Food and Beverage ERP

Why most ERP software struggles to support food and beverage safety.

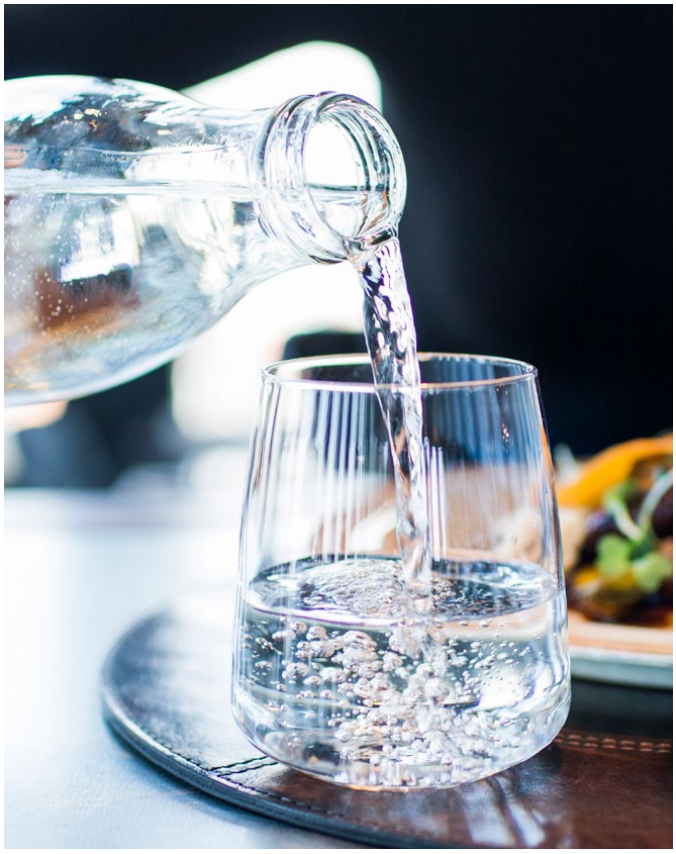
Mitigate risk and prevent quality failure

Enterprise resource planning (ERP) software should encompass all the central business processes of your business, reducing risk, and increasing transparency and control. Since most food and beverage manufacturing businesses of any size run some type of ERP software, and this software should integrate quality management with the rest of the enterprise, how come there are still so many recalls of such massive size?

Should ERP run by these companies enable them first of all to mitigate risk and prevent quality failures that lead to recalls, but narrowly identify the lot and batch of products to be recalled?

The answer to these questions is of course an emphatic yes. But for some reason, food recalls are frequent and truly massive. Consider the list of recalls from the United States Department of Agriculture's Food Safety and Inspection Service. In 2019 alone, recalls included:

- 11,760,424 pounds of Tyson brand chicken strips due to foreign matter contamination
- 2,094,186 pounds of chicken pad Thai and chicken fried rice due to undeclared allergens
- 2,071,397 pounds of poultry from Simmons Prepared Foods for foreign matter contamination
- 515,000 pounds of pork from Morris Meat Packing for being produced outside federal inspection hours and without federal inspections having been conducted
- 191,928 pounds of Duke's brand pork sausage for possible adulteration due to product contamination
- 190,00 pounds of chicken fritters, again from Tyson, for possible foreign matter contamination



On the other side of the Atlantic, there are of course recalls as well, the classic example of complete overkill being the 1990 Perrier scare. The entire United States inventory of Perrier brand mineral water was destroyed–72 million bottles–. In what turned out to be a public relations and marketing disaster that left an opening for competitors to enter the market, Perrier implemented a global recall and shut down production for three months–all for an elevated level of benzene that exposed no consumer to any risk of harm.

The burning question is that if ERP can help a manufacturer tie back a contaminated product to a specific lot or batch of finished product or raw material, and a specific production run over defined pieces of processing and packaging equipment, why are these recalls so large? It seems obvious that in even these very large consumer packaged goods (CPG) companies, this is not happening. Otherwise recalls would at the very least be much smaller and more targeted.

Let's examine how we got into this mess, the specific failings of most food and beverage ERP, and how to select and implement ERP to eliminate this massively expensive functional gap.

