

Presentation for ISQED 2013:

System Level Perspective on Semiconductor Innovation for Intelligent Networks

Bill Swift
Vice President Engineering
Cisco Systems

March 5, 2013

Today is a Watershed Moment of Change?



The New York Times

Science

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION

ENVIRONMENT SPACE & COSMOS

Why You Won't Be the Person You Expect to Be

The End of History Illusion

Jordi Quoidbach^{1,2}, Daniel T. Gilbert^{2,*}, Timothy D. Wilson³

ABSTRACT

We measured the personalities, values, and preferences of more than 19,000 people who ranged in age from 18 to 68 and asked them to report how much they had changed in the past decade and/or to predict how much they would change in the next decade. Young people, middle-aged people, and older people all believed they had changed a lot in the past but would change relatively little in the future. People, it seems, regard the present as a watershed moment at which they have finally become the person they will be for the rest of their lives. This “end of history illusion” had practical consequences, leading people to overpay for future opportunities to indulge their current preferences.

The World Is Changing... Only Constant Is Change

BUSINESS TRANSITIONS

Growth /
Productivity
Opportunities

Speed of Innovation
New Business
Models

Changing Customer
& Employee
Experiences

Emerging Markets
Global Talent

Security, Privacy,
Regulatory
Compliance,

INTELLIGENT NETWORK

HARNESS NETWORK VALUE | DRIVE BUSINESS AGILITY | CREATE OPERATIONAL SIMPLICITY

Mobility / Video

Cloud

New Breed
-Apps
-Platforms
-Operating Systems

Big Data

Internet of
Things

TECHNOLOGY TRANSITIONS

Next Generation Internet Drivers



Traffic Growth



Device Proliferation



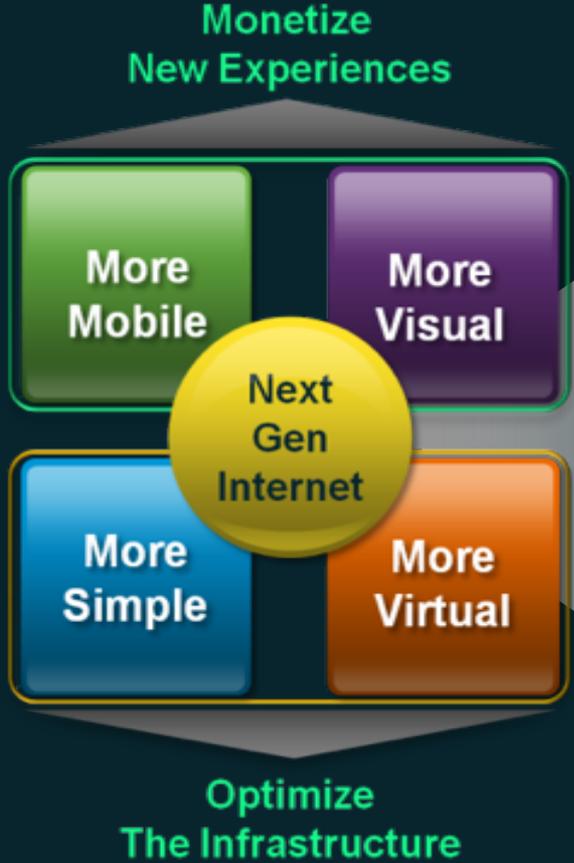
Emergence of Cloud

- From **2010 to 2015** mobile data traffic will grow at a CAGR of 92%
- By **2014** video will quadruple all IP traffic
- By **2015** the amount of content traversing the Internet annually will be 540,000 times the 2003 amount
- By **2015** video-on-demand traffic will triple
- By **2020** 50 billion devices will be connected to the Internet
- By **2020** 30% of all data will live in or pass through the cloud

