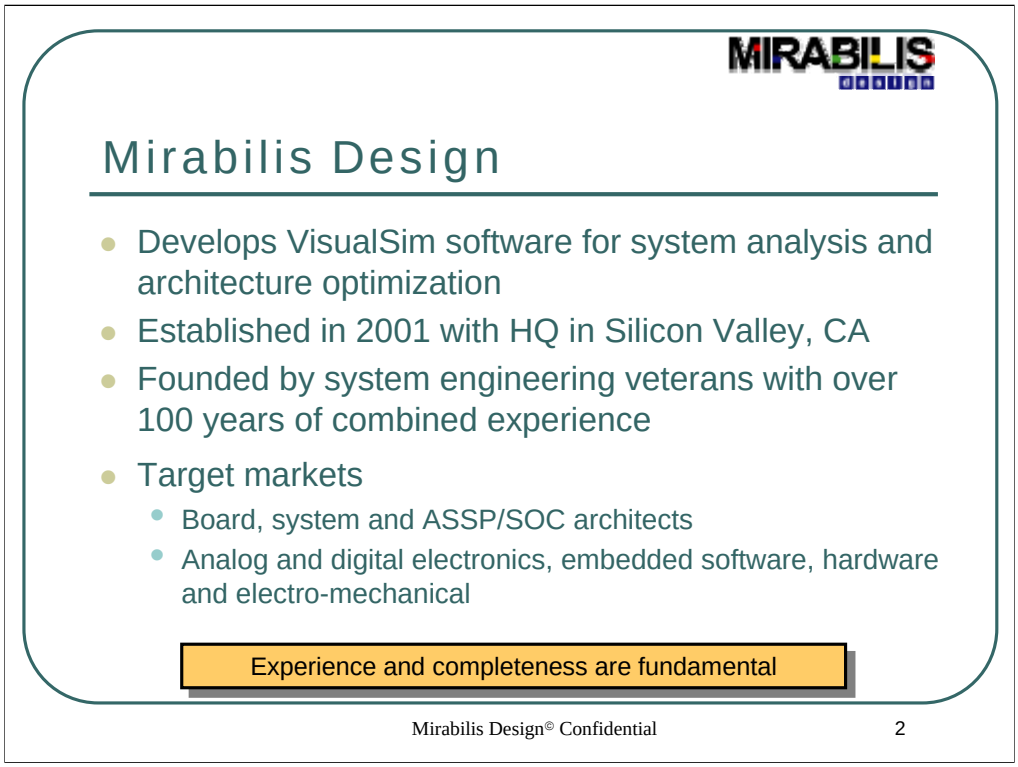
MIRABILIS design

Implement Imaginations

VisualSim©

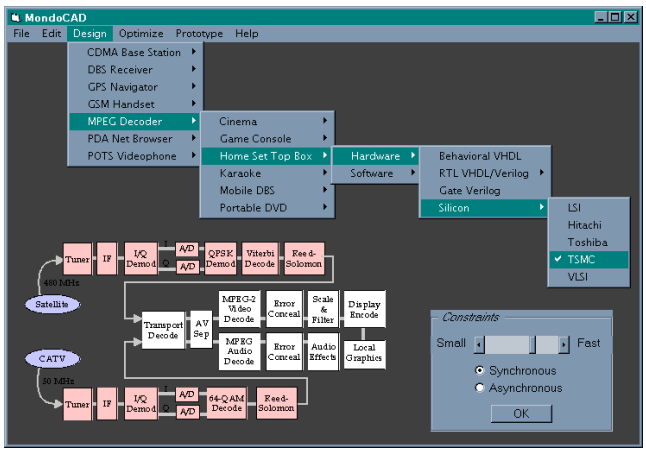
Welcome to our presentation on VisualSim from Mirabilis Design. This presentation talks about the company, the problem involving system design and an overview to VisualSim.