An enterprise wide approach

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Defining the problem

Food and beverage ERP must help you mitigate risk in the different parts of the business where failed processes may lead to a recall.

- Supply chain management, where contaminated meat and vegetables may enter the manufacturing process
- Manufacturing, where cross-contamination between one product and other can result in introduction of allergens
- Asset management and maintenance, where equipment failures introduce foreign matter or chemicals into the food product, ranging from lubricants to degraded pieces of gasket to metal shavings
- Packaging, in large part because a mismatch between the manufacturing bill of materials (BOM) and the packaging process can result in mislabeling
- Warehouse management, where ingredients and finished products should be easily segregated according to incept date, organic status and allergens by individual, batch and multi-bin traceability
- Distribution, where inventory transactions must be guided by consume-by dates, and where the manufacturer must document proper inspections, particularly for imported products, and that product has been kept at the requisite temperature and separate from potential contaminants

ERP should combine all these disciplines, along with tightly embedded inventory-related and non-inventory quality functionality so you can manage not only quality of the product, but consistency and quality of the processes that ensure food safety.

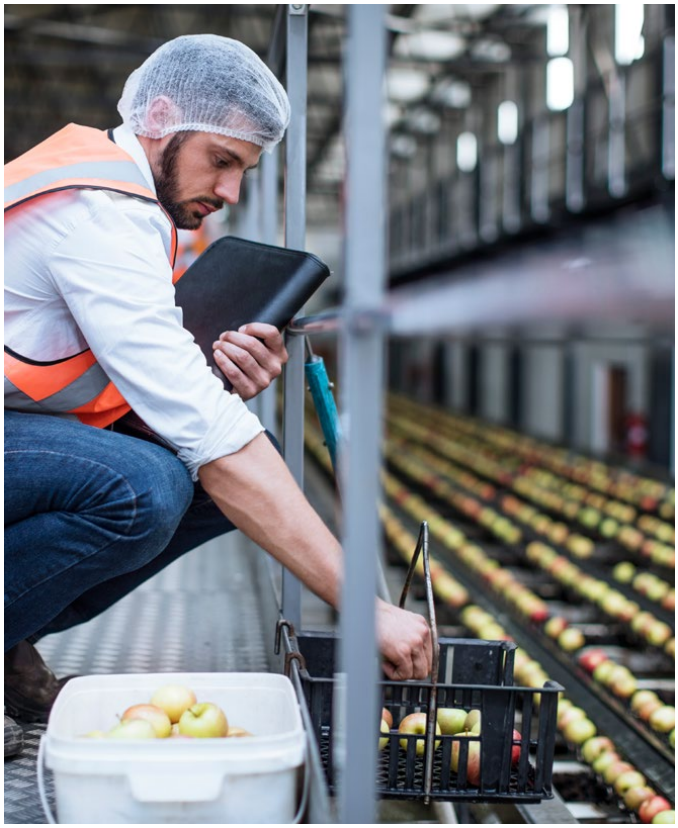
Regardless of whether recalls are the most severe type, USDA FSIS Type 1 which can result in serious illness or death, Type 2 where there is simply a risk consuming the product could cause health problems or Type 3 in which consumption will not cause harm, data from across the entire enterprise must be quickly marshalled in order to successfully and efficiently respond to a recall crisis. And, it must be a sound tool for the preventive controls that will prevent food safety hazards to begin with.

ERP ought to deliver traceability at a very granular level, so when a supplier or regulatory body reports an issue with products sold to a food manufacturer, that manufacturer can quickly see what day those materials were received at their facility, what inspections and tests were performed, what machine and operator processed those materials, and what batch of product consumed those materials and who purchased those products on which date. Or if regulators, retailers or consumers report problems with products that have already entered retail distribution, the manufacturer can reverse engineer the pathway that specific batch of product took, to define the affected product as precisely as possible.

In the case of a company like Tyson, it is not likely that 6,000 tons of product were in fact contaminated. Tyson does in fact run an ERP suite from a major top-two software vendor. So why does Tyson–and why do many other major food manufacturers–still have regular, tremendously huge recalls?