Source: Cisco VNI forecast 2011 and IBSG

Next Generation Internet

Opportunities for Operators



Next Generation Internet Technology Investment



Video SW Solutions



Mobile SON Management



Cloud Solution Management



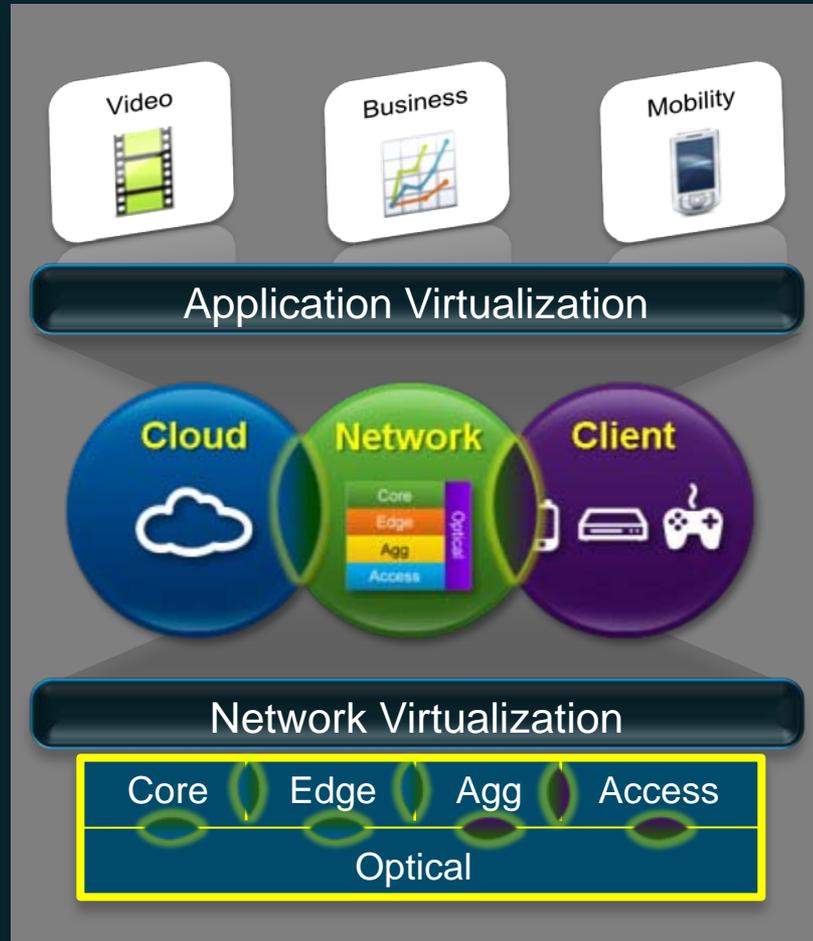
Network Automation Intelligence



Security for VMs



Virtual Network Overlay



Mobile Provisioning



Location Data Analysis



Real Time Data Analysis



Policy Control Management



Network Security Intelligence



Data Center Automation

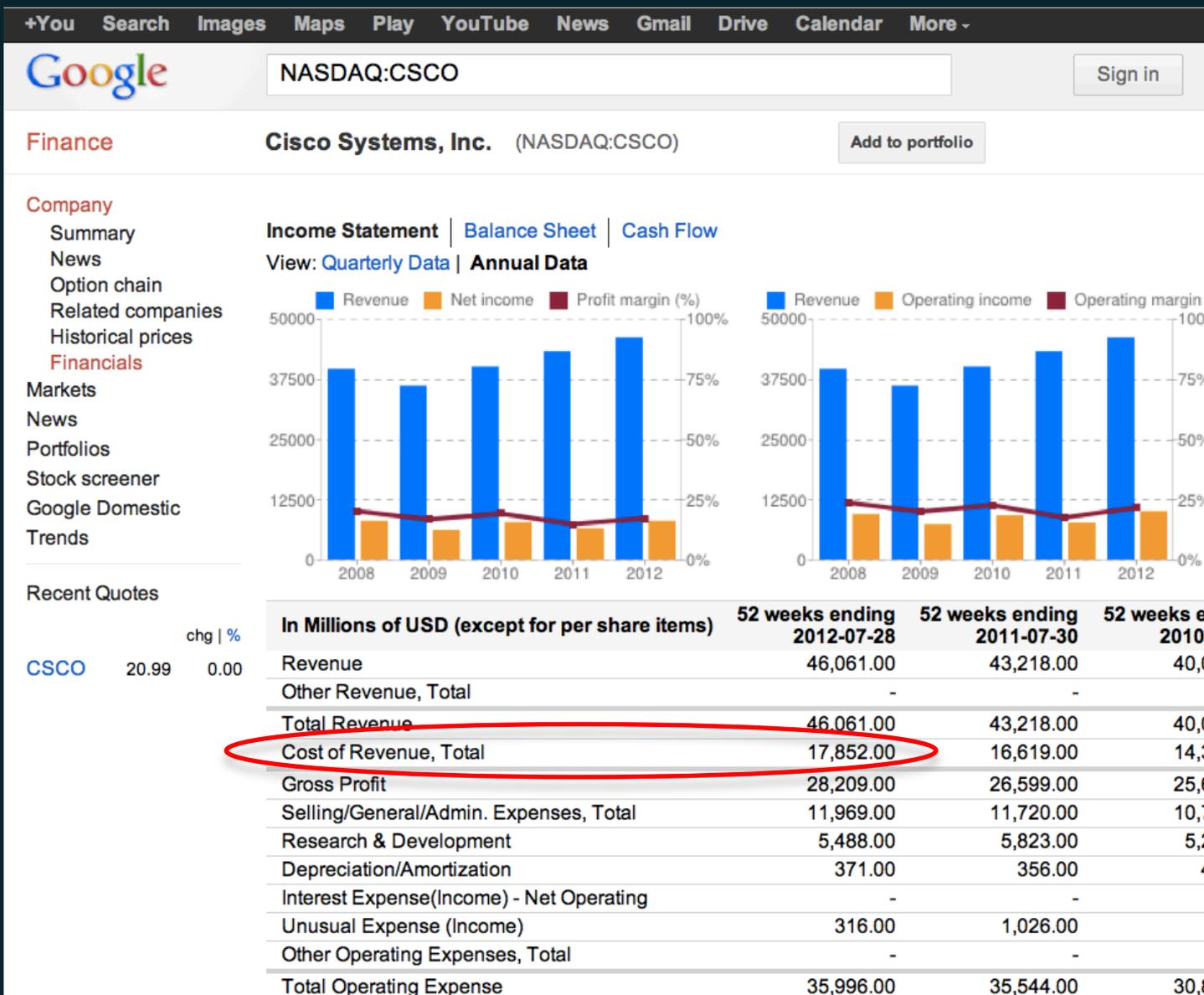


Silicon Photonics

System and Semiconductor Innovation

- Importance of Semiconductor Technology at Cisco and the Diversity of our Requirements
- Transition from Programmable to Intelligence in Design
