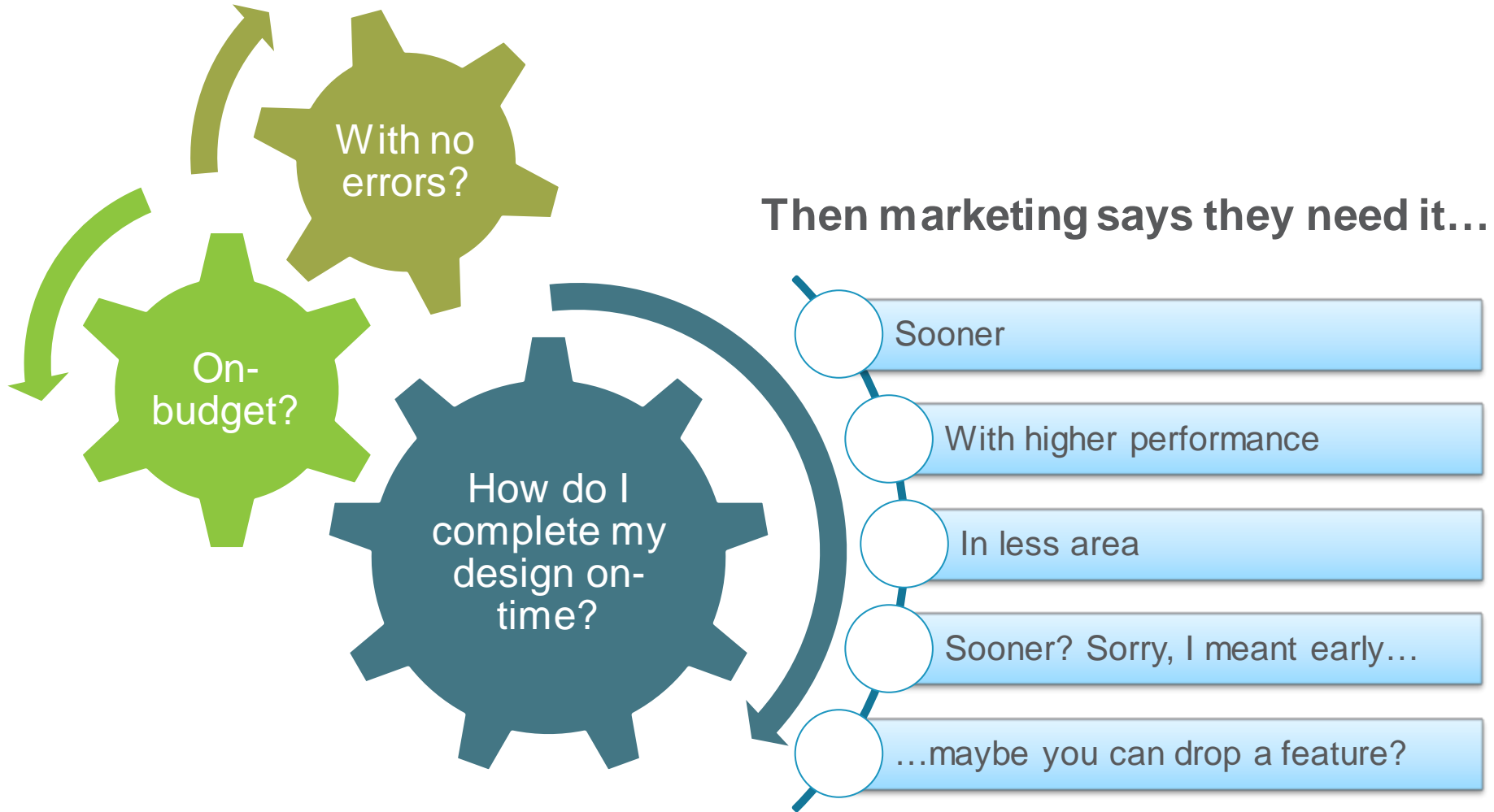




Solving the System-Level Design Riddle

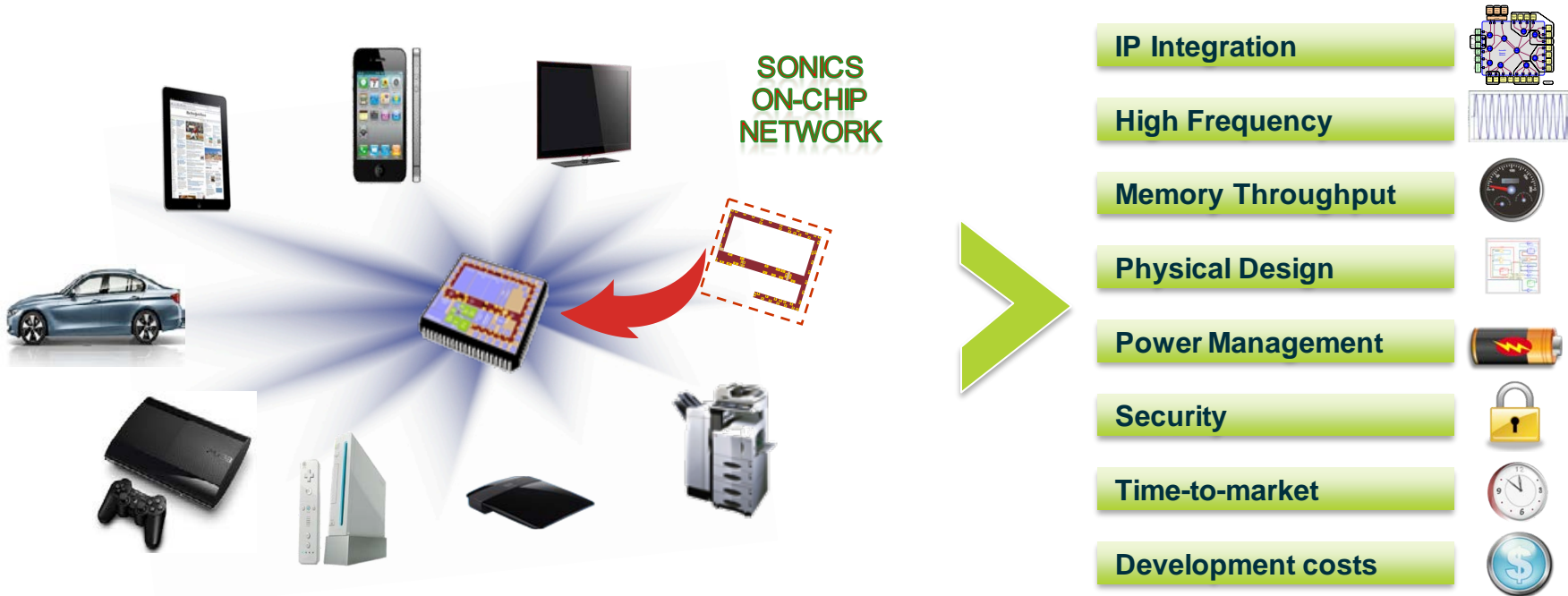
October 2014

➤ What is the System Design Riddle?



How Sonics helps

Sonics' on-chip networks help leading SoC designers solve some of the most difficult challenges in SoC design



» **Sonics System IP:**
On-chip Networks, Memory Subsystem, Power Partitioning & Management, Performance Monitor & Debug, Security Firewalls

Sonics – The NoC Leader for 18 Years

- **Sonics enables designers to integrate any IP from anywhere, anytime**
 - *Easy IP re-use*
 - *Connecting third party IP/subsystems*
- **Total System IP approach:**
 - *Intelligent memory scheduling*
 - *Optimal power-aware designs*
 - *Data flow services: QoS, Security firewalls*
 - *Software drivers*
- **Commanding presence in digital entertainment, mobile and wireless**
 - *200+ SoC tape-outs*
- **Results: 2.5B+ units shipped**
 - *138+ patent properties*
 - *Improved TTM and quality*

