# Real-Time Plant Monitor Case Study
# A Case for Integration


## P. Flanigan and Sons Inc.
## Baltimore Maryland

P. Flanigan and Sons (PFS) has operated as a General Contractor in Baltimore for over 120 years. PFS owes its longevity to two key beliefs – that quality in workmanship and leveraging current and cutting edge technology are vital to its success. The company currently operates two Standard Havens drum plants, which produce a combined total of 400,000 to 600,000 tons of asphalt each year.

As part of their continuous improvement strategy, P. Flanigan and Sons Inc. replaced an outdated load-out computer system in each plant with a fully integrated Libra Generation3 (Gen3) and Enterprise Information Server (EIS) in 2004. Prior to the upgrade, PFS used a combination of independently operating load-out systems and a custom generated end-of-shift production data collection system that was limited to end-of-shift data collection. The quality and consistency of this data was controlled by each plant – the plants were in charge of entering and maintaining job, customer, truck and mix information at each plant *independently*. The result was that the data was inconsistent between plants; a disaster for further use of this data. At the end of each shift, this data was collected and exported to the main office, where tickets would be compared with the exported data and corrections made. After corrections were made, the data was matched with the main office list of projects, customers and mixes and further corrections were made. They stored this data in what was called the "permanent ticket record." This record was then used for billing and inventory reconciliation. Although PFS could report production for a shift after the initial data collection, billing and inventory control were always days behind. The multiple steps necessary to produce billing and inventory data, combined with the time lag from production to data analysis and customer invoicing, created costs that kept PFS from operating as a best-in-class asphalt producer and general contractor. Time is money, and PFS knew they could be more profitable by reducing the time it took from asphalt production to customer invoicing and inventory management.

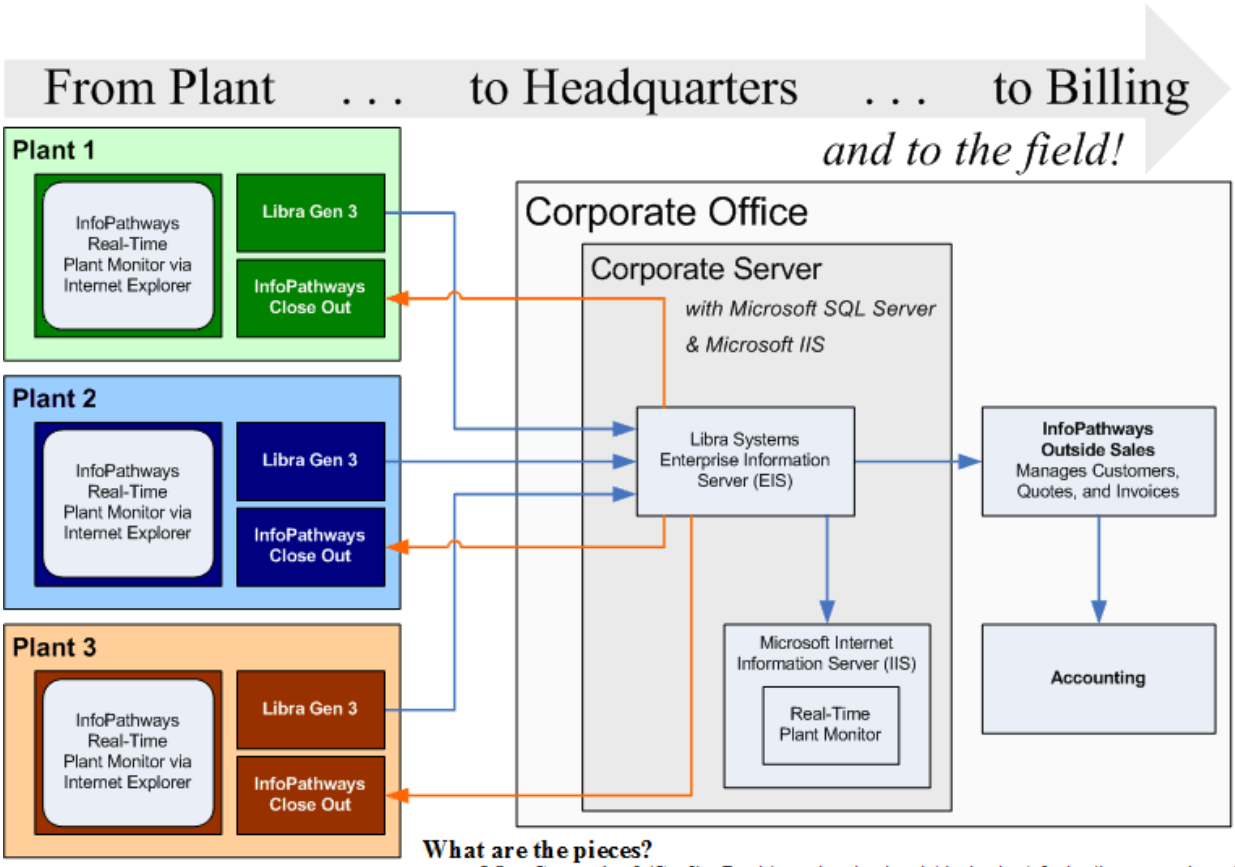
The Libra EIS system improved this scenario by allowing PFS to completely control the ticket information at the plants from a central location. This control not only standardizes key information such as job, mix, and customer numbers, but trucking and customer naming conventions as well.