- Advancing Design Innovation thru Modeling
- Technology and Business Innovation is Key to Delivering Customer Value

Importance of Semiconductor Technology at Cisco



Importance of Semiconductor Technology at Cisco

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Google Sign in

Finance

Company

- Summary
- News
- Option chain
- Related companies
- Historical prices
- Financials

Markets

News

Portfolios

Stock screener

Google Domestic

Trends

Recent Quotes

chg | %

CSCO 20.99 0.00

Cisco Systems, Inc. (NASDAQ:CSCO)

ABSTRACT – SEMICONDUCTOR VALUE CHAIN

IHS iSuppli
Semiconductor Spend Analysis

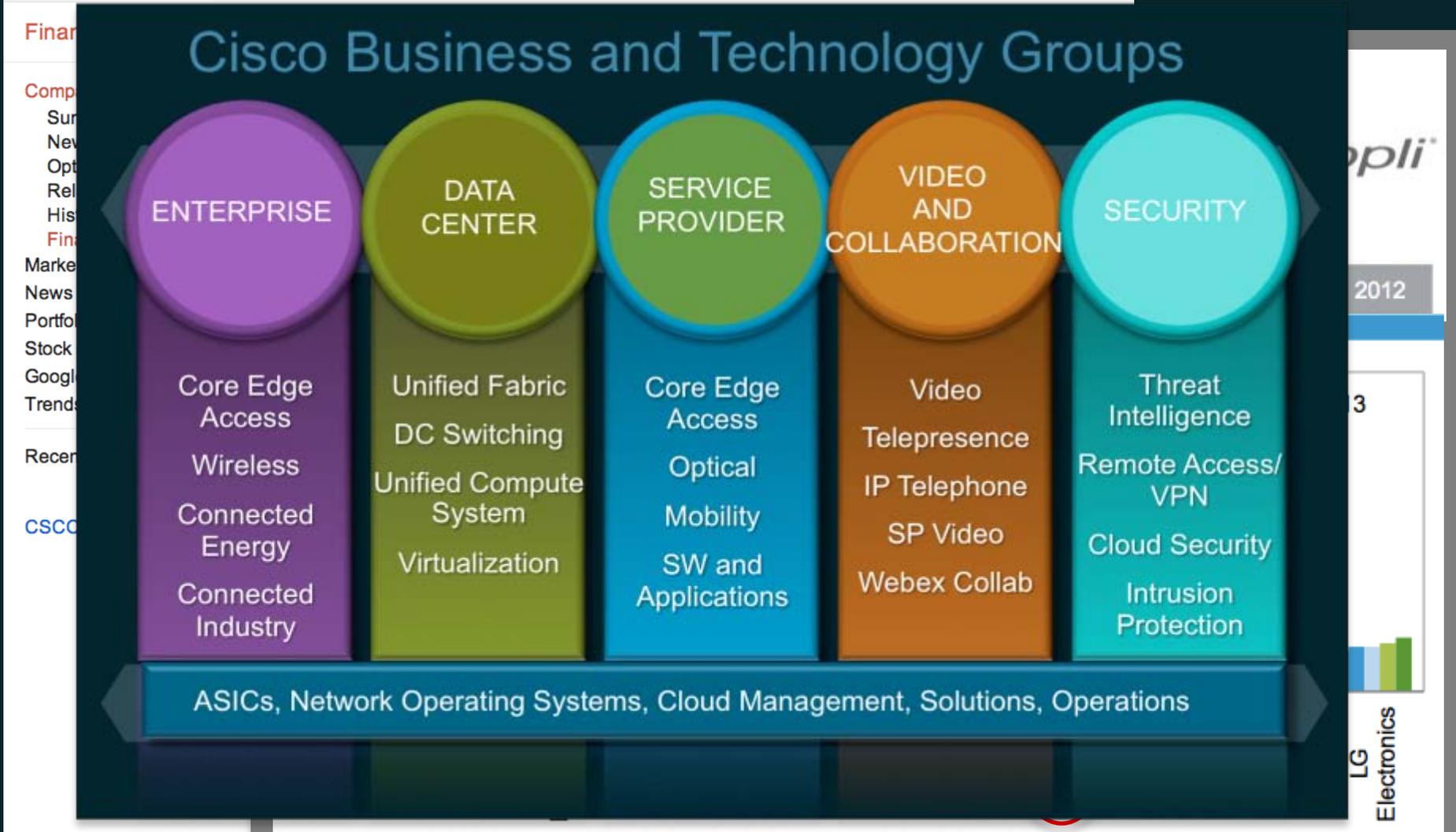
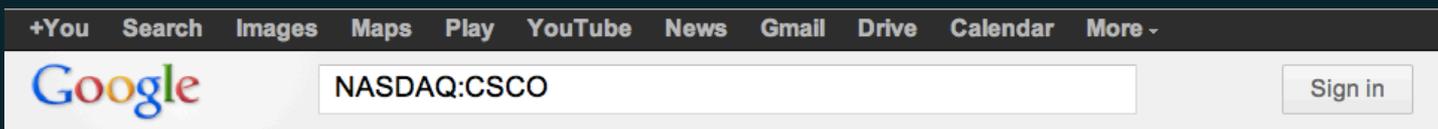
IHS has acquired iSuppli

