

# NIDays

WORLDWIDE GRAPHICAL SYSTEM DESIGN

## CONFERENCE

# Welcome to NIDays

## THE LabVIEW Conference

Joris Donders  
Sales Manager NI Belgium

# Thank you!

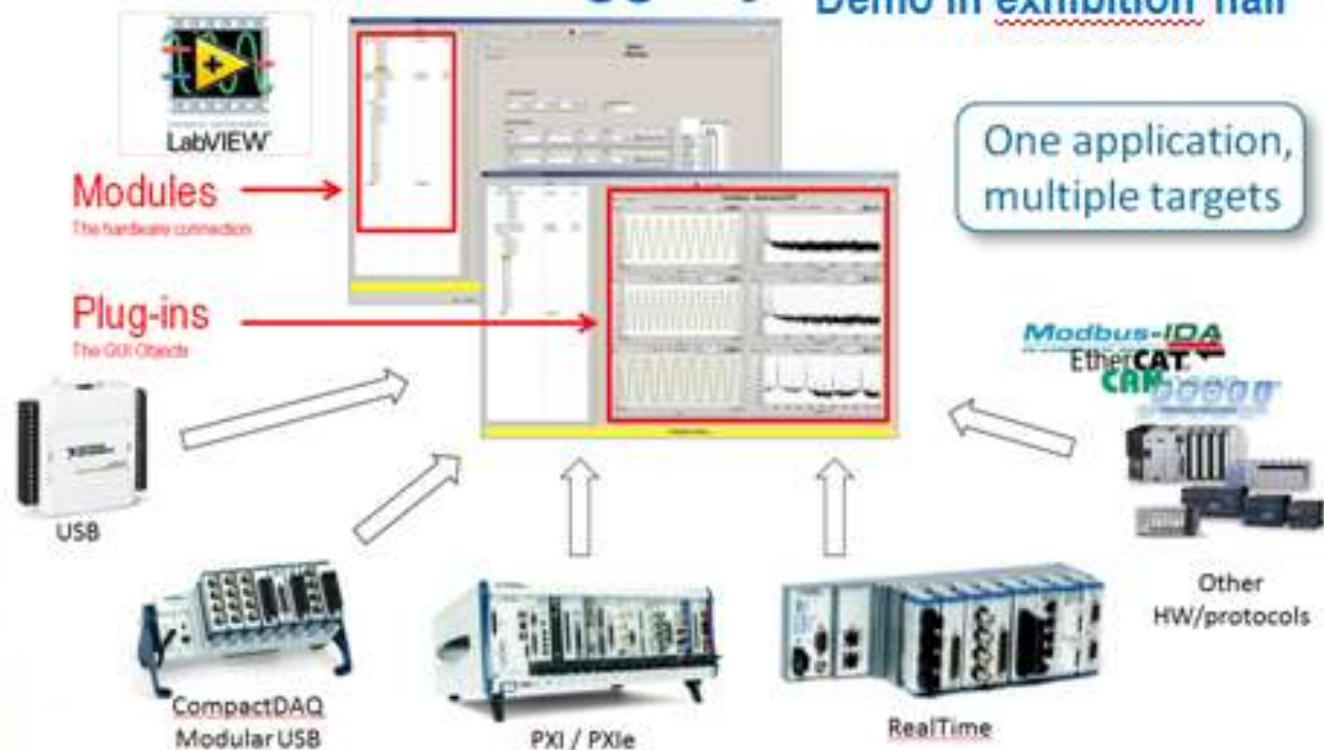


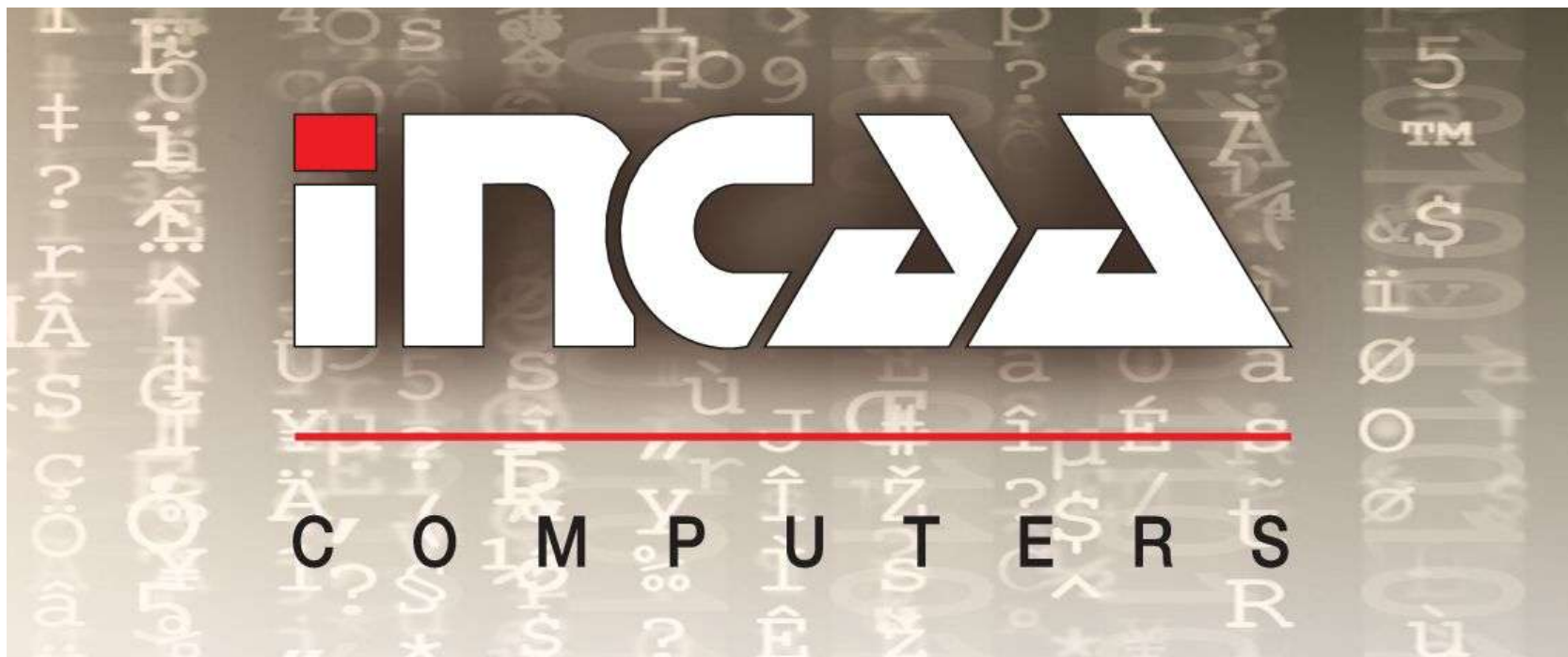
# CENAT



## FLEXSTAND Logger

Technical session at 11:45  
Demo in exhibition hall







# Mechatronic system design from concept to realization

Research & development

Test & measurement

Agricultural  
machinery



Mechatronic  
systems



Test benches



Measurement  
services



## Enabling your R&D road map

# Konrad Technologies



- System Integration Company with focus on Test & Measurement Solutions
- Headquarter: Radolfzell, Lake Constance
- NI Alliance Partner since 1994
- Activities include
  - Custom test systems
  - Board Test (Functional Test, ICT, ...)
  - Semiconductor Test (PXI-based platform FINN)
  - Turnkey production solutions
  - Feasibility studies
  - Engineering and Consulting services
- More than 1000 installed solutions worldwide





## Test & Measurement

Process Control  
Automated Test Cells  
Realtime Deterministic Execution  
High Speed Measurement & Control



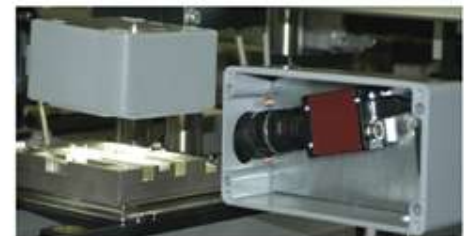