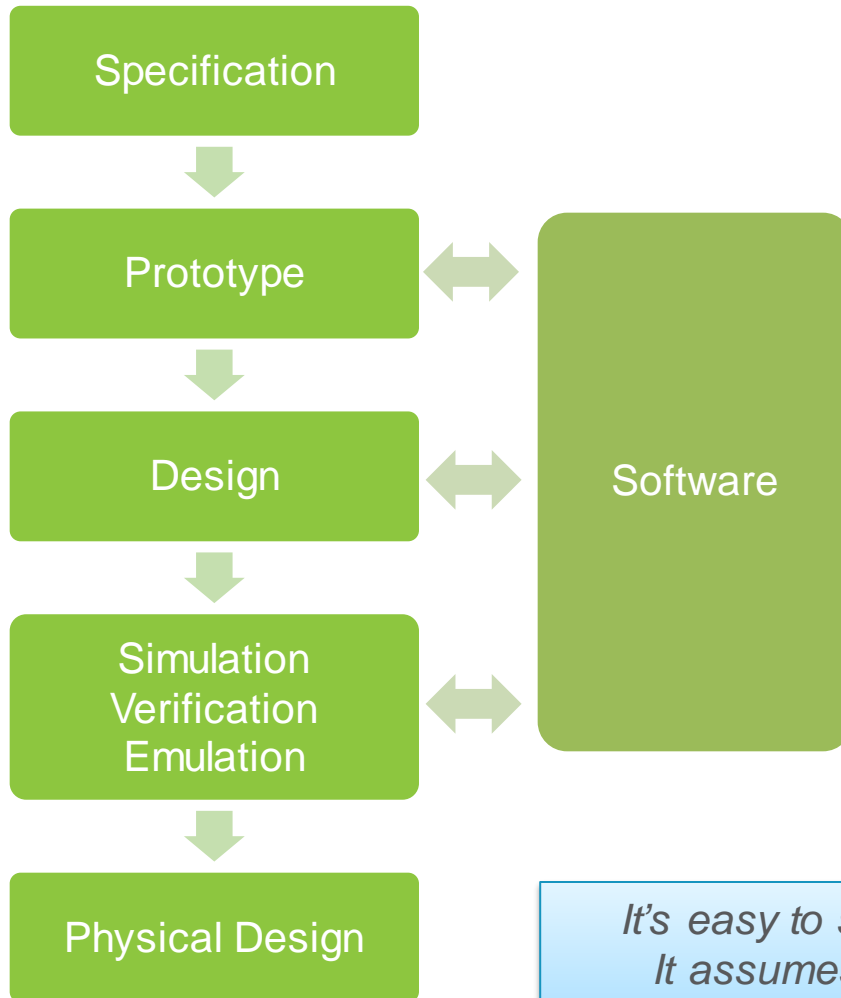


> Does Sonics Solve the Riddle?

> No, not entirely

- *Using Sonics and other high-quality IP will aid greatly*
- *But there are limitations that good IP alone doesn't solve*
 - Your design methodology is probably wrong, though it may be the best you can do today

What's wrong? Waterfall Methodologies



- > Sequential operations
 - *Little parallelism*
- > Changes in one phase may result in a reset of all downstream steps
- > While design reuse (and use of purchased IP) is allowed, it cannot be fully exploited
- > If one feature is causing a delay, it may be impossible to move forward with the rest of the design until it is resolved
- > In general, the focus is on the process, rather than the desired outcome

It's easy to see the problems with the waterfall method. It assumes that every requirement can be identified before any design or coding occurs.