Disjointed and disconnected

While ERP in principle is a single, contiguous software suite, in practice it is often made of separate software products, sometimes united by a common interface. That interface may obscure the fact that an ERP vendor has bundled software products they gained through acquisition into what is sold as a unified application. In other cases, an ERP vendor may have developed the different functionality required for food manufacturing traceability, but it is still too difficult, complex and expensive to implement in an integrated fashion. Even a consumer products giant may not choose to roll it out.



As a result, lot and batch traceability just does not work in practice. Tyson may not have been able to track contaminated chicken strips to an individual batch, but only to a period of time –and a broadly defined time at that.

Perrier faced the same problem. It could be that elevated benzene levels were present in only a thousand cases, but due to poor traceability, Perrier wound up being removed from retailer shelves and has faced a business setback from which they have taken 30 years to recover.

ERP can, if it has embedded quality management functionality, define product routings around product testing at key critical control points and record the results. The hazard analysis and critical control points (HACCP) process according to the World Health Organization has become the universally recognized and accepted method for food safety assurance. HACCP is also a significant requirement placed on food and beverage manufacturers by the U.S. Food and Drug Administration (FDA) and Food Safety Modernization Act (FSMA). National governments around the world have adopted HACCP standards as well, including the EU Food Hygiene legislation.

Because change is constant

ERP must be agile enough to allow end-users to define new product routings around not only the requirements of production, but around these critical control points, thresholds, procedures and corrective actions.

HACCP-related regulations will all be built around similar best practices that can be built into the process flow of your ERP software, most notably the specific steps enumerated by the FDA

- Describe the food and its distribution
- Describe the intended use and consumers of the food
- Develop a flow diagram which describes the process
- Verify the flow diagram
- Conduct a hazard analysis
- Determine critical control points (CCPs)
- Establish critical limits
- Establish monitoring procedures
- Establish corrective actions
- Establish verification procedures
- Establish record-keeping and documentation procedures

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This will help a manufacturer, for instance, identify the different missteps that can introduce allergens like peanuts or seafood into products that are to be free of these substances, exposing consumers to potentially life-threatening anaphylaxis. By thoroughly defining the flow diagram, they can ensure data from the manufacturing BOM is successfully tied to the correct batch as it is routed through a fill and seal line, preventing mislabeling. Embedded warehouse management functionality in ERP can be made to segregate peanut- and non-peanut ingredients. ERP with embedded industrial maintenance can schedule machine cleandowns between batches, inspect equipment regularly enough to note and prevent equipment failures that introduce foreign matter into the product and trace any issues back to a failure in this process or equipment during a specific production run. ERP and quality are intertwined because in practice, quality is an operational discipline, and ERP should be the operational system of record.

As noted, some major food manufacturers run into trouble because they have often implemented primarily financial functionality from their ERP vendor and are not in fact using that ERP as their operational system of record. This may be due to the cost or complexity of implementation and systems integration, or in some cases, they may have attempted and failed to arrive at an integrated solution. Or maybe their operation changes too quickly for their enterprise software to keep up, and they had paid millions of dollars to create routings in the ERP for their original products, but newer ones are relatively uncontrolled. Data resides not in a well-structured database with metadata explaining what resides where, but in a myriad of Excel spreadsheets and point solutions. Bottom line, they cannot automate compliance, and they lack the traceability to reverse engineer where a pathogen or contaminant might have come from.

