SYNOPSYS®
Silicon to Software™

At The Dawn Of Industry 4.0

Design ~~Will~~ Makes Everything Different!

Victor Grimblatt

Design Group, Synopsys

Santiago de Chile; Source: ISS030-E-238185

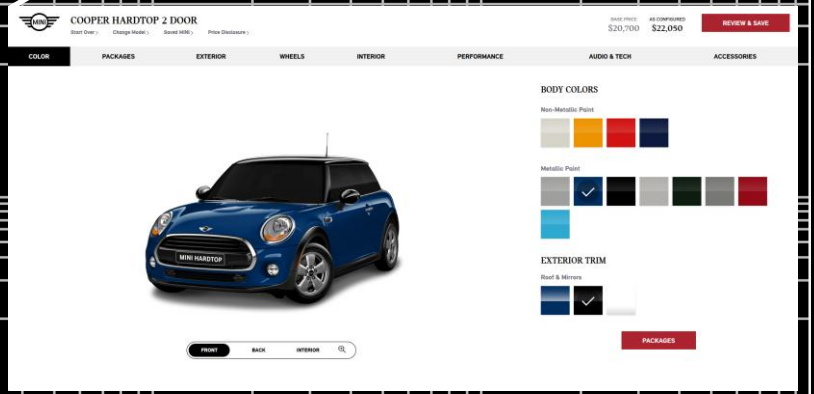
Industry 1.0 Through 3.0 Explained

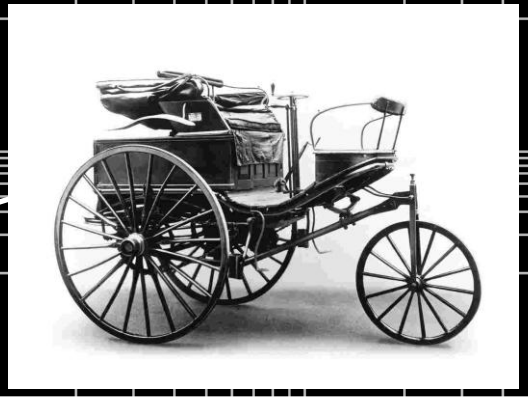
From (1.0) Benz Patent-Motorwagen (25 Configurations, 25 Cars Manufactured)
To (3.0) Mini (10 Million Configurations, 3 Million Cars Manufactured)

# of Cars Manufactured

Industry 2.0
1 Configuration
16M Manufactured

Industry 3.0
10M Configurations
3M Manufactured





Industry 1.0
25 Configurations
25 Manufactured

# of Different Configurations

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Industry 4.0 Explained

Durum Wheat Semola + Water + 3D-Printer at Home + 3D-Design from the Internet

Indeed, a Great Deal of Opportunity!

