

Enabling Innovation and Productivity Across the Product Development Cycle

An Introduction to NI DataStudio

George Zafiropoulos

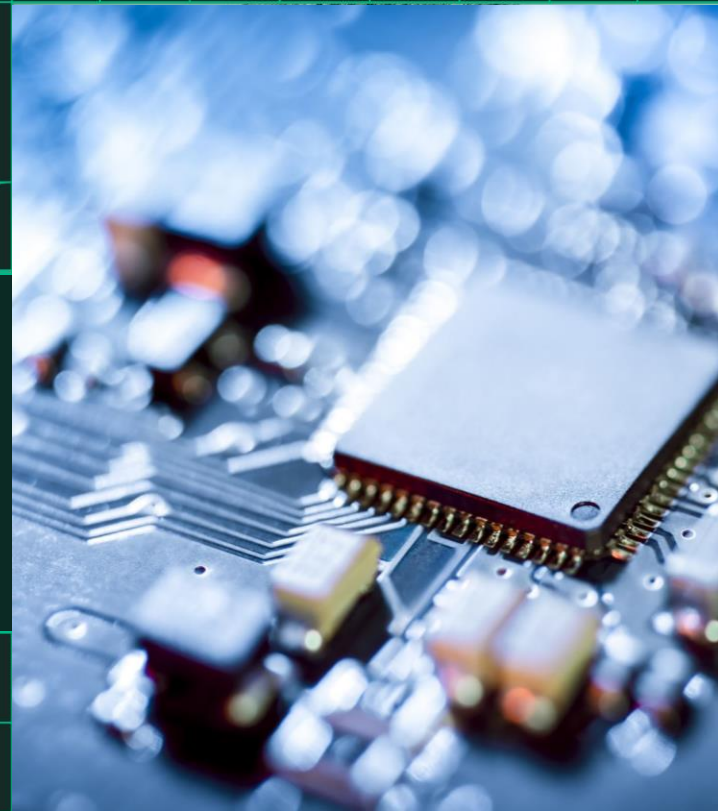
Offering Manager Director - NI

Richard Barthel

Principal Systems Design Engineer - NI

Frank Schirrmeister

Sr. Group Director, Solutions & Ecosystem - Cadence



Semiconductor Company Challenges

Economic

- Reducing time to market
- Reduce design spins
- Lower selling prices
- Lower operational budget
- Lower CapEx budget

Technological

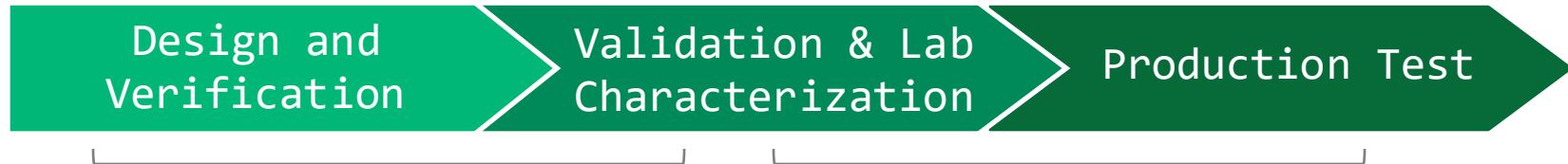
- Growing design complexity
- Growing test dimensionality
- Mixed analog, digital, RF
- New wireless standards
- Requirements tracking
- Leveraging data analytics

Organizational

- Fragmented flows
- Lack of IP reuse
- Increasingly multinational
- Desire for standardization
- Poor management reporting
- Be more data driven

Valuable Lessons Customers Taught Us

Disjointed Product Development Workflows



Big gap between design, lab test, and production test

Different people, languages, tools, methodologies, databases

Poor data management infrastructure

Difficult to correlate measurements to specifications

Need to answer: Am I meeting specs? Ready to release?

Engineers want to focus on their products—not infrastructure



NI Launches DataStudio to Break Down Silos, From Design to Test

AUSTIN, Texas, May 24, 2022 – NI (NASDAQ: NATI) announced today the launch of DataStudio, its design-to-test data analytics solution. This new analytics solution provides the foundation for a modern, secure, scalable engineering data infrastructure and applications, accelerating the pace of innovation for wireless, semiconductor, and electronics innovators.

