



How Software Data Management System helped to Improve Efficiency and Quality

Abstract:

With the rapid development of technology, every industrial sector is observing a significant change in the way of doing business. In the era of Industry 4.0, the amalgamation of software technology and the manufacturing sector has brought speed, accuracy, and data-driven decision-making capabilities to every business process. From understanding the customer's behaviors to analyzing a mammoth data set, software applications offer immense benefits to organizations.

This case study will discuss how FreeTechCafe Technologies helped one of India's largest tyre manufacturing companies to replace its antiquated paper-based system with a software-based one. Due to its reliance on a legacy method for quality and data management systems, the company's processes were less efficient and error-prone, and the decision-making was slow. This case study will also describe how the client's requirements were outlined, and a tailored approach was designed to offer a unique automation service. The software data management system provided an easy and automatic way to handle the company's data, which boosted its productivity.



Partner:

About Us

FreeTechCafe Technologies is one of the leading automation services and technical support providers in the market. With more than 7 years of experience, they offer unique customized solutions to industries across the globe. Having in-depth expertise in advanced technologies like Process Automation, Mobile and Web App Development, IoT, Artificial Intelligence, Machine Learning, and Cloud, they innovate what you imagine, bringing to life some of the brightest custom-designed data management systems.

The Client:

The client was one of the leading tyre producers in India and one of the top 25 in the globe. With a presence in 105 countries, the client has 12 "sustainable" factories, 9 in India and 3 in Mexico, that turn out 35 million tyres yearly. This case study is concerned with one of the outlet and quality test centres of the manufacturer, where they were facing significant challenges in managing their massive set of data. It wasn't easy to manage the Quality Management System through the legacy data management system.



The Problem:

Being a large-scale tyre manufacturing company serving numerous global automobile makers, it is essential for the client to have a robust quality management system in place. But due to the manual data capturing and analyzing process, they faced several significant challenges.

Slow legacy system:

The customer had been using an antiquated, labour-intensive method of data capturing prior to this project's inception. There was no method to feed the live production data into the existing system. Information was captured from the production and quality test centres, and manual data entry was done for reporting, review, and approval purposes from different department heads. In the present digital era, this outdated method could have been more efficient. Decisions took longer to make, and productivity was lower because of the high maintenance costs of a paper-based system.

Hefty data management:

Due to the manual intervention in data capturing, the data management process was itself very time-consuming. As a result, management had to put a cap on the number of tyres examined at once to minimize the probability of making mistakes. In addition, retrieving historical records took a lot of work due to the slow archives maintenance process.



Costs significant time and resources:

The lengthy procedure not only affected the product quality but also consumed a lot of time and money for the business.

Isolated process:

Due to the long-winded process, it was entirely an internal activity that ruled out any constructive customer feedback system. There was less opportunity for continuous improvements, and therefore, the business was losing competitive advantages.

Lack of data security and accessibility:

Data is the most valuable asset of any organization. In this case, as the data management process was entirely human-dependent, there was always a chance of data vulnerability. Moreover, as the system was isolated, there were restrictions to accessing the best practices of other departments, facilities, and manufacturing sites.

Goals:

The primary objective of the project was to establish a robust and automated data management system. And to ensure the success of the project within a limited time frame, it was imperative to establish synergy between FreeTechCafe and the client.

Some key objectives of the project were as follows:

- To reduce data entry errors by minimizing human intervention
- Automating data entry processes
- To improve data retrieval and access
- To eliminate duplication of data
- To streamline processes and improve efficiency
- To enhance data security
- To reduce the overall TAT (Turn Around Time) of the process

There were some secondary goals of the project.

- An application with a user-friendly interface and easy navigation
- Providing Multi-role Access to make the records available to different levels of management simultaneously.



- Creation of a direct communication system for the Production Center and Tyre Testing Center to exchange requests and provide access to test records for tyres.
- A clear-cut hierarchy in the system to notify the approving authorities when a test report is approved by the testing facility. They should receive a mail alert, and the notification should be saved in the app for later review.
- The system should provide the live availability status of the Tyre Testing Machine and also reflect the real-time efficiency.

Solution and methodology:

In this project, FreeTechCafe customized the way of testing data management to provide the best and most realistic test results and automated processes in a short time of six months.

Digitalizing the data from the quality testing and uploading all information into a safe and centralized system was the primary solution the team came up with for all the issues listed. In this way, relevant employees can get their hands on any relevant data whenever they need it.

To avoid any human error in the data entry part, FreeTechCafe implemented Poka-Yoke (Error proofing) in the initial data input stage. Below two approaches were implemented to achieve a higher level of accuracy.

1. System integration with other existing systems wherever possible to avoid human intervention.
2. Implementing strict validations and control mechanisms where human data entry was unavoidable.

Another critical solution approach that was adopted during the project was implementing Role-based Access Control (RBAC) in the application. This helped to set up a control mechanism in the system itself as per the delegation of authority (DoA), which let different users perform their activities at their level based on the finalized process. FreeTechCafe implemented 3 Kaizen activities to make the process more robust and controlled.

Results and advantages:

FreeTechCafe's specially tailored procedure helped the leading Tyre Manufacturing company to get its desired outcome with other advantages.

Automated data entry: With the implementation of automated software in the data capturing and management process, the organization was able to eliminate manual data entry. This eventually increased the data accuracy to 100%.



Improved TAT: Aiming to reduce the TAT, this project helped to reduce 100 hours by integrating the new software quality system with other existing applications.

Significant cost savings: By reducing the use of unnecessary resources, the company is now able to save up to 1-2 lakhs every month. Even better, the client paid nearly nothing for the technology. As there are no license fees for the fully open-source system, the client's system gets updated for nearly nothing.

Elimination of duplication of data: With the help of automated data feeding from the tyre testing machine, implementing validation checkpoints, and necessary input type, data duplication and errors have been significantly reduced by more than 60%.

Enhanced data accuracy and security: The newly developed system was integrated into the existing SAP system, which improved the data accuracy and response time. Additionally, the system integration enhanced data security.

Improved data retrieval and access: Users and reporting heads can extract data and customized reports directly from the system from machines for some specific tests on a real-time basis. It enables easy MIS and reporting.



Efficiency enhancement: With the new automated approach, when the tyres are made and tested, all data would be collected from the live server and entered into a centralized system. With minimal to no manual input, data is transferred from the machines to the system, increasing efficiency and reducing the possibility of mistakes or operational omissions.

Streamlined processes: After the implementation of the project, the process became leaner and more flexible. Several Non-value-added activities were identified and eliminated, which helped to improve efficiency and productivity.

Seamless communication: This strategy provided for a multi-client system that creates a clear line of communication between the consumer and the producer as well as multi-role access for the leaders of various departments within the organization. Additionally, the improved data management system helped to build a robust quality inspection process. Better quality products directly helped to improve the customer experience and delight.



Conclusion:

The software data management system deployment resulted in an effective and automated method for the leading tyre manufacturing company to manage its data accurately and efficiently. This system helped to boost accuracy, productivity, decision-making, cost savings, data security, service to customers, and scalability. After the implementation of this advanced system, the client can now make more well-informed decisions, increase productivity, and better serve its customers.

The organization can rely on the flexibility of the software data management system to accommodate its changing requirements over time. With the help of cutting-edge technologies, FreeTechCafe offered an exceptional solution to the client in a short time. A thorough analysis of the end-to-end process with a significant sample size offered the intended results, which helped the customer to produce high-quality products with enhanced customer delight.