

The Total Solution Revolution in Product Design

By
Dennis McCarty

March 8, 2011

Overview

Engineers have been implementing complex standard communication protocols such as Ethernet for many years. At first designers used discreet devices on PCBs and wrote their own software to implement protocol designs.

With the introduction of RTL languages, synthesis tools and technologies such as FPGAs and standard cells it became possible to enter designs that could be made into libraries and reused on other designs. From that it was a short leap to commercialization of such libraries as Intellectual Property (IP) products

The Intellectual Property Revolution

Since the first IP products were introduced engineers have gained huge advantages with the ability to focus on their value-added application design while licensing the standard logic and interfaces. Using IP in designs allows engineers to create value much faster.

Applications that use complex standard busses or protocols gain the most in design time, lowering risk and cost by using Intellectual Property (IP) products. Standard IP products have made large, fast designs of complex protocols practical for even small companies. Engineers have only to integrate the IP blocks into to device-level application to build a complete design.

Use of IP products speeds product development, not only in design entry, but also in verification and implementation. IP products usually come with a test bench which can be added to the device-level test bench to verify the entire design. Also included are synthesis scripts to ensure correct implementation.

As much as IP has been a boon to developers the licensing individual components has become a tarnished paradigm that is breaking down for a number of reasons.

As designs have come to incorporate more functionality at greater speed IP users have been vexed by the lack of an integrated, total solution that offers everything from analog to software from a single source. Since most vendors offer piecemeal, point solutions designers have had to deal with multiple vendors in a single project. Typically a designer uses one vendor for the one standard interface and another for a different standard.

By the same token, within a standard one vendor supplies the digital logic, another the analog PHY layer design and a third the firmware driver code.

Using different sources for a single standard interface is a recipe for finger pointing when the different pieces do not work with each other. The overhead involved in screening vendors, mastering user guides and interfacing from one layer to another.

As new standards proliferate and existing ones are superseded by more faster and more powerful versions it becomes more difficult for most IP providers to maintain their product portfolios. The vast majority of providers consist of small companies that simply lack the resources to participate and contribute to standards development, as well as to design, test, verify and document new products quickly.

The handful of larger providers lacks the deftness to move quickly into new, unproven standards. They have assembled their offerings, for the most part, by gobbling up small

companies over the years, often losing the expertise during this process. Their principal businesses are not even IP products but semiconductor development tools.

Companies whose business is not IP or who do not serve on the industry committees may not be aware of the efforts required to maintain standards expertise. Every year, many standards bodies are formed and various specifications proposed by new and existing bodies. Companies wishing to use standards should be cognizant of the risks in pursuing standards and proposals that may never come to fruition.

Arasan assumes the risk as a part of its business so that its customers do not need to invest in and follow these proposals. Arasan partners license only committee-adopted and proven standards IP.

Through its service on the standards committees Arasan helps to define the standards and this expertise is embedded into our products. By making products available to customers, Arasan bring emerging standards to life.

Some examples of the bodies on which Arasan serves include to following:

- USB-IF, member since 1996
- SD Association, member since 2000
- MIPI, member since 2004
- eMMC/JEDEC, member since 2005

The Bus Stops Here Campaign

Arasan revolutionized the industry a decade ago with its “The Bus Stops Here” campaign by offering the entire bus Interface and mobile storage standards. Arasan’s products are internally developed by key employees who are retained long-term so that the expertise resides continuously within the company.

Privately held Arasan has been profitable since inception and has no plans to stray from the IP business or to broaden its base beyond IP and consulting.

Arasan customers can rely not only on the company to keep its product offerings current, but to keep their customized versions of the IP current with the latest specification so that, should they need to use it again, it’s at their disposal at the current specification.

Maintaining products for standards using high-speed data transfers is especially daunting. The data rates require high-frequency, DDR sampling. Developing physical layer devices (PHYs) that reliably sample data entails analog design expertise that is quite beyond the expertise of most digital logic IP providers. Such a device may not be available as a discreet component for a long time.

One could use a PHY from a PHY-only provider, but that evokes the conundrum of multiple providers and is not as cost effective as licensing from a single source.