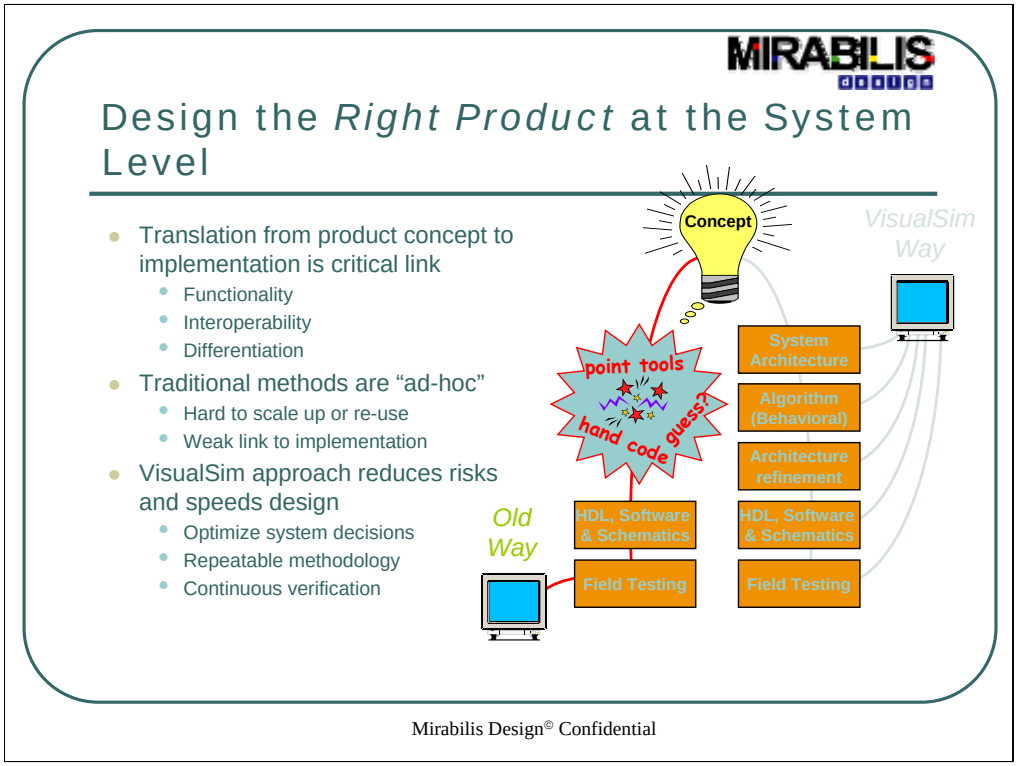
Mirabilis Design provides a complete system design solution with emphasis on performance analysis and system architecture exploration. Founded by architects and systems engineers that understand the need for a tool that simplifies and extends system design. VisualSim capabilities include system, board and chip-level modeling. During development, the product was reviewed by architects at various corporations. The extensive experience of our team has resulted in the creation of a product, complete in it's offering.

Customer's Desired Design Flow

In a Perfect World ...