Importance of maintenance

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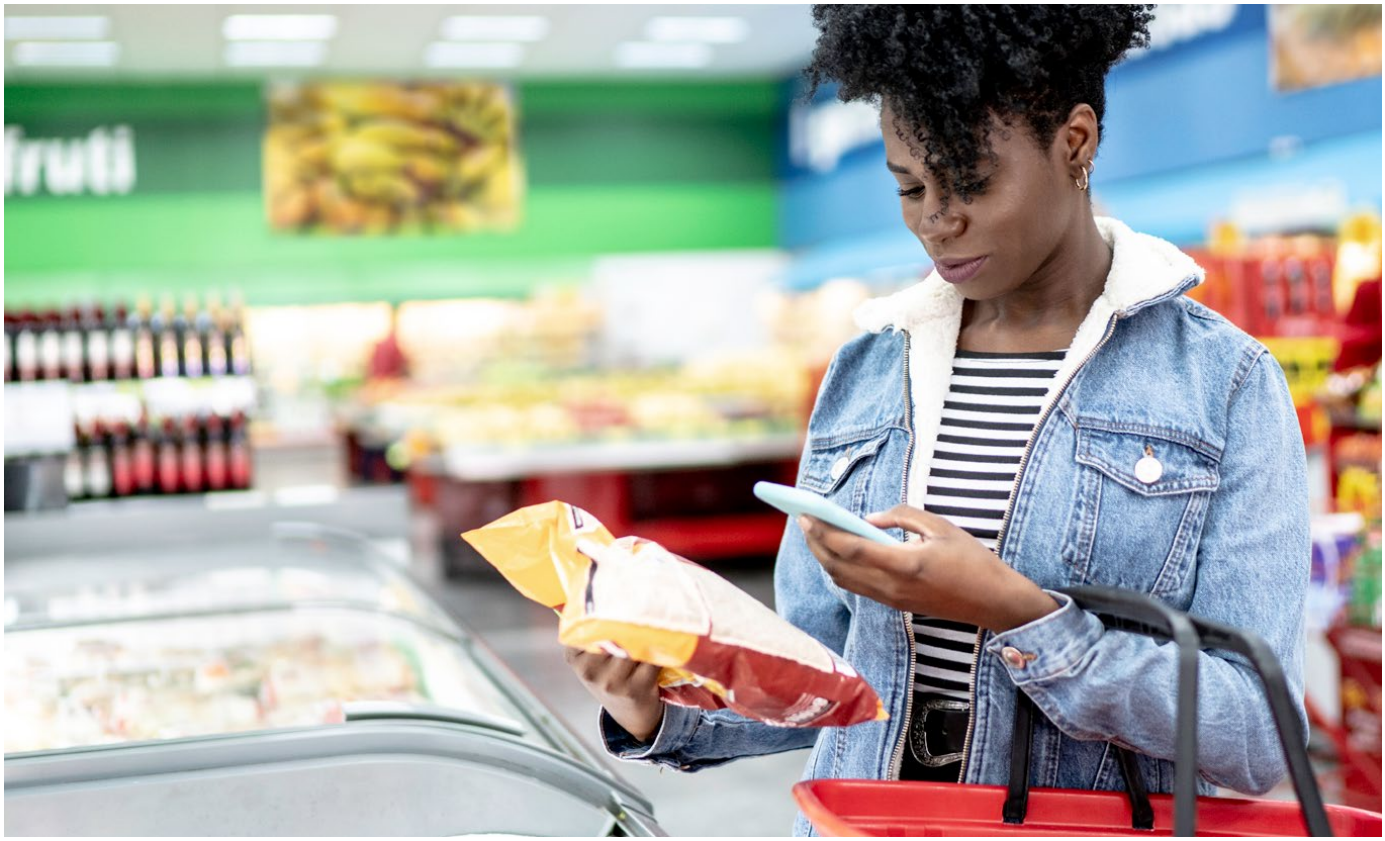

Helper technologies

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Advancing technology

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Something as basic as bar code scanning of the product to check incept date of the product raw material, provenance and to ensure the contents in the BOM match the label can go a long way to prevent mislabeling. Testing for biological pathogens and other contaminants is now also typically faster, and many tests are performed on-site by the manufacturer and then verified by regulators. This can speed up the initial testing process from 24 hours to mere minutes. But again, after a presumptive positive test, this technology will only help so much if the manufacturer lacks the ability to tie back those results to a well-defined lot or batch.

Smart packaging, too, can help mitigate risk once food has entered the channel of distribution. Advanced film-based packaging and UPC code tags can change color when gases generated by spoilage are present. But again, if product is shown to spoil prematurely, tracking that back to the original batch of produce or meat will be difficult without a thorough approach to traceability in ERP.

