

RESEARCH

Analysis of daily work management charts at TVS motor company Ltd.

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Received: 16 February 2023; **Accepted:** 28 July 2023; **Published:** 25 September 2023

This paper is all about a study that is mainly focused on daily work management (DWM) charts at TVS Motor Company, Mysuru. The objective is to study the process of managing DWM charts and simplification of the process and its impact on the team leader's decision-making process. The essential information has been gathered from the team leaders of the engine and vehicle assembly through face-to-face interviews, observation, and a deep study of current DWM charts. Secondary information was gathered from books, journals, articles, and websites. Implementation of a dashboard has caused various effects on the DWM of team leaders in different ways one of the major impacts is the reduction (40%) in the time the team leader takes to store the data. It also resulted in a reduction in the shift handover time due to the availability of relevant data in the digitalized format. Not only this, the implementation of digitalized format has also reduced paper consumption in the organization to a greater extent. It has been noticed that the shift handing over time has been reduced to 20 min from 30 min due to a simpler and more precise representation of data from the previous shift through dashboards. Since it has been proved that the digitalization of DWM charts has reduced non-value activities of the team leaders, digitalization of DWM charts can be made in the other units as well.

Keywords: DWM charts, dashboards, team leaders, decision making

Introduction

Dashboards are intended to avoid overloading information and to increase efficiency and decision-making when appropriately constructed. As a result, the market expansion of dashboard solution providers has recently shown increasing interest in dashboards. Although they are widely used, the extent to which dashboards are valuable for companies is little known. Dashboards contain materials from a range of disciplines but rely on visualization to provide the stakeholders with vital data. As a result, better visualization can contribute in a better way to the dashboard. Evaluation of performance, its grounds

and responsibilities, decision-making, and upcoming research may be studied, and dashboard design can also be improved.

TVS Motor Firm is India's third-largest two-wheeler producer with sales of over \$1.4 billion a year in 2011–2012 and one among the top 10 worldwide. The \$7.29 billion TVS Group is a flagship firm., the company's business, includes Automobile component manufacture and supply, two-wheeler- production, peripheral computers, financial services, contract production services, and software development. In terms of both size and turnover, TVS Motor Firm Ltd., (TVS Motor) is the biggest firm in the TVS group. TVS, a transport company with a vast fleet of trucks and

buses known as South Roadways, was founded in 1911. In Madurai, the first bus service began.

Review of literature

MacKay DB, Villarreal A. (1) It has been suggested that graphically displayed multivariate data help decision-makers better understand the information they are called on to analyze. This study compares judgments made from one recently suggested multivariate display technique with judgments made from traditional tabular displays of financial figures. Significant differences in task performance are found to be related both to differences in the stimulus sets and to individual differences among the subjects. Results suggest that the relative contribution of graphic displays to decision-making may vary considerably from situation to situation.

Merchant KA, Van der Stede WA. (2) With its unique range of case studies, real-life examples, and comprehensive coverage of the latest management control-related tools and techniques, *Management Control Systems* is the ideal guide to this complex and multidimensional subject for upper-level undergraduates, postgraduates and practicing professionals.

O'Donnell E, David JS (3) Technology has created new information alternatives that may influence the way information system users make decisions. The research framework focusses on examining how features of an information system affect the decision-making process. The framework is synthesized by merging frameworks from the accounting information systems (AIS) literature and the human information processing (HIP) literature. The framework is then used to organize a literature review of 15 journals from 1987 through mid-1999, which identified 57 decision-making studies. Findings indicate that a wide range of opportunities is available for information systems research on issues of contemporary importance. This discussion includes changes in the decision process initiated by implementing enterprise resource planning (ERP) systems, data warehouses, electronic commerce, virtual organizations, online financial reporting, and disaggregated financial statement information.

Shields MD. (4) Business Intelligence (BI) intends to provide business managers with timely information about their company. Considerable research effort has been devoted to the modeling and specification of BI systems, with the objective of improving the quality of resulting BI output and decreasing the risk of BI project failure. This paper focuses on the specification and modeling of one component of the BI architecture: the dashboards. These are the interfaces between the whole BI system and end-users and received less attention from the scientific community. Preliminary results from an action research project conducted since February 2019 with three Belgian companies. Our contribution is threefold: (i) we introduce BIXM, an extension of the existing

TABLE 1 | Profile of all the participants in the interview.