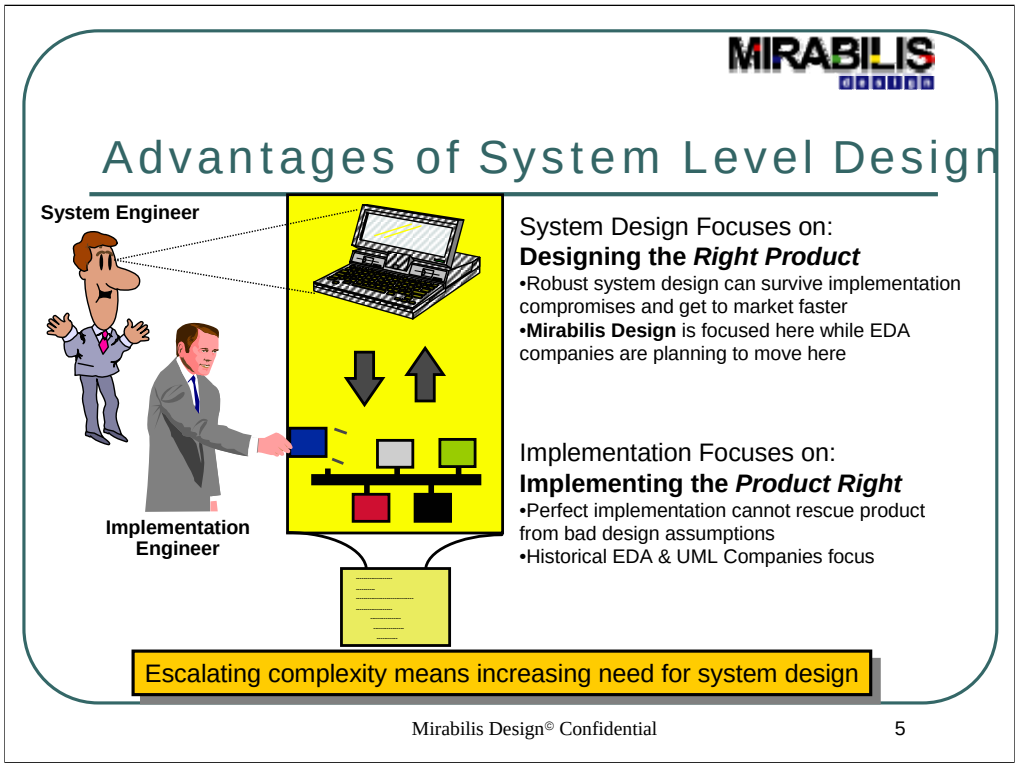


In a perfect world, this is what management would like to see. A customer would make a request and the architect would click on a few menu commands and the chip will pop out at the other end. We are nowhere near a perfect world and hence VisualSim is essential.



Let's look at the traditional flow of ideas from concept to prototype and then compare that to the VisualSim way. Every new product begins with a concept; it may come from marketing, a customer or from top management. In the traditional flow, this concept is handed to a group of bright designers in the "applied R&D" or "central research" department. This group picks out the basic technical strategy, or algorithms, for turning the concept into reality. Perhaps the most important "tool" for this team is experience or the ability to make educated estimates. In addition they may use point tools like math programs and hand coded C programs. But in any case the design process does not have the formal structure of an EDA environment.

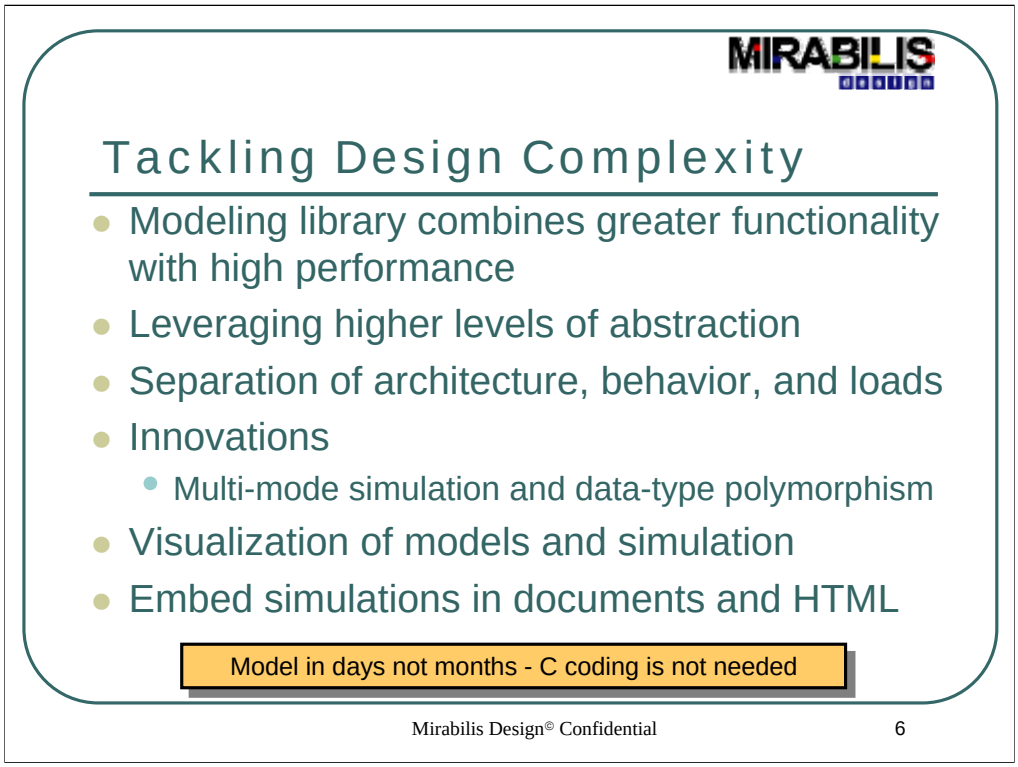
The output from this group is probably a set of block diagrams and some specifications, or in the best case, an HDL description of the concept. The next step is either synthesis or design capture, and at this point the first full-system simulation becomes available. But simulations at this level usually execute very slowly. Many customers have told us that an MPEG decoder simulation takes around a day to produce a single frame of video. In order to get a realistic impression of the design's performance, many companies proceed immediately to some kind of silicon prototype. This probably achieves the necessary speed. However, by the time the silicon prototype is working, much of the project's time and budget has been spent. Very few companies are willing to go back to the system level to make changes to optimize the design, especially since the system-level design stage is relatively unstructured and maybe risky. Instead, they settle for low-level optimization of whatever algorithm they have working in the prototype.