Consistent with the need to fast-track product development, DataStudio bridges critical data across the semiconductor design and test workflow. DataStudio Specification Compliance Manager (SCM), the first application in the DataStudio family, manages device specifications, connects to measurement data sources, and automatically generates compliance reports. DataStudio SCM provides a comprehensive view of the device's conformance to target specifications enabling better decision making and reporting, and leverages data often lost across the design, validation, and production test silos. By laying the groundwork with comprehensive data infrastructure, engineers gain clear and actionable insights to improve productivity and reduce the manual effort required during chip development.

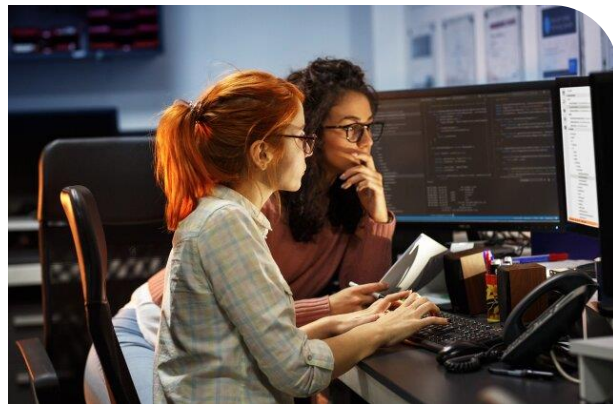
In addition, NI is launching the DataStudio Bench Data Connector (BDC) validation bench test library. The BDC library provides a standardized way to store validation data that is automatically compatible with the DataStudio Specification Compliance Manager making it easy to import bench measurement data into the compliance reporting software.

Solving Two Problems



Poor specification management & reporting

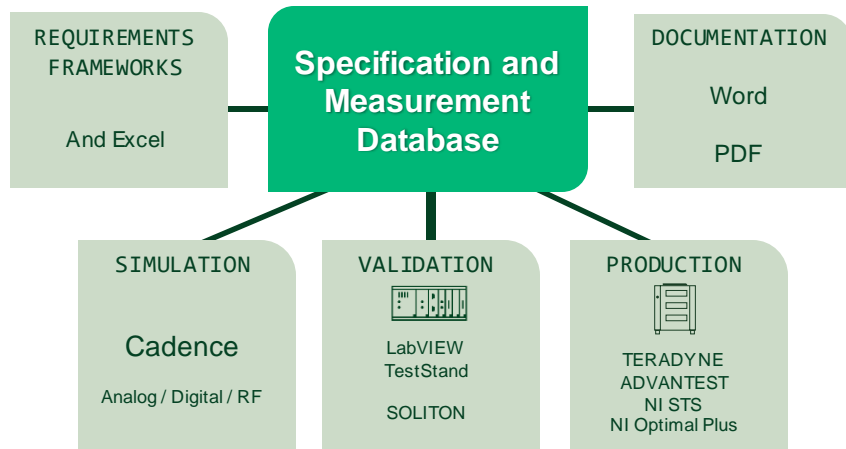
- Specs stored in Excel, Word, or a DIY database
- Very manual effort to collect measurements
- Manual effort to create compliance matrix
- Time consuming to create coverage reports
- Difficult to manage changing specifications
- Mistakes cause customer delays



You invent your validation data storage

- You decide how to store data
- You need to build the infrastructure
- You need to process it into something useful

DataStudio Specification Compliance Manager

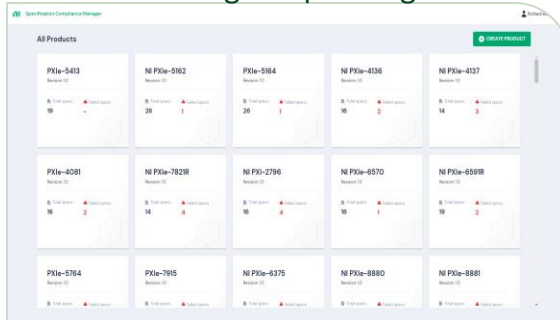


- Central repository for specifications
- Imports measurements from
 - Simulation
 - Validation
 - Production
- Specification compliance reporting
- Analysis

Compliance Matrix

The screenshot shows a table titled "Electrical Characteristics (50/5000)". The table has columns for "operation [sig]", "AVDD_3P3V", "Min", "Typ", "Max", "Unit", "Health", "CPU", "Min", "Typ", "Max", "Unit", "Health", "CPU", "Min", "Typ", "Max", "Unit", "Health", "CPU". The table contains multiple rows of data with status indicators (green, yellow, red) and a "Pass/Fail" column.