Reasons for Changing IC Methodology

Some drivers for change

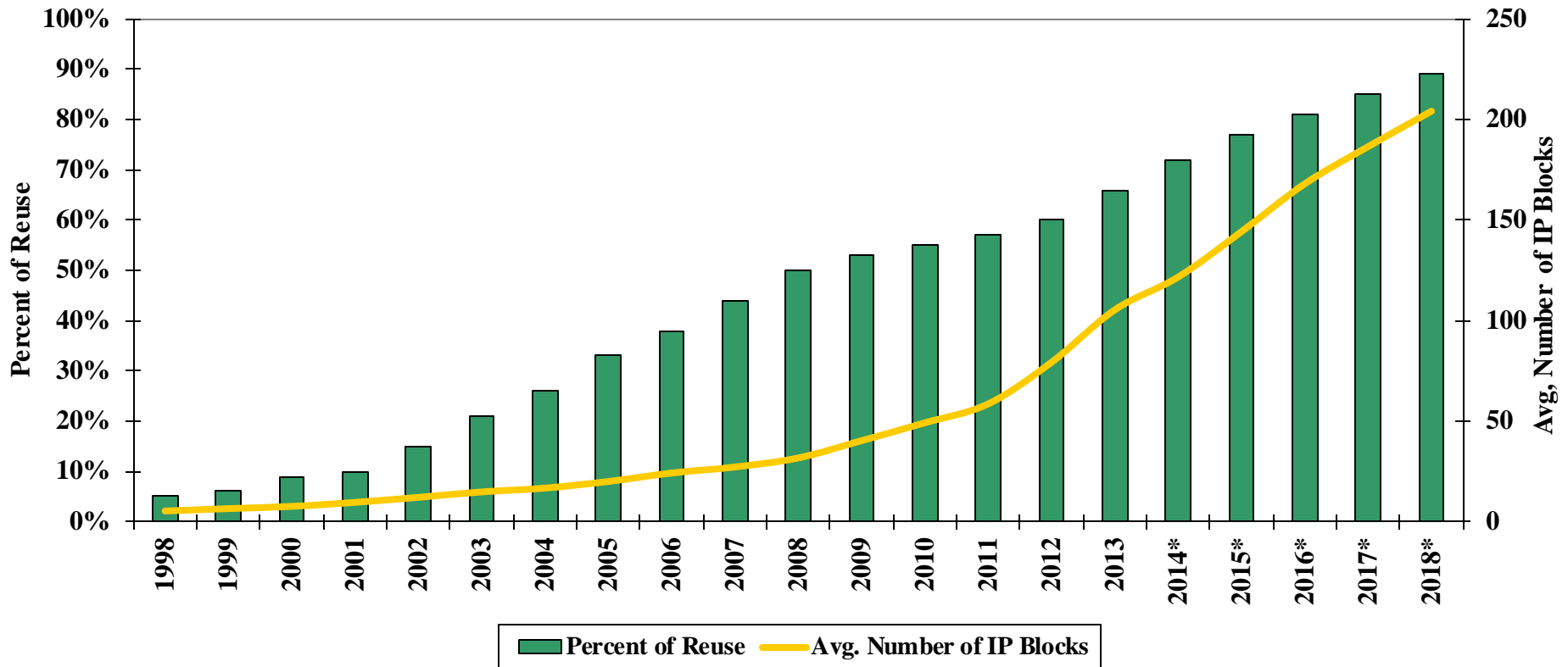
- > **Consumer** products
 - *Short release cycle*
 - *Low power, but still always on*
 - *Security*
 - *Design costs*
- > **IoT**
 - *Starting design without a complete spec*
- > **Makimoto's wave** shifts emphasis from standardization to customization
- > **System companies** are in best position to assume product risk

Desired new attributes

- > Ability to make reasonable progress with an incomplete specification
- > To better solve modern design challenges:
 - *Time-to-market*
 - *Power*
 - *Security*
- > Ability to easily ship “on-time”/early with a reduced feature set
- > Improved relationship between architectural, logical, physical, and software design

Why is Sonics leading this?

