

## ***Expanding Your Instrument Panel***

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When part of a commercial airliner's instrument panel fails and goes black, it's usually considered a major emergency and the airplane is directed to land at the nearest available airport. However, most agri-food companies operate everyday with only partial instrumentation to guide them, and they think everything's fine. It isn't. The instrumentation to operate their company could be better, significantly so, and the cost of adding enhanced instrumentation is manageable. As an added bonus, the company can improve their traceability capability, a need that many are finding increasingly urgent. Think spinach, lettuce, pet food (wheat gluten), green onions, and meat. What's next?

Tracing and tracking to meet government or commercial compliance requirements, delivered by the right traceability system provider, can be leveraged to also give agri-food executives a more complete, decision-support instrument panel for operational decision-making that goes well beyond traceability. This new generation of corporate instrumentation can provide executives, managers and supervisors specific information they need to make a wide range of operational decisions, not just traceability decisions. It can also generate **alerts** from the in-line supervisor to the CEO to allow them to take the needed corrective actions to protect or gain value from their supply chain.

How? The essence of a traceability system is the tracking of each individual incoming raw product, ingredient, additive or dry / wet good from the plant's receiving dock, across the fabrication floor, through various product transformations, to the final, finished goods package, carton and pallet – often using systems or processes already in place.

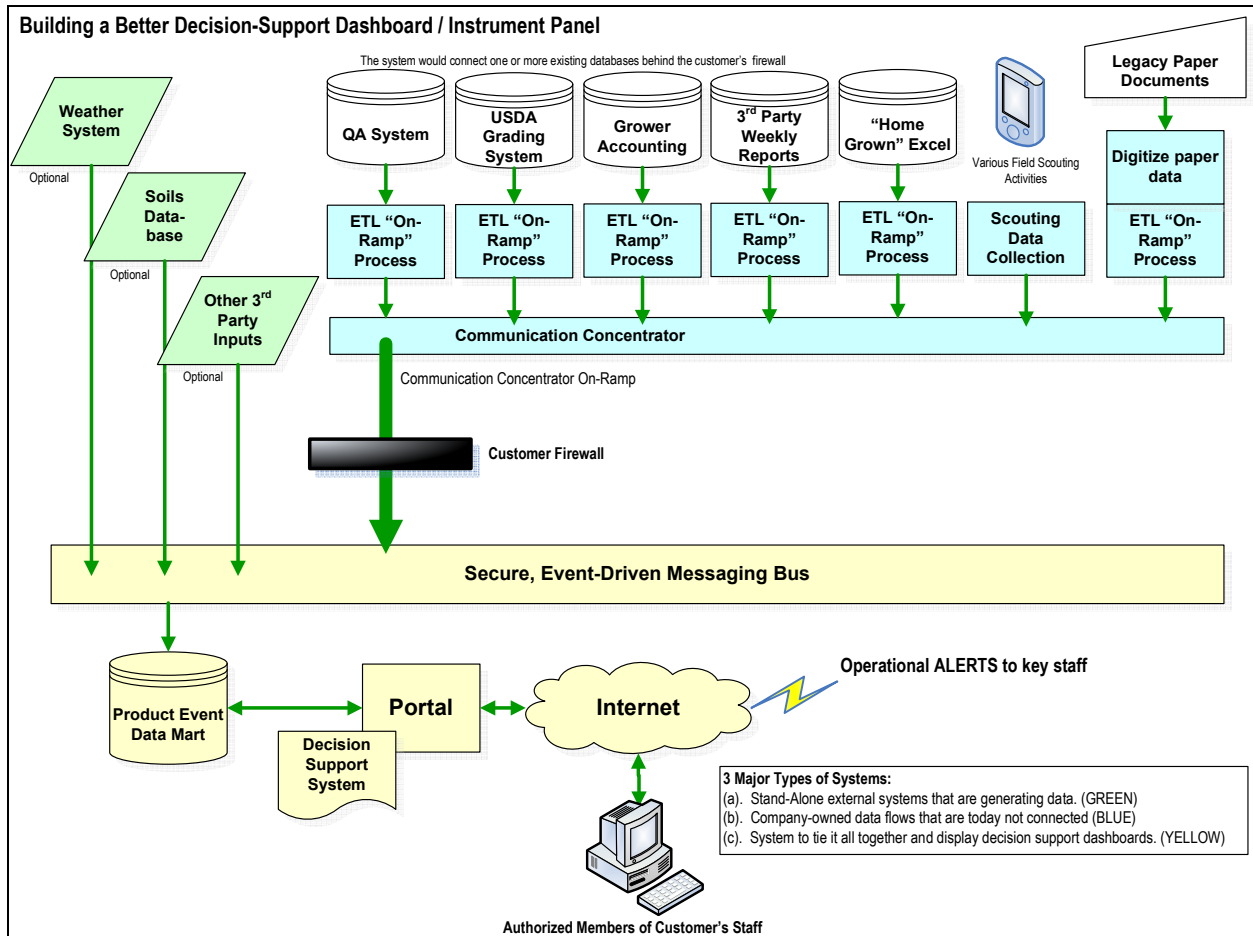
So if my company has a traceability system, I can leverage it?. Not really. Having it means you can generate real-time alerts when something is wrong in the supply chain, and that you can generate near real-time views of your operation to make better operational decisions. Most in-house traceability systems can't accomplish these tasks. To accomplish these tasks, you need to collect the relevant information from each process step (hopefully using automatic data collection technology such as barcode or RFID), maintain identity across product transformations, and reroute these data into an event-oriented data mart, possibly adding some electronically collected new data. This event-oriented data mart then contains the pedigree of each carton leaving your plant, a repository of product attributes and key events during the life cycle of each production unit.

