The Potash Company Supply Chain Management

Integration

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The Potash Company is a salt mining and refining company that has completed its last phase of its Supply Chain Management (SCM) information systems (IS) integration and implementation. The following is a summary of how the integration and collaboration of our ISs have made the information flow more efficient and cost effective, from costumer order to order delivery.

The largest of our costumers consist of Farming Collectives. These farming collectives use state-of-the-art upgrades on their trackers informally called farming tools, to collect data needed for the correct fertilization of its crops. These farming tools, a hardware extension of the Farming II system, consist of GPS systems, dosage calculators, soil sampling machines, and other high tech electronic machinery. Using these tools the farmers save money by not over-fertilizing the crop lands and keep within environmental standards by calculating the exact amount of each macronutrient needed by the crops. The farmers then take this data, saved on a USB flash drive that connects to the farming tool's interface and upload it into the Farming II system that calculates actual and projected quantities of all types of mineral fertilizers.

The farming II system has a direct connection to the manufacturing resource planning system (MRP-IIS) server at our main data warehouse, where all the company's information systems collaborate and share data with each other. Through the MRP-II the data from Farming II is used to calculate the economic order quantity (EOC) which then lists quantity demands of K2O, the chemical formula used in the N-P-K (nitrogen-phosphorus-potassium) numbers on the labels of fertilizer bags, in tons. This information is in turn used by the mining information system. The mining information system uses drilling samples to measure the content of specific minerals

in underground deposits. Through the mining information systems the miners know exactly how many cubic meters have to be mined in order to produce any number of different salt mineral products.

Having both the mining IS and our production ISs collaborate directly with each other through the MRP-IIS the data is shared with the MPR module which calculates the master production schedule (MPS) for production planning. This is important because of the number of products produced from one mined mineral conglomerate. This collaboration means that the new MPR-IIS can now track production in real time, efficiently modify production schedules, and forecast future production quantities up to a year out for every production area. (Effy Oz, 2006 pg 79.).

To speak of the entire product pallet produced by our company would exceed the limits of this essay, so we will concentrate on the SCM of only one of our products, Plantlife®. Plantlife® (potassium-magnesium sulfate) is a mixture of $MgSO_4$ (magnesium sulfate) and Kieserit K_2SO_4 (potassium sulfate), this is our most sold product and therefore worthy of note. There are three different plants that will operate, two will produce the $MgSO_4$ and K_2SO_4, the two main ingredients of Plantlife® and the other plant mixes the two together through a special patented process (Simmons, Timothy, 2006 pg. 7). Using this as an example, the production planning IS calculates not only the amount of Plantlife® that has to be produced, but how much of the ingredient products, the estimated amount of natural gas, electricity, machine wear, maintenance and labor costs that are needed by the finance IS to accurately budget operations and projects – all of this in a matter of seconds.

One of the most amazing parts of this new IS integration and collaboration project is the new product distribution system and its integration into the MPR-IIS. This new system consists of weight sensors, radio frequency identification (RFID)

tags and transceivers.   RFID transceivers and tags have revolutionized our distribution operations and were responsible for an inventory turn of 60% in the first quarter of its implementation.

Unfortunately for a few rail controllers who where laid-off last month there is no need for the 5 controllers we once had. The old UPC bar code cards that are used to identify the boxcars now have RFID tags glued to them. RFID transceivers installed around the rail yard now ensure that the boxcars are put into the right packages for shipment. Both engineers and the rail controllers now carry PDAs that depict a map of the rail yard, all the boxcars with their contents, the boxcar's destinations, and their shipment serial numbers. Both controllers and engineers can sign electronically now with their PDAs to certify receipt handovers – which is also done electronically with Bluetooth signals between PDAs. Once the boxcars leave the leave the rail yard the shipment serial numbers, and digitally signed receipts are sent via Wi-Fi to the data warehouse where the distribution system then awaits the next receipt from the our partner Johnson's Packaging Company. The packaging company attaches RFIDs to each pallet as well which identifies each pallet with the costumer that ordered it. Each of our costumers was sent an identification card for easy check-out.

Once the pallets reach the fertilizer distribution centers the costumer simply picks up their order and wheels it out to their truck. The RFID transceivers read the costumer's ID card, the RFID tags on the pallets, and transfers funds via EFT from the costumer's bank account to ours, thus closing the supply chain cycle.

We have to thank our costumer management system for some of the new partnerships we made with the developers of Farmer II. If it wasn't for the dedicated costumers who filled out our online surveys we would still be adding data in the old fashioned way – by hand.

References

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Simmons T. (2006) *Salt and Potash Salt Research Paper.* Unpublished research paper, (People, Sciences and the Environment Course) Southern Christian University; Montgomery, Alabama