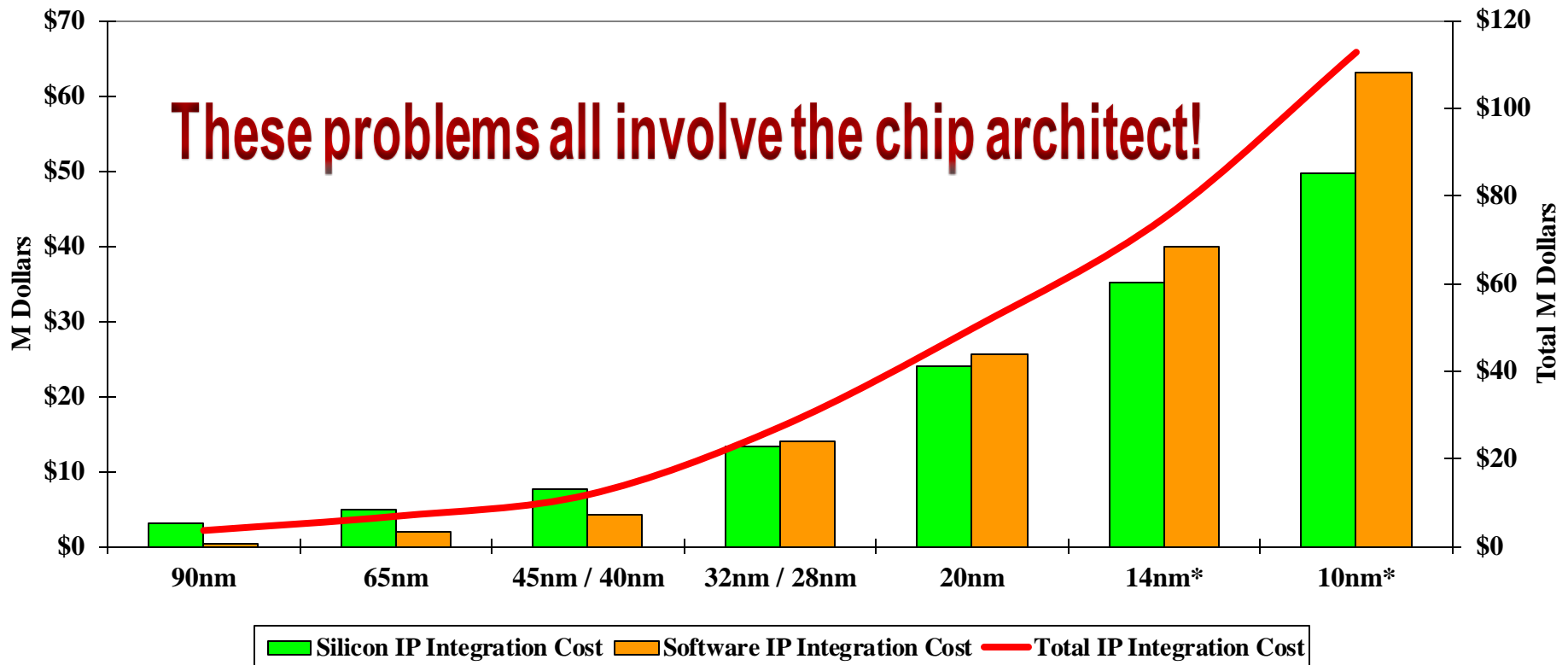
SO MANY BLOCKS!?



Source: Semico Research Corp.