Source: https://www.youtube.com/watch?v=oz6D1FXwuvA, Barilla, EXPO 2015

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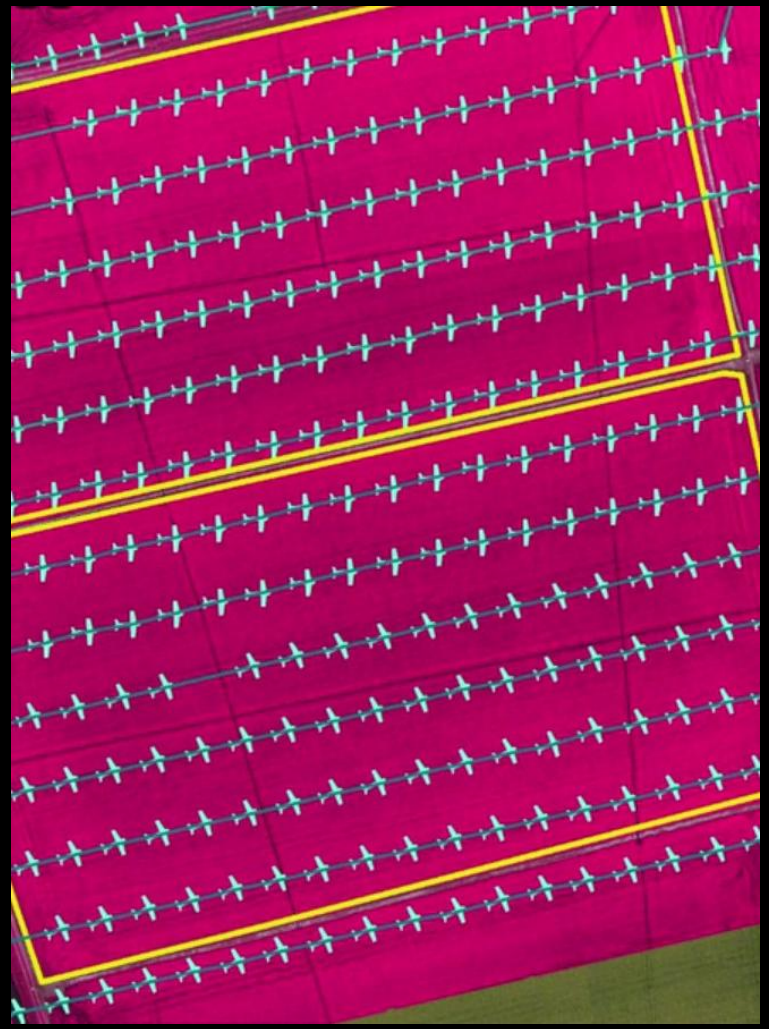
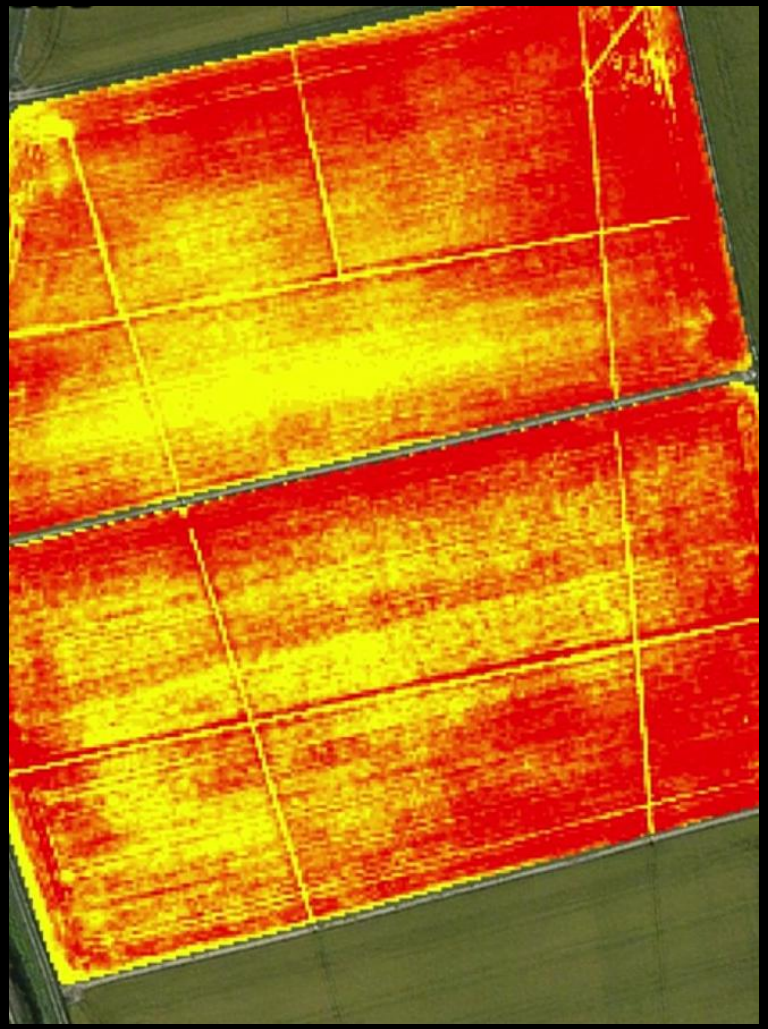
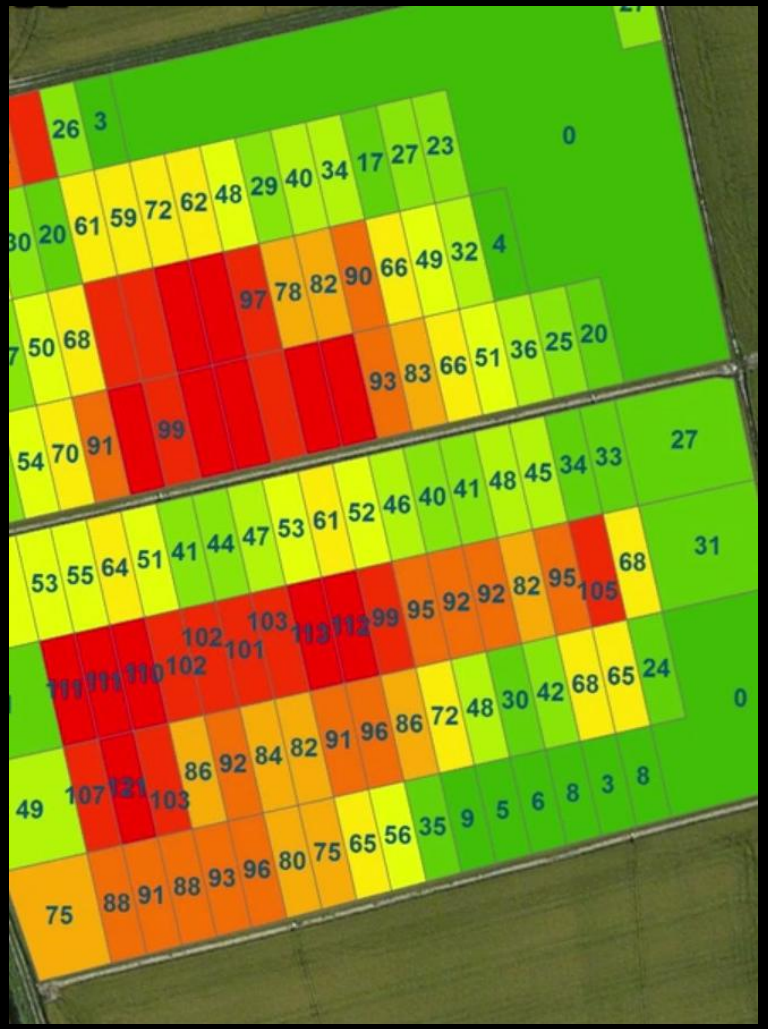
A Great Deal Of Opportunity Ahead!

