File name: Supply Chain _ Inventory Management and Forecasting.mp4

Moderator questions in Bold, Respondents in Regular text.

KEY: **Unable to decipher** = (inaudible + timecode), **Phonetic spelling** (ph) + timecode), **Missed word** = (mw + timecode), **Talking over each other** = (talking over each other + timecode).

Stephen Drummond: Good afternoon everyone, thanks for joining us today, and welcome to this webinar on inventory management and forecasting. My name's Stephen Drummond, and I'm joined today by my colleagues, Brian Durnin and Jo McVey (ph 00.15). We're supply chain advisors, working in supply chain development team within Invest Northern Ireland. Today's webinar is aimed at providing an overview of inventory management and forecasting, and hopefully will help you recognise the key elements of inventory management and forecasting within your organisations. Jo and myself will take you through the presentation and Brian and I will then jointly take questions at the end. You can add your questions in the chat box. Thanks very much for your attendance and, and we'll continue on with the presentation.

Jo McVey: The subject we are covering today is around basics of inventory management and how it links with forecasting. We want to look at what inventory management is, and how it can help your business going forward. I am Jo McVey.

Stephen Drummond: And my name is Stephen Drummond.

Jo McVey: Supply chain support from Invest NI is provided by the Supply Chain Resilience and Development Framework team. Or SCRDF for short. We are part of that team. The team is made up of supply chain professionals seconded from business, and of experience of implementing supply chain improvement in a wide range of industries. Our role is to work with business, to analyse what they do, analyse where development is possible, and provide mentoring and support throughout projects, to deliver tangible value and cost savings. We can also provide financial support for a supply chain role in your company, to deliver supply chain improvement if resource or skills do not exist at present. The webinar's designed to primarily help you understand some of the principles of inventory management, provide some wider context on, on how inventory management can both help or hinder your organisation, and most importantly, highlight how you can make changes in your processes to build resilience by reducing costs and improve performance. We have also signposted some tools, techniques and resources that you may consider as next steps. So let's start with the basic definitions. What is inventory? Inventory can be seen throughout your manufacturing process and is both the goal (ph 02.21), business writer, Eli Goldratt, suggests, that if a company's goal is to make money, then they should focus on increasing through output, and decreasing inventory. Inventory can be very costly to your organisation and have a huge impact on your cash flow. So if it's so costly, why do we need it? We can see for some of the reasons on the screen, from improve customer service to stock out costs.

If you ask a production manager about inventory, they may say, 'I need it so I don't run into shortages and delays, or it gives me flexibility to keep everyone working efficiently. I get an urgent order, I can react to it.' There are many reasons not to hold inventory. If you ask a financial controller about inventory, they may say, 'I have a ton of working capital that I pay interest in, tied up in inventory. It also is costing me money to store it and move it about. If I continuously get stock production charges for obsolescence, stock losses, and stock going out of life.' The challenge here is to find the optimum level that balances the good and the not so good reasons to hold inventory. And remember, this will change as circumstances change. Tell it to the production manager, if the supply chain works well, and orders are both placed and materials delivered on time, they won't run into shortages and delays. If a production system is operating properly and the capacity and demand within production will match, and the planning function should manage (mw 03.55) demand, so it doesn't impact operations. All these associated processes working effectively reduce the need for increased inventory. When they don't increase stock or a work in progress is used to plug the gaps in your system and operations, the diagram shows there are many reasons for excess inventory. Important to get the root cause of these to make a positive impact on your inventory levels. So when a company recognises these issues, they can begin to eliminate, or at least mitigate, the causes of excess inventory. They can bring down both inventory levels and the associated costs.

The first area you want to look at is the management of inventory. The objective and intent of inventory management is having a process that gets the right parts to where they're needed and when they're needed. To manage inventory effectively, you need a good understanding of the processes that control inventory, which we'll talk through on the next slide. Important to the inventory both from the perspective of the company, but also the customer point of view. The ability to be flexible and react to changing customer needs can be achieved with increasing inventory levels. So it's a balancing act when controlling cost versus customer requirements. Then the supply chain-, your customer may require you to make frequent just in time deliveries, which will also affect how you manage inventory and finish goods to be able to respond to the customer.

