

A NOVEL APPROACH TO VISUALIZING MANUFACTURING DATA: FROM ANALYSIS TO DIAGNOSTIC**Franck Gasnier¹****Guillaume Hennion², Poh-Boon Yong², Jacques Pinaton¹***FRANCK.GASNIER@ST.COM, guillaume.hennion@kla-tencor.com, poh.boon.yong@kla-tencor.com**¹STMicroelectronics ZI Rousset**²KLA-Tencor Corp**13106 Rousset cedex**Phone: +33 -442685045*

In semiconductor manufacturing, the quantity of data and the number of parameters measured throughout the process have increased exponentially over the past several years. In addition, fabs need to reduce time to market while maintaining efficient yield in order to satisfy shorter cycle time constraints on new products. As a consequence, engineers face the challenge of collecting and analyzing accurate data in order to quickly diagnose root causes for process issues. In order to respond to this challenge, ST has chosen to implement a platform that allows access to all manufacturing data, performs appropriate and advanced statistical analysis, and captures analysis logic so that it can be re-used or applied systematically. In order to do this in a reasonable timeframe, this platform is required to integrate semiconductor dedicated solutions.

Typical engineering data analysis involves engineers conducting their own analysis and decision making flow, based on their experiences and interactions, and depending on the needs identified for problem resolution. This process is usually not formalized in a way that ensures full capture of the knowledge involved in the problem resolution. ST has chosen to implement Klarity® ACE XP, one of KLA-Tencor's yield enhancement solutions, which is based on the Decision Flow Analysis concept. Practically, the Decision Flow Analysis captures the human decision process carried out during the analysis of a given problem into 'recipes' or 'workflows'. This, in particular, enables sharing of Best Known Methods (BKM) and facilitates the standardization of analysis practices across the ST world. The practical implementation chosen by ST Rousset in utilizing this capability results in workflows grouped by business activities.

This paper presents an example of implementing a daily Statistical Process Control (SPC) analysis that allowed the diagnosis of daily SPC issues in a much shorter time. This was possible due to the automatic execution of a software-based analysis flow compared with a previously manual analysis. Dedicating the known analysis to software enabled

the final diagnosis to be made without resources at various times, and to be automated for supervision.

ST Rousset's implementation of this methodology resulted in each business activity developing their specific workflows. The concept has been widely adopted and has resulted in the need for a 'macro' decision flow to link and drive the already deployed business workflows.

Figure 1: User environment

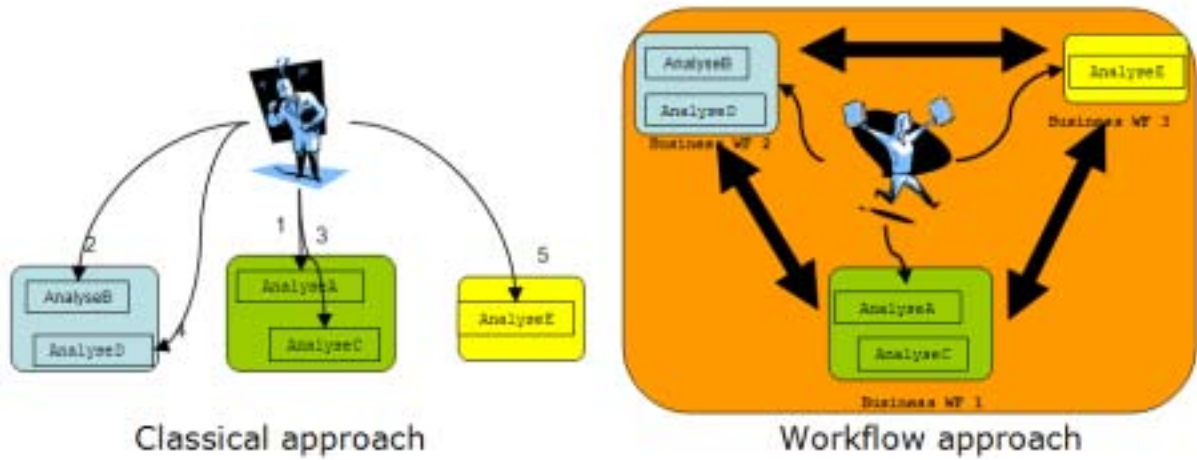
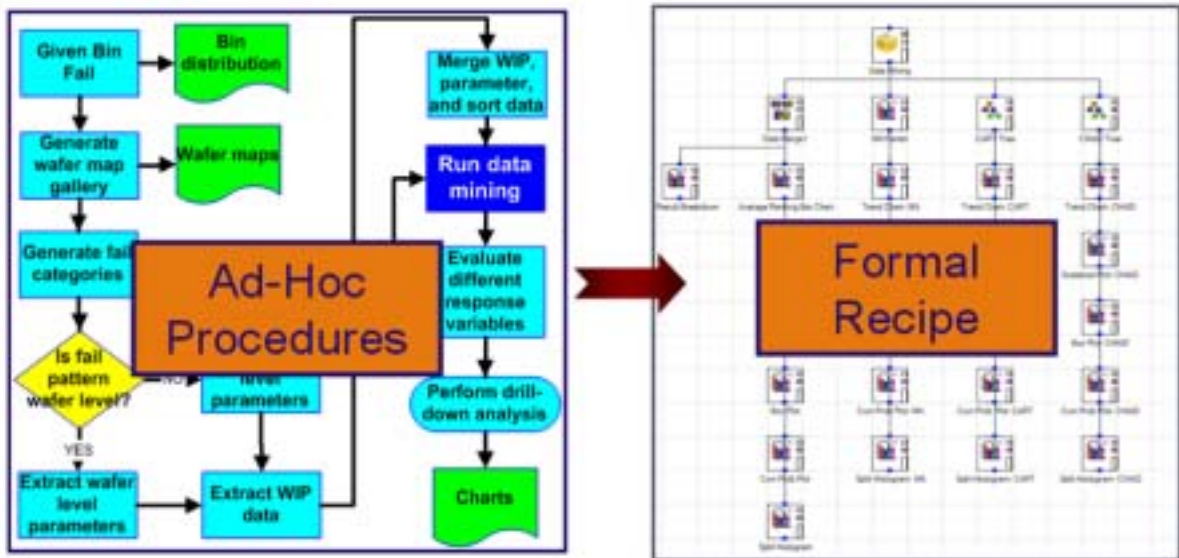


Figure 2: Workflow / Decision Flow Analysis Concept – methodology patented to KLA-Tencor Corp.



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PATENTS

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