Agriculture 4.0: 30% Fertilizer Reduction, Higher Yield, Better Quality

IR Camera + MCU + RF +… Airborne + Variable Rate Fertilization







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Source: Salt & Lemon Srl + A.C.R. Progetti Srl + Studio Associato Barbieri & Rognoni, 2016

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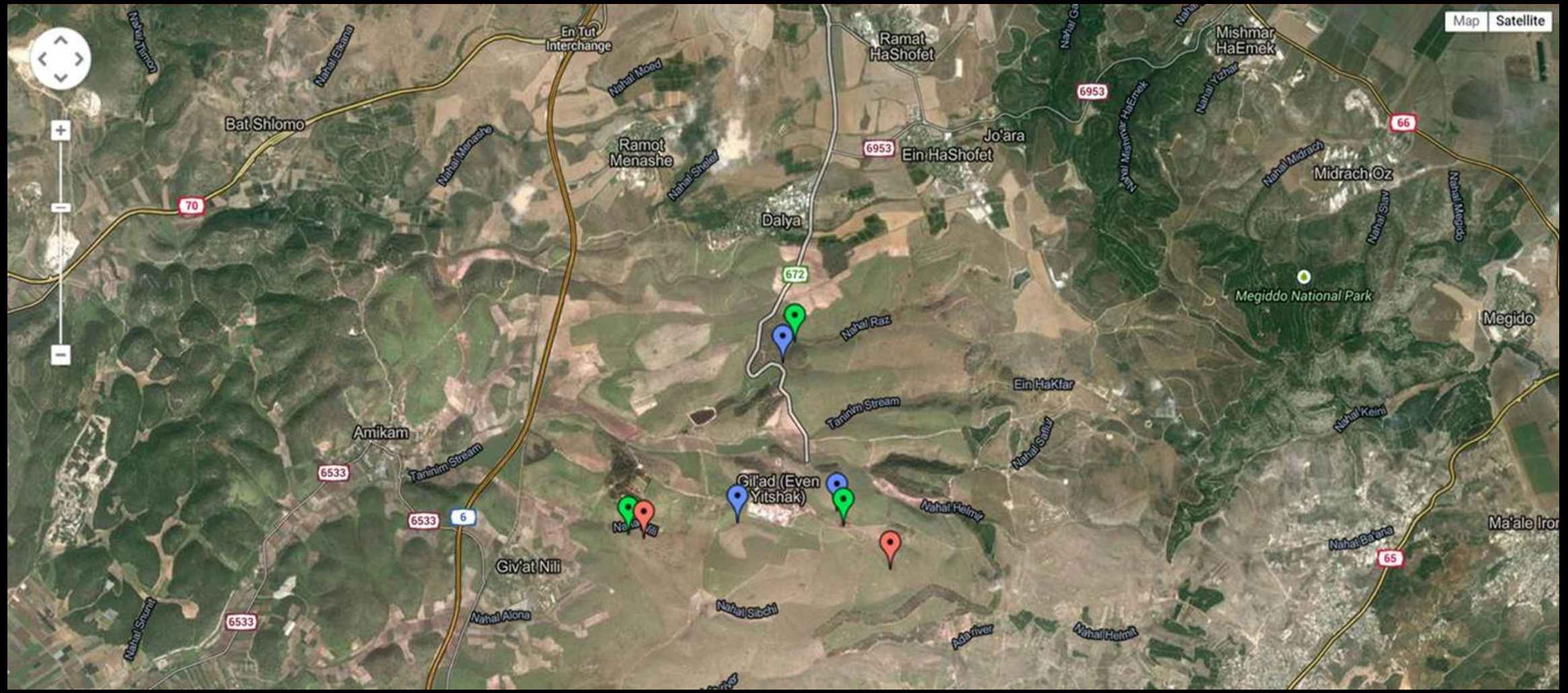
A Great Deal Of Opportunity Ahead!

Breeding 4.0: Monitoring Cows near Gal'ed (Even Yitzhak), Israel

MCU + Sensors + GPS + RF + Solar Panels +… Google Maps



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Courtesy of A. Gat, Moonitor Cows, Israel, 2015

A Great Deal Of Opportunity Ahead!

Mining 4.0: Autonomous Haulage System (Driverless Trucks)

~ 70 Trucks, > 4 Million Kilometers Driven, > 400 Million Tons Iron Ore Hauled

Pilbara, Western Australia; Source: G. Lilleyman, Rio Tinto, 2015

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A Great Deal Of Opportunity Ahead!