Stephen Drummond: This is a generic illustration of an inventory management system. Let's start with the customer. When you place an order for finished goods, material planners, and then process the order, and create the demand for it on the internal system. Usually via an MRP system. Purchasing, source and order the parts of materials and create a purchase order. That goes to the supplier, who then fulfills these orders. Parts and materials are delivered from the supplier and can go either directly to the production men (ph 06.05) or can be received into the stores. Parts and materials move from the stores to point of use, and when they are used by operations during this process, they are known as work in progress. The finished items are then shipped to the customer. Inventory management system involves a movement of data as well as physical inventory, and this needs to be understood and managed through the processes to operate effectively. Sometimes when we think of inventory, it's just stores and warehouses that we consider. However, the image on this screen shows that inventory movement both exists and is controlled through the entire manufacturing process. Keeping this process as lean as possible ensures that inventory levels are kept to a minimum. Shorter, less complex process cycles result in less inventory. Flow of inventory can be interrupted or bottom lines can develop throughout the process, all of which can increase inventory levels. The process that manages inventory flow needs to be able to highlight these problem areas and fix them as they occur. Each step in the process can have issues, from erratic customer ordering to poor

quality from a supplier base, to near completion of finished goods. Again, all of this adds to waste-, all of this adds waste into the process.

On a practical level, it's very useful to walk through the production process from start to finish, and look for inventory problems (ph 07.40). This may identify improvement opportunities for your company going forward.

Jo McVey: Here are just some of the early warning signs that can show inventory management systems may not be working correctly in your premises. Having too much inventory and yet you've got both shortages and unhappy customers. If you see evidence of any of these signs, you probably need to act. All of this is noise in your system, and this leads to increased costs. So what can you do? Set your own inventory management process. Do you have a process? Is it documented? Is it being used and is it fit for purpose? These are some of the questions you may have been ignoring. However, the impact of not addressing these is an impact to your profits. Here's a simple example of the cost of holding inventory. This can sometimes get ignored by companies who see inventory as the purchase price, and that's it. The cost of holding inventory includes storage, obselescence, insurance. For the rough example we've used 25% as a notional holding cost percentage. This can be much higher. Each company will be different. In the example for 100k of stock, the inventory cost could be 25,000. So each 1000 added in stock inventory levels can impact your profits by £250. Holdfast (ph 09.11) to this, if you see a 1000 in inventory, it's an increase to your profits of £250. That's the equivalent of getting 5000 in sales at 5% margin. So it's an important area to tackle to keep your business competitive and profitable.

Stephen Drummond: Moving on, we're going to look at the relationship between inventory levels and demand forecasting. In order to meet customer expectations and having finished goods available when they're needed, 3 main factors come into play. Is the company holding the right levels of inventory? These inventory levels are dictated by customer need, buffer stock, which can cover short term fluctuations of requirement, and a longer term demand for forecasting, which allows a company to match their capacity with the market customer requirements. That forecasting can be done effectively, the less buffer stock is required and shorter lead times are possible. The site shows a number of sources of information which can help build up a demand forecast, from current order book to stark information and trends, a forecasting however is only as good as the information that you included in the calculation. These are different types of data that are useful to consider. Trends are helpful to predict future demand by predicting future buying habits. Seasonality. Here we are looking at the presence of variation which occur at certain intervals, weekly, monthly or quarterly. Various factors may cause seasonality, like weather and holidays. Cyclical elements data can exhibit waves and falls that are not of a fixed frequency, they are often due to economic reasons (ph 11.06). Auto corrections. The degree of similarity between a given time series and a light version of itself, measures the relationship between a variable, current value, and it's past value. Random variation, events that are impossible to predict.

Time serious models forecast future based on past models, and there's a lot of software out there that can

help with this process. It's good practice to build a forecast on a short, medium and long term basis, as these serve different purposes. Short term forecasts will help you properly prioritise current production. Medium term forecast will help to balance near term (ph 11.50) requirements with occurring capacity and may impact resource levels, should patterns that play with raw materials and machine time required. Longer term allows the company to look at their strategic position across labour, capital investments, and market direction. For example, if you're moving towards a sustainable and supporting green economy, they use of fossil fuels, reducing emissions, need to be factored into your plan. And also, you may have production lines that may be phased out and you may be looking to change production mixes going forward. Building a forecast model. Things you need to be clear on. What am I trying to forecast? What is it-, what is the demand that I'm kind of looking at going forward? What is the timeframe? Is it short, medium, or long? It's always good to start with the data you have. Historical data is a good reference point. Is demand increasing or decreasing? Adding to this, then you can start with demand you already know, more orders from your customers or more guaranteed regular work. Then we can overlay high potential sales enquiries over work that you're likely to be. Using market trends, customer information and marking sales input. The next level, which is more speculative, includes potential areas of opportunity for production.