Products rarely fail because of bad implementation. Most times the failure is because of the unknown. It is very difficult to identify these unknowns during implementation because there is a narrow focus for each engineer involved.

System design is the part of product development where requirements form shape as a product specification and generates the definitions for the hardware, ASIC, software and mechanical engineer to implement. The focus is on design and not on writing lesser number lines of code or reducing gate count. The decisions made here are key to getting the right product after 18 or 24 months.

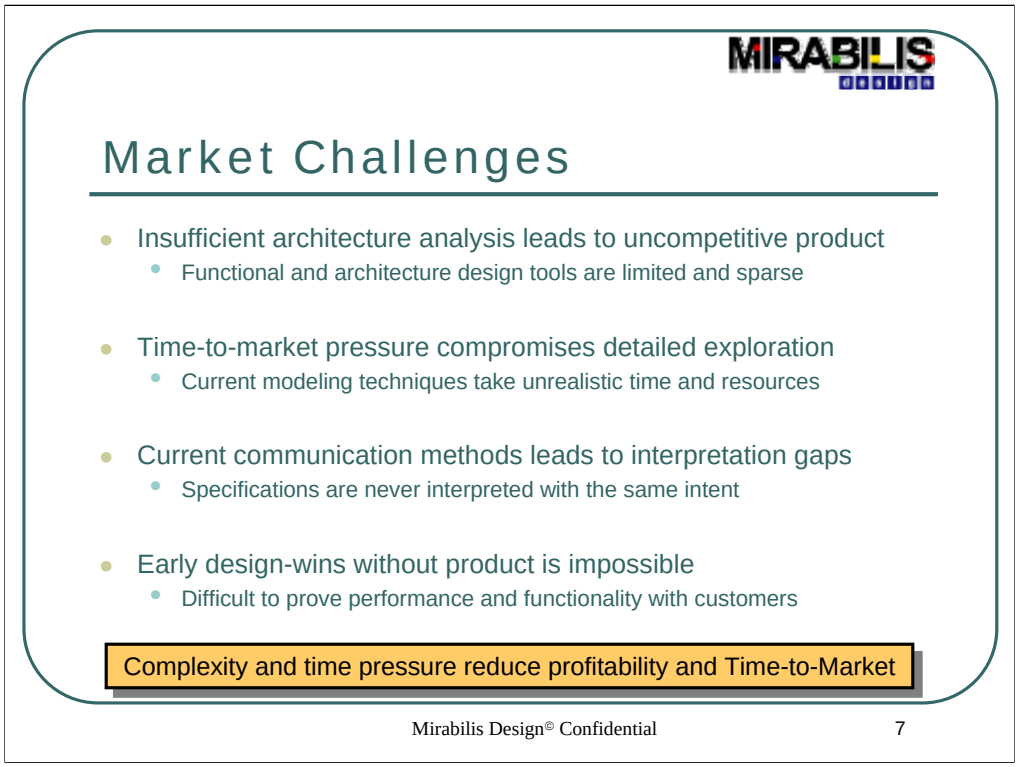
Current EDA and UML companies are involved in speeding up simulation at RTL-level of generating code from a flowchart definition. This is important part of the design flow but cannot make up for any unproven design assumptions. Moreover it has been shown that proper system planning and analysis can reduce the number of large refinements at implementation.



In system design, extensibility and flexibility are key. System design problems can be solved in numerous ways. Engineers must focus their time primarily on analysis and not on coding. Mirabilis Design has accomplished this in VisualSim by developing a methodology and a library of parameterized building blocks. These blocks emulate the operation of hardware and software entities, application and instruction behaviors and traffic profiles in a system. These blocks, numbering less than 100, form the foundation on which system models are developed. Our methodology separates the architecture, behavior and workload, and creates a virtual connection between them. This enables reuse and a more readable model.

