

Slutrapport för projektet ”Förbättrad prognoskvalitet inom fordonsindustrin” inom NAF/Odette Sweden (V 03)

Bilaga nedan:

“Implementation Guideline: Enhanced Forecasting Accuracy within the Automotive Supply Chain”

Introduktion

Projektet förbättrad prognoskvalitet har haft som målsättning att utreda bakomliggande orsaker och komma med åtgärdsförslag för att skapa en resurssnålare försörjningskedja för fordonsindustrins försörjningskedjor genom att ta fram rekommendationer om hur företag skall arbeta med prognoskvalitet.

Arbetet har bedrivits i workshopform med ett antal pilotprojekt för att kontrollera våra förslag samt värdet av införandet av en strukturerat arbetssätt med prognoskvalitet.

Deltagare har varit logistikansvarig från svensk fordonsindustri från bolagen:

Autoliv
Bulten
Haldex
Lesjöfors
Leax
SAPA Heat Transfer
SKF
TitanX Engine cooling
Volvo Group
Volvo Parts

Projektstöd

Odette Sweden har fungerat som projektledare.

Genomförande projektpart var Meridion.

Projektets syfte och mål var

- Delta som svensk representant i Odette Internationals program kring prognoskvalitet
- Kartlägga effekter och problem på grund av dålig prognoskvalitet samt dess orsaker
- Identifiera och analysera förbättringspotentialer inom området
- Mäta nuvarande prognoskvalitet enligt överenskommen modell
- Synliggöra problematiken med prognoskvalitet och sprida kunskap om effekterna av dålig prognoskvalitet
- Identifiera mätetal och utveckla modell för hur prognoskvalitet skall mätas

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- Ta fram rekommendationer för hur företag bör arbeta med prognoskvalitet samt förslag på åtgärder för att förbättra prognoskvaliteten
- Genomföra en pilot för att verifiera och testa föreslagna åtgärder

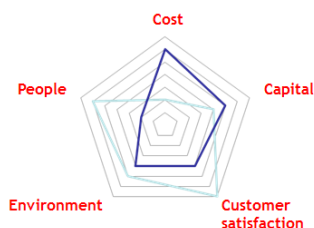
Projektets genomförande och resultat

Projektet har genomförts med planerad verksamhet och resultat dock har tidsplanen förskjutits på grund av den kalendertid som krävdes för att insamla data samt fördröjd projektplan för det Europeiska samarbetet.

Genomförandet har som planerat baserats på 3 huvudworkshops och däremellan arbetsmöten i mindre grupper fysiskt sam över webben.

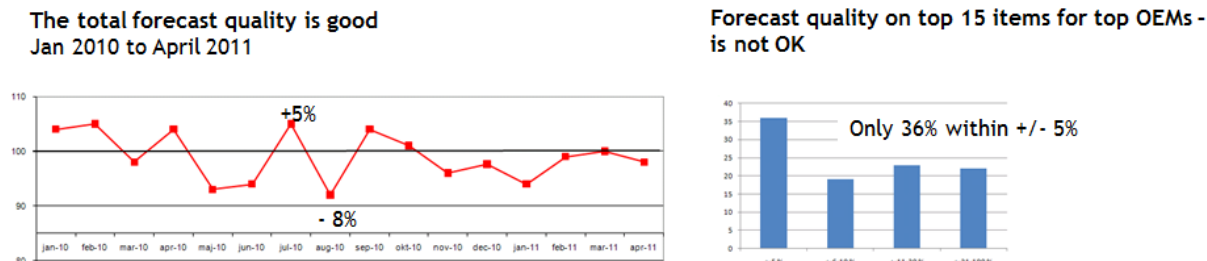
Orsaksanalysen har sammanfattats i "3-CEP" vilket står för "Cost, Capital, Customer satisfaction, Environment & People" och visar på vilka områden som påverkas av en dålig prognoskvalitet.

