

## ABSTRACT

Quality Built-in Computer-aided Process Control is very important for the Semiconductor industry in order to stay the competitive advantage. It is useful for industrial organizations and technological strategists not only to reach the practicality of six-sigma process control but also to ensure that organizational goal of improving quality and productivity through CAPC system can be achieved effectively.

The proposed methodology for Computer-aided Process Control (CAPC) system was designed and implemented to center the process at the target or nominal value of the characteristic. With regard to the effectiveness of the proposed electronic control chart, it is examined by three mechanisms in order for dealing with process variability namely: Process data acquisitions, Process variation diagnostic & solving and process consistency & improvement. The raw data were collected from seven Integrated Circuit operations through questionnaires supporting the framework. Results of CAPC show the accuracy in process trend and process capability index. Furthermore, decision making model was created as a strategy in order to manage quality. Finally, we *proposed an approximate predictive equation based on a linear regression technique.* Engineers and system designers can use this predictive model to estimate the performance of the system by giving a combination of levels to each factor.

Therefore CAPC, the innovated system permits us not only to identify the process variation problems, which impact to the quality consistency of product by the six-sigma process design, but also to provide the plant-specific solutions to these problems.