The LabVIEW software development environment lets us integrate measurement and control functionality with important aspects such as user-friendly visualisation, datalogging, database communication and report generation.

## Visual Inspection Systems

Product Localisation and Identification  
Quality Control  
Combination with Motion (robots)  
Smart Camera

**NiniX**  
Technologies

**NATIONAL INSTRUMENTS™**  
**Alliance**  
M E M B E R



# Leading Supplier for Electronics Test.

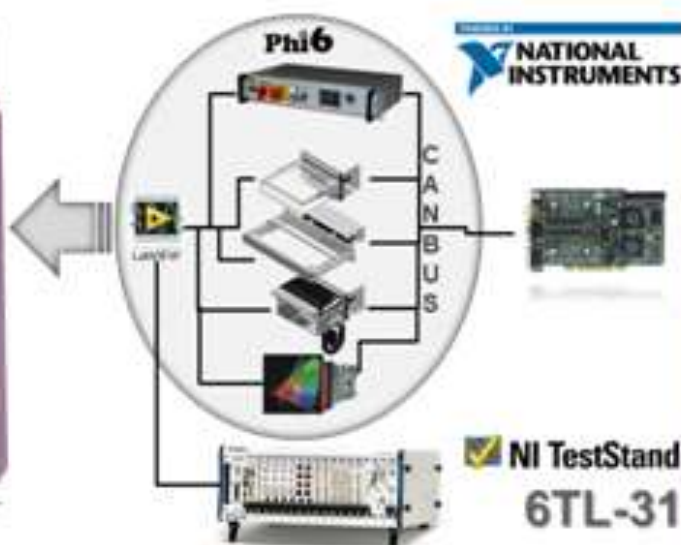


Your Partners in True-  
Flexible, Reliable, Modular,  
Re-usable Test Solutions &  
Mass Interconnect Systems.



**NI – Partner Presentation**  
**11h45-12h30 – Track C**

**How to create a reliable  
and flexible production  
test system concept with  
LabVIEW.**



Testing and more.







## VI Technologies is specialist in delivering solutions based on NI LabVIEW.

- ✓ Support and consultancy in the area of measurement and automation applications based on LabVIEW and/or TestStand
- ✓ Custom LabVIEW software development
- ✓ Automated Test and Measurements Systems
- ✓ Machine Vision and Motion
- ✓ Machine automation
- ✓ Training in LabVIEW (object oriented) software architecture
- ✓ LabVIEW Realtime, FPGA and Embedded