3-CEP



Figur 1. Påverkade områden

Effektsanalys har skett och vi ser att man tydligt måste studera den detaljerade nivån



Figur 2. Utdrag ur prognoskvalitet på hög respektive låg nivå

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Förslag till åtgärder har sammanfattats i en implementation guideline

Categories	Primary causes/Problems	Actions - final proposal
Agreements	Unclear (or no) forecasting rules	Forecast details are not specified in the commercial agreement, and needs to be captured in a separate logistical agreement. Suppliers must take initiative, summarize their requirements in a proposal to customer and come to a mutual agreement that is ok for both parties.
	Shipping frequency, small delivery quantities and long purchasing/production lead time - creates problems for supplier that need to produce larger batches resulting in high stock levels which is not considered in agreements	Include parameters such as order quantity, purchasing lead time, etc. in logistical agreements. Also create targets for forecast quality for: 1) Horizon for raw material lead time. 2) Horizon for freeze time for production order. 3) Horizon for next month.
	Frequent changes in schedules by customer	Rules for changes in schedules is to be addressed in logistical agreement, also include cost for obsolescence due to poor forecasting accuracy.
	Low stock level commitments - customers do not take out as agreed resulting in high stock levels at supplier	Stock level agreements should be included in logistical agreement - take actions if not followed by raising the issue with the customer.
	Too short freeze times	Make sure that freeze times are agreed and followed., also communicate upcoming issues to customers. When customers insist of very short freeze times - a solution can be fixed stock levels of semi-finished

Figur 3. Utdrag ur implementation guideline, se bilaga nedan

Ett antal piloter har genomförts i den supply chain som finns inom de deltagande företagen och även om effektresultaten är svåra att sätta specifika monetära mått på så har samtliga företag upplevt mätningen som givande och vidtagit ytterligare interna åtgärder för att kontrollera och dra nytta av informationen.

För att nå effektresultat har vi sett att medvetandegörandet är viktig och då detta ofta handlar om maktkamp mellan stor och liten, kund och leverantör, så kan gemensamma mätetal verkligen hjälpa kommunikationen och därmed underlätta fokus på problemlösningen.

Förbättrad kommunikation och samverkan är dessutom ett överordnat mål med NAF och där har detta delprojekt bidragit till att öka kommunikationen såväl inom Sverige som med andra aktörer inom den allt mer globala industrin. I projektet har vi deltagit i möten med övriga Europeiska initiativ som sker primärt i Frankrike & Tyskland.

Vårt arbete har offentliggjorts genom öppna webinarer, konferenser och utskick.

Detaljerade rapporter och förslag finns tillgängliga på www.odette.se:

- Implementation Guideline: Enhanced Forecasting Accuracy within the Automotive Supply Chain
- Final presentation Enhanced Forecasting Accuracy within the Automotive Supply Chain

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Nästkommande arbete

Då samtliga har deltagande företag har upplevt att detta projekt höjer deras effektivitet på kort och lång sikt vill vi sprida budskapet än mer och har tidigare föreslagit ett steg två inom prognoskvalitet med avsikt att ta med resultaten från detta projekt och sprida kunskapen och implementera ett verktyg för mätning i det Svenska fordonsklustret.

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Implementation Guideline: Enhanced Forecasting Accuracy within the Automotive Supply Chain

This Implementation guideline is a part of the recommendation followed by the project "NAF: Förbättrad prognoskvalitet i fordonsindustrin"

The project has been performed during 2010 & 2011 by a workgroup of company representatives and funded by Tillväxtverket. Additional documentation is available at www.nafonline.se and www.odette.se

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We hope that this guideline will develop through new implementations of forecasting measurement implementations and enhancements are received through Odette Sweden or Meridion