The outcome of this approach is a reduction of modeling effort from months to a few days and still accomplishing more, which has been validated by early users.

The end-goal of system modeling is to leverage the activity for various downstream tasks such as system specifications and golden test benches. VisualSim models can be published as an Applet that can be embedded in documents as an executable simulation. The viewer of this document does not require the software but is still capable of viewing, modifying and executing the system models. This reduces the communication gap between distributed teams and enhances understanding irrespective of language and design phase awareness.



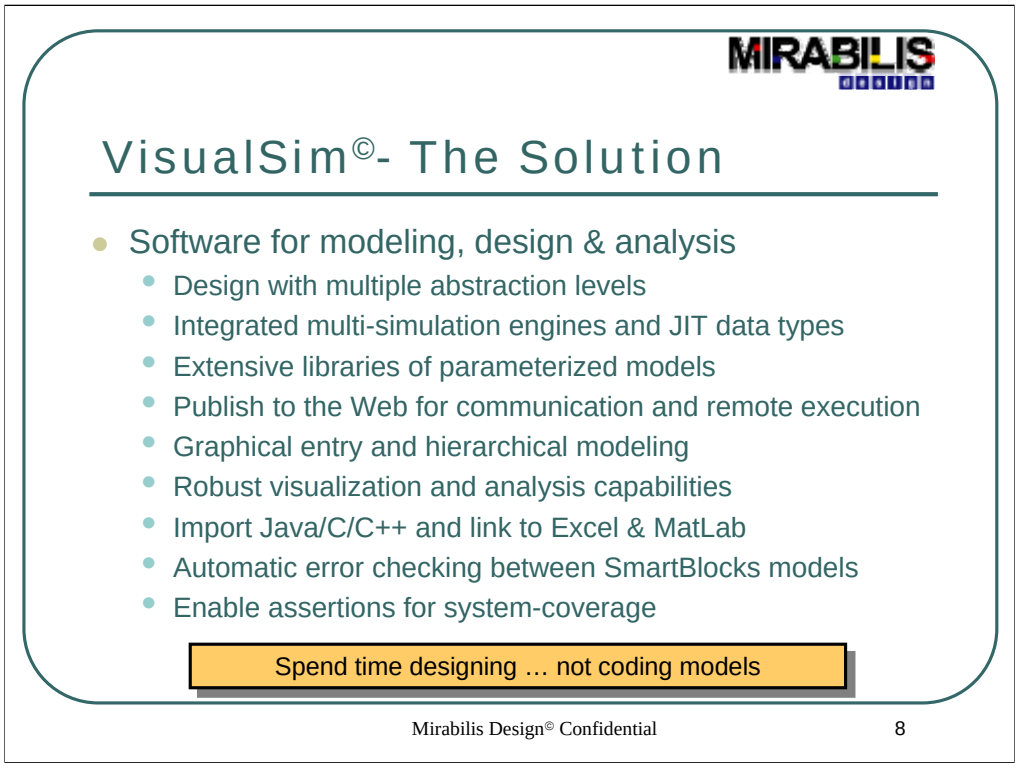
This slide describes challenges faced by the company as a result of insufficient early system analysis. Rarely has a product failed because of poor development. Most times, the cause of failure points to

•Incompatibility between different parts of the system (Raytheon rocket)

•Chip performance (Pentium) or

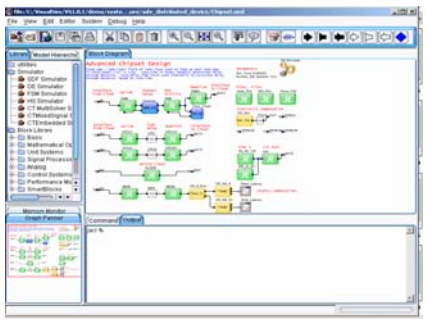
•Product cannot be implemented according to specification.

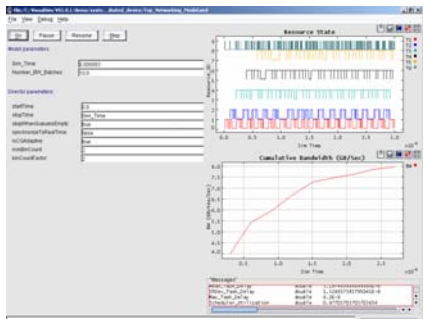
As product complexity and time pressure increases, any delay can significantly reduce profits and as such viability of the entire product-line.