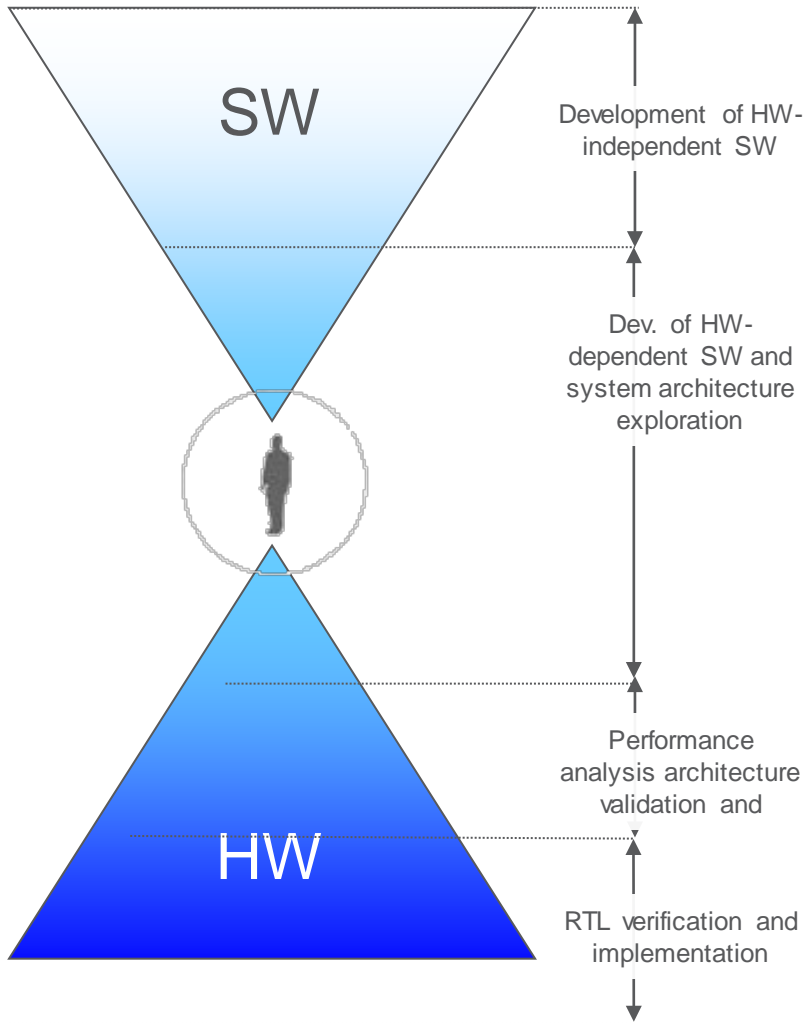
Why is Sonics leading this?

SO EXPENSIVE!?



Source: Semico Research Corp.

