Optimizing Bus Assembly with Process Digitization

How Milestone Technologies migrated a leading bus manufacturer from manual processes to a digital solution, enhancing inspection accuracy, reducing errors, and fostering cross-department collaboration for improved efficiency and profitability.

The Background

The client is a leading American manufacturer specializing in the design and production of heavy-duty transit buses. With over 125 years of industry experience, the company holds a prominent position in the North American market, capturing approximately 31% of the combined U.S. and Canadian market for heavy-duty transit buses.

Known for its commitment to quality and innovation, the client's extensive portfolio supports transit agencies across the region, helping them meet evolving public transportation needs. The organization's legacy, combined with its focus on sustainability and performance, ensures it remains a trusted partner in the transit industry.

The Business Problem

The client relied on paper-based inspection sheets to manage production and quality control, leading to several operational challenges. Handwritten inputs were difficult to process and prone to errors, while the broad and generic nature of inspection requirements added complexity.

Engineers had to manually transfer data from paper forms into digital systems, making report generation slow and time-consuming. Additionally, the lack of real-time alerts for shortages hindered responsiveness, and tracking efficiency was cumbersome, limiting the organization's ability to identify and implement improvements effectively.

The Objective

The client needed to implement a digital system enabling real-time data entry and seamless access across departments, such as body, chassis, engine, and electrical. The solution was aimed at reducing errors caused by manual data entry, handwriting misinterpretation, and lost paperwork.

It also sought to enhance cross-departmental collaboration by providing easy access to inspection data for teams across quality control, production, and engineering. The solution involved implementing a digital audit trail to track inspections and ensure accountability throughout the plant. It also incorporated the use of iOS tablets to perform inspections from any location within the facility, increasing flexibility, accelerating data entry, and streamlining the overall inspection process.

In summary:

- **Enable real-time data entry and access** across multiple departments.
- **Minimize errors** from manual data entry and handwriting issues.
- **Improve cross-departmental collaboration** by providing easy access to shared inspection data.
- **Create a digital audit trail** to track inspections and maintain accountability.
- **Increase flexibility** by enabling inspections from iOS tablets, speeding up data entry and the inspection process.

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The Milestone Solution

Milestone developed a digital E-Card application, transforming the client's manual paper-based system into a seamless, real-time platform accessible via iPads and Salesforce. The E-Card application provides instant access to inspection requirements, defect tracking, and KPI reporting across departments. It also stores detailed information about parts, including status and serial numbers, for easy tracking.

Salesforce and the iPad application display data through APIs hosted on Heroku, interacting with Postgres databases and AWS S3. These APIs, built using Python, allow multiple users to monitor various stages of bus manufacturing, production, quality checks, and factory output. Any changes made on Salesforce or the iPad are updated in real-time within the Postgres database through Heroku, ensuring accurate, up-to-date information across systems.

Additionally, iPad users are authenticated via Salesforce's single sign-on (SSO), providing secure and seamless access to the application.

In summary:

- Developed a digital E-Card application on iPad and Salesforce, replacing paper-based systems.
- Provided real-time access to inspection requirements, defect tracking, and KPIs.
- Stored part details, including status and serial numbers, for streamlined tracking.
- Integrated Salesforce and iPad applications with Postgres DB and AWS S3 via Heroku APIs.
- Enabled real-time data updates between Salesforce, iPads, and the Postgres database.
- Secured iPad access through Salesforce single sign-on (SSO) authentication.

The Result

The solution led to increased client satisfaction and profitability through improved quality and reduced costs. One of the key outcomes was a 15% reduction in the time required to complete assembling a bus, significantly enhancing production efficiency. The system also provided access to 4,730 buses in the database since 2021, with an average of 2,520 buses assembled each year. Inspections became more efficient, requiring less manpower, and an average of 70 discrepancies were resolved each month.

Real-time feedback on defects ensured supervisors could address issues before moving to the next workstation, reinforcing built-in quality throughout the assembly line. Any parts shortages were immediately communicated to the supply chain, enabling quick action and preventing delays. Additionally, inventory management and tracking saw significant improvements, further supporting operational efficiency.

In summary:

- Bus assembling time was reduced by 15%, improving production efficiency.
- The database now holds 4,730 buses, with 2,520 assembled annually.
- Inspections required fewer personnel, reducing manpower costs.
- Approximately 70 discrepancies are resolved each month.
- Supervisors receive real-time defect feedback, ensuring built-in quality.
- Parts shortages are reported to the supply chain instantly for quick resolution.
- Inventory management and tracking saw significant improvements.

Key Learning

Transitioning from a paper-based system to a digital solution significantly improved operational efficiency. The elimination of manual errors, reduced delays, and real-time data transmission between the production floor and other departments enhanced cross-departmental collaboration. Leveraging APIs on Heroku, Python, Postgres DB, AWS S3, and Salesforce enabled seamless data exchange between the iPad app and central databases, minimizing manual errors.

The digital solution provided valuable insights into production performance and defects, supporting data-driven decisions and real-time improvements. Cloud-based services like Heroku and Salesforce ensured scalability, secure data storage, and user authentication through Salesforce SSO. Reduced manpower, faster discrepancy resolution, and real-time inventory management further contributed to cost savings and optimized resource utilization.

In summary:

- Digital transformation eliminated manual errors, delays, and enhanced collaboration.
- APIs integrated with cloud platforms enabled seamless data sharing, reducing risks.
- The system provided insights for real-time improvements and data-driven decisions.
- Heroku and Salesforce ensured scalability, secure storage, and user authentication.
- Optimized manpower, quick discrepancy resolution, and real-time inventory tracking reduced costs.

Why Milestone

Milestone Technologies was selected for its expertise in implementing digital solutions that align seamlessly with complex operational needs. With a strong track record in Salesforce integration and cloud-based technologies, Milestone was uniquely positioned to transform the client's paper-based processes into a scalable digital platform.

The use of Milestone's tailored approach, combining Salesforce, APIs, and cloud infrastructure, ensured smooth data exchange and real-time insights across departments. By enhancing inspection processes, streamlining collaboration, and reducing operational costs, Milestone delivered a solution that not only met but exceeded the client's strategic objectives.

About Milestone

Milestone Technologies is a leading global IT services and digital solutions provider that collaborates with organizations worldwide to revolutionize their technology infrastructure and digital capabilities.

With a strong commitment to innovation and customer satisfaction, we empower businesses to accelerate their digital transformation journey and unlock new opportunities for growth and success.

By leveraging our extensive expertise in cutting-edge technologies, we provide companies with the agility and scalability needed to stay ahead in today's rapidly evolving digital landscape.