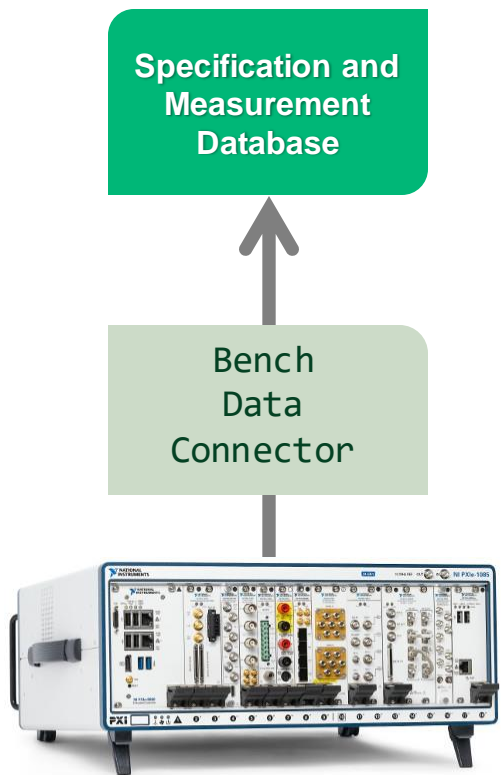
Coverage Reporting



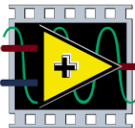
Distribution Analysis



DataStudio Bench Data Connector



- Validation bench test library
- Stores validation data
- Uploads data to Spec Compliance Manager
- Supports LabVIEW, TestStand, Python, C#/.NET



LabVIEW



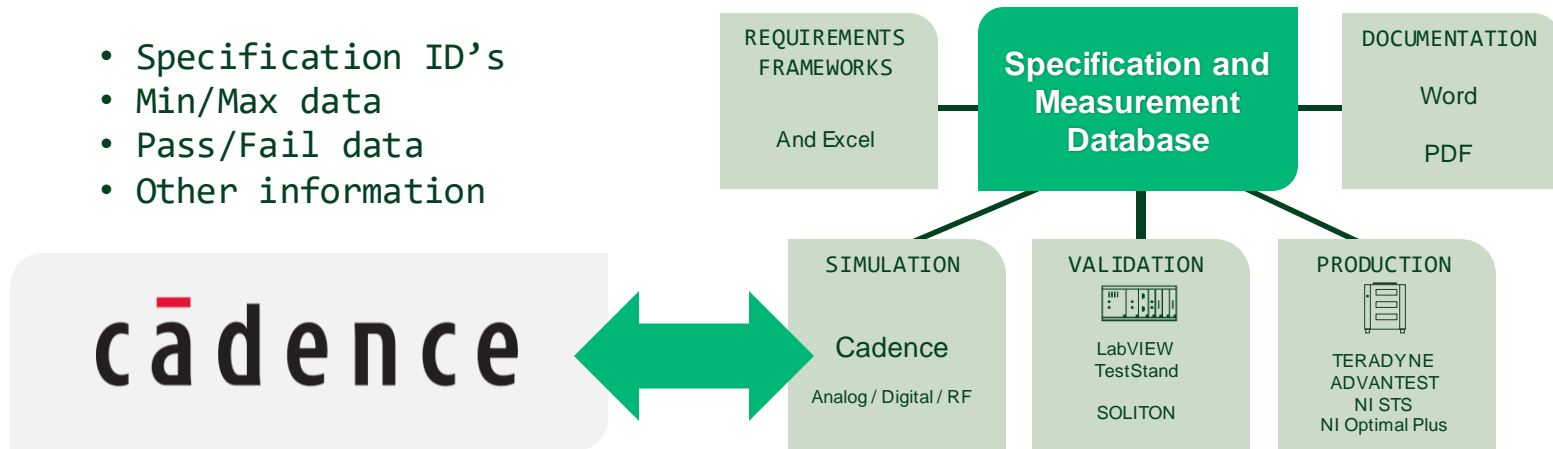
TestStand



Partnering with Cadence Design Systems

- Cadence: Leader in analog/mixed-signal and RF design tools
- Strategic relationship announced in 2020
- Most chips tested on NI hardware come through a Cadence flow
- Bi-directional interface between DataStudio and Cadence ADE Verifier