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Categories	Primary causes/Problems	Actions
Agreements	Unclear (or no) forecasting rules	Work with the customer to agree on forecasting rules that are good for both parties - also continuously review and update rules Forecast details are not specified in the commercial agreement. Needs to be captured in a separate logistical agreement. Suppliers must take initiative, summarize their requirements in a proposal to customer and come to a mutual agreement OK for both parties.
	Shipping frequency and small delivery quantities in combination with long purchasing lead time/production lead time - creates problems for supplier that need to produce larger batches resulting in larger stocks that are not considered in current agreements	Create better agreements that are related to the real situation and actual demands, and also include batch quantities and purchasing lead-time as two important parameters in agreements
	Frequent changes in schedules by customer	Make sure that there are clear rules about changes in the schedules in the agreements and that these are followed. Mostly there is an unwritten agreement between customer service and respective planner at customers but it is not formalized at the purchasing dept with the customer. This point needs also to be addressed in a logistical agreement, Use Odette Logistics agreement as a template
	Low stock level commitments - customers don't take out as agreed resulting in large stock left at supplier	First - make sure that needed information is in agreements and take actions if they are not followed by starting to talk to the customer about the issue.
	Too short freeze times	Make sure that freeze times are agreed and followed. Also communicate with the customer about problems with too large variations



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Information/Communication	Lack of understanding between parties	Measure forecasting accuracy and do continuous follow ups and evaluations, and communicate issues and problems directly to the customer to make improvements and find a common solution. Create a good communication and make sure that the right channels are found and contacts established. Start with customer's production planning, visit customer for discussion on this topic. Involve purchasing/sales in next step. Again, initiative needs to be taken by supplier and the communication needs to be positive and with a mutual interest to improve.
	Poor awareness about the need for forecasting accuracy	Start to communicate the issues due to lacking forecasting accuracy to the customer in order to increase the awareness and find improvements
	Lacking communication between parties	Measure forecasting accuracy and get facts to start to communicate with the customer about in order to find improvements
	No feedback on accuracy from supplier to customer	Results from measuring should be used to start discussion with customer in order to improve the situations and the forecasting accuracy. The interest for accurate forecast is primarily with the supplier who needs to ensure resources to work with forecast issues. Make sure that this work is organized and describe in work routines for example there is one person (halftime approx.) permanently responsible for forecasts - both EDI and manual. This person belongs to the logistic function together with customer service, production planning and despatch.
	Lacking transparency/visibility of demand in supply chain	Start to communicate needs and demands with the customer to make them aware about the situation and what information that is needed in order to make correct deliveries on time



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	Increased demands on flexibility from customer	Could price, requirements on stock levels and commitment period be added to agreement?
	Lacking usage of KPI's and continuous follow up	Start to measure forecasting accuracy and find KPI's relevant to the business that can be used for evaluation and input to actions for improvements. Make sure that somebody is responsible - needs to assigned to focus on this and ensure that the results are used for continuous improvement in logistic and production process
Market situation	Unique customers and certain market situations - difficulty to predict, e.g. aftermarket	Monitor these customers/situations with extra focus to be able to adjust purchasing/production to new market situations/demand. For the long term forecasts to sub suppliers and capacity planning one might have to rely on forecasts from sales division.
	Careful forecasts and sometimes missing forecasts from some customers	Review forecasts and make sure that all demands are included. If the situation remains then make the customer aware of the situation in order to take actions
	Too high forecasts compared to takeout's	Check the following: - Do we have too high stock levels? - Is the marketing function too optimistic and wants to increase volumes? - Lacking internal collaboration - volume forecast compared to operative forecast? - Possible to manually reduce forecasts since they are expected to be too high? Several of our OEM customers admit that they add a certain percentage on the forecast volume to safeguard capacity for their needs at supplier. This could be between 10-20% on short term. If data is collected over a longer period it is easy to present to the customer and ask them to correct this error. It is possible but time