Again, from a sales and marketing team, and can be added to the forecast. This should also reflect the company's strategy, in terms of production output. The model of this forecast demand can be estimated. As you can see from the example, this is a range from high to low, that can be used for supplier production planning. The difference between high and low estimate widens with a longer horizon. Forecasting should also be seen as a continuous process that should be repeated as part of the budgeting process, at least once a year. As we have said, forecasting is a continuous process, maybe useful at identifying issues ahead of time. Here in this example, you can see fluctuations in short, medium and long term. They created this forecast that allows you to ask questions, can draw some conclusions that you may want to consider going forward.

Jo McVey: Moving into this section, we will cover stock management. How the stock is managed has an impact on inventory, and again, the overall costs. You need to consider what your stock management process is. Are you using an MRP? Or Min-Max? The key here is having a documented process that is understood by all. The other big question is, is it working for you? Do you have shortages or excess stock levels? When you do have an issue, is the process being followed? Are you getting to the root cause of the issue to eliminate it going forward? It's also vital to ensure you've a robust (mw 15.03) process, supporting both the production and inventory holding costs. You need to know what you actually have on the system is actually in the store. Safety stock and buffer stock levels can be used to help when demand or supply is volatile, and these are specific to your business and one size doesn't fit all. But any extra stock is extra cash. Here is an example of a simple tool, Min-Max. The goal here is to keep the inventory between two levels. Minimal level is a stately level to cover unforeseen circumstances and the maximum is the most economic quantity, balancing stock holding versus reorder level costs. This is done by launching replenishment orders to arrive as the stock reaches the minimum level, as the order quantities should not bring stock levels above the maximum level, as this is dictated by badge size and the frequency of orders. The reorder point is back scheduled using the lead time for the commodity to replenish stock, as it reaches the minimal level. This is normally managed through an MRP system.

Worth noting again, the accuracy, the usage, and the lead time data are critical to this process working well.

Stephen Drummond: Basic warehouse operations. This is an example of a basic warehouse operations. Companies will have a different approach, depending on their needs. However, they usually include receive goods, putting away, pick and kit and issue, alongside cycle counting and return of parts to stock. The objective is secure an outward control of stock. Ask yourself, do you have a documented process? Is there a control system in place and is it working? Is the process adequate for your current and future operations? Is the process understood and being followed by your staff? When issues occur, is it because a process is not being followed or the process is not working? What happens next? Do you work to fix the process or fix the problems? There's an old saying that what gets measured gets done. That if you don't focus on measuring your inventory levels, they may get out of control. You can see some typical metrics on this slide, from stock turns to obsolete stock levels. Metrics that you see what's working and what things are going wrong. You need a balanced approach. If you push too hard to reach your sure inventory, that could impact production. The lower term that is widely used in industry is IES and OP. Sales and inventory operations planning. It is the process of planning future resource levels so supply is in balance with demand. This is a top management process and works at risk levels (mw 18.05) parts for the business.

Jo McVey: So in conclusion, what are the next steps? Do you have documented inventory management processes or procedures? And are they right for where your business is now? Are they fit for purpose? If not, fix them. Make sure everyone understands, then eliminate single points of failure. Enforce the operating system, your documented processes, and monitor it through key performance metrics. Do you maintain and update supplier lead time and inventory levels? Important to drive data accuracy. In times of high volatility, work on forecasting and demand management needs you to be flexible in your approach. So based on what you've seen, where are you now? What problems are you already aware of? If you need advice on any of these areas, we are here to help. The aim is to build internal strength to move your processes forward. So what now? There's a supply chain checklist, which covers four key areas. Risk management, risk mitigation, inventory management, and supply chain management. And if you fill this questionnaire in, that allows us to see what areas we can help you with. This service is free to companies who meet the criteria, and to get in touch with us, you can email us on supplychainquery@investni.com and fill in the questionnaire link below. Thank you for listening.

Stephen Drummond: Okay, thanks very much Jo. So we're talking to Brian, we're just going to have a look just to see what questions we have here. So first question, Brian, I'm seeing, is how do we start to reduce inventory?