Interviewee	Role	Department	Duration
Interviewee1	Team Leader	Engine Assembly	15 min
Interviewee2	Team Leader	Engine Assembly	15 min
Interviewee3	Team Leader	Engine Assembly	15 min
Interviewee4	Team Leader	Engine Assembly	15 min
Interviewee5	Team Leader	Vehicle Assembly	15 min
Interviewee6	Team Leader	Vehicle Assembly	15 min
Interviewee7	Team Leader	Vehicle Assembly	15 min
Interviewee8	Team Leader	Vehicle Assembly	15 min

Business Intelligence Model (BIM) that accounts for BI user-experience aspects, (ii) we propose a quality framework for BI dashboards and (iii) we review existing BI modeling notations and map them to our quality framework as a way to identify existing gaps in the literature.

Schulte MF. (5) Understanding and Assessing the Impact of Data Visualization On Stakeholder Access to Data, Sensemaking and Decision-Making in the Context of the Local Control Funding Formula.

Research objectives

1. To study the current methods and practices followed by team leaders of the engine and vehicle units to update the DWM charts at TVS Motor Company, Mysuru.
2. To study the effect of implementing a digital dashboard.

Data and methodology

The information is collected from both primary and secondary sources. The essential information was gathered from the team leaders of the engine and vehicle assembly through face-to-face interviews, observation, and a deep study of current DWM charts. Secondary information was gathered from books, journals, articles, and websites.

Data analysis and interpretation

Interpretation

From **Tables 1–3**, it is observed that the team leader under engine assembly spends more than 1 hour entering the data manually, which will be used in decision-making at the end of the shift. The data stored physically consume a large amount of paper every day. As is observed, the team leader under vehicle assembly spends around one and a half hours

TABLE 2 | Charts that are updated manually by the team leader in the engine assembly.

Chart	Time taken	Source of information
First-hour output	7 min	SAP
Shift output	7 min	SAP
First-hour preparedness	8 min	SAP
Operator stage deployment	10 min	Manual
Safety daily calendar	3 min	Manual
Cleaning frequency	5 min	Visual Check
5S audit check sheet	5 min	Visual Check
Stage deployment adherence	5 min	Visual Check
Line stopper-customer end	10 min	SAP
Attendance list	10 min	Manual

TABLE 3 | Charts that are updated manually by the team leader in vehicle assembly.

Charts	Time taken	Source of information
Attendance sheet	10 min	Manual
Stage v/s operator matrix	10 min	Manual
Critical to quality check	10 min	Manual
First-hour output	7 min	SAP
Shift output	7 min	SAP
Assembly rework	5 min	SAP
Scrap chart	10 min	SAP
AQI Chart	7 min	SAP
FQI Chart	7 min	SAP
Safety calendar	5 min	Manual
5S audit check sheet	5 min	Manual

entering the data manually, which will be used in decision-making at the end of the shift. Information overload can be reduced through efficiently constructed dashboards to improve performance management. As a result, there has been an increasing interest in dashboards recently, which is visible from the growth of dashboard solution suppliers. Despite the ubiquity, very few are about the efficiency of the organization. Dashboards are taken from different disciplines, but in the end, conception is used to provide the stakeholders with crucial information. Better visualization understanding can therefore enhance the dashboard design **Figure 1**.

It is clear from **Figure 2** that implementation of a dashboard has caused various effects on the DWM of team leaders in different ways. One of the major impacts is the reduction (40%) in the time the team leader takes to store the data. It also resulted in reduction in the shift handover time due to the availability of relevant data in the digitalized format and reduced paper consumption in the organization to a greater extent.

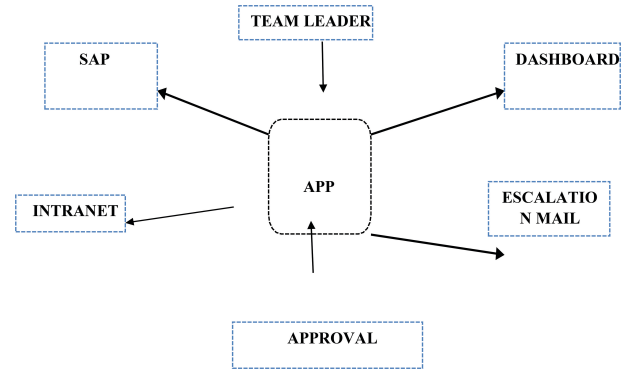


FIGURE 1 | Action in creating the dashboard.