VisualSim is graphical and platform-independent architectural analysis and exploration software tool. All of the building blocks, simulation platforms, analysis and debugging required to construct a system are provide within a single framework. The solution is key in providing modeling and simulation that enables users to spend time analyzing rather than coding.

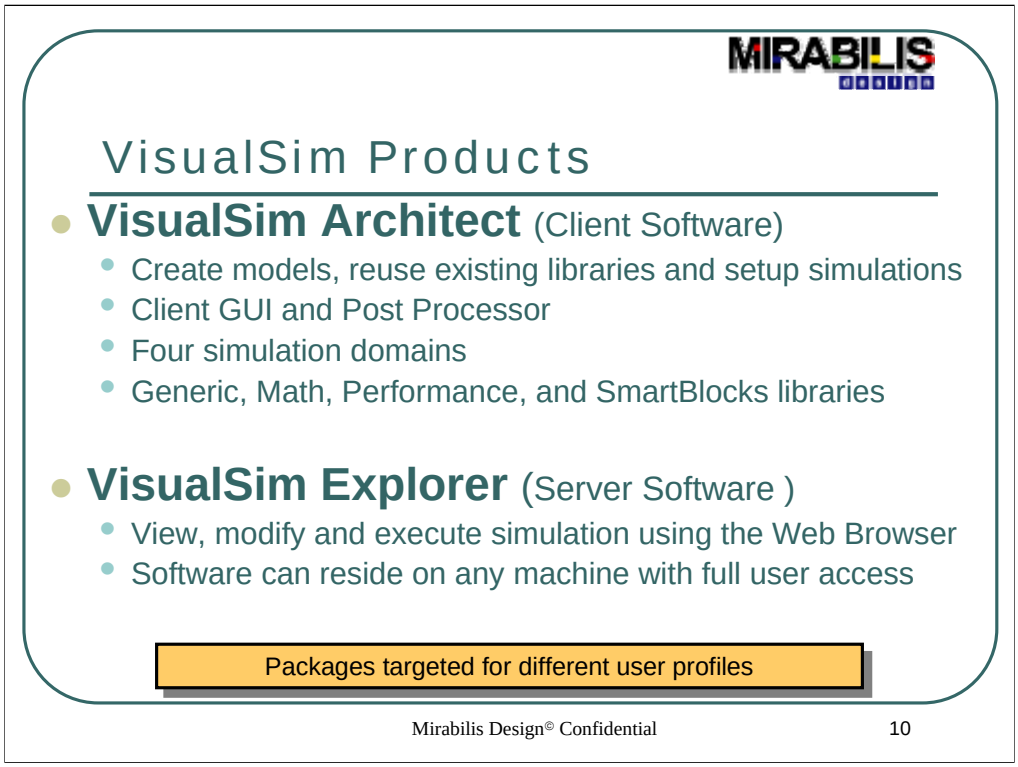
VisualSim
User Interface & Post Processor





Designer selects the use methodology; None imposed
Integrated analysis facilitates better and faster decisions

VisualSim is a fully integrated product and combines a User Interface for the model creation and a Post processor for analysis. The developed models are highly readable and facilitates a methodology of reuse. The Post processor enables easy exploration and provides immediate visualization even during model execution.