- Specification ID's
- Min/Max data
- Pass/Fail data
- Other information





The background features a dark blue gradient with a faint hexagonal grid. Numerous translucent cubes of various sizes and colors (cyan, blue, orange, red) are scattered across the scene, some appearing to float or move. Mathematical formulas are visible on some of the grid cells: $F(s) = e^{-sT} \left(\frac{\alpha}{s + \alpha} \right)$ appears on the left and right; $f_m(t) = 1 - e^{-\beta t}$ is on the top right; and $f = mv \sqrt{2m - m_0}$ is on the bottom right.

NI – Cadence Partnership

Frank Schirrmeister, Sr. Group Director, Solutions & Ecosystem
NI Connect, May 24th 2022

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Cadence At A Glance

Cadence Overview

Leading provider of
**Intelligent System
Design™** solutions—
software, hardware, and IP that
turn design concepts into reality



**Computational
software**
for designing today's
electronic systems

Q1 2022
revenue: **\$902M**
~9,300
employees worldwide

**Culture of
innovation**
more than 20 significant
new products in last 3 years

23+
Global development
centers

Software subscription model
Very high customer renewal rates and loyalty
Nasdaq, CDNS, S&P 500 and Nasdaq 100 indexes

Source: Cadence Earnings Press Release, April 25, 2022
https://www.cadence.com/en_US/home/company/newsroom/press-releases/cadence-q1-2022-earnings-report-2022-04-25.html
https://www.cadence.com/en_US/home/company/newsroom/press-releases/cadence-q1-2022-earnings-report-2022-04-25.html

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Systems



Board and Package



Implementation



IP and
Subsystems

System Analysis

“Does it work when put together?”

Electromagnetic, Thermal, Low Power,
Computational Fluid Dynamics

Packaging PCB Integration

**“Silicon into packages and parts into
PCBs and 3D-IC heterogeneous
integration”**

HW/SW Verification

“Is it functionally correct?”

