

Fuzzy mean and range control charts for monitoring fuzzy quality characteristics: a case study in food industries using chicken nugget

ABSTRACT

Organizations must improve or at least maintain the quality of their products to be competitive in today's market. Thus, developing a new approach which could utilize more information from the production process has become an inevitable quality improvement program for each organization. In current study, a fuzzy mean and range control charts were developed to monitor the production process. Fuzzy control charts could handle the uncertainty due to vagueness, ambiguity and/or incomplete information in addition to the inherent uncertainty due to randomness in quality characteristic measurements. The proposed fuzzy control charts were validated through a case study at the chicken nugget production company by collecting data from the factory floor and comparing it to the traditional Shewhart control charts which have been already applied by the factory for monitoring the process. The results reveal that the proposed fuzzy control charts could detect abnormal shifts in the production process more accurately than the traditional Shewhart control charts, as they had used more information from the process. The proposed approach has several benefits for the company by improving the quality and increasing the productivity.

Keyword: Chicken nugget; Fuzzy control charts; Statistical process control