### Presentation

**15h15: How to Drive the Dutch Supplemental Reserve Power Grid with LabVIEW**

# System Design for the 21<sup>st</sup> Century

Michael Neal

Senior Product Manager, LabVIEW

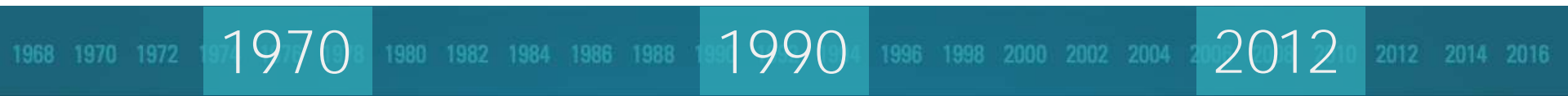


# Rapid Software Expansion

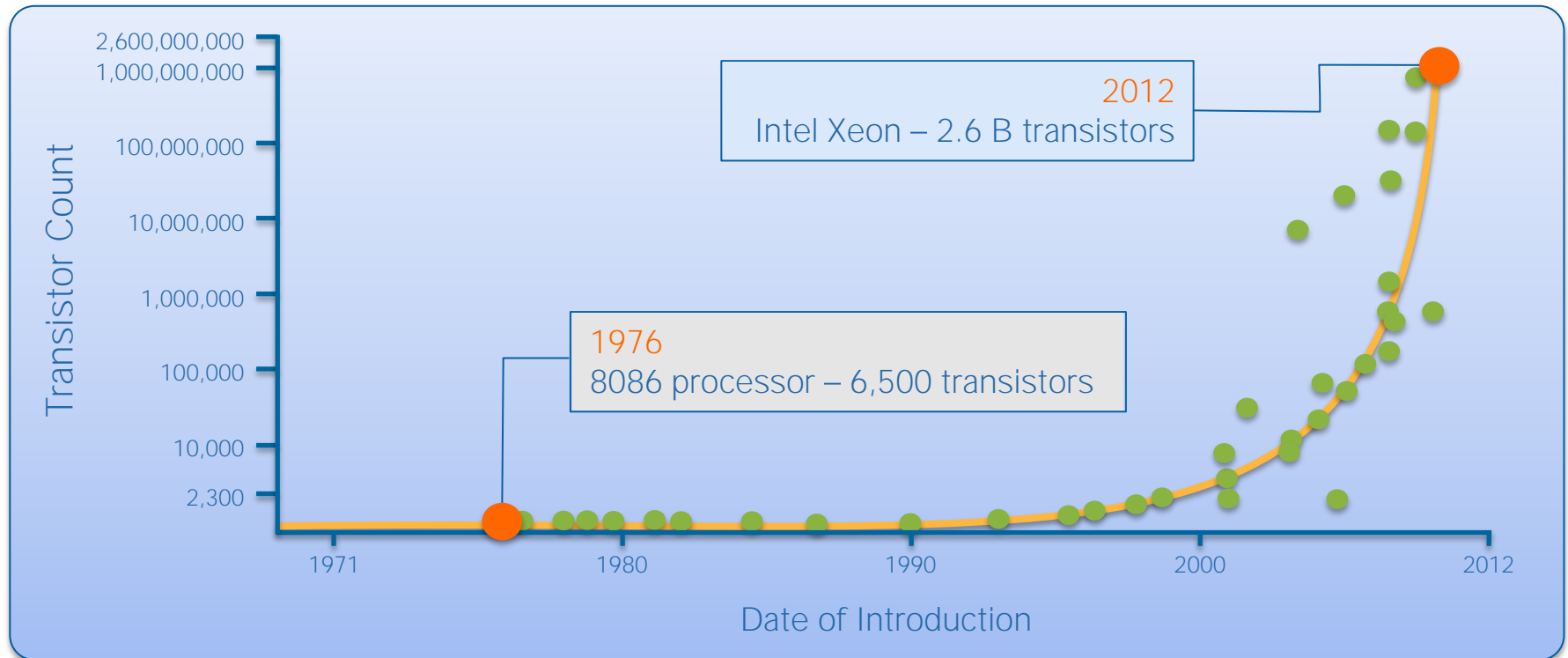


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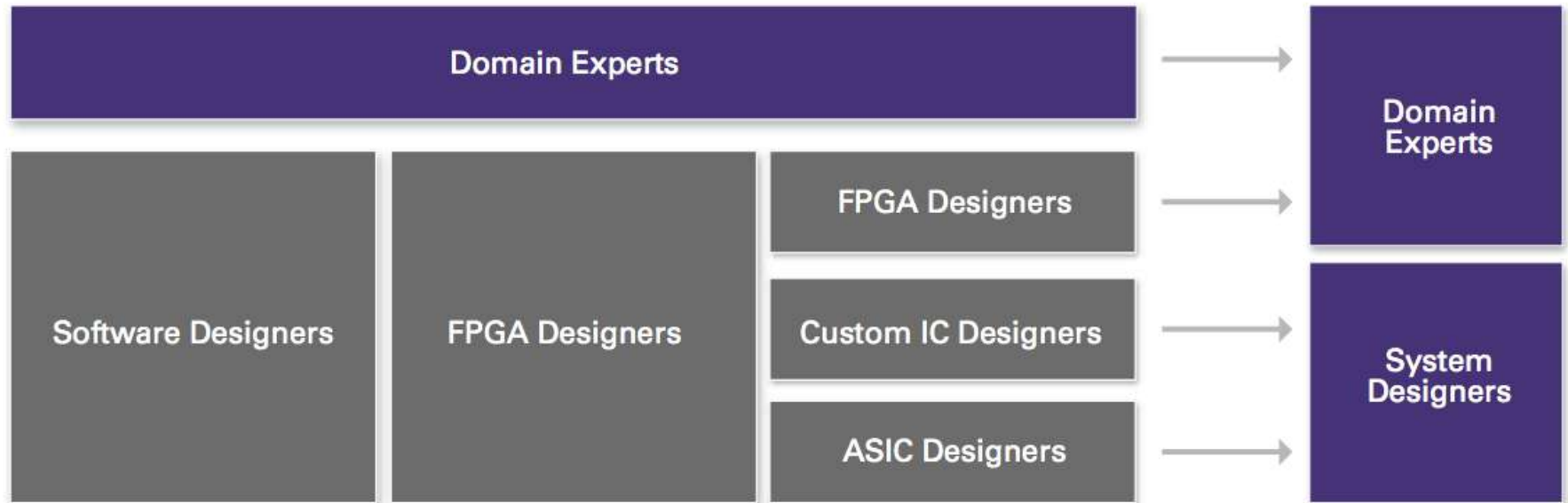
# Evolution of Instrumentation



# Moore's Law



# Innovating More With Less



*“Innovation initiatives that were once handled by dozens a decade ago are now run by only handfuls...less apparently enables more.”*

