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Open Framework of Interactive and Communicating CAD Tools

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Short Summary

In this contribution the specific aspect of the *integration of tools*, the *interactive communication among tools and designer* as well as the system architecture will be explained in detail.

The paper will explain the outline for an *open architecture* allowing for interactive communication between CAD tools running in parallel. It is conceived in such a way that it is possible to *interactively communicate between user-interface tools and simulation and verification tools* by user-pointing and screen highlighting of structural objects. This allows a direct interaction between for example a timing verification program and a schematics editor by highlighting critical delay paths on the schematics. In this process two (or more) CAD programs are active at the same time. In the example this is the timing verifier and the schematics editor.

The architecture is set up in such a way that individual tools can be developed rather independently. The system architecture majorly integrates around the concept of structural data that is communicated between tools. In order to integrate tools easily they are not too much constrained. Tools are allowed to have their own "primary data bases". It is only required that the tools are also able to generate the structure information from this primary data via the SPI structure procedural interface. The fact that there are not too much constraints on the tools themselves allows that *existing CAD tools* can be integrated without too much difficulty. This fact together with a good definition of procedural interfaces for communicating to other tools contributes to the aspect of an *open system architecture*.

The key components of the system architecture (see figure 1) are:

DTM Data and Tool Manager that manages the interaction of tools and design data.

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DMS Design Management System that organizes design data.

SPI Structure Procedural Interface.

UIM User Interface Module

The function and relation of these modules will be discussed as well as the implications on CAD tools that are integrated in the system.

Important in this architecture description is the philosophy of allowing CAD verification tools (simulation, timing, AI-based debugging) to communicate interactively to the user via the primary input descriptions (layout, schematics, module generators...). In this way a much faster feedback is achieved to the designer and also a more efficient design cycle is obtained. Example design sessions will be discussed.

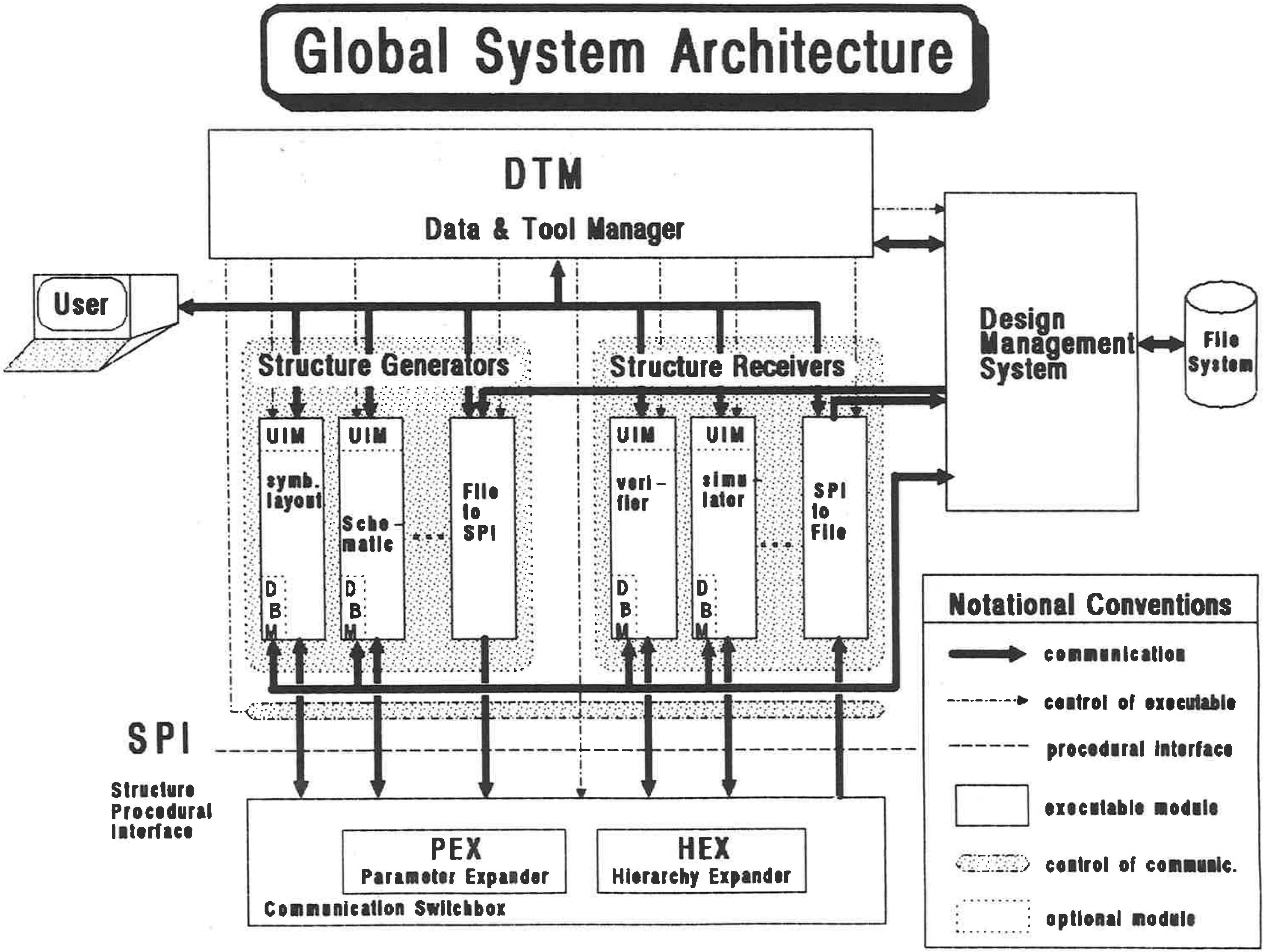

Figure 1: System Architecture