SoC Architects Drive Both SW & HW

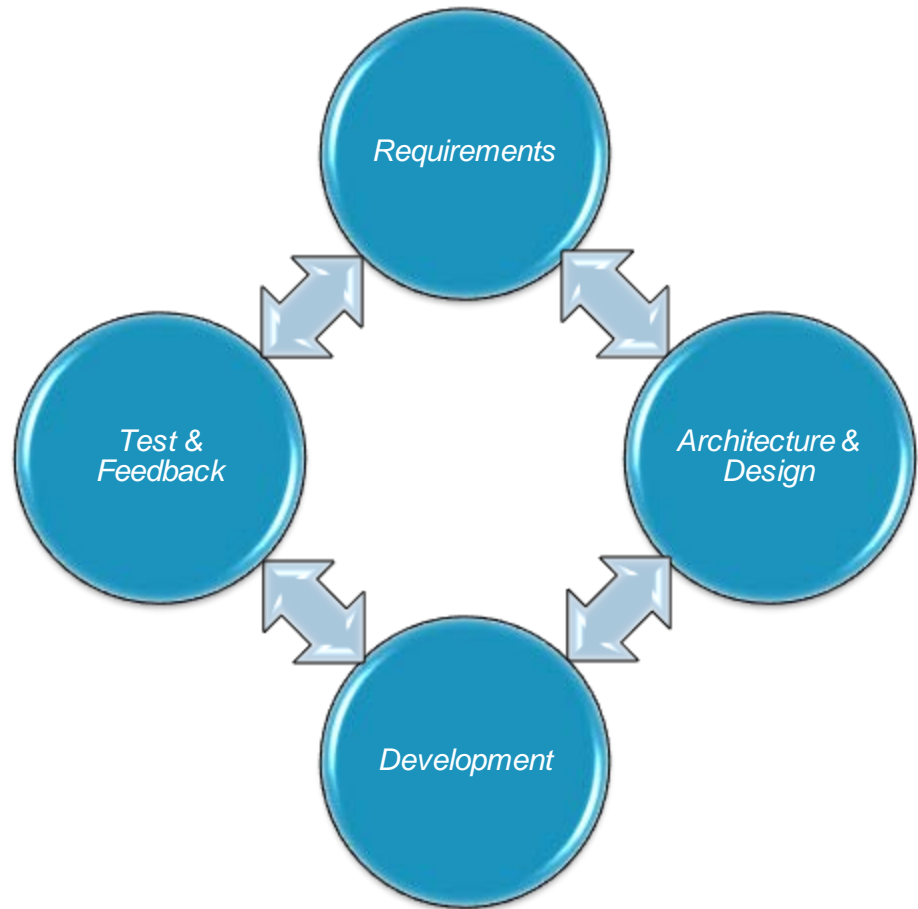


- > Large (and growing) teams dependent upon architecture
- > SoC architect responsible for many views of architecture
 - *Normally disparate*
- > Increasing complexity of SW and HW results in increased costs and delays

Worth considering: Agile SW Development

➤ The Agile Manifesto was written in February of 2001, at a summit of seventeen independent-minded practitioners of several programming methodologies. The participants didn't agree about much, but they found consensus around four main values:

- *Individuals and interactions over processes and tools*
- *Working software over comprehensive documentation*
- *Customer collaboration over contract negotiation*
- *Responding to change over following a plan*



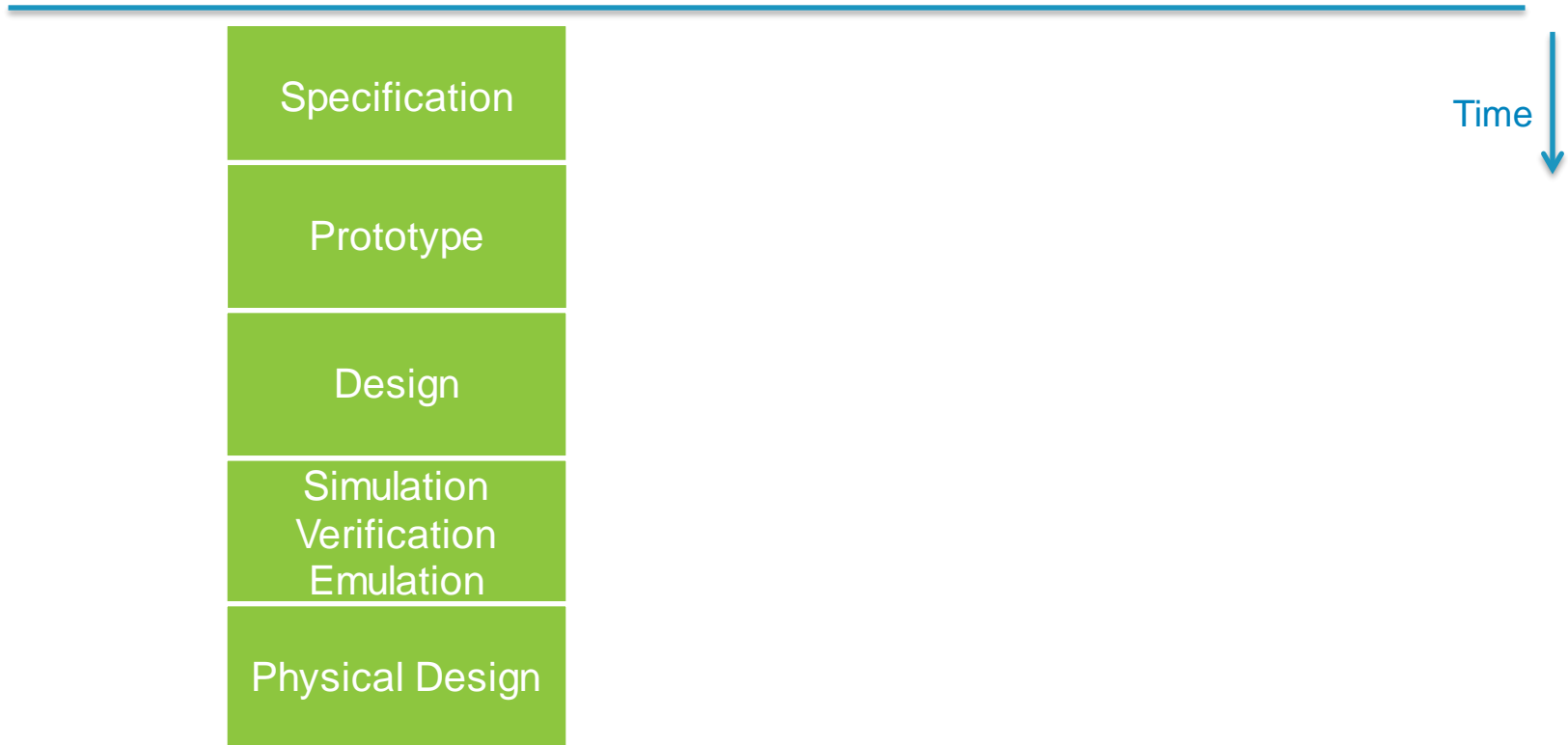
“The Agile movement proposes alternatives to traditional project management. Agile approaches are typically used in software development to help businesses respond to unpredictability.”