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		<p>consuming to manually correct the customers EDI schedules and the error should definitely be corrected at schedule source, i.e. at customers end.</p> <p>Use the forecast measurement to check for patterns.</p>
	Fluctuating market conditions	Create warning system in measuring tool to react on unusually large variations in demand and monitor these groups/items with extra focus
	Volatile market (trend shift)	Create warning system in measuring tool to react on unusually large variations in demand and monitor these groups/items with extra focus
Customer forecast planning	<p>Bad routines and concepts for forecast planning</p> <p>Alt 1: Vertical integration - one responsible for customer service, one for purchasing and one for production for the same selection of items</p>	<p>Sales is entirely responsible for the customer forecast. Customer Service, Supply Chain & production should be handled as separate functions.</p> <p>Have customer service, production planning and forecast handling closely integrated to the logistic department, this enables to keep an extremely close and common focus on order line level. Contact also with sales but their forecasts are for long term planning (financial purpose and frame). Focus on short and direct communication with planner at customer.</p>
	<p>Bad routines and concepts for forecast planning</p> <p>Alt 2: One responsible for all customer service, one responsible for purchasing and one responsible for purchasing</p> <p>Customer service responsible is focused on next weeks' deliveries and are lacking understanding of information needed for</p>	<p>Increase internal communication and communicate requirements between functions in order to improve external communication.</p> <p>Customer service while need to be 'aware' of the planning function, they need not be 'experts' in it. Customer service need to focus on customer. A monthly meeting with representation from a.) Customer Service/Sales b.) Planning c.) Production & d.) Purchasing (desired!) needs to be promoted for effective internal communication</p>



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	production planning	
	Low effort from sender (customer) - aggregated demands in forecasts - OEM's say they are afraid to show too much details since suppliers take that as real demand - Supplier afraid of breaking down incoming aggregated demands since there is an uncertainty in how the real demand will be	Customer needs to break down forecasts depending on pick-up frequency and lead-times Again the primary interest to increase forecast quality lies with the supplier and after we have data supporting our case to present to the customer discussions between the parties can be initiated with the aim to achieve a forecast which is of mutual benefit
	Planner not motivated to have high DSQ	Inventory level targets & availability failures are motivation enough for the planners to follow-up on the 'correct' forecasts
	No goals on accuracy	Forecast Accuracy Measurements need to be put in place & actions need to be initiated for improving accuracy.
Tools and software	Sending/Receiving frequency	Too much connectivity will hamper operations. Inputs received from customer forecasts need to be converted to settings in system & adjusted accordingly This needs to be in harmony with shipment dates and quantities ordered. Our experience is that the customers often are flexible and willing to change frequency and transmission day if asked from us as supplier.
	Manual input to received customer forecasts	Forecast need to be a combination of both qualitative & quantitative approach, hence manual input is required in addition to the system intelligence.
	Incorrect parameter settings (order multiples)	This is primarily driven by targets proposed by the managements & inputs from business. E.g. inventory targets, safety stocks, lead-times etc. Forecasts must reflect actual shipment days and order multiples as much as possible. Here historic data is helpful.



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	Large variations and changes in forecasts	Order quantities could be decreased in order to create a smoother demand. Safety stock creates too large stocks why safety time should be used. Set up a satisfactory frequency of incoming EDIs in combination with an agreed freeze time with the customer.
	Long lead-times from supplier and small order quantities	Use safety stock and not safety time in order to maintain flexibility. Certain safety stock in qty can be necessary but for non-frequent items with small quantities
	Changes of components - phasing in/out items and replacing items	Check that BOM and date is correct when item changes
	ERP systems not aligned with customer systems (messages do not match) - lacking communication	Too much connectivity will hamper operations. Customer orders cannot always be taken at face value as a forecast as the order might undergo change/cancellations Technical problems with EDI are solved in cooperation with our EDI partner and customers equivalent. This should not be allowed to be an obstacle in forecast handling and must be on top priority list until solved.
	Specific principles example DELFOR D00 with max and min quantities in combination of DELFOR might not be supported in supplier system	Analysis and test must be made between sender and receiver until a working regular EDI transfer is secured.
	Lacking continuous system maintenance	Setup routines for continuous system maintenance This area must be prioritised by IT/IS department and management to allocate necessary resources until the EDI handling is working satisfactorily
Supply Concepts	Wrong concept to the product (Full-load, Kanban, deljit/delfor, VMI, sequence) and	Supplier Kanban is a great method to use to control supplier call-offs when a stable situation is established that is close to our



