THE ENGINE TESTING WORK-FLOW ANALYSIS THROUGH
VALUE STREAM MAPPING AND SIMULATION

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ABSTRACT

In this paper, a detailed study has been made at an automotive industry to analyse the engine testing line to improve the productivity. The challenges faced by the industry in engine testing work flow is identified as lack of coordination due to difficulties in accommodating the changes in schedule and test cell priorities, productive time wastage in waiting for parts and delayed movement of palletized engines. Other issues which added up in the problem scenario includes availability of skilled labour and work requirement which are not perfectly synchronized and the lack of proper space allocation due to the random placement of engines in the build area. Among all the engines which are being tested, a single model of engine which is of most priority for the customer is chosen for analysis. The data regarding the arrival of engines per day, time and manpower required for each task, and daily installations of engines in test cells are collected. A regression model with the distribution that fits the data is given as the input for modelling and simulation. Further the points of improvement identified through value stream mapping (VSM) are considered for enhancing the entire work flow. Through simulation the optimum number of workers to be engaged in each operation and the possibilities of performing parallel activities and thereby reducing the total time for engine installations are obtained and also, a better layout for the build area where these operations are conducted is figured out. Future State Value Stream Map is plotted showing the possibilities for reducing non-value added activities and changes that need to be adopted for improvement in each operation and thus, an optimized workflow for engine testing is obtained.

KEYWORDS: Value Stream Mapping (VSM), Discrete Event Simulation (DES) & ARENA

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