—Michael Schrage, Harvard Business Review Blog Network



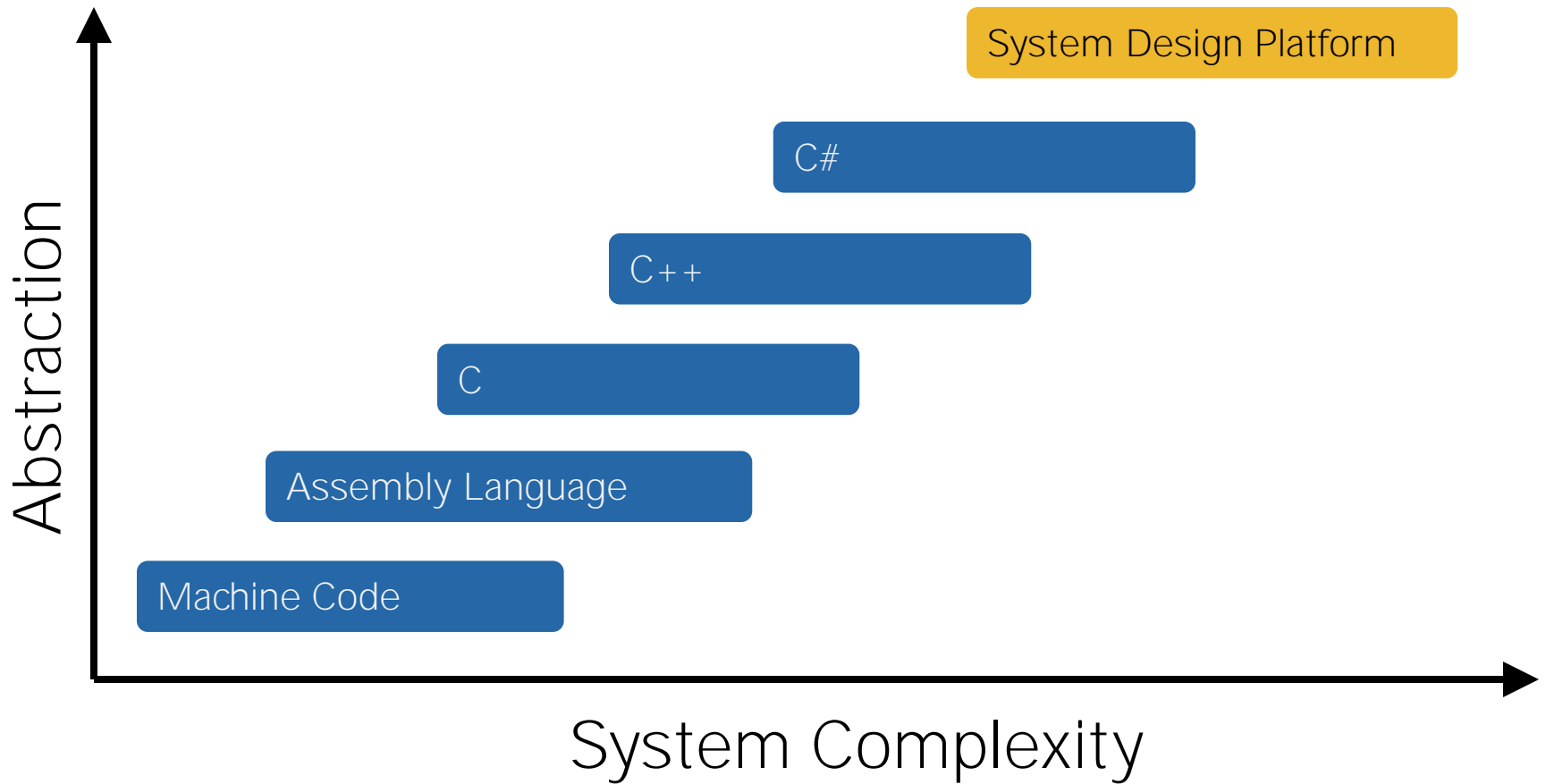
Number of  
Engineers

> 10 Million

Number of  
HDL Designers

~ 100,000

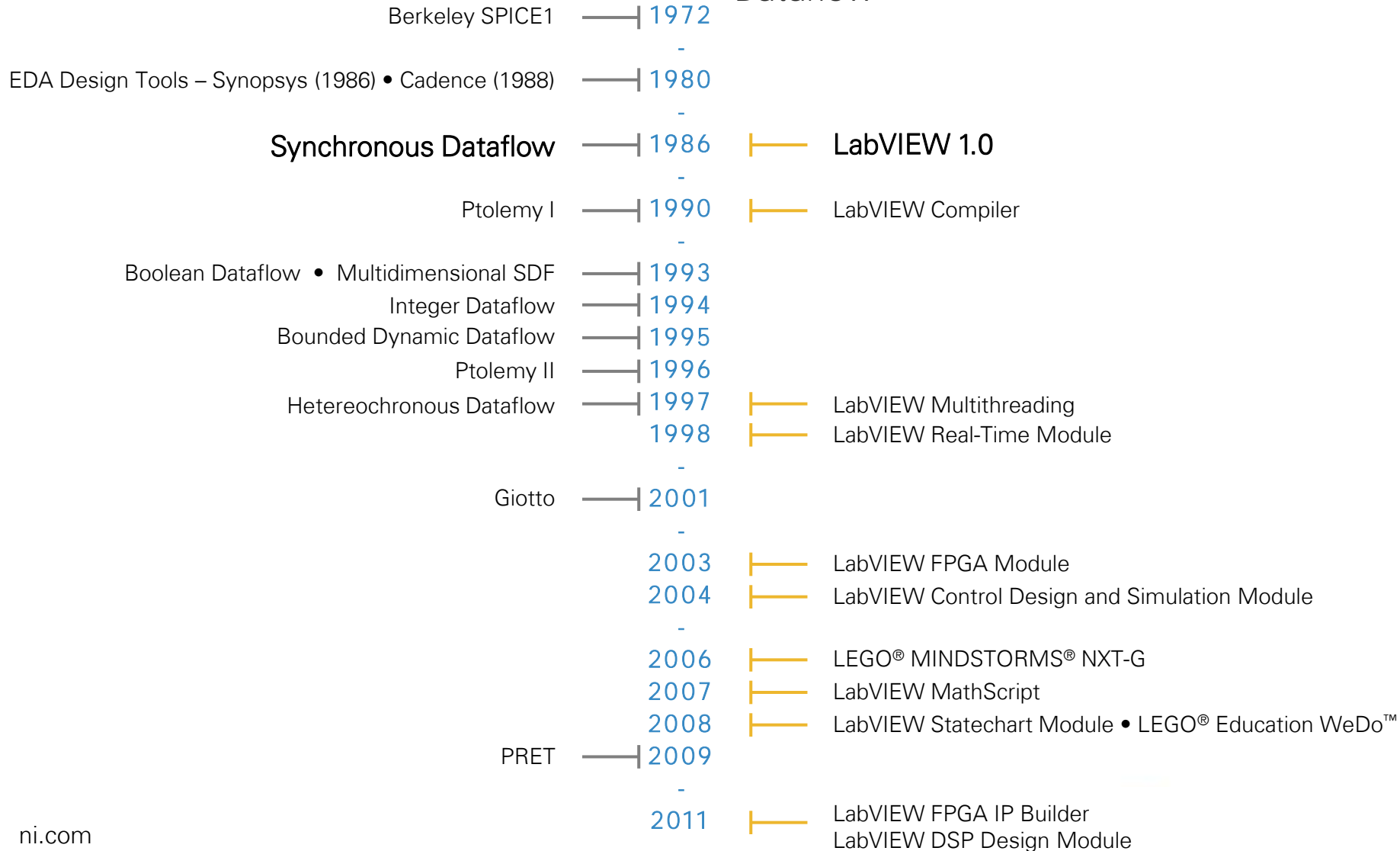
# Scalable Software Abstraction



# Academic Foundation to Strong Design

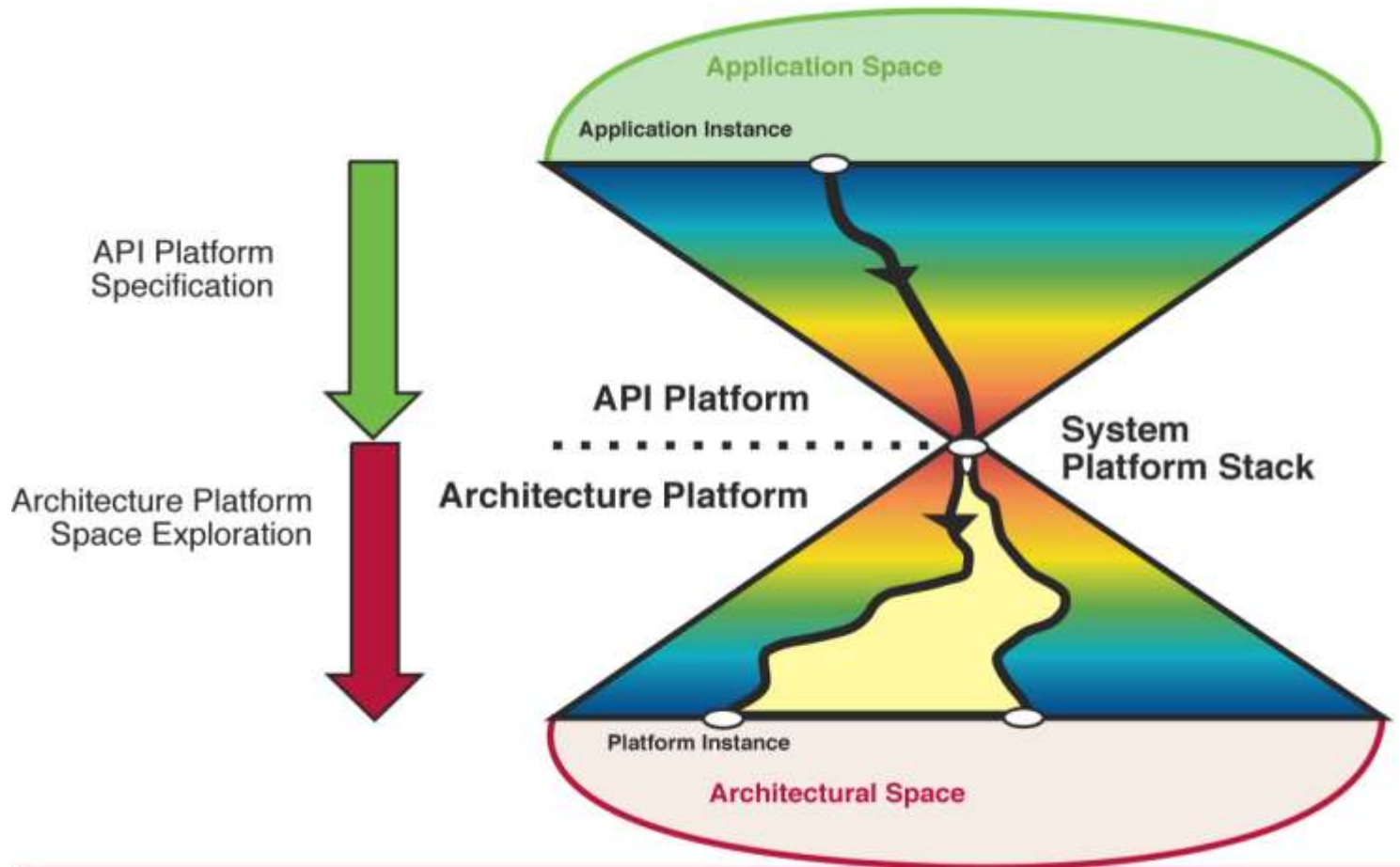
University of California Berkeley

National Instruments LabVIEW  
Dataflow



# University of California Berkeley

## *A Platform-Based Design for System-On-Chip*

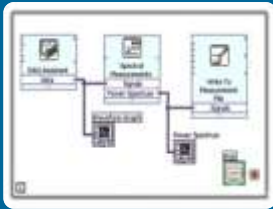


*A. Sangiovanni-Vincentelli, UC Berkeley. Defining Platform Based Design. EEDesign, Feb 2002*

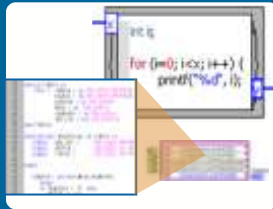
# Graphical System Design

*A Platform-Based Approach for Measurement and Control*

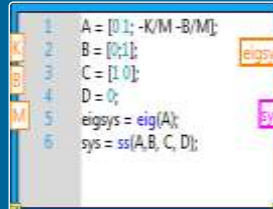
Data Flow



C/HDL Code



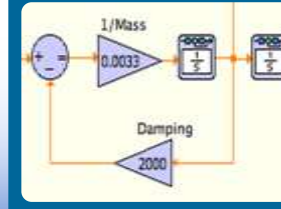
Textual Math



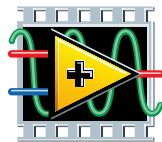
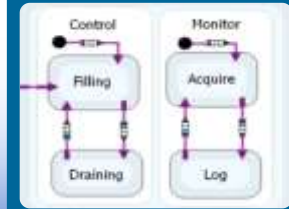
Multirate DSP



