

SUMMARY

The business environment in which businesses produce and operate is rapidly globalizing and digitizing. This necessitates the obsolescence of traditional methods and techniques of business process monitoring. The most impacted area is the monitoring of manufacturing and production systems. Unlike the traditional use of Excel worksheets to monitor progress, the globalized and digitized world encourages the emergence and increased use of dashboards [8]. Dashboards are not a recent discovery, but their use in production monitoring and visualization is an emerging trend. The design of dashboards can be approached from a variety of different angles. A wide variety of manufacturing process specialists and academics have been at the forefront of developing the concept of how the pertinent information might be anticipated by collecting the contexts of a variety of users. The visualization of the process in dashboards is determined by factors like user preferences, the purpose of the dashboard, and categories of data to be visualized.

The visualization of KPIs is especially essential for process improvement in business, especially in manufacturing and production. The KPIs are essential indicators of how well a certain aspect of the firm or business is performing. The three categories of KPIs include the engineering, maintenance, and financial KPIs. Of these, the engineering KPIs are the most critical for manufacturing systems. The engineering KPIs measure how effectively a system is working technically, such as the efficiency with which the equipment produces the desired products. Manufacturing mainly concerns the maintenance of maximal levels of efficiency of machines and manufacturing systems. This efficiency is best deduced from the effectiveness of the equipment, hence engineering KPIs.

The design and development of a dashboard must take several factors into consideration. First, the ease of use must be considered to make the dashboard easily usable by those who need to utilize its content for decision-making. Furthermore, the display clarity of the dashboard is an important factor; the dashboard should display the information in a manner that can be easily acted upon by the decision-makers. The display should easily permit the spotting of progress and areas of possible improvement without the user straining or having to do additional analyses to determine their course of action. Furthermore, the dashboard should be able to display multiple pages or performance metrics at a time to enhance comparative monitoring and evaluation of processes. Through these considerations, dashboards enhance real-time decision-making based on real-time data generation [13].

For manufacturing systems, the OEE is the essential KPI as it summarizes the key elements of production performance, availability, productivity, and quality. As an industry-standard, OEE measures the productivity of manufacturing by gauging the level of productivity of individual machines and manufacturing systems. An OEE of 100% is ideal, representing the perfect products, and is practically unachievable due to the practical dynamics of manufacturing. Most systems produce at 60% OEE, while 85% OEE is the long-term goal of most manufacturing processes. An OEE of 40% is considered low and signals the need for urgent action to optimize the manufacturing equipment and systems. The calculation of OEE factors in all its three elements was mentioned earlier.

Conducting an OEE analysis provides managers with insights into how to schedule, organize, and execute maintenance tasks necessary to prime the manufacturing systems. As such, OEE determines the productivity of a manufacturing asset, informing asset management decisions and job scheduling for the manufacturing floor employees in the company. While the OEE and the OEE dashboard information may not be as important for the floor personnel directly involved in the execution of manufacturing tasks, they are critical for the manufacturing managers who make decisions to directly determine how the floor employees execute their roles towards enhanced productivity informed by the OEE dashboard metrics. As such, the OEE is important for total productive management in any firm that features manufacturing and production as its core aspect or operations.

Despite the essence of KPIs, data visualization in manufacturing, and the role of OEE in total productive management, many firms still do not adequately rely on modern visualization methods to monitor and evaluate their manufacturing processes. Many firms still depend on obsolete traditional methods of visualization like the use of Excel worksheets. These methods are very cumbersome and lead to a wastage of time that would otherwise be used to perform other essential tasks in the manufacturing process. As such, the firms relying on such traditional visualization methods cannot effectively optimize their manufacturing systems. Consequently, visualization systems like the dashboard developed from the Visual Components and NetSuite digital platforms can effectively enhance how these firms visualize and monitor their systems for optimized operational outcomes.