

Automotive Paint Defect Analysis

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In automotive manufacturing, the exterior of a vehicle must not contain flaws or imperfections in the paint and finish (consumers purchasing a new vehicle expect a flawless finish). When defects are detected, they are corrected on the assembly line. Analysis of the types and number of defects can lead to a discovery of the cause of the defects, which can then be addressed and prevented. For example, small weld balls sometimes remain on the surface from the body shop; when these are painted over they result in bumps in the surface. These are sanded down and repainted. An increase over time of this type of defect may indicate a problem with the body shop, which can then be investigated and corrected. Likewise, in one case, an increase in yellow fibers on the paint was observed on only one side of the vehicles; this analysis led to the discovery of a cloth placed over an air vent which blew fibers onto the vehicles.

Currently, the analysis of paint defects occurs in the following way. The client analyst has paper diagrams of the outline of the vehicle models being manufactured at a given plant (e.g., GMC Acadia, Chevrolet Traverse, and Buick Enclave are manufactured at the Lansing Delta Township plant). As vehicles come down the assembly line, at certain checkpoints, the client analyst examines the vehicle for flaws in the paint and finish and marks on the paper model the location, type, and severity of the flaw. Once a sufficient sampling of vehicles is done, the analyst then collates the collected data and produces a daily report on the nature of the flaws found. An example is attached.

Additionally, the analyst needs to track defects over time and so produces other kinds of reports, which are also attached.

The client would like to automat the system to eliminate the paper diagrams and automatically generate the desired reports from the entered data. The client would also like to use the system at all three of the GM plants they have cotntracts for: Lansing Delta Township, Lansing Grand River, and Lake Orion Assembly.