WebFabIS: a WEB Based Information System for Microelectronics Manufacturing

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1. The system

"WebFabIS" is a new software tool realised for the planning, scheduling and control of the technological process in the microelectronic clean-room of the Microsystems Research Division of ITC-Irst. The R&D activity in microelectronics and microfabrication field concerns with continuous innovations in the fabrication processes and with new devices to be developed. For this reason, the scientific and technological know-how shared among the research team is continuously growing and so are the variables to be studied and monitored. Some of the device is also produced in small series. All the detailed information and the related instructions about the fabrication process are necessary not only to researchers, who design the device and supervise the wafer processing in the clean-room, but especially to the specialised technical staff, who needs to have all the instructions from the researchers.

Contrary to commercial software available, generally designed for standard and stable production processes, "WebFabIS" is a system:
- flexible: the researchers can include new technological steps by himself;
- easy to use also to non-expert users: the GUIs are browser pages and the program is activated by typing an URL address;
- open to several users but safe: an identification system allows to many users to access the system with the possibility to decide what information to share and what to keep private;
- "active": specific algorithms extract new information from the database of the system in order to help the researchers in monitoring the device processing and the laboratory manager in the monitoring of the resources.

Furthermore, it must provide traditional functions, such as indication to the technical staff about the processing to be done, planning, yield and cost estimation. The low budget of the used tools and their portability to several platforms, resulted in an additional advantage with respect to systems available.

From the software point of view, "WebFabIS", is based on modern design (UML, OO) and implementation technologies (JAVA, HTML, servlets, relational database, WEB browser interface). For the implementation the following components have been chosen:
- a relational database: where all the information of the system are stored (PostgreSQL 6.5.3);
- a database driver: it allows the connection from the web server to the tables (JDBC);
- java and java servlets: used for the implementation of the browser interface (in html pages) and for the processing of the information (JAVA2, JSDK2.0);
- a web server (Apache Server1.3.19);
- a java servlet engine: it manages through the http protocol the communication between the client (user interaction with browser) and the server (database and java code) (Apache JServlet Server 1.1);
- a web browser: it allows for user-system interaction (Netscape, InternetExplorer and so on).

The strong attention paid to the OO representation of the data allows to extend the system capabilities to new technologies and devices without changes in the source code. Further it can be adapted to other environments such as industrial plants, both in microelectronics and not. "WebFabIS" has been installed and is now used by the clean-room of the IMTEK, University of Freiburg (Germany).

2. Bibliography