The Total Solution Revolution

Customers need solutions that guarantee interoperability between different elements of the standard implementation and speed the integration process. The elements include software and hardware, analog and digital. The IP portfolio should offer flexibility in selecting different

application interfaces to accommodate applications. All elements should be available in a timely manner so that the lack of any does not impede projects. Data integrity must be maintained at the fastest speeds in the specification for full compliance.

What are needed now are IP providers that offer not just individual blocks of synthesizable logic, but full solution products that implement the entire standard. Such a provider would be a leader in developing and extending standards IP and possess an intimate knowledge of them through leadership on the standards committees. IP should be the provider's principal business in order to command resources within the company.

Arasan Chip Systems, a pioneer in the IP business, recognized that its customers are seeking to adopt emerging technology standards and have had to rely on piecemeal licensing of blocks of IP as a means to implementing the standard, Arasan has revolutionized the business by offering a complete suite of products, "The Total IP Solution", that customers can use to adopt emerging standards. The advantages of using a single IP vendor whose sole focus is on the IP business are manifold.

Interoperability of all implementation elements is guaranteed. Uniformity of documentation and support is ensured. The company assumes responsibility for customer success. Overall implementation costs, from licensing fees to debug, are far lower than the piecemeal licensing method. Development time and risk are reduced.

Companies whose business is not IP or who do not serve on the industry committees may not be aware of the efforts required to maintain standards expertise. Every year, many standards bodies are formed and various specifications proposed by new and existing bodies. Companies wishing to use standards should be cognizant of the risks in pursuing standards and proposals that may never come to fruition.

Arasan assumes the risk as a part of its business so that its customers do not need to invest in and follow these proposals. Arasan partners license only committee-adopted and proven standards IP.

Through its service on the standards committees Arasan helps to define the standards and this expertise is embedded into our products. By making products available to customers, Arasan bring emerging standards to life.

Some examples of the bodies on which Arasan serves include to following:

- USB-IF, member since 1996
- SD Association, member since 2000
- MIPI, member since 2004
- eMMC/JEDEC, member since 2005

First to know, first to Market

Being intimately involved with developing the standards ensures Arasan's position as the first to know where the specifications are heading, the first to start updating its products to comply with these specifications and the first to market with the products. Our Total IP Technology licensees gain from this advantage.

Arasan helps its customers from the outset by working with them to define their MRD and to architect their SoC designs using its intimate knowledge of the standard and system-level approach. The company sells not just IP, but a complete solution.

Quality is achieved through interoperability testing with other early adopters of the standard, long before the associations themselves establish a certification body.

Considering the early adopter-testing of the VIP it is no wonder that Arasan's Verification IP, which is included as part of the product is superior to other third party VIP providers.

Arasan maintains strategic partnerships with EDA companies that provide Verification IP and who use Arasan's IP to validate their own VIP.

Arasan offer more than technical and business leadership. The company, at well over two hundred employees has the size to develop and support comprehensive solutions yet retains its focus on IP for standard interfaces alone.

The company is a veteran of fifteen years in the IP industry and has extensive experience is popular technologies of all sorts. All its products are developed and verified internally.

Products

Product offerings include synthesizable analog and digital hardware designs, verification IP, hardware development kits, software drivers and stacks.

Arasan's products also include verification boards with programmable logic devices containing implementations of its IP. The boards are used for system verification of software and hardware allowing these elements of the system to be verified simultaneously.

Arasan is breaking new ground with ESL Models in SystemC of its digital IP. The ESL models are combined with the software stacks IP product to perform Transaction Level Modeling using SystemC simulator. The high-level the software and hardware allows architectural exploration, performance modeling, independent software development, functional verification, and high-level synthesis.

Co-verification is a means of verifying system architectures and of ensuring higher levels of RTL verification.

Summary

The company's products offer customers the fastest and least risky path to completing their product through a seamlessly integrated solution. Arasan stands by its solutions with a world-wide support network that will shepherd the project through to a completed product.

Arasan Chip Systems Inc.

Data Sheets Link:



2010 N. First Street, Suite
510, San Jose, CA 95131

<http://www.arasan.com/datasheets/login.php>

Phone: 408-282-1600

For a complete directory of Arasan

Fax: 408-282-7800

IPs, please visit: www.arasan.com

Email: sales@arasan.com