Wenlie Ye, Analyst 2012

Top 10 OEM Semiconductor Buyers

Company	2009	2010	2011	2012	2013
Apple	\$9,500	\$16,000	\$23,000	\$27,000	\$29,000
Samsung Electronics	\$10,500	\$14,000	\$16,000	\$17,000	\$18,000
Hewlett-Packard	\$10,500	\$14,500	\$14,000	\$13,000	\$13,000
Dell	\$8,000	\$11,000	\$10,500	\$10,000	\$9,500
Panasonic	\$5,500	\$7,500	\$8,500	\$8,500	\$8,500
Sony	\$6,500	\$8,500	\$8,500	\$8,500	\$8,500
Cisco Systems	\$5,500	\$7,500	\$6,500	\$6,500	\$6,500
Nokia	\$8,000	\$8,500	\$6,500	\$5,000	\$5,000
Toshiba	\$3,500	\$5,000	\$5,000	\$5,500	\$5,500
LG Electronics	\$4,500	\$5,000	\$5,000	\$5,500	\$6,000

Importance of Semiconductor Technology at Cisco



System and Semiconductor Innovation

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- Advancing Design Innovation thru Modeling
- Technology and Business Innovation is Key to Delivering Customer Value

Programmable to Intelligence in Design

MIPS
TECHNOLOGIES

ALTERA

XILINX[®]