Hardware/Software, Power, Architecture,
Safety, Security

Chip Implementation

**“Optimized, advanced-node
implementation”**

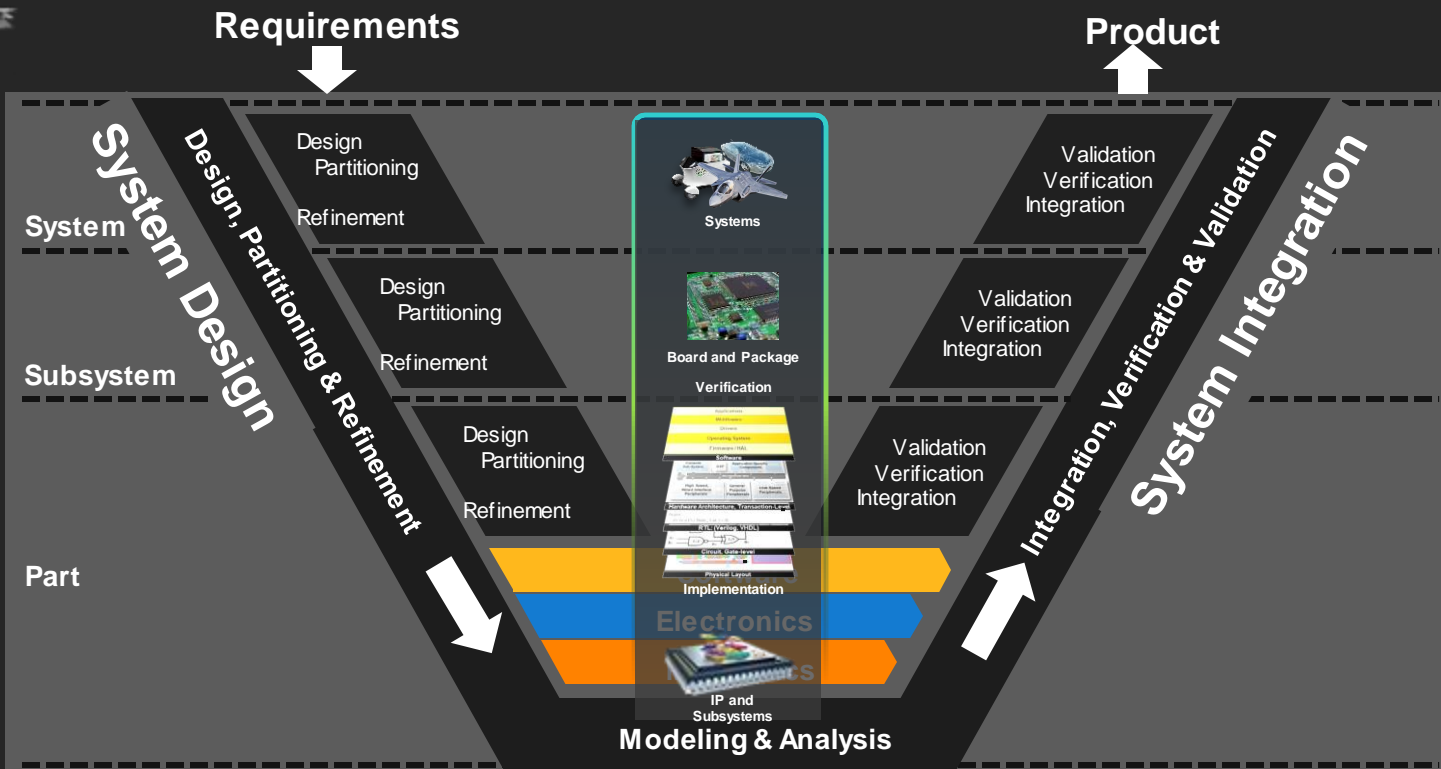
Performance, Power, Cost

IP Selection

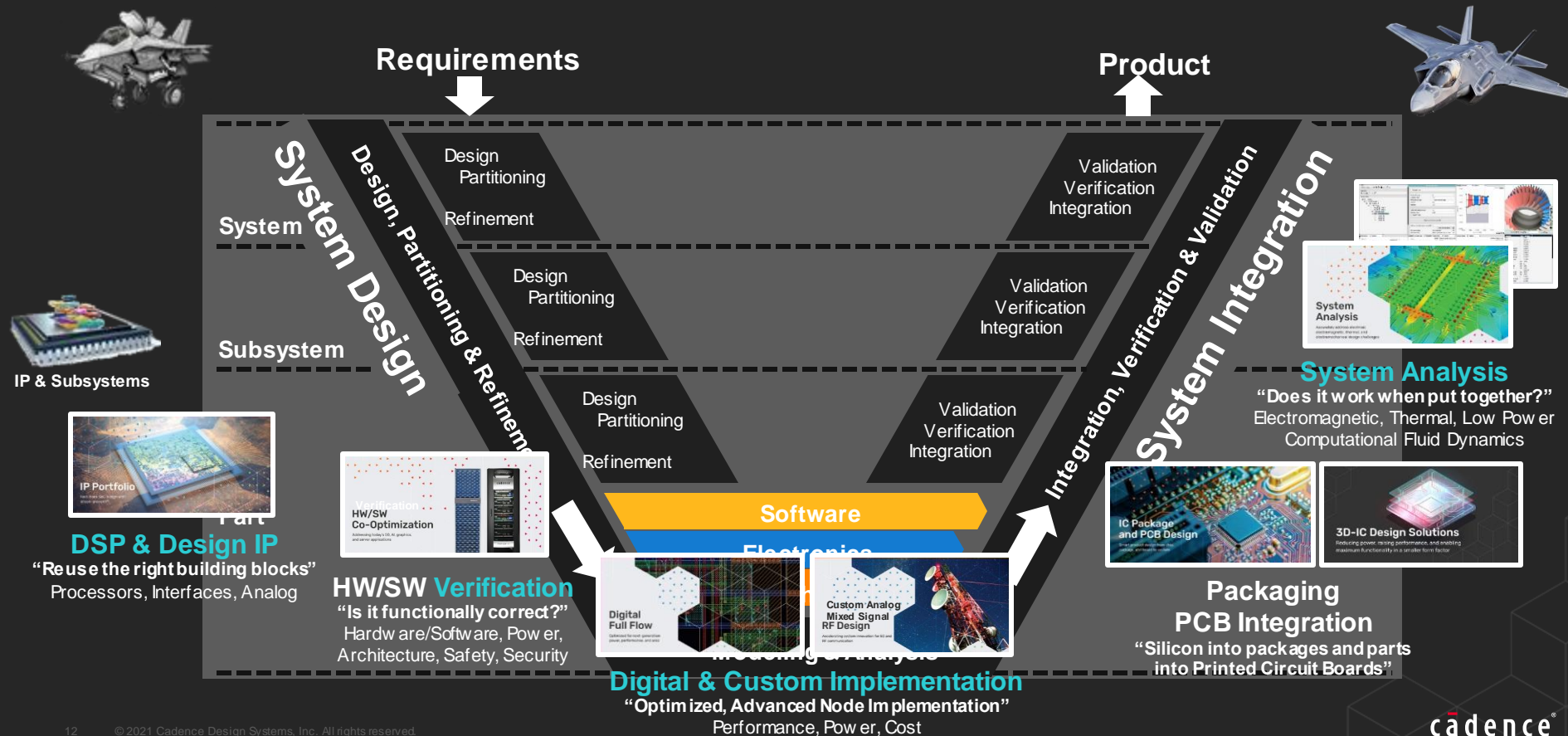
“Reuse the right building blocks”