Brian Durnin: How do we start to reduce inventory, always a great question to start with. First thing you have to do is just have a look at what is your current situation. How much inventory do you have? And I'm a big advocate of management by walking about. So go and have a look. Walk the production line and see what you have. If you're doing that and you notice things, ask the questions. How long has this been here, why is it here, what systems do we have around controlling this? And then when you've got a good

handle on kind of what's lying round your factory or where you have things, start looking and figuring out, right, how much does this inventory cost? I mean, is it a high value item, is it a cheap value item, what is it? And start having a look also about what silos are there. Are they in your rework silo, is it WIP, is it finished goods, how is it? So it's always really, you know, very good to just walk around your factory and have a look. And that way, you can get a good appreciation of the situation, of where your inventory is, where it's sitting, how long it's been sitting there, how well you're moving it and you can get an understanding of that. It's also important to make sure that you keep very accurate data. So when you're looking at this kind of stuff, you have records and you can do that, that will really help you when you manage going forward then to do that. Just make a (mw 21.14), high value items, low value items, short lead time items, long lead time items, whatever way you want to try and run your business, you need to know your strategy and therefore, you'll look at it to do that.

Another way of trying to keep inventory low is to either work with your suppliers and have vendor managed inventory, where they will look after it for you, and they will keep it maybe in a warehouse off your site and just release to as and when you need it. That's a good way of doing it. Also having inventory on consignment, where it's actually owned by the distributor to you, but you have it on your site. So quickly, I would just say, how do you reduce your inventory? First of all, know what your inventory is, know the value of it, know how long it's been there, and then look at the systems you have for managing them and start picking the process map to figure out, do I have any opportunities here? I hope that one answers that question.

Stephen Drummond: (inaudible 22.09) The next one is, what's the best way to reduce inventory? It's very much in the same thing. Usually, the first question I ask companies is, you know, how much non moving stock do you have and how much slow moving stock do you have? And that's usually stuff that's sitting in the store that's been bought years ago and nobody knows what to do with, so really what I advise companies to do-, because all it's doing is taking up space and it's, you know, it really doesn't have any value as it stands, I mean, you're not going to consume it. So what I advise companies to do is try and sell it on or get rid of it in some relationship of one, you know, so preferably to try and get some cashback for that, for that material. The next thing I would do is probably pre-load the stock, you know, whatever has value in it, and as Brian said, start looking at the most valuable stuff and trying to look at why that's there. You know, have you got the right lead times? Have you got the right usage in those parts, and can you afford to bring those things down, so that you're reducing the amount of stock you're actually holding? More generally, I'd probably look at the overall stock management system. Is there anything within that that's driving your inventory up, you know, the two elements that obviously sort of influence stock, you know, the right lead times, you've got the right safety levels, and the outflows of stock, you know. That's coming back to the forecasting, you know, you've got the right demand, is the usage correct, you know, is it getting consumed as you expect it to be consumed?

So those are the basic elements of it, you know, and that's, that's the approach I would generally take. Alright, so, the next question then is, due to supply worldwide chain-, sorry, due to supply worldwide chain issues and increased cost, I have to hold more stock to avoid paying higher prices, (mw 24.05), so

avoid price increases, what's your opinion on that, Brian?

Brian Durnin: Okay, so this is basically just people buying ahead, bringing in stock in case they go short on it. So risk management is an important part of supply chain, and I think in subsequent webinars, we're going to cover that in more detail. Whether you're hedging your prices or you're looking at your strategy or duel sourcing or whatever it is, so I think we'll look at that a wee bit further in the future. But it's safe to say at this point that circ um stances which dictate to you, I bring in more stock and I hold more stock, that's a balancing act, right. There's no wonderful answer for this. It's a balancing act. But the act is basically this. Do I short my customer and ruin my reputation and loss revenue? Or do I pay for more inventory that's going to sit in the warehouse and I'm going to pay for the storage, the security, the obsolescence opportunities or anything like that. You have to balance that kind of thing to do that. And what you basically do is you just look at that equation and how can you do it. But here's the thing. You could buy a lot of product because you think you're going to be short and have the raw materials sitting in your factory, only to find out that the price drops and you're carrying a higher cost that you shouldn't have done. Or you're looking at something that becomes obsolete and you're going to have to replace that or, you know, it perishes, depending on the kind of business you're in. So I understand people wanting to be secure with regards to their customers, but remember your goal is to manufacture the most economic way that is, that's what you do, and you should keep focused on that.