Mining 4.0: AutoHaul® (Driverless Trains)

2,000 Km, 190 Locomotives, > 350 Million Tons Iron Ore Hauled per Year

Pilbara, Western Australia; Source: G. Lilleyman, Rio Tinto, 2015

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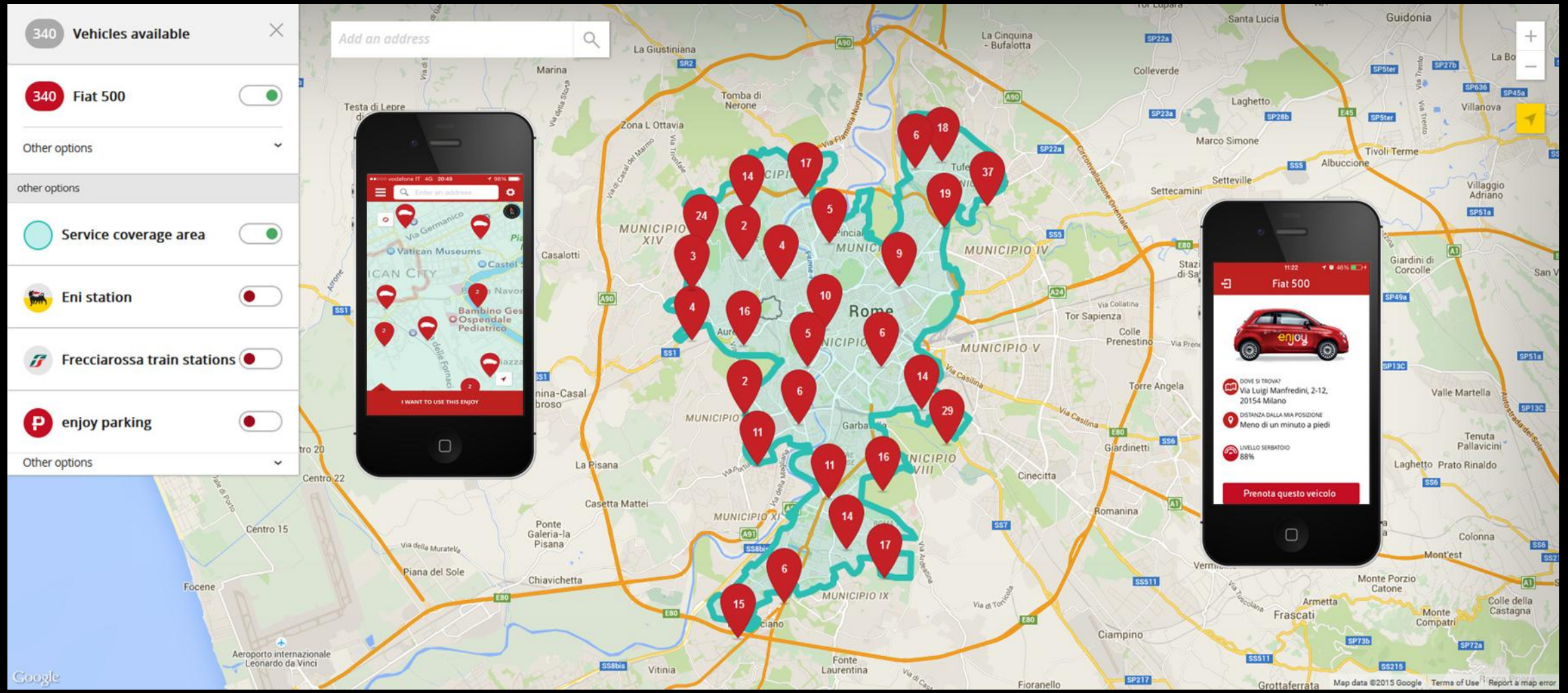
A Great Deal Of Opportunity Ahead!

Transportation 4.0: Car Sharing in Rome, Italy (1 Car per 100 Customers)

Enjoy Is in the Cloud, Your Smartphone App Is on the Edge, and the Car Is the "Thing"



