



Management Summary

The topic of this work concerns a new methodology for hardware design that mixes the advantages of waterfall design with the flexibility of some Agile tools.

Waterfall design practice was developed over the last century and is a robust approach when the design environment is stable and the project is using known techniques. It is perfectly adapted for the classical PMBoK project management system. Its focus on reducing uncertainties very early in the design phase is good for resource optimization. But it falls short when the environment is rapidly changing because of the market evolution or when the design is based on new technologies or architectures that are not yet completely known. The .com economy strong volatility was the reason for the Agile design methodologies for software design. A similar evolution already happened one generation ago with the Toyota Production System that exploited resource versatility to reduce time to market in the automotive business. This historical base of the study will be explained in the first part of this document.

In the second part of the document, the new methodology is described and used to run two real design projects for integrated circuits. The project execution and control and the tools used for this purpose are described and their limitations are explained.

Finally a short conclusion hints to opportunities for further study in the field of agile design of hardware projects.

The study focuses on integrated circuit design; it probably applies more generally to any hardware design type of projects, where – contrary to software design – manufacturing lead-times are significant compared to development cycle times.

As customers get used to software design practices with their iPhone receiving a new operating system every year, their GPS receiving a new map every quarter, they will expect us, hardware providers, to be able to include all the latest trendy features in our products. We will have to be able to include new features in our circuits during the design phase.

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