Sometimes people can get a little bit side tracked and it's about buying in the future's market and getting the price right and doing everything else, and that's a slightly different business. We're almost speculating on future markets. So it's a balancing act, but what you've got to do is look and see where the value system is in your factory and how you do it. And then you can look and say to yourself, right, pardon me, is this a really expensive item, and do I want to hold a lot of those? What's the lead time on it? How do you manage that? Or is this like the paperclips. I don't really have to go and buy tons of those things in the future market, whatever it is. So it's a question of, is there one component that's going to stop your process? Or maybe I want to buy that component and have double up on that, but I definitely don't want to do this across the board, I want to do this on just high value items or things that leave me vulnerable. And a cricheck (ph 26.42) model, and we can talk to you about that another time, a cricheck (ph 26.44) model would be a good way of identifying some key components that you may want to double up on, but you certainly don't want to do it across the board and it's a balancing act. So that would be my kind of take on that one, Stephen.

Stephen Drummond: Thanks for that, that's good advice, Brian. So next one is on forecasting. Forecasting is very difficult in my business, where they start-, and there are a lot of businesses where demand is very very fluid, very dynamic, so that's a really good question. Probably the easiest place to start, as we said in the presentation, is to look at your historic usage or your historic demand, you know. And if you have a small number of customers and talk to those customers and see where they're going, have a relationship with them, or if you're selling into the wider market, then try and do some general market analysis. You know, is it a growing market or a retracting market? Can I expand my market or is the market shrinking, you know, those types of things. And really, even if you ask yourself the very very basic question, is demand going up or going down, you know, against particular products that you're selling and

manufacturing, are, is-, am I likely to sell more or less of those products in the future than I have in the past? At least that gives you a starting point, you know, saying I need more capacity or I need to cut back on capacity or I need to concentrate on this product rather than that product, you know. So it's getting those things, getting those things in the balance and trying to make some reasonable decisions with the information you have, you know, appreciate you've very little information on the scenario, but trying to make some reasonable assumptions and conversations around that. Okay, that's that one. Let's see, what's next here? I think that's-, one here, Brian, can you advise some key metrics that could be used for stock management? Can you talk a wee bit about stock terms maybe, or any other measures that you'd recommend?

Brian Durnin: Yes. We can look at just basically that. How you're turning your stock around, what the lead time is for your stock. Min-max levels that you have in your stock, also your kind of burn rate that you have for your stock, so you can calculate out if you've got slow moving stock, how you're going to try and, and work that down. You-, in the presentation, you could kind of see the sawtooth, min-max, and you needed to know the lead time on this, it's important that you do that because if you order too early, what you're doing is just forcing the max up each time, that sawtooth will start escalating up. So min-max are always a good way of looking at what you have in your inventory. One of the clever tricks is also just the space. You know, give inventory a certain amount of space, and if you're walking around and you're finding other things piled up outside that space, you're probably ordering too much. So there's a lot of visual cues, I would say, to do that. Also keep an eye on, on your spend. How much are you spending on your inventory? Where it is, it should be enough for your manufacturing and if it's over and above that to a great extent, then you may be getting that balance wrong. So that would be just some of the quick kick-off things I would have in my head about (talking over each other 30.15) stock levels.

Stephen Drummond: One of the metrics I, I, I find very useful because it's not-, it takes into account changes in level of business is stock turns, you know. Stock turns, essentially what that does is it divides your level of stock by your minimum spend. So it gives you a number that changes, sort of normalise by the amount that you're actually spending. So your stock turns should stay at the same level, you know. The inventory increases, the stock turn should stay at the same level. It also gives you a comparison to other companies within your industry range, you know, sort of, you know, with your-, that would be a particular industry, you know, there'll be expectations to six stock turns, where, when you're using your inventory every two months-, do you find that useful at all in, in the companies you've come across?

Brian Durnin: Yes, oh, absolutely, absolutely, stock turns is, is a great way of looking at that. It just keeps a barometer and a cadence to your business when you're looking at, so yes, absolutely, great one.

Stephen Drummond: That's just probably what we'd recommend then.

Brian Durnin: Yes, I'd recommend stock turns very much.

Stephen Drummond: So that seems to be all the questions we're having at the minute.

Brian Durnin: Okay.

Stephen Drummond: There is-, in terms of getting in touch with the team, with the Invest Northern Ireland Supply Chain Resilience team, the information should be up on your screen there at the minute. So email address is supplychainquery@investni.com, and the link there should take you into-, so if you just-, if you search online from the Invest Northern Ireland website, you'll find it's on there. You're digging a wee bit, but you'll find us on (inaudible 32.02), Supply Chain Resilience department framework. So have a look. By all means, get in touch, we'd be glad to hear from you. Thanks very much.