ADEXA Predict, not just response

End of an Era - Manual Scenario Analysis to Plan Your Supply Chain

We are now in a digital era. Today supply chain planners are in a position to improve the overall operations of the supply chain more strategically rather than spending an inordinate amount of time to manually move things around resulting in an inferior plan. Adexa's approach is to define organizational objectives and let the system deliver the most feasible and optimal plan based on all the possibilities that are known to the system. In the meantime, the system is given the guidelines as to what can be tolerated or optimized. This is what we refer to as *controlled autonomous planning.*

Manual scenario analysis gives a false sense of security and confidence in developing plans that are most likely sub-optimal and inferior compared to those generated by planning systems that deploy artificial intelligence, capable of evaluating millions of possibilities. What most users like about scenario analysis is that it gives them a sense of control. With that perception of control comes a lot of time spent building a plan out of so many possibilities. However, the responsibility can be given to an intelligent system to perform the heavy-lifting, presenting the users the results that can be analyzed instead of trying to tediously construct a solution.

However, manual scenario analysis is exactly what most vendors recommend and demonstrate in their planning software, with a simplistic supply chain having a few products and a few nodes. In such trivial scenarios, the audience easily understands the imbalance to be solved and it is intuitively obvious what needs to be moved and to where in order to create a balanced plan. Real supply chains are complex, a lot more complex!

Needless to say that manual scenario analysis has its uses when it comes to design of the supply chain and strategic risk analysis. For example, what-if a supplier goes away or price of oil increases by 30%. Scenario analysis only shows the resulting issues, but it does NOT give you the solutions. This is exactly where the right systems can help to provide the solution.

If you depend on scenario analysis for planning and solving constraints in the supply chain operation, it is best to rely on systems to examine the possibilities to get a solution that best meets your organizational objectives. Let's examine why controlled autonomous planning is a necessity.

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Real supply chains are complex – One of our clients, Seagate technologies has over 570 nodes and thousands of connections in their supply chain and thousands of products and parts going through these nodes. Imagine looking at the node graph of this typical E2E example and searching which product is late or which part from which supplier is arriving late! If you have only 10 products and 10 nodes then manual planning and scenario might be easy, what if you had essentially millions of combinations. How do you go through the issues and try to resolve them one by one? Note that the problem is even more complex when it comes into looking at tax issues and regional regulations and different shipping methods and alternative suppliers etc.

There are too many choices to be examined – When a planner is doing scenario analysis based on one product line and a couple of late or unavailable supplies, it might look OK—even at that it can get confusing with 3 or 4 scenarios. Because with each change the number of combinations grows exponentially. There are thousands of scenarios to be examined. To mention a few: what if we used alternate material and adding shift as a scenario? Revenue would go up and perhaps margin changed slightly. What if we used another vendor and paid for expedited delivery? What if we changed the priorities? What about alternate resources or sites to produce the same product? Even with 6 parameters mentioned above there are 720 discrete possibilities, if we assume they have constant values. However, in reality they have many more values than just one! Using algorithms, systems can examine thousands of variables to recommend solutions that are optimal much faster. And if you don't like it, then you press a button to get another one that suits your objectives..

Planners conflict – Most organizations that we deal with have multiple planners. When one planner picks a solution in terms of quantities and/or financials; she may not have access to other planners' decisions and what other planners are doing with overlapping resources and/or material. Trying to coordinate even 5 planners becomes a nightmare and could take days. Even if they all agree to a plan, it is not the best mix of products.

Units per period gives False results – Using buckets for capacity for key resources does not provide true available capacity and can give false information as to what you can or cannot do on that resource in the monthly or even weekly buckets. Systems can be capable of taking product mix into account and even recommend optimal product mix to get best revenue and margin. Thus, eliminating subjective decision making.

Late supply is not always an issue – in the course of scenario analysis, if a late supply or unavailable supply is showing, then it may not necessarily be an issue because you could expedite it, use alternates or because of other key material delays they may not be on a critical path. With manual planning, given the number of parts and BOMs in real life, it would be impossible to manually figure out the ones on the critical path. To this end, a simplistic solution is found by a few scenarios.

However, systems can identify the impact of each event such as late supplies, weather issues, shipping delays, a high priority surprise order, increase in price of a commodity, a resource going down and so on. This is what we mean by "impact-driven" planning approach in our algorithms. The impact of each event is identified on financials, delivery performance and other key objectives. Moreover, no time is wasted by the users to try and resolve a problem that may not have an impact on the deliveries one way or the other.

Time taken to produce plan – in a real environment with many supply parts and resources, going through a few possibilities can take days. What if you take your best scenario to your manager and then she says try a couple of other vendors. Try lowering the priority of 5 customers; or we cannot do it because other product or region are getting higher priority, etc.

Events and Alerts – It is nice to receive alerts and notifications regarding suppliers, shippers and other potential disruptions. But the question is what can you do about it? Running manual scenarios as described above? Systems can be designed such that they can act and learn from their experiences and predict and respond to events. Getting 200 alerts a day for each planner is not the best use of their time and talent. Systems should be capable of understanding the impact and examining different solutions to come up with a recommendation to the end-user—that is, in almost real-time.

If you multiply two large numbers, a calculator would do it in sub-seconds. With pencil and paper, the final outcome needs to be constructed or even worse found by trial and error and what-if analysis. Using an intelligent system would have the right answers for you in real-time, not just give you the work bench to construct a solution. An autonomous vehicle may operate on its own but you decide where to go, when to go, and faster or slower. Let the system worry about the traffic, bumps on the road, and figuring out the best and fastest way to get there using least amount of energy. For more information on controlled autonomous planning click **Here.**

Adexa 5777 Century Blvd. Los Angeles, CA 90045 USA (310) 642-2100 | (833) ADEXAINC www.adexa.com info@adexa.com

Adexa's worldwide locations **North America:** Los Angeles, CA | Toronto, ON **Europe:** Germany **Asia:** Japan | China | Taiwan | South Korea