***One Customer, Three Names???*** Prior to EIS, a customer was literally listed in many different ways. Company ABC might be listed at the plant as Company ABC, ABC Company, ABC, etc., while at the corporate office it was listed as Company ABC. With EIS, a common customer database is used, and Company ABC is always listed in the system as Company ABC, at the plant(s) and at the corporate office. This dramatically reduces time wasted on matching quotations with client rates, expediting billing. InfoPathways developed an asphalt customer billing and export validation application (Outside Sales) to allow billing personnel to quickly process quotations and customer pricing information for all plants concurrently, generate invoices and a validated export file. Note that the export file was validated against the contents of the accounting system prior to importing to ensure that the export file was absolutely correct prior to importing it into Accounts Receivable, resulting in a further reduction in errors and wasted time.

The process of asphalt data collection from the plant was changed from an end-of-shift export to an automated process requiring virtually no user intervention. In the past, when the plant computer failed or experienced a communication error prior to exporting ticket

and production information, the data remained at the plant until the problem was corrected. In the event of a complete plant computer failure, the information contained on the plant computer was potentially lost and had to be completely rekeyed at the main office from the hard copy tickets. Using EIS the data is transmitted to the main office constantly and stored in a secure central database, which also maintains an audit trail of any changes and corrections. Conversely, the plant can also operate with no connection to the central database, and the Gen3 database will transmit its data when communication to the main database is restored. With EIS, information such as jobs, customers and mixes can all be updated from the central location while the plant is in full operation. At the end of each shift, the plant operators run an end-of-shift reporting tool (developed by InfoPathways) which tags the loads for a particular shift. This allows the plant operators to add notes and related plant data to an end-of-shift report (a digital version of the plant's Shift Log).

This improved level of information control now allows for detailed enterprise level reporting. In the past, the end-of-shift data collection could generate a history report of daily production, but it never provided real time production information, requiring much of the intra-shift information to be relayed by phone,




**What are the pieces?**

**Libra Generation 3 (Gen3)** – Provides a plant-level tool (single plant) for loading out trucks and generating tickets with Customer, Job, Material and Load information.

**Libra Enterprise Information Server (EIS)** – Provides an enterprise level tool for collecting ticketing information across multiple plants, as well as managing consistent Customer, Job, Phase and Materials data across multiple plants.

**InfoPathways Real Time Plant Monitor** – Refreshed automatically every 60 seconds, this internal web view provides for a real time view of production data across multiple plants, plant-by-plant, customer-by-customer and project-by-project.

**InfoPathways Close Out** – Provides for flexibly grouping tickets into shifts and managing shift related data, including shift notes, materials delivered to the plant during the shift and material remaining in each silo.

**InfoPathways Outside Sales** – Provides for an efficient means of generating invoices from the tickets collected via the Close Out process. This application provides for managing one or more quotes for each customer; the quoted prices are used when generating the invoices to price the material, providing great flexibility in billing.

adding more work for the plant operator. EIS allows PFS to see real time production (load by load) and provides the ability to reroute customers and deliveries to other facilities if needed. The communication between EIS and the Gen3 load-out can be set to any interval – PFS opts for nearly instantaneous reporting for continuous updating of production information. With use of the Real Time Plant Monitor for EIS developed by InfoPathways, this production information is made available via a corporate intranet (internal web page). This information allows for production information to be made available to field personnel on the company's construction projects. The continuous flow of data includes information such as number of loads, status of trucks, tonnage let to each project and more. This information increases PFS' production efficiency, reduces errors, and provides better information to the field to help them reduce project construction costs.

The introduction of the Libra System and Real Time Plant Monitor for EIS has also produced some less obvious, but dramatic changes in the way asphalt production is viewed by the entire organization:

- **Standardized Job, Customer, Mix Name and Plant Information:** The EIS model allows for P. Flanigan to set up projects, mixes, customers and plant information from a central source. This reduces coding and billing errors.
- **Customer Hold:** EIS allows for placing a customer on credit hold from a central location, and removing a customer from hold. This helps the plant avoid selling asphalt to customers who are slow or no pay.
- **Executive and company-wide awareness:** PFS leverages the "Real Time Plant Monitor" to help the entire organization view, share and understand what is happening company-wide in real time.
- **Metrics:** PFS is currently evaluating long term trending of the data to better understand how their plants are operating and is searching for ways to optimize their production.

Implementation of a fully integrated Libra Generation 3, Enterprise Information Server and the Real Time Plant Monitor by InfoPathways has given P. Flanigan and Sons greater control of their production and plant operations by vastly improving the relevance of their data. The integrated system allows them to *proactively act* on real time plant information, rather than waiting for data and *reacting* several days later. This proactive approach has drastically reduced the time from production to billing, reduced errors and the time associated with corrections, as well as streamlined plant operations to allow plant personnel to focus on their key objective – producing asphalt – and allowing the computers to focus on data collection and communication. These improvements are critical to helping PFS stay competitive in construction and asphalt production, carrying them into their next 120 years of continued success.

For more information on Libra Systems, Generation 3 (Gen3), and Enterprise Information Server (EIS), please contact:

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