



Leaders In

System on Chip (SoC) Modeling Services (SystemC, TLM2.0)
Embedded software services using virtual platforms

Quick start your ESL activity

About CircuitSutra

CircuitSutra Technologies Pvt Ltd was started in November, 2005 and is able to establish itself as the centre of excellence in **SystemC based SoC Modeling**. We create the software models of the complete System on Chip (SoC) or the individual IP blocks at various abstraction levels. CircuitSutra has an in-depth understanding of various standards in modeling domain (OSCI TLM2.0, OSCI TLM1.0, STARC TL Guidelines, OCP-IP TLM Kit, SystemC Synthesizable subset draft, OSCI CCI). We are providing SystemC modeling services to a worldwide customer base, which range from small fabless companies to the top ten semiconductor companies.

CircuitSutra is an emerging company based in India, with an aim to emerge as the **world leader in software services to the Semiconductor industry**. More and more contents of a SoC are becoming software, more and more chip design steps are becoming like C / C++ programming, CircuitSutra has an important role to play in the future of semiconductor industry. With current focus on SoC Modeling and Embedded software services using virtual platforms, CircuitSutra plans to expand into Outsourced ESL / EDA tool development. CircuitSutra is the first company in India to get seed funding from JSSATE, Science & Technology Entrepreneurs Park. CircuitSutra is the recipient of ISBA Entrepreneurship Award, 2008.

Latest News about CircuitSutra: www.circuitsutra.com/news

Testimonials

- CircuitSutra works with OCP-IP on use of the OCP Modelling Kit in virtual platforms, and their technical work has been excellent in all areas including SystemC/TLM-2, processor models and embedded Linux adaptation. CircuitSutra's commitment to achieving a high quality final result has been unwavering. The code, which can be downloaded from OCP-IP, illustrates how the OCP protocol can be abstracted for virtual platform modelling and OCP's compatibility with TLM-2.0
James Aldis, OCP-IP Director and Lead Architect of OCP-IP System Level Design Working Group.
- We are very pleased that CircuitSutra developed, first in the world, a demo SystemC model set compliant with our TL Modeling Guide second edition. By studying this newly developed demo model set, engineers can easily understand the technique of transaction level modeling. The demo set will undoubtedly accelerate the widespread use of TLM methodology in the industry.
Mr. Sho Sano, Senior Manager, Design Standard Group, Planning Department, STARC, Japan
- CircuitSutra have displayed an in depth knowledge of SystemC and TLM-2.0, using excellent C++ skills, producing novel and efficient solutions to complex modelling problems in a timely and cost effective manner..
Mark Burton, Founder, Greensocs Ltd, UK (Former chairman of OSCI TLM workgroup)

Unique value proposition

CircuitSutra is a very domain focused company. Our laser sharp **domain focus** allows us to attain in-depth understanding of the technology and its use case, and clearly differentiate us from other software services companies.

SoC modeling is hybrid of two domains (Software development and Chip design), and requires very **unique skills**. It requires entirely different approach as compared to the hardware design using verilog / vhdl. CircuitSutra has acquired these unique skill set, and developed the training modules for fast ramp up of new team members.

- We are experts in C++ and very well understands about how to model the real world objects using the OOPS features of C++.
- We understand the concepts of Electronics System design.

Our ability to create virtual platform of an SoC, and using the virtual platform for embedded software development makes us the ideal **long term partner** to SoC companies.

CircuitSutra has partnership with all the key players in the ESL ecosystem and can help the customers in the adoption of these ESL technologies.

CircuitSutra has expertise in latest standards being formulated in SoC modeling domain. We can help customers to develop standards based tool independent models and modeling infrastructure.

Business Models

We are flexible on engagement models with the customer, and are willing to accommodate the mix and match of the following as per the customer's convenience.

- Fixed price projects
- Time & Material
- Programmers on contract
- Extended development team

We can also setup the dedicated ODC for a customer

Contact Us

CircuitSutra operates from a state-of-the-art technology park in Noida, India. Contact us to learn more about how you can benefit from our services and get a free estimate.

