

Statistical Process Control in Manufacturing, a Case Study on an Iranian Automobile Company

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Abstract : For automobile companies, it has become very important to ensure sound quality in manufacturing and assembling in order to prevent occurrence of defects and to reduce the amount of parts replacements to be done in the service centers during the warranty period. Statistical Process Control (SPC) is widely used as the tool to analyze the quality of such processes and plays a significant role in the improvement of the processes by identifying the patterns and the location of the defects. In this paper, a case study has been conducted on an Iranian automobile company. This paper performs a quality analysis of a particular component called "Internal Bearing for the Back Wheel" of a particular car model, manufactured by the company, based on the 10 million data received from its service centers located all over the country. By creating control charts including X bar-S charts and EWMA charts, it has been observed after the year 2009, the specific component underwent frequent failures and there has been a sharp dip in the average distance covered by the cars till the specific component requires replacement/maintenance. Correlation analysis was performed to find out the reasons that might have affected the quality of the specific component in all the cars produced by the company after the year 2009. Apart from manufacturing issues, some political and environmental factors have been identified to have a potential impact on the quality of the component. A maiden attempt has been made to analyze the quality issues within an Iranian automobile manufacturer; such issues often get neglected in developing countries. The paper also discusses the possibility of political scenario of Iran and the country's environmental conditions affecting the quality of the end products, which not only strengthens the extant literature but also provides a new direction for future research.

Keywords : capability analysis, car manufacturing, statistical process control, quality control, quality tools

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