deploying this strategy of offshoring, right and/or outsourcing certain resources and tasks okay? But what I hope you've become aware of now and have become more cognizant of and will think about, right, when you're making these decisions or yet what are the goods, but also what are some of the pitfalls and what are some of the bads?

Or what are some of the things I need to be careful of, if I choose to outsource or offshore?