Source: Enjoy, 2015

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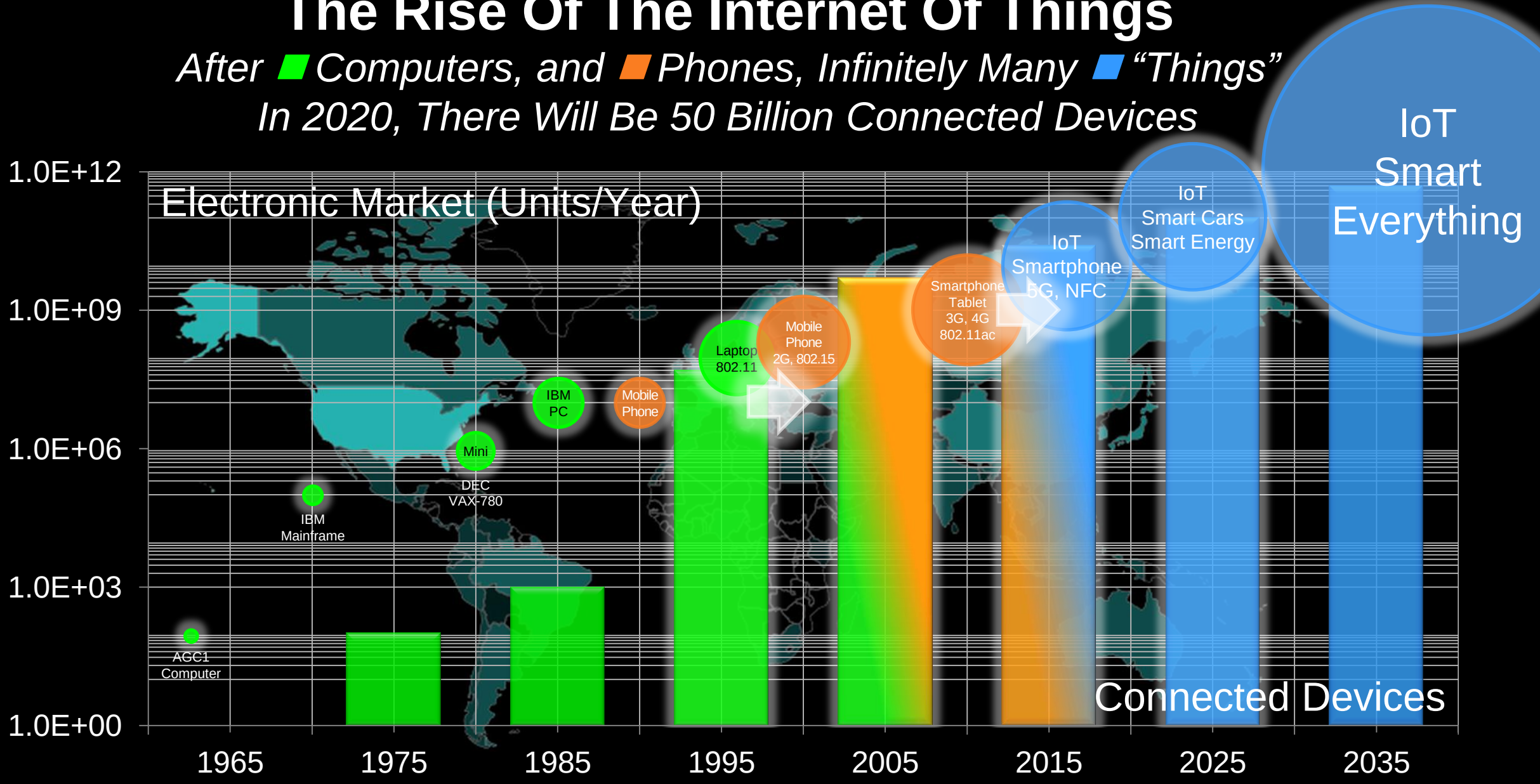
The Rise Of The Internet Of Things

After Computers, and Phones, Infinitely Many "Things"

In 2020, There Will Be 50 Billion Connected Devices



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Source: Wikipedia, 2015; Cisco Systems, VNI Forecast 2014