Simulation



State Chart



NATIONAL INSTRUMENTS  
**LabVIEW™**



Personal Computers



PXI Systems



NI CompactRIO



NI Single-Board RIO



NI USRP



# Graphical System Design

*A Platform-Based Approach for Measurement and Control*

Test



Monitor



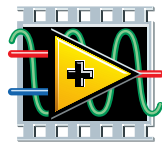
Embedded



Control



Mechatronics



NATIONAL INSTRUMENTS

# LabVIEW™



Desktops and  
PC-Based DAQ

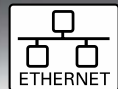


PXI and Modular  
Instruments



NI CompactRIO and  
Custom Designs

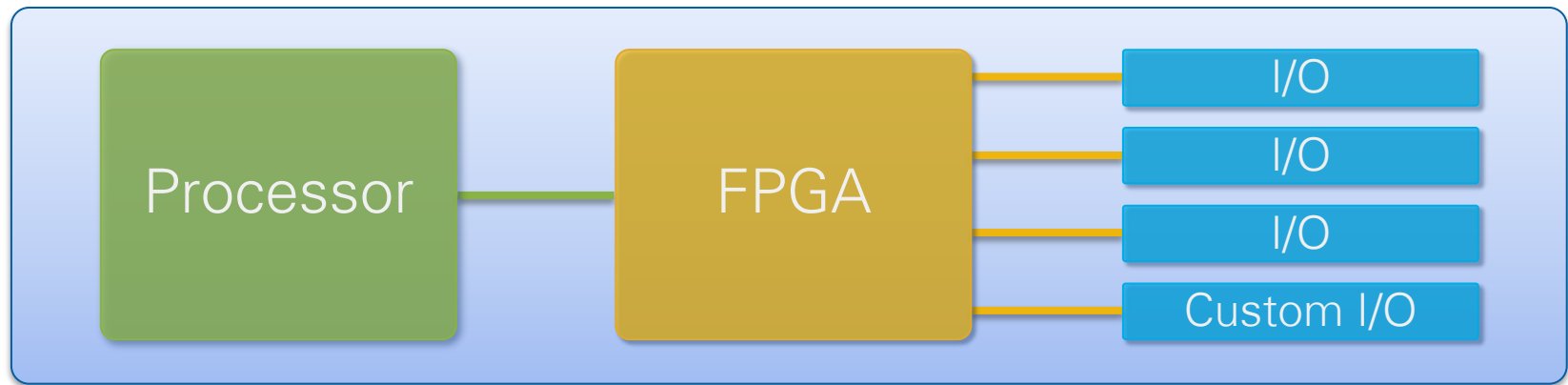
**GPB**  
IEEE-488



**HI-SPEED**  
CERTIFIED **USB**

Open Connectivity  
with 3<sup>rd</sup> Party I/O

# LabVIEW Reconfigurable I/O (RIO) Architecture



NI CompactRIO and NI Single-Board RIO

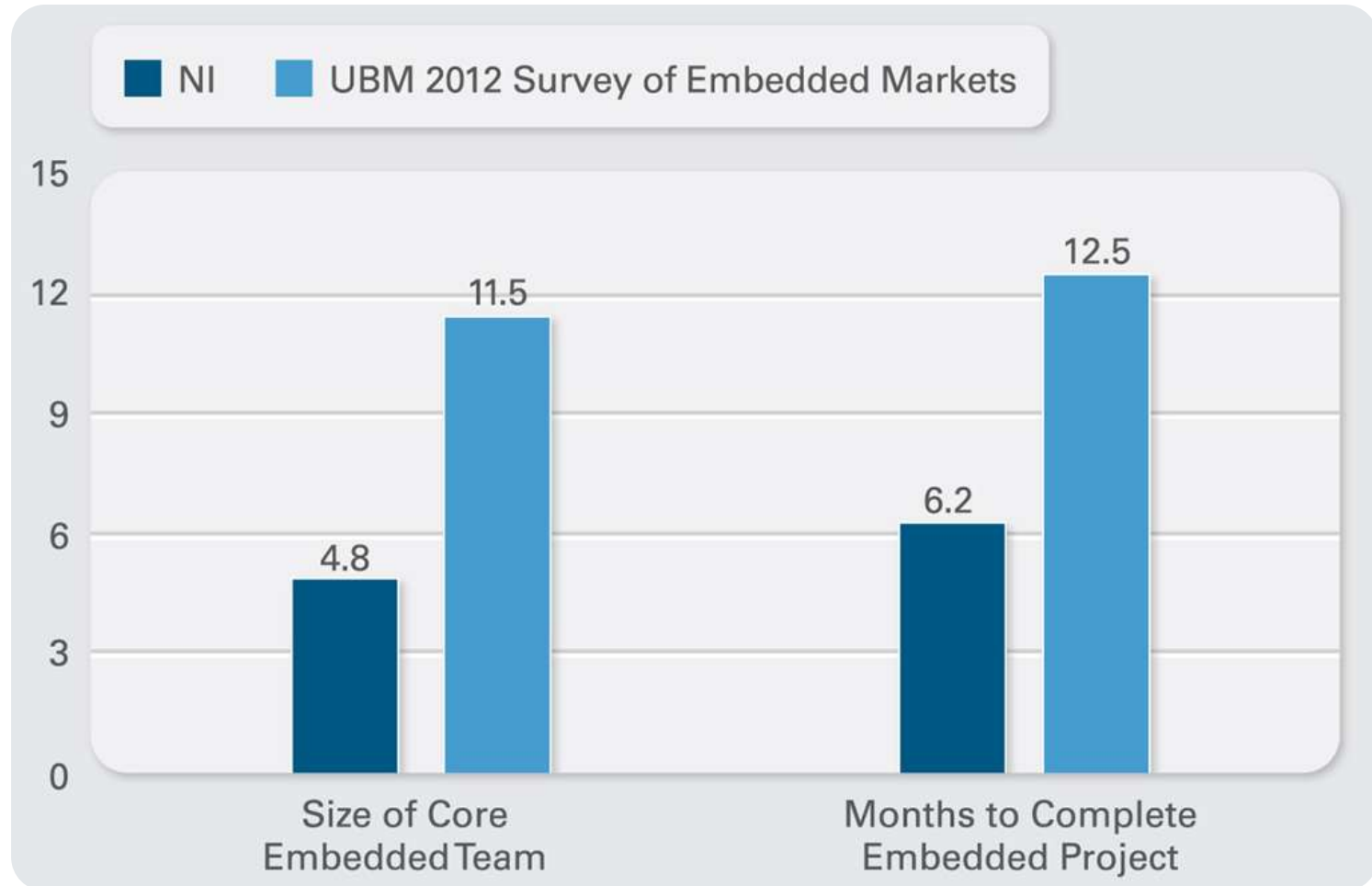


LabVIEW RIO in PXI, PC  
(NI R Series, NI FlexRIO)



# Smaller Teams Get to Market Faster

*Using the NI Graphical System Design Approach*







# Stand-Alone NI CompactDAQ

## *Embedded Measurements and Logging System*

NI LabVIEW  
System Design Software

NI DIAdem  
Data Management

NI-DAQmx  
Driver Software



External Devices  
USB, Ethernet, Serial,

>50 I/O modules  
Analog, digital, CAN, etc.

32 GB hard drive  
Log for 360 hours\*

Intel Core i7  
Dual-Core processing

Multiple OS Options  
Windows or Real-Time

High Data Throughput  
Stream up to 30 MB/s to disk





# Casper Klop

## Technical Marketing

# Wireless Everywhere



*"the proliferation of mobile devices, including smart phones and other mobile devices, will continue to be the key growth driver into the foreseeable future."*

*- Jessy Cavazos, Industry Director, Frost and Sullivan*

“The best way to predict the future is to invent it.”