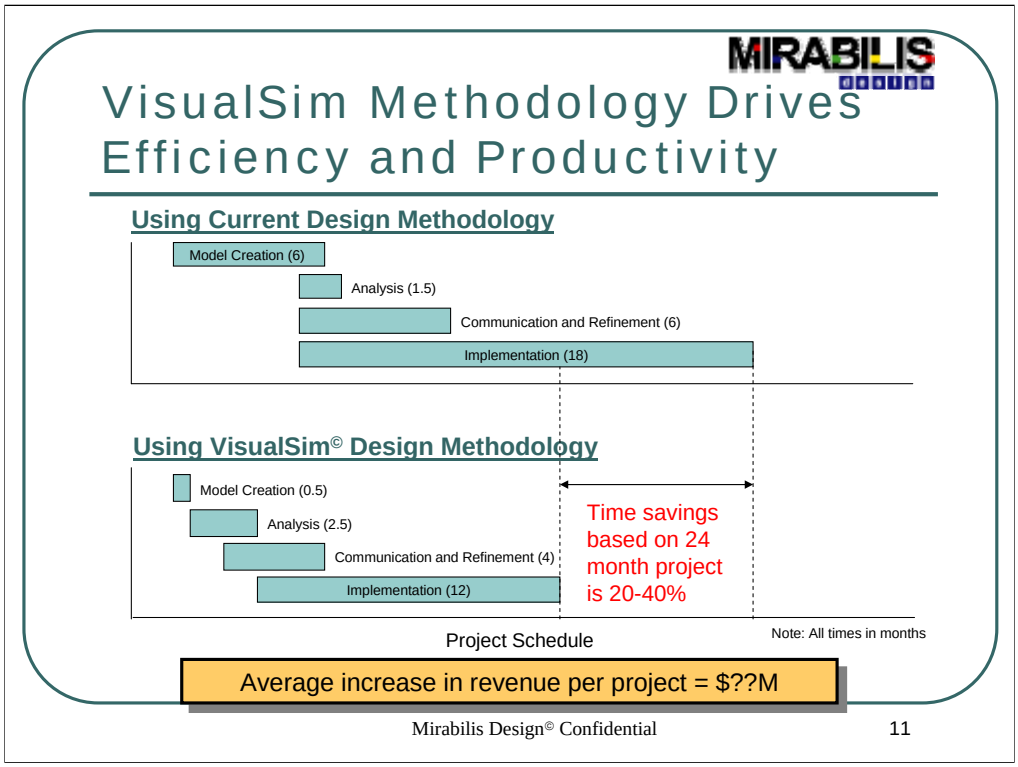


VisualSim Products:

•VisualSim Architect is the software used by engineers to create models, simulate, analyze and conduct detailed refinement.

•VisualSim Explorer enables the models to be published as Applets to be embedded in an HTML document. The models can be used in the same way as in the client software but all activities are performed within a Web browser, without the need for additional software. The models can be viewed, parameters modified and simulated with the document. A single instance of the VisualSim Explorer can support a large number of users.

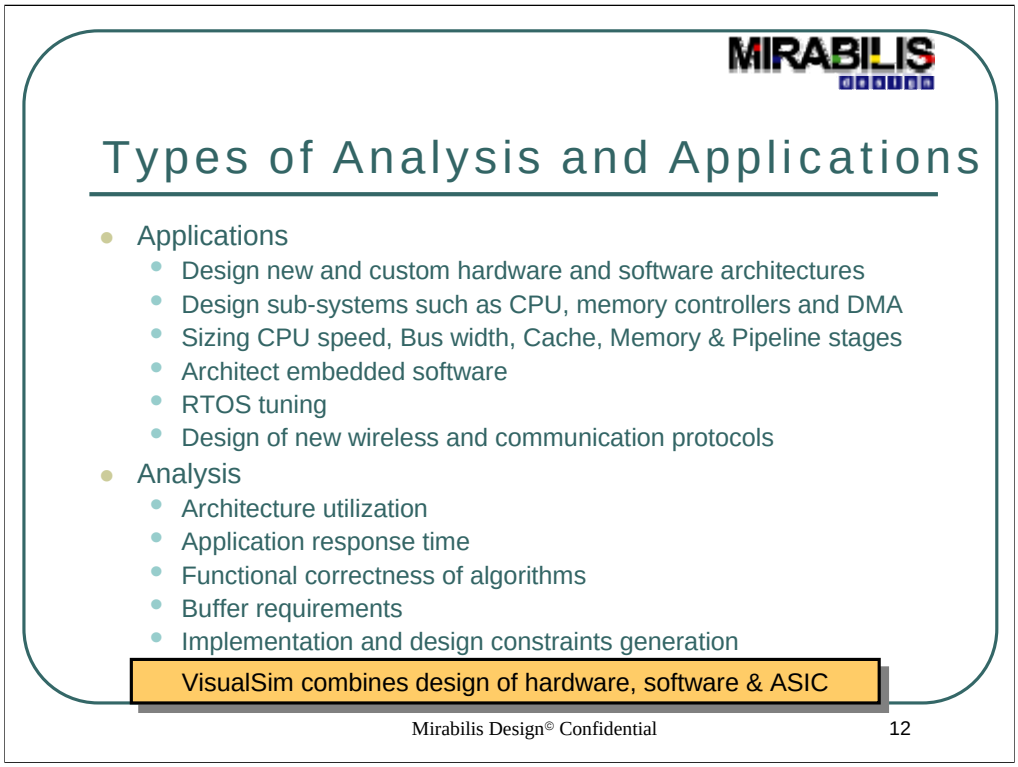
The availability of the two product enables companies to select the right quantity according to their project needs. Also the packaging eliminates the cost of adoption for sub-contractors of large system integrators.



