ASML’s Problem

ASML is the world’s leading manufacturer of chip-making equipment and a key supplier to the chip industry. ASML designs, develops, integrates and services advanced systems to produce semiconductors. In short, it makes the wafer scanners that print the chips. These wafer scanners are used to manufacture semi-conductors (e.g., processors in devices ranging from mobile phones and MP3 players to desktop computers). Because of competition and fast innovation, the time-to-market is very important. Following Moore’s law, there is an ongoing effort to reduce the line widths on silicon wafer. Every new generation of wafer scanners is shifting the frontier of what is technologically possible. As a result, the testing of manufactured wafer scanners is an important but also time-consuming process. Every wafer scanner is tested in the factory of ASML. When it passes all tests, the wafer scanner is disassembled and shipped to the customer where the system is re-assembled. At the customer’s site, the wafer scanner is tested again. Clearly, testing is a time consuming process and takes several weeks at both sites. Since time-to-market is very important, ASML is involved in an ongoing effort to reduce the test period. To assist ASML in these efforts, we applied process mining techniques to their test processes.

Results

Using process mining ASML was able to get a better view on the actual testing process. Analysis showed that the testing process is very dynamic and unstructured. Using ProM process models were generated showing the actual testing process and these were compared with the documented procedures. Using conformance checking it was possible to discover where the main deviations occurred. Moreover, ProM was able to generate all kinds of interesting metrics for the test process. This information provided ASML with new insights and allowed for discussions based on the real process. It is expected that this will lead to improvements of the testing process such that the time-to-market is shortened. Moreover, the quality and predictability of the testing process can be further improved based on these insights.

More information

About process mining: www.processmining.org
About ProM: prom.sf.net