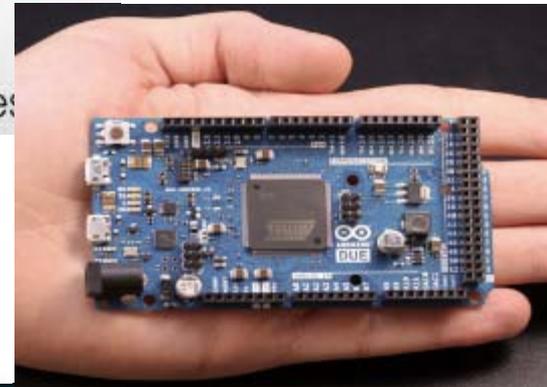
ARM [®] POWERED

CISCO [™]
QuantumFlow Proces

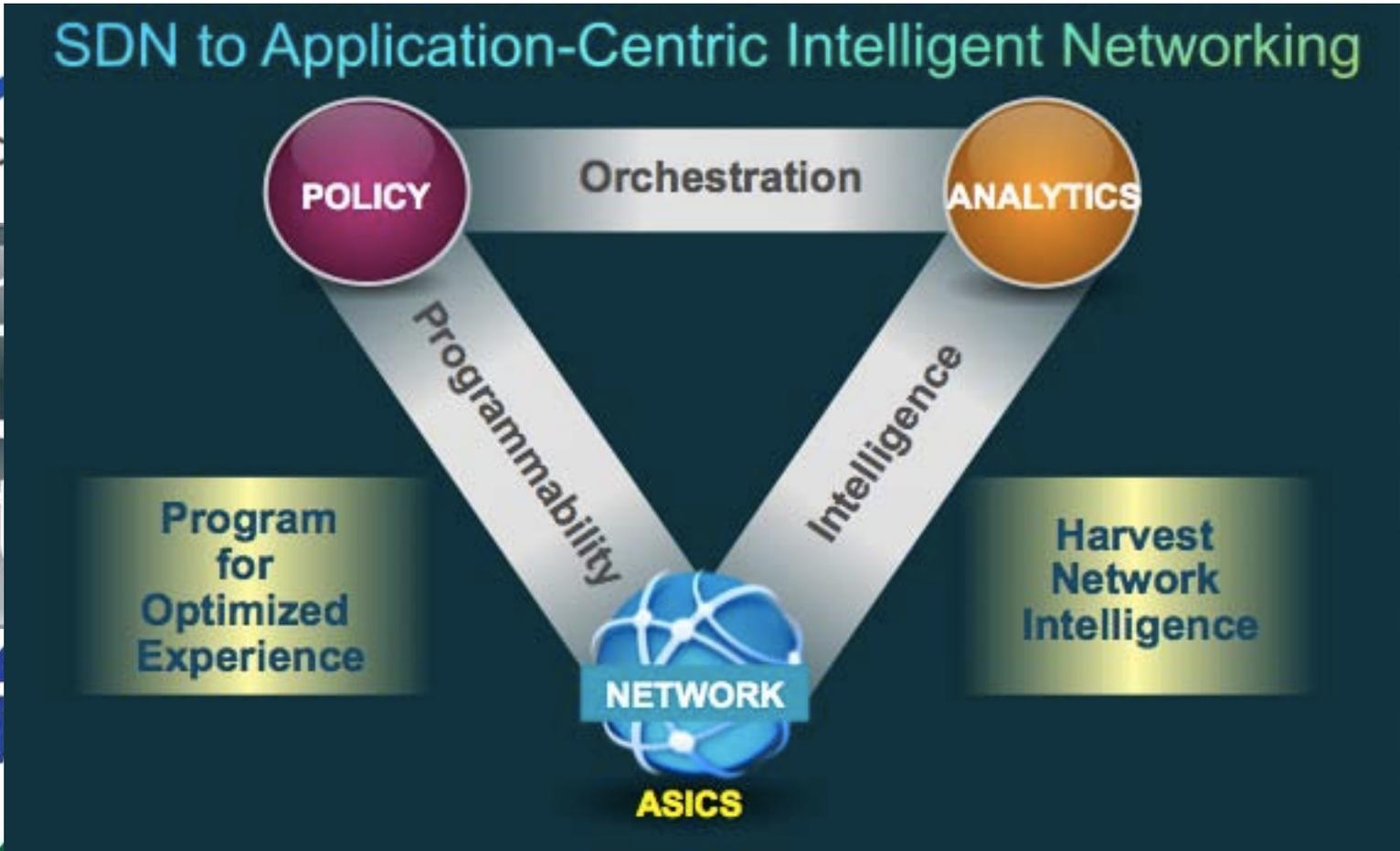
ARDUINO

tensilica

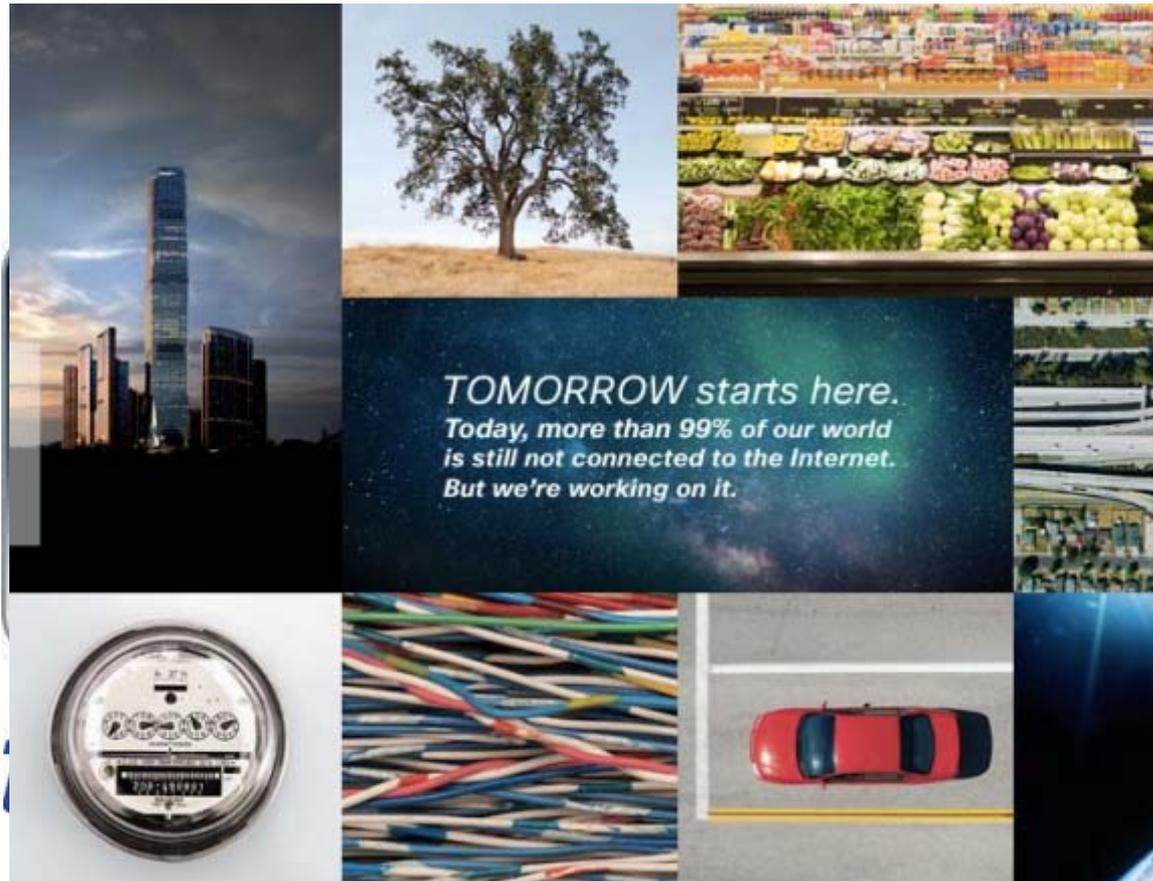
PowerPC[™]