Selecting and implementing ERP for quality management

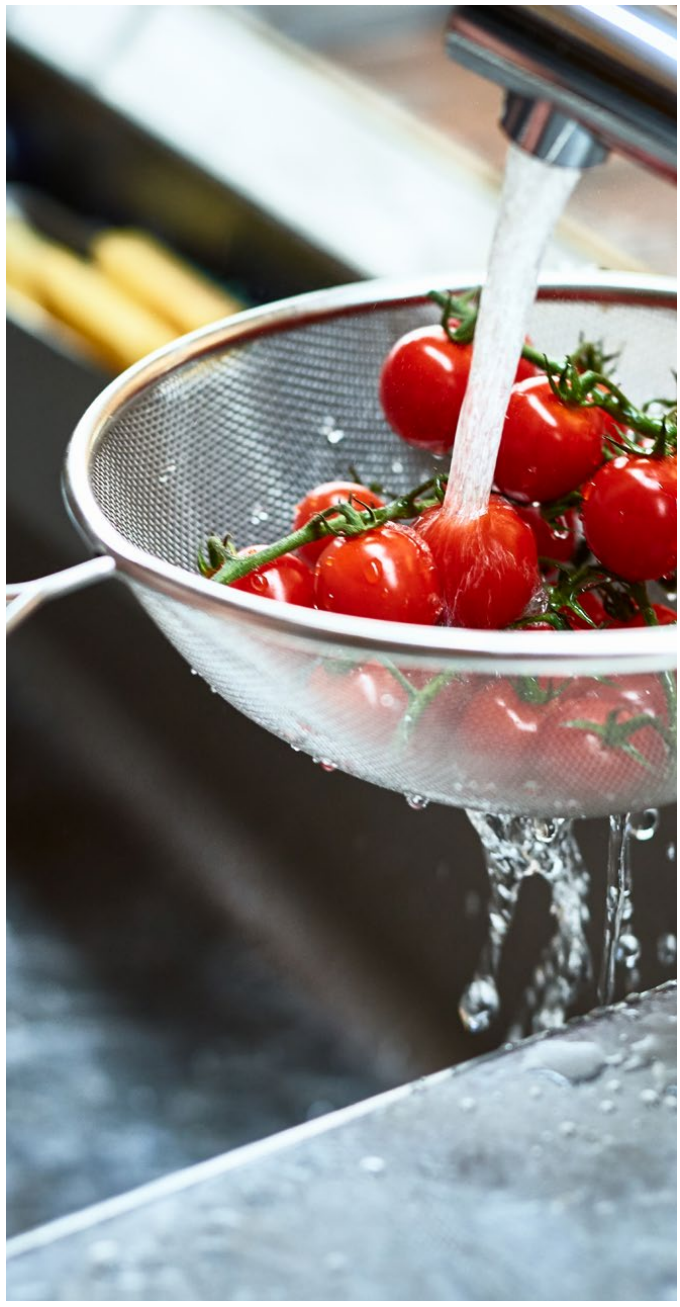
Ensuring that ERP includes embedded functionality to address the entire quality lifecycle–from supply chain management to thorough treatment of manufacturing work in progress to maintenance, warehouse management to distribution–is essential. The fact that a vendor is selling a purportedly integrated solution is not enough though. Due diligence requires a food or beverage manufacturer to talk to references to ensure the solution can be implemented and then successfully evolved to address new products and routings.

ERP should establish not just preventive controls according to HACCP, but detective controls to determine at what point an issue occurred, and precisely which products are exposed. This must cover not just accidental but deliberate acts, which means user-based traceability is essential to assign responsibility, along with forensic accounting tools to find suspicious data patterns.

Conclusion

With modern ERP technology, you can prevent most food and beverage recalls, and certainly control the cost and disruption of recalls that do occur. This requires a complete solution not just on paper, but in the degree to which ERP is used as the operational system of record in your organization.

To find out more about how IFS can help you achieve the operational mastery to reduce recall exposure, visit ifs.com/corp/industries/manufacturing/food-and-beverage-erp/key-ingredients/



About the author

Colin Elkins is the Vice President for Manufacturing Industries at IFS, with over 20 years' experience in ERP software solutions for process industries. Colin has been a professional consultant and senior pre-sales consultant for much of this time and has extensive knowledge of the business issues and requirements faced by process manufacturers. This covers many industry sectors, specifically food and beverage, chemicals, pharmaceuticals and mills and metals. He is a key member of the IFS Product Directions Board and plays an instrumental role in the decisions regarding IFS product strategy. Colin completed a mechanical engineering apprentice and holds a BSC degree in Production Technology and Management with a further endorsement in Metallurgy. He has held senior positions within a large engineering company as works manager, production director and worldwide group systems manager.

About IFS

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