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SystemC Modeling Services

Virtual Platform of System on Chip (SoC)

- Different use cases (Embedded software development, Architectural exploration, RTL verification, HW/SW co-verification etc..)

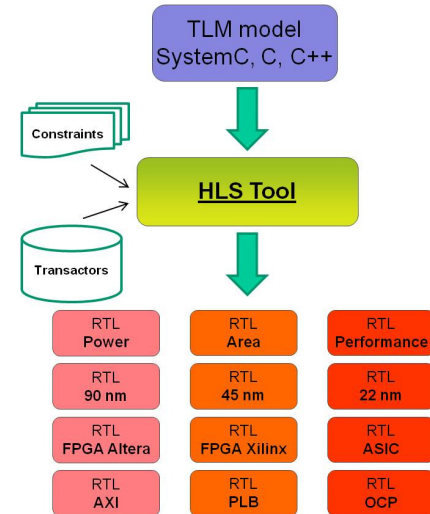
Synthesizable models for High Level Synthesis

- High level design using Synthesizable SystemC subset
- Function is separated from implementation. Designers can focus on the functionality, HLS tool generate the most optimum RTL code for specific constraints
- Raises the abstraction of chip design. Only one version of design code, less amount of code, fewer bugs

Bus specific TLM Kit (By extending OSCI TLM2.0)

Adaptors between different abstraction levels

Outsourced ESL tools & infrastructure development, enhancement & support



SoC Modeling Standards

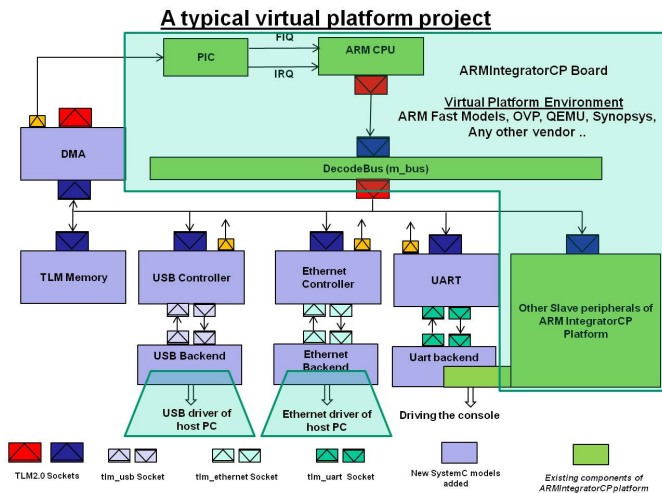
CircuitSutra is very much committed to the adoption of standards. We have developed expertise in the standards being formulated in the SoC modeling domain:

- SystemC IEEE 1666 (Reference implementation from OSCI)
- OSCI TLM 2.0
- OCP-IP TLM Kit(TL3, TL2, TL1)
- STARC TL Guideline
- Closely following the upcoming standards (OSCI CCI, SystemC synthesizable subset, SystemC AMS extensions).

We create standard based models that can be plugged into any ESL environment or any virtual platform environment.

The models are created by using STARC TLM guidelines. The communication is separated from computation so as to allow maximum code re-use across abstraction levels

We are the sponsor member of OCP-IP and are actively participating in the SLD Working group.



Benefits of SystemC models

- Allows the eSW development without FPGA boards
- Reduces time to market for SoC. Chip design and eSW development can proceed in parallel.
- Enables HW/SW co-verification and TLM based advanced verification methodology
- High level synthesis technology is maturing, it promises to raise the abstraction of chip design

Embedded SW services using virtual platforms

- Porting the operating system to new SoC architecture. Kernel optimization for new SoC architecture
- Device driver development
- Embedded application development
- Processor architectures expertise: Arm, MIPS, Intel Atom..
- Embedded OS expertise: Google Android, Moblin, OpenMoko, busybox, various other Linux flavours ..
- Embedded Software development for multi core SoCs

PARTNERSHIPS

CircuitSutra is entering into partnership with key player in the ESL ecosystem. Our offerings combined with partner's technology, spans virtually all the scenarios of ESL usage.

	Virtual platform environment	HW/SW co-verification TLM based advanced verification	High level synthesis	Processor models Other modeling infrastructure