➤ HW and IC Design Teams Must Evolve

Yesterday	Tomorrow
Component-Level Aggregation	System-Level Architecture
One-time Usage	Platform Reuse
Hierarchical Requirements and Stepwise Design Management	Concurrent Engineering and Agile IC Methodology
Dedicated Resources	Shared Resources

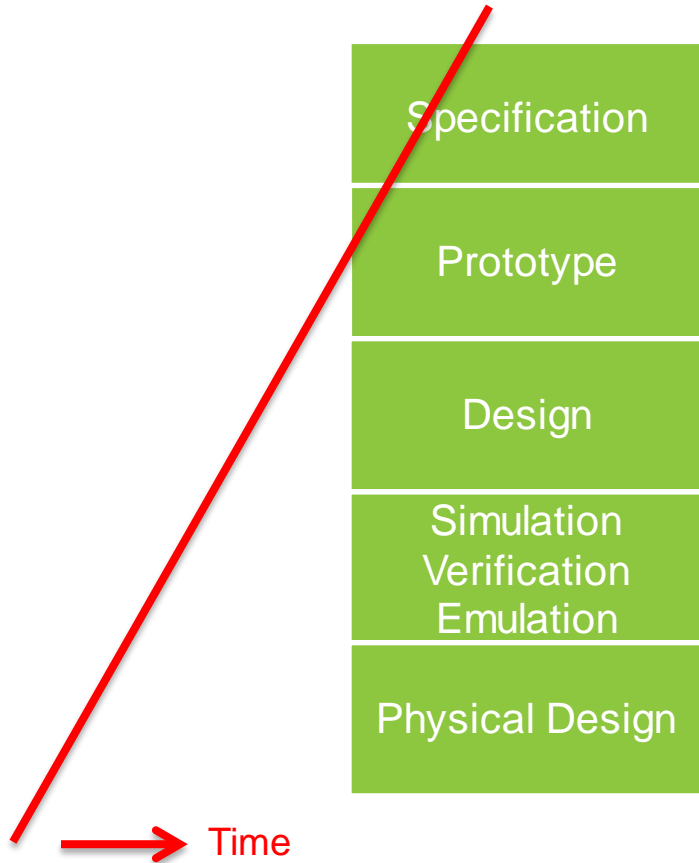
➤ What an Agile IC Methodology Might Look Like

Waterfall



➤ What an Agile IC Methodology Might Look Like

Agile IC Methodology



Change the slope! The more vertical the better!

Sonics' Plan

- Get the discussion started
- Create the communications links
- Gather the interested parties

How you can help

- Join the LinkedIn group
- Participate in the conversation
- Invite others to get involved too

Step 1: Join the “**Agile IC Methodology**” group on LinkedIn
Step 2: Join the conversation – participate!

Partnering to Win with Sonics Now, and in the Future

- Sonics has
 - *The best technology*
 - *The strongest commitment*
 - *The largest team*
 - *The most experience*
 - *The best support*
 - *The strongest roadmap*

- What can we do to help your team?