This pedigree data mart can be used to uncover hidden relationships between upstream events or product attributes and desired downstream outcomes such as the relationship between incoming raw product characteristics and the raw product conversion percentage in the plant. Or between key packing and processing steps and the percentage of product which grade premium. It can also fuel a new generation of instrumentation to provide focused, decision-support systems which increase operational effectiveness and efficiency, boosting profitability. And it can issue alerts when business rules get violated. Not bad for a system that was thought to only answer regulatory and commercial compliance questions about each shipped carton.

A major myth is the belief that a company needs to scrap their existing software systems or mount a huge IT project to achieve these goals. They don't. Most companies already have most of the information needed to create a powerful set of instruments and to build an alert system, but the data sit in different databases and can't easily be combined. Some companies try to use tools like Excel to create these integrated data views, but creating this type of dashboard is labor-intensive and is usually available only to a handful of individuals.

Building a secure, focused event data mart requires tying together these different databases within a company's operation, providing identity preservation across transformations, and adding a few new bits of

data about each production unit. Figure 1 shows nine years of experience in building solution-focused, decision-support systems.



When we talk about decision-support systems with companies, another typical reaction is that the company thinks their current Enterprise Resource Planning (ERP) system can provide this functionality. It usually can't.

Typical ERP systems obscure key associations. A typical ERP system will note that so many tons of lettuce arrived at a fresh, bagged salad plant. It also will note so many tons of carrots arrived as did so many pounds of flavor additives and so many bags and boxes (dry goods). The ERP system will also probably report the number of bags and cartons of a specific SKU and manufacturing lot that were produced and palletized. You can also probably determine that pallet #89240 contained 48 cartons, each with six bags of a specific bagged salad SKU 236-9807 and that the specific manufacturing lot was lot #B25015A, and that this pallet was shipped to customer XYZ on 8 September 2005 via a specific bill of lading # which generated a specific invoice #. What is missing?

To understand the actual shortcomings most ERP systems have in building key associations look at a recently published FDA food safety report on a 2005 spinach food safety issue. After 18 months of extensive government investigation at both the Federal and state levels, the FDA concluded that the ERP system employed by this major agri-food company along with the various manual data collection systems within the plant couldn't answer the basic question of which farm field contributed contaminated product to a salad mix lot that made quite a number of people sick. The source was not found, the dots not connected, and the key associations not made to provide the alerts.

Most ERP systems do not track the individual production units, and they don't usually maintain product identity across transformations. Regardless of the commodity, even fresh product, there are usually ten to twenty or more transformational points in any agri-food operation where the product is sorted and stored for later processes. At these transformations you need to maintain identity across the transformations and provide the key associations and the alerts.

So, should agri-food companies scrap their existing ERP system? Absolutely not. These systems have been fine tuned to handle a range of management tasks, such as generating grower settlement statements, and they do them well. What is required is to add a "bolt-on" trace and track module such as shown in Figure 1 to an existing ERP system. Adding such a module builds the event-oriented product pedigree data marts and stores the key associations and provides the alerts leading to new found value in productivity.

The system shown in Figure 1 typically has three major components:

1. the company's existing databases and major operating applications that are tied together (in blue)
2. third party data systems, that are then combined with the company's data (in green); and
3. the consolidated data dashboards that are directed to solving specific, operational problems along with issuing the operational alerts (in yellow).

When you have all three, the supply chain is properly linked, sources are known, and decision-making is improved.

The important thing to remember when designing these types of systems is to begin with the end in mind. What operational problem are you trying to solve? How is that problem being solved today? How can I make more money in solving the issue? What data are being used? And how do I get alerts to the right managers who can change things before it's too late?

For nine years this three component approach has provided decision-support systems that have focused on solving a wide range of managerial problems, from understanding the aging of raw, incoming product (what fruit will be ripe when) across a range of different farm operations, each with its own data systems, to more complex problems such as helping predict product yields at various points in the raw product growing process. Each of these understandings has lead to finding real money.

By designing bottoms-up from Figure 1, the designer can ensure that the system cost and complexity will be reduced.. Too many systems we've seen have tried to collect every possible data element from the Blue and Green systems and store them in a very complex Data Warehouse. Data designers can easily get wrapped up in creating the perfect data warehouse for the company, and lose sight of specific corporate problems that need to be solved today. By focusing on a well-defined set of operational issues, and only storing the data needed to populate a working dashboard which sends out operational alerts, the, systems can be typically delivered in a few months, not the years that the general, all-inclusive data warehouse project takes.

Just as you want your commercial airliner to have the latest and greatest avionics and instrumentation to safely lead you to your destination, as an agri-food executive, you owe it to your company, its owners, its customers and its employees to have the very best instrumentation to guide your company. Tracing and tracking to give you operational alerts leads to real cash and a safer product supply chain.

Further information can be found at [www.aginfolink.com](http://www.aginfolink.com).