Alan Kay, software pioneer

# Introducing the PXIe-5644R

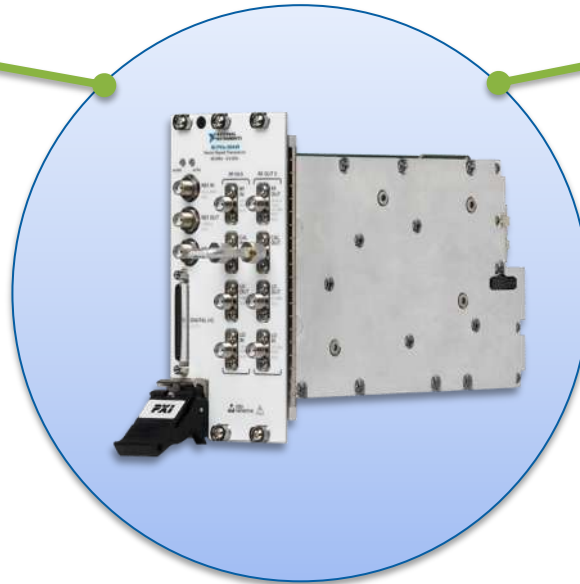
*Worlds First Software Designed Instrument*



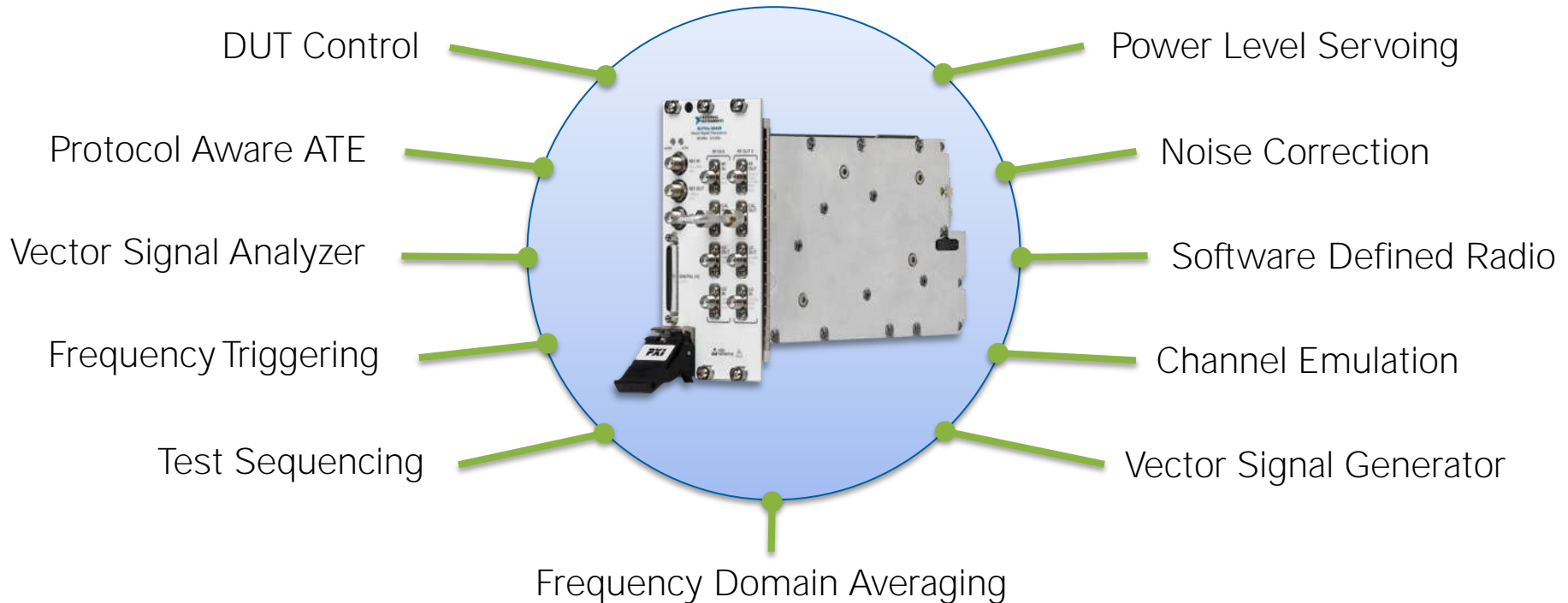
# Software-Designed Instrumentation

Vector Signal Analyzer

Vector Signal Generator



# Software-Designed Instrumentation

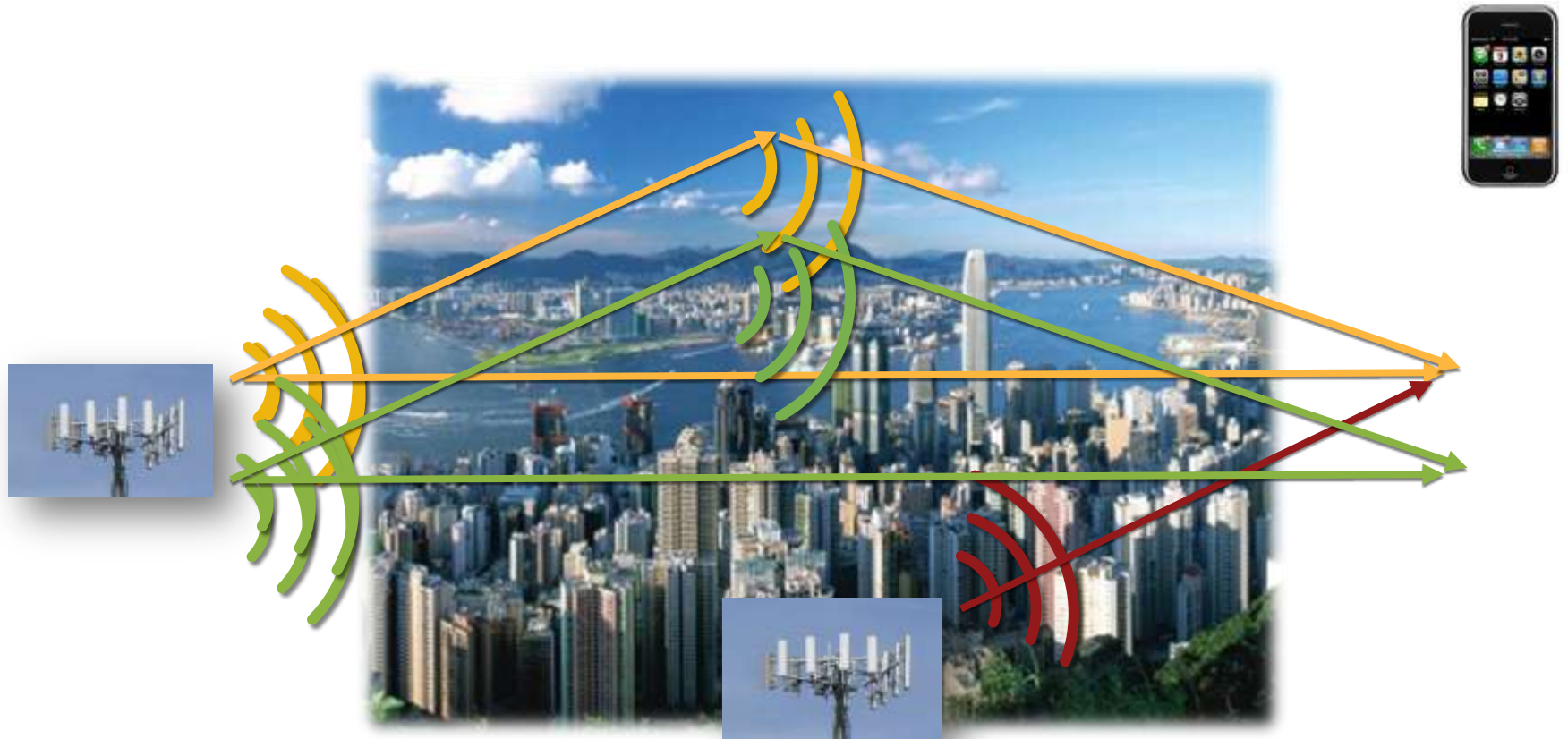




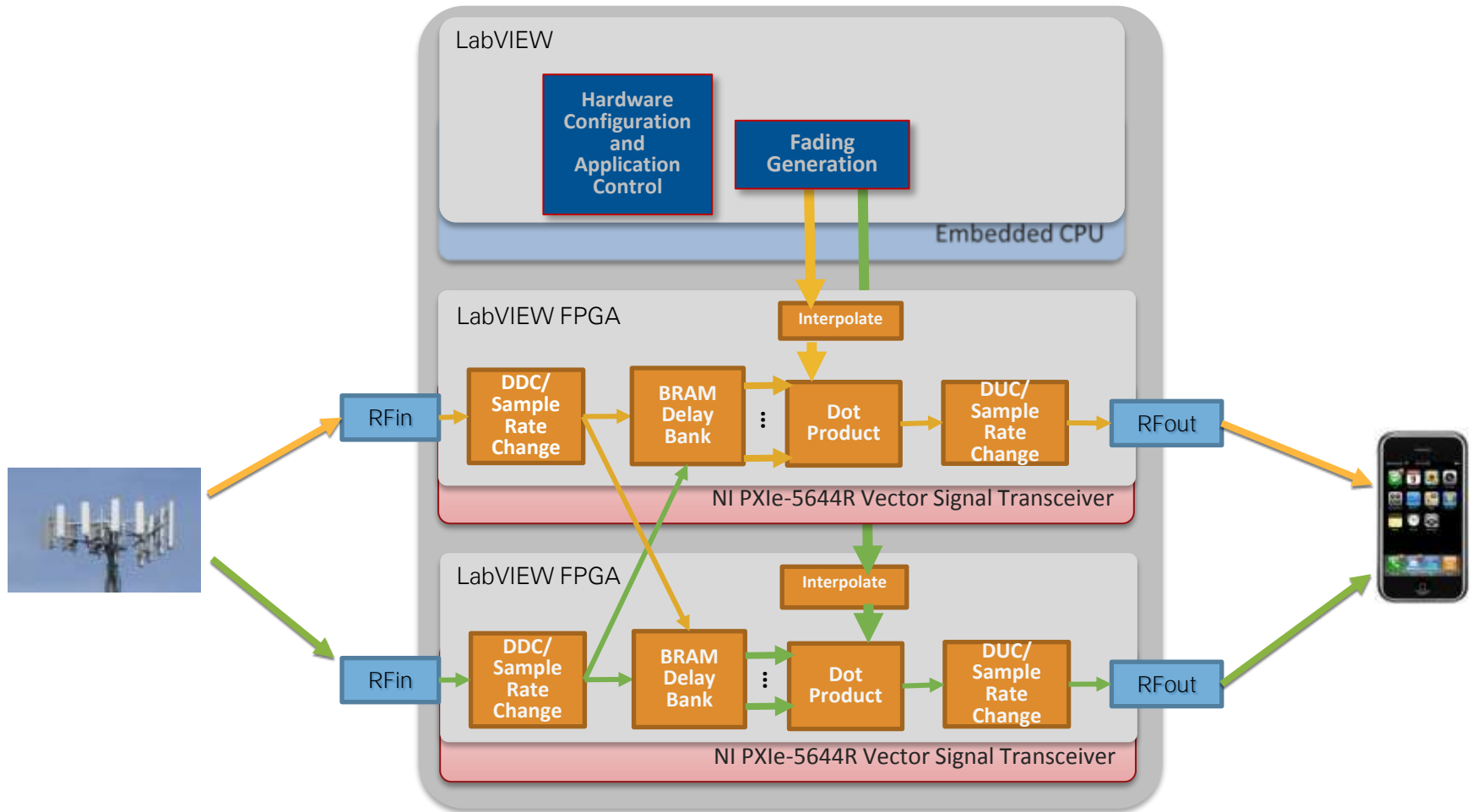
# Remco Krul

## Technical Marketing

# Radio Propagation Environment



# Real-Time