Chapter 1 : Predictive Analytics in the Supply Chain - Data Science Central

Master and apply the core methodologies used in supply chain analysis and modeling, including statistics, regression, optimization and probability - part of the MITx Supply Chain Management MicroMasters Credential.

Fulfillment for example could easily be understood to encompass all of finished goods inventory, order-to-deliver, and out-bound logistics. Manufacturing is understood by some to include all the process steps leading up to that point. But however you divide it, there is agreement that it is one continuous process and that a delay or failure at any point will ripple through the system and prevent efficient execution. While these seven elements of the supply chain are each the focus of separate management activity, visibility over the entire supply chain is also a requirement. Particularly visibility into exceptions to the plan that might mean failure or delay. In the past this meant actions taken based on observed events being closely linked with mitigating strategies up and down the chain. For example, using historical data we could determine that a part takes on average X days to arrive and even calculate standard deviations to make some fairly sophisticated adjustments in our procurement plan. Likewise on the demand side, we could look at historical demand data and try to extrapolate demand into the future, converting that to forecast production requirements and backwards into procurement and logistics requirements. Advanced maturity typically meant having the features of lots of information sharing and even direct cooperation in product and parts design. Increasingly though, a requirement of high maturity is the ability to better foresee the future, anticipate future events, and make optimal tradeoffs based on intentional strategic choices of top management. In short, to be at the top of the game in Supply Chain Management now requires including advanced predictive analytics. Enter Predictive Analytics Advanced predictive analytics is beginning to make a difference in successful supply chain management. There are long term forecasts that are more like broad risk assessments to try to evaluate whether our customers will continue to want our product or will it become obsolete when they change to a wholly new solution. There is also the downwards view of this same question, are our suppliers sufficiently stable to be able to continue to provide critical resources that we need. Of course the secret to good forecasting is to keep doing it over and over until you get it right. That is to say forecasts should be continuously updated and incorporate time frames that may be several years out to anticipate the obsolescence issues , mid-term forecasts that drive our financial investments in plants and new products, and near term forecasts that drive actual production and procurement. As you approach the near term forecast the details become more complex. While longer term forecast can be seen as fairly smooth, short term forecasts suitable for supply chain control need to take into account a whole host of smaller variables unique to each stage in the process. These may be weather or holiday related, allow for specific promotional campaigns, known changeovers in logistics or production, respond to anticipated increases or decreases in costs like freight, or other delays. In short, forecasts suitable for supply chain direct control are anything but simple. So where modern predictive analytics begins to make inroads into supply chain management is typically in providing more accurate forecasts. This means testing any of a dozen mathematical forecasting models from ARIMA through dynamic multiple regression modeling to see which ones work best. The other role for predictive analytics is contributing the mathematics of optimization. Visualization plays an important role especially at the production level. We want the models we create to be easily understood by workers at all levels. Visual displays like dashboards on tablets are increasingly a valuable medium for converting the large scale action into the specific tasks and needs of the person using it. This means drilling down to the atomic level of activities, inventory, procurement, shipping units, and customer orders. These new tools mean near zero delay in interpreting the inflow of customer orders, current inventory positions, and any manufacturing or external delays into near instantaneous updates to supply chains forecasts and plans at all levels of detail. Demand Analytics â€" How is my forecast tracking with actual sales. Detailed demand forecasting at the level of point of sale store level, retailer, distribution channel roll-up Deviation analysis of forecast versus actual at the SKU level. Forecast integration with promotional events and holidays to fine tune the forecast. Inventory budget optimization Segment inventory for tailored and customized fulfillment strategies by customer type.

Replenishment Planning Analytics â€" What, when, and where should I ship. Integrated planning at the retailer, distributor, and channel level. Optimize fulfillment logistics to account for handling, storage or warehouse constraints. Network Planning and Optimization â€" Do I have the right network of manufacturing and warehousing facilities. Number of physical plants for manufacture and warehouse. Optimized flow paths to fulfill different segments of customer demand at the lowest total cost. Fixed and variable costs of operations. Transportation Analytics â€" Optimizing transportation routes and loads including contract compliance. Optimizing routes including backhaul. Maintaining compliance with transportation contracts. Procurement Analytics â€" How to achieve lowest landed cost and secure long-term high quality supplier partners. Scoring models for vendor quality, cost, and stability. Predictive Analytics on the Factory Floor While the factory floor is often not considered part of the supply chain, delays here can obviously impact the overall supply chain performance. At least one technique from predictive analytics is achieving wide acceptance and that is predictive maintenance. In short, predictive maintenance utilizes different types of sensors on critical, capital intensive production machinery to detect breakdowns before they occur. The sensor data is initially analyzed by data scientists to prepare predictive models of different failure conditions. Those predictive models are then used to evaluate the incoming streaming data from the equipment and if a potential fault is detected, depending on the type, a message can be sent to the operator and maintenance staff, or an action can be created to immediately shutdown the machine to avoid damaging the capital asset and further disrupting production. Geospatial Analytics in Network Planning and Optimization In addition to the forecast and optimization mathematics that are standard for this task, we would add geo-spatial analytics. Several advanced analytic platforms now allow the addition of detailed location information that can be evaluated for travel time between nodes and especially against local customer density and time-of-day traffic patterns. Strategy and Tactics Supply chain improvements need to happen from both the bottom up and from the top down. Tackling one problem at a time, the bottom up approach, captures near term value. The data and insight that predictive analytics provides for both perspectives lets you address some of the really difficult questions with greater accuracy. How fast will the supply chain recover from external shocks? How do I plan for those external shocks and protect against them? Where are the biggest opportunities for additional profits from the supply chain? How can you protect margins when demand falls? How can you plan to protect profitability at the product level if a major supplier fails? To be at the top of your game as a supply chain manager today, you need to understand and utilize advanced predictive analytics. He can be reached at:

Chapter 2 : 10 Best Logistics and Supply Chain Books of All Time

*Supply Chain Planning and Analytics: The Right Product in the Right Place at the Right Time (Supply and Operations Management Collection) [Gerald Feigin] on theinnatdunvilla.com *FREE* shipping on qualifying offers.*

It highlights emerging concepts and potential applications in descriptive, predictive and prescriptive analytics fields. The 46 articles presented in the proceedings are from over contributors from academics and industry. These 46 articles are classified into 6 groups based on the main theme of the respective studies. This reference work comprises 60 selected papers on different aspects of business analytics in various sub-disciplines of operations management. D in operations management. He also received M. He was a visiting consultant at Sultan Qaboos University, Oman. He has published over 55 research articles in both international and national journals, edited books and also presented over 50 research papers both at international and national conferences. He is the co-author of two books and a monograph. Formerly, he was a faculty member in School of Industrial Engineering at Purdue University for 13 years and at University of Oklahoma for 15 years He holds a B. His graduate degrees are from University of California, Berkeley, where he received an M. He has published six books and over journal articles in operations research. Chandrasekharan Rajendran obtained his B. He has more than publications in journals of international repute. He has been ranked within the top 30 researchers in the world in terms of the number of publications in the area of operations management during the period that appeared in the top 11 international journals in operations management. He has also been ranked as the top researcher among those in the management schools in India. He has played a noteworthy role in establishing analytics practice in India and India as a premier offshore service destination. He was instrumental in introducing high quality standards for software delivery services and in building up the skill sets of thousands of employees. Over the years, he has sustained considerable interest in academics and executive training. He has been a guest faculty and invited speaker in numerous colleges, executive training programs and industry fora. Ravindran was his Thesis Adviser. His main contributions in the past 20 years have been in the area of computer applications in industry and government sectors, and technology and policy for higher education in India.

Chapter 3 : Supply Chain Analytics for Dummies - Supply Chain 24/7 Paper

â€"Madhukar Bidani, Head of the Supply Chain with a fortune Oil company and USER of the analytic solution based on SAP Supply Chain Analytics is a critical lever, enabling business managers with accurate and actionable insights on performance.

Chapter 4 : theinnatdunvilla.com0x Supply Chain Analytics and other 9 free book(s) | Ohio Public Library

Applying analytics to the supply chain is still relatively new. As the technologies for intelligent analysis and data visualization explode, it is a great time to look at what your business can achieve through a comprehensive supply chain analytics strategy.

Chapter 5 : Smarter Insights with Supply Chain Analytics | Deloitte US

Supply chains are a rich place to look for competitive advantage. If your supply chain management models are based only on past demand, supply and business cycles, you could be missing big opportunities to put analytics to work.

Chapter 6 : Supply Chain Consulting | Packaging Engineering | Chainalytics

Book Description. Every company must continually wrestle with the problem of deciding the right quantity and mix of products or services that it should produce as well as when and where to produce them.

Chapter 7 : Advanced Analytics in Supply Chain - What is it and is it better than Non-Advanced Analytics?

There is the book Big Data Driven Supply Chain Management: A Framework for Implementing Analytics and Turning Information Into Intelligence by Nada R. Sanders. In addition, Big Data Analytics for Supply Chain Management: A Literature Review and Research Agenda by Samuel Fosso Wamba and Shahriar Akter might be of help too.

Chapter 8 : Better Business Analytics: Recommended Reading: Supply Chain Network Design

Supply chain analytics is a system that facilitates the execution of products and services from supplier to customer. Supply chain systems incorporate several components such as information, organizations, people, activities and resources to change raw materials into finished goods.

Chapter 9 : Supply Chain Analytics - Jigsaw

2 Supply Chain Analytics The three-minute guide 3 Globalization and complexity have put supply chains in the spotlight like never before Supply chains are a rich place to look for competitive advantage, partly.