Programmable to Intelligence in Design



Programmable to Intelligence in Design



INTERNET OF EVERYTHING

Digitize Society's
Nervous System
(Internet of Things)

Sensors Everywhere
Machine-to-Machine
Pervasive Intelligence
Ubiquitous Automation

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Advancing Design Innovation thru Modeling

THE WALL STREET JOURNAL.
 U.S. EDITION | Saturday, August 20, 2011

Home | World | U.S. | New York | Business | Tech | Markets | Market Data | Opinion

Arts & Entertainment | Cars | Books & Ideas | Fashion | Food & Drink | Sports | Travel | Health

TOP STORIES IN LIFE & CULTURE

1 of 12 **Take Monday Off: Houston**

2 of 12 **Best Hotel Feature Goes to...**

ESSAY | August 20, 2011

Why Software Is Eating The World

Article | Video | Comments (443)

Email | Print | Save | Facebook | Twitter | LinkedIn

By **MARC ANDREESSEN**

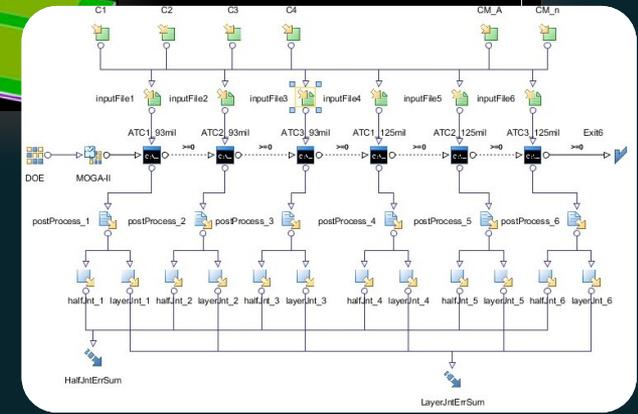
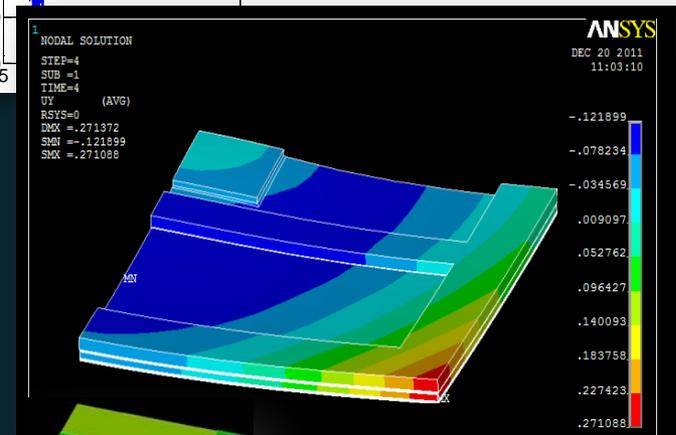
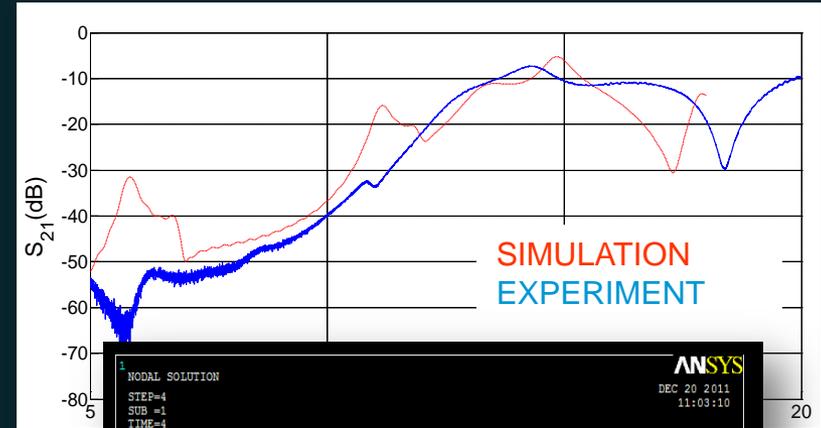
This week, Hewlett-Packard (where I am on the board) announced that it is exploring jettisoning its struggling PC business in favor of investing more heavily in software, where it sees better potential for growth. Meanwhile, Google plans to buy up the cellphone handset maker Motorola Mobility. Both moves surprised the tech world. But both moves are also in line with a trend I've observed, one that makes me optimistic about the future growth of the American and world economies, despite the recent turmoil in the stock market.