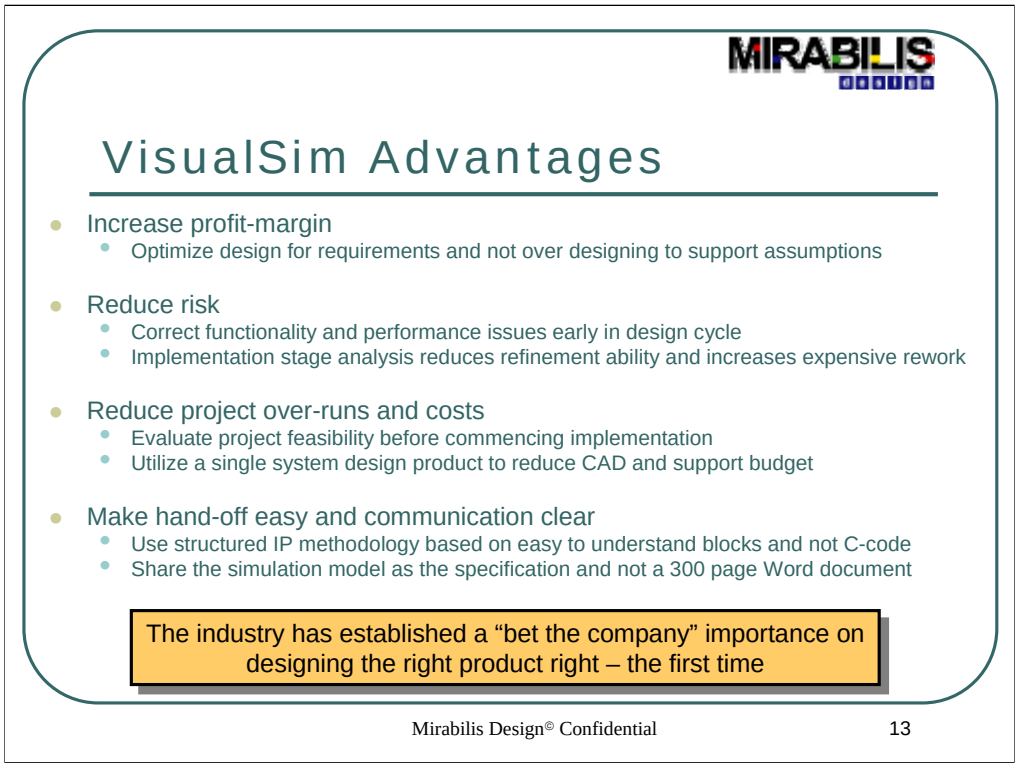
This graph was created in association with a customer that used a legacy system design product in their project. In the current methodology, the architecture was being validated alongside with implementation. This meant that architecture errors were identified after implementation was already completed for that region. This has been identified to be biggest bottleneck in new product development. They estimated a 40% savings in product development time as a result migrating to VisualSim, the gain being reduced modeling time and increased analysis.

VisualSim moved the focus from modeling to analysis. The availability of pre-built, parameterized blocks enabled model creation to be completed in a matter of days, even for complex designs. Hence the analysis was completed before implementation started.

The increased efficiency from VisualSim reduces R&D expenses and increases profit by being the first to market.



VisualSim can be used in any application that requires the design of hardware and software elements. The list provided is some of the examples to stimulate the user of the possibilities. The key is that all of the system design aspects are addressed by VisualSim using the building blocks. Thus models in all these analysis can be constructed quickly and easily.



The success of a company depends on the superior quality of the architecture. Any missteps on the architecture can produce an un-optimized or even a wrong product. High quality implementation cannot save the project. Hence it is important to design the product correctly the first time and not have to depend on rework. VisualSim provides the first platform where the entire product can be explored before the implementation or field trials.

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Thank you for attending this Introduction to Mirabilis Design.