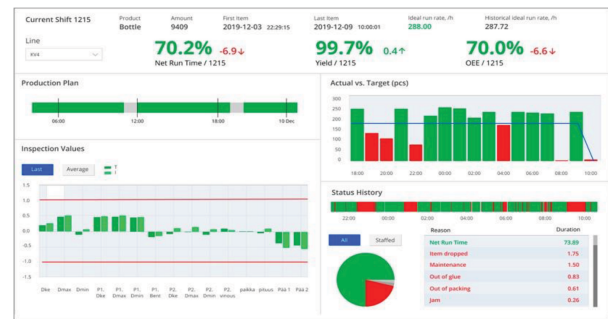


FIGURE 2 | Sample representation of the dashboard.

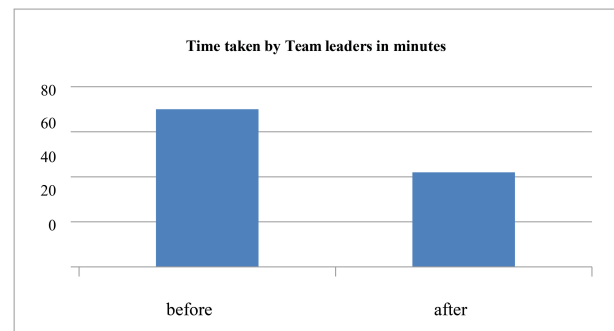


FIGURE 3 | Time taken by the team leaders in minutes.

It is clear from the **Figure 3** that the major impact is the reduction (40%) in the time the team leader takes to store the data. Not only this but also the implementation of digitalized format has reduced paper consumption in the organization to a greater extent. Through the method of observation, it has been noticed that the shift handing over time has been reduced to 20 min from 30 min due to the simpler and more precise representation of data of the previous shift through dashboards. So, considering the time constraint here to take the decision at the shift end null hypothesis is eliminated and the alternate hypothesis is proved.

Findings

Digitalization of the DWM charts has resulted in a reduction of the time taken to fill them by the team leaders by 40%. The manual charts which created a waste of paper after 3 months of duration have been reduced to zero. Data being stored digitally have given access to data from anywhere at any time. This digitalized data bank has made data analysis handier and more accurate. Digitalization has reduced team leaders' manual work of filling the manual charts. On the other hand, this new system required initial costs for implementing these into the system. Digitalization has incurred additional costs to maintain this software system. Team leaders needed time to get along with the new system which eventually changed along with time. The implementation of digitalized DWM charts has changed the workflow in management. Software management happens to be the additional work after implementing the dashboards.

Conclusion

Many manufacturing companies are struggling with a lack of information about their daily operations, which has resulted in delays in decision-making, increased production costs, lower production yields, and poor customer service. It may be concluded from the examination and discussion of the aspects of dashboards used in those industrial businesses that to construct a dashboard for a manufacturing company, it must be related to the organization's operating site as it is where the company's core activities take place. It is the organization's beating heart, and information flowing from it is vital. Any issues that arise because of it will have a substantial impact on a manufacturing company's success or failure.

The dashboard should be developed in real time, including previous and future data (if available) as well as colorful graphs and charts for better visual appeal. Clickable graphs and charts with drill-down functionality are required to locate more information or the root cause of problems. A manager's dashboard (managerial dashboard) will include knowledge, supplier, and customer interface. This is to assist decision-makers in making more informed and timely business decisions. The dashboards they implemented helped them achieve a lot of benefits both internally and outside with their staff and consumers. As a result of the dashboard elements outlined above, a study to design a dashboard framework for usage in a manufacturing organization has gained importance. The features can be added depending on the challenges a manufacturing organization faces to boost the company's ability to excel and remain competitive in its area. Since it has been proved that the digitalization of DWM charts has reduced non-value activities of the team leaders in some of the units of a manufacturing plant, digitalization of DWM charts can be made in the other units also as an overall enterprise initiative.

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