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	concept that are in conflict (full-load)	<p>Supply Chain vision with respect to high delivery frequency and low order multiples.</p> <p>Following general guidelines is to be used:</p> <ul style="list-style-type: none"> * An indication, that need to be handled with intelligence is "MASK Criteria" -> MRP or MASK * When we get closer to EOP is it better to use delivery schedules and minimal order multiples to avoid products becoming obsolete. * Kanban is perfect to for consumption material and components with high insecurity in stock balances -> not MRP (e.g. screws, etiquettes, components with uncertain demand (gram, meter etc)) * Being geographical close is a strong reason for Kanban (lead time < 1 day) * Kanban is not recommended when adjustable order multiples that results in lower stock levels compared to MRP * When it is more time consuming administration for MASK compared to MRP, it is important to confirm profitability for each supplier that is introduced to Kanban.
		<p>Classify material</p> <p>A= High-runners. Yearly demand greater than 3 MSEK, but it is flexible in order to create a good distribution of A-B-C items for each planner. It can also be ok to classify physically large items as A items, or items that have a relatively large value but very low delivery frequency.</p> <p>B= Remaining items that are not classified as A or C.</p> <p>C= Low-runners. All spare parts and items where the price is less than 3 SEK per item.</p> <p>A-items should be prioritized with respect to stock values and be optimized with respect to delivery frequency, order quantities,</p>



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		<p>safety days and safety stock. Guideline is that the order quantity should be less than 2 days consumption. Safety days = 2 and safety stock = 0. For geographically close suppliers should the safety days be reduced to 1.</p> <p>B-items should be reviewed continuously and be optimized regarding delivery frequencies, order quantities, safety days and safety stock. Guideline is that the order quantity should be less than 5 days consumption. Safety days = 2 and safety stock = 0. For geographically close suppliers should the safety days be reduced to 1.</p> <p>C-items should be managed with minimal maintenance but it has to be secured that stock levels are high enough in order to avoid material disturbances as far as possible. Better with a little too much in stock and decreased delivery frequency in order to not create unnecessary work in the goods receptions and in the warehouse.</p>
		<p>Reasons for lacking forecasting accuracy:</p> <ol style="list-style-type: none"> 1) Different items have various long supply chain, from Supplier to OEM customers. The longer supply chain - the more changes in forecasts. Knowledge about the design of the supply chain for each item number can help, e.g. the number of parties/levels in the supply chain. 2) Our A-B-C-classification of items results in deviations of various kinds. If the supplier knows about these issues they are able to optimize their planning process. 3) Higher order multiples results in higher deviations. 4) One of the major reasons are our market requirements on minimal stock values. This usually results in adjustments in production even at small changes at the customers, which



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		obviously results in fluctuations upstream in the supply chain.
	Stock process at customer	Ensure understanding of the stock process at the customer site. A 2 bin concept with big lot sizes might create unwanted variations. Usage of automated storages sometimes takes out the complete quantity and is then put back in. The process must be controlled so that MRP is not rone when these situations apply.
	Understanding and ability to create a way to measure (Volvo, SKF, VDA, NAF (Finnveden) model)	There are several ways to measure. Priority 1is to measure and take actions but from our project we have found that one key action is communication. To get best help and benefit from the measurement it should be the same and understood between both parties and hence we recommend the Odette publication known as VDA 9000