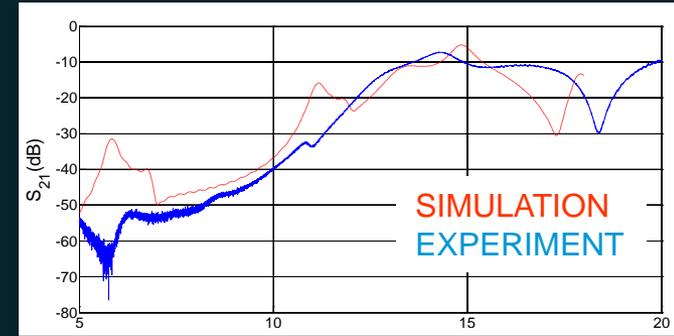
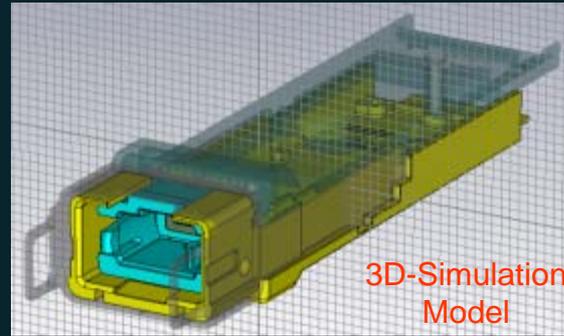
In an interview with WSJ's Kevin Delaney, Groupon and LinkedIn investor Marc Andreessen insists that the recent popularity of tech companies

In short, software is eating the world.

More than 10 years after the peak of the 1990s dot-com bubble, a dozen or so new Internet companies like Facebook and Twitter are sparking controversy in Silicon Valley, due to their rapidly growing private market valuations, and even the occasional



Modeling for EMC Simulation



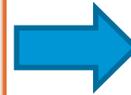
Simulation Tools



CST MWS



Ansys HFSS

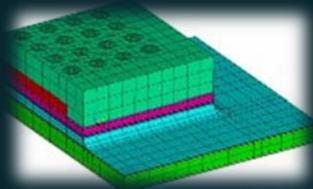


Test Equipment



Reverberation Chamber

Numerical Modeling – Physics to Product For Silicon Photonics



Mechanical Build Model

Thermal

Multiphysics

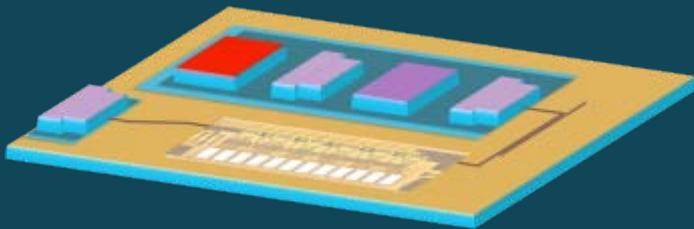
Fluid

Cyclone™—HPC Cloud results on demand™

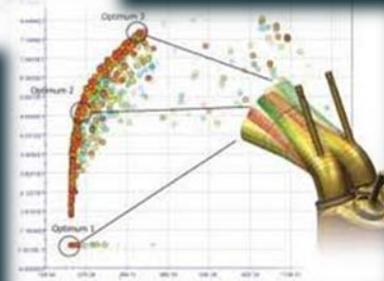


Cloud Computing

Response Surface Analysis



Silicon-to-System modeling allows us to capture interactions and **optimize and innovate design**