MIMO Channel Emulation



# Qualcomm Atheros – Evolution of Instrumentation

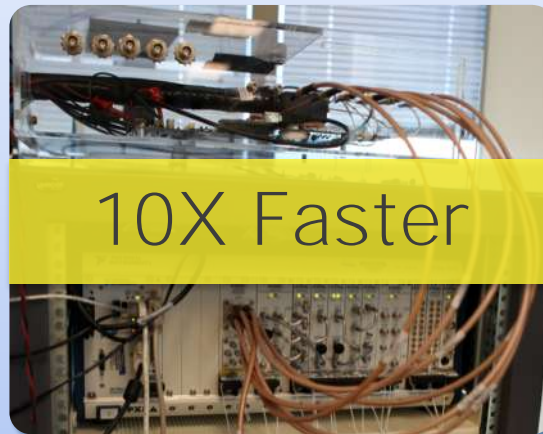
## EVM (dB) versus Average Output Power Chain

802.11a + b + g



Early 2000s  
Traditional Rack and Stack

+ 802.11n



2007  
NI PXI RF Instrumentation

+ 802.11ac

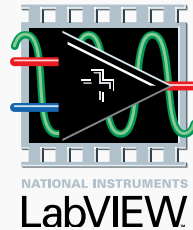


2012  
NI Vector Signal Transceiver

# Domain Experts from LEGO to Rocket Science



**LEGO** mindstorms  
education



**SPACEX**



# Enjoy your day!