DSPs, Interfaces, Analog

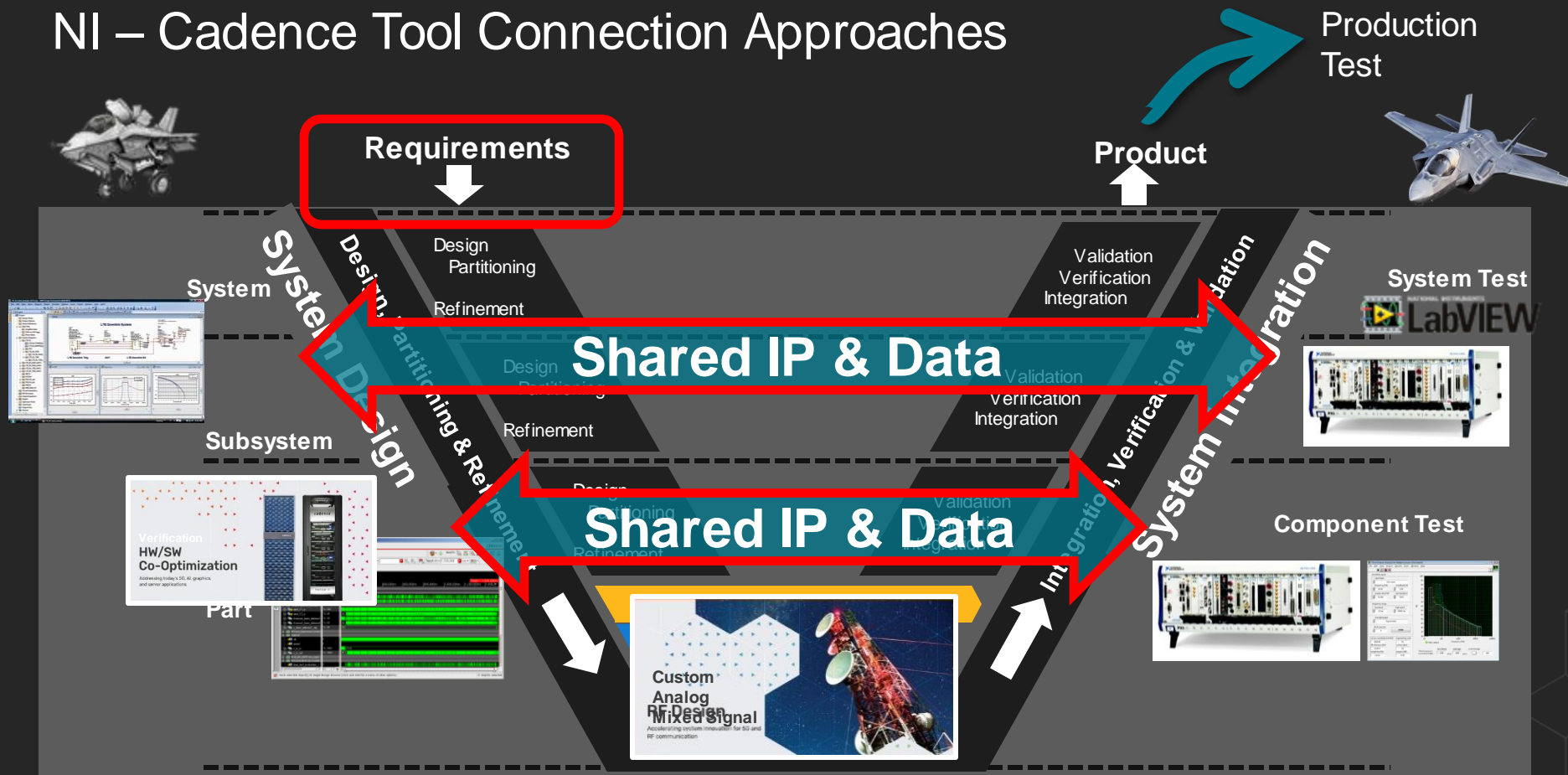
A Generic System Design Flow



A System Design Flow with Cadence Offerings



NI – Cadence Tool Connection Approaches



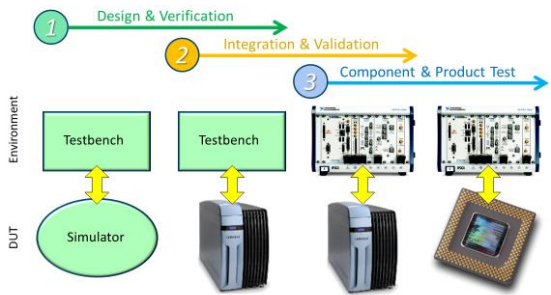
The Vision Started Several Years Ago...

Post- and Pre-Silicon Verification The Best of Both Worlds

George Zafiropoulos
VP Marketing, AWR Group
National Instruments

DAC 2013/14

Integrated Flow From Design to Test



ni.com

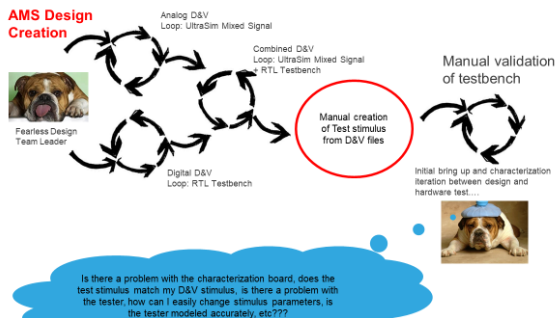
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Cadence and National Instruments Collaboration

D2T Summit '14

How things are today for the AMS chip lead:



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Strategies for Accelerating Advanced Design, Verification & Test
NI Virtual Executive Forum – August 5, 2020

Tom Beckley, Senior VP – Custom IC, IC Packaging, PCB & Analysis
Frank Schirmer, Senior Group Director, Solutions

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From IC to System: Re-architecting the Virtuoso Design Platform

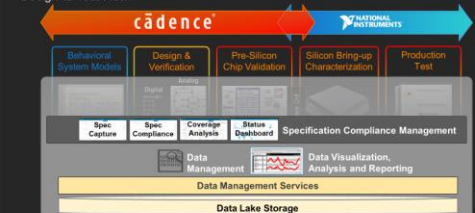


Exec Connect '20



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Cadence and National Instruments Partnership
Design to Test Flow



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It's Getting Real in 2022

NI DataStudio Design-to-Test Across the Life Cycle

DataStudio Specification Compliance Manager

Spec Capture

Measurement Ingestion

Compliance Reporting

DataStudio: Future Applications



MathWorks **cadence**
MATLAB® Spectre Xcelium
Simulink® Analog Digital
Simulator Simulator

ni.com



PXI

Production Test Production Analytics
OPTIMAL+
is now ni

GOALS

Integrated software platform

Scalable modular architecture

Serves all phases of design and test

Single "source of truth" for specifications and measurements

Connect to production analytics and system management

Much more to come ... Let's discuss !

And this is just the beginning ...



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DataStudio Demonstration

George Zafiropoulos

Richard Barthel

Summary

DataStudio Specification Compliance Manager: Available now

Strong collaboration between NI and Cadence: more to come

Roadmap for more DataStudio applications and integration with our other enterprise software including OptimalPlus production analytics and system management software



Scan to connect with an expert



Scan to learn more about DataStudio



National Instruments
is now NI.



Scan to connect with an expert