Optimization [Multi-Objective Genetic Algorithms (MOGA), Monte Carlo Simulations]



Mathcad imp

Design Guides for End Users

Center of Excellence for Numerical Analysis (CENA)
Component Quality and Technology (CQT)
mudasir.ahmad@cisco.com

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18

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Business Models and Innovation

Feb 7, 2013, 8:55am PST | **UPDATED:** Feb 11, 2013, 2:28pm PST

Disruption guru Christensen: Why Apple, Tesla, VCs, academia may die



Cromwell Schubarth
Senior Technology Reporter-
Silicon Valley Business Journal
Email | Twitter | Google+

Harvard business professor **Clayton Christensen** literally wrote *the* book on technology disruption, and he thinks Apple, Tesla Motors, venture capitalists and most of the nation's colleges and universities should be afraid.

The author of *The Innovator's Dilemma* said Wednesday that all of them could be killed by less advanced competitors in the same way that many once dominant technology companies have been in the past.

Christensen shared his theories about how innovative giants are felled and replaced by relatively less sophisticated rivals, speaking to an attentive crowd of young entrepreneurs and funders at the Startup Grind conference in Mountain View on Wednesday.

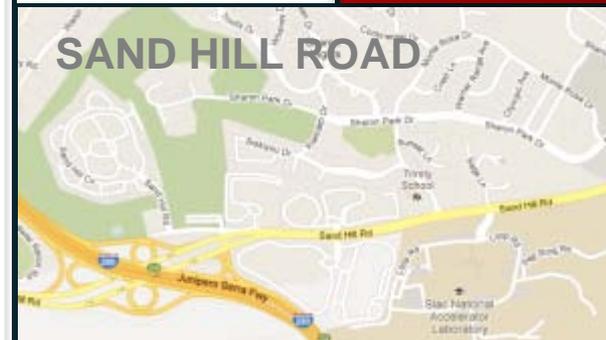


[+ Enlarge](#)

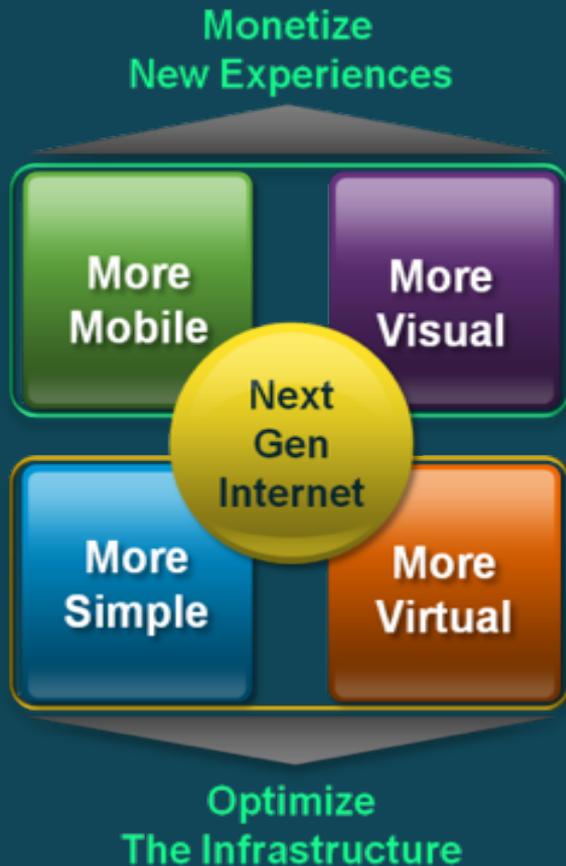
Clayton Christensen, Harvard Business School professor and author of *The Innovator's Dilemma*, says Tesla, Apple, VCs and universities all face big disruptive threats.

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Accelerating Innovation for Customer Value



SEMICONDUCTOR TECHNOLOGY

TECHNOLOGY:

Silicon Photonics
Interposers and Substrates
Accelerated Modeling and Tools
Silicon Process Technology
Next Gen Memory Technology
Assembly and Test

BUSINESS/PARTNERSHIP:

Known Good Die Ecosystem
Tool and IP Licensing
IP discovery and Ownership
Open Innovation
Venture Capital Models
Standards and Open Source

CUSTOMER VALUE



INNOVATION

Final Thoughts...

The impact of the internet on our lives is **accelerating** and the innovation required to build these networks is accelerating with it.

As an industry and at Cisco, we continue to **embrace innovative technologies** and search for more disruptive technology innovations to keep pace with the challenges and demand.

ISQED: bridges the gap among Electronic/Semiconductor **ecosystem** providing electronic design tools, integrated circuit technologies, **semiconductor technology**, packaging, assembly & test to achieve design quality.

This is an Exciting Time to be an Engineer!!!



TOMORROW starts here.