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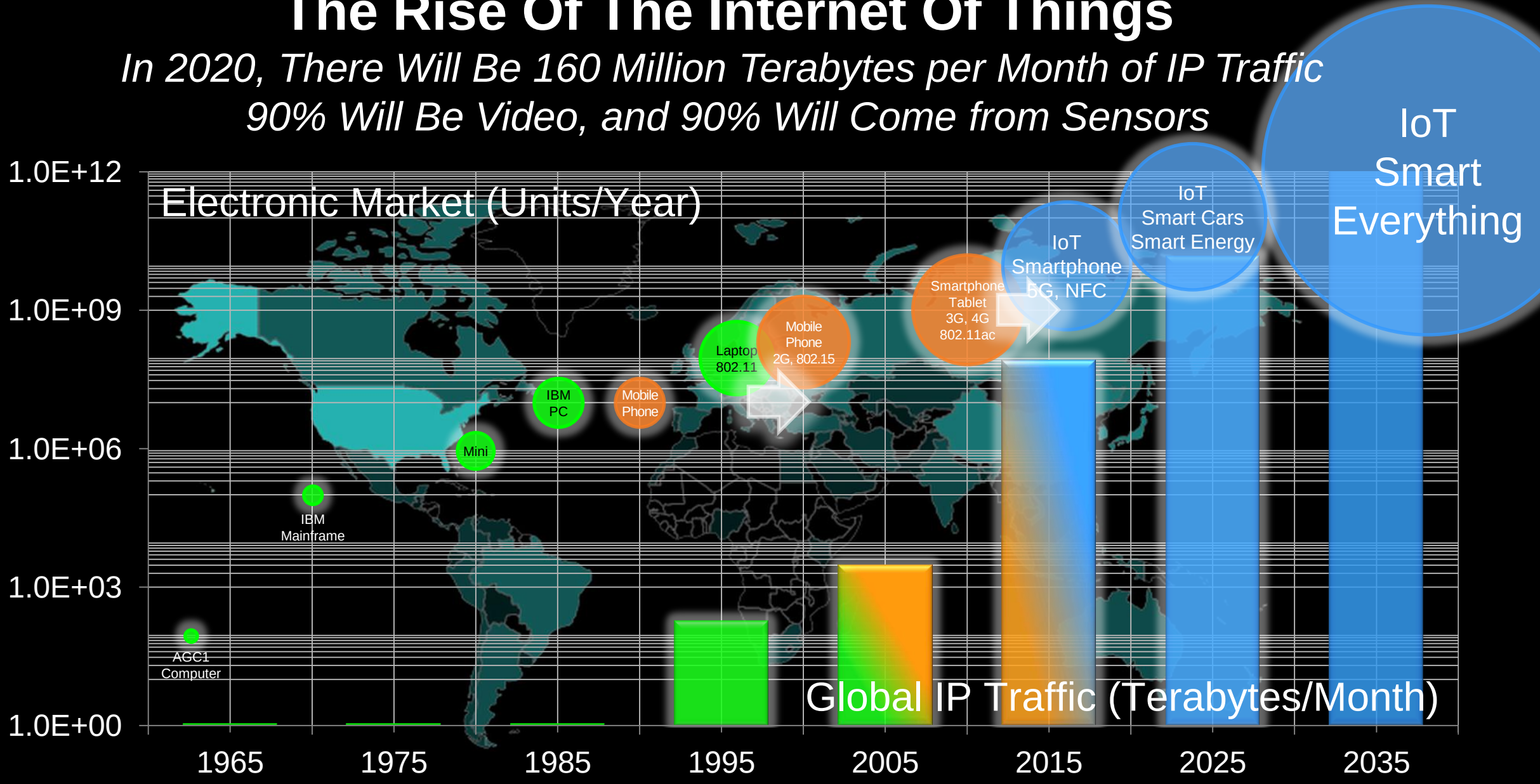
The Rise Of The Internet Of Things

In 2020, There Will Be 160 Million Terabytes per Month of IP Traffic
90% Will Be Video, and 90% Will Come from Sensors



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Source: Wikipedia, 2015; Cisco Systems, VNI Forecast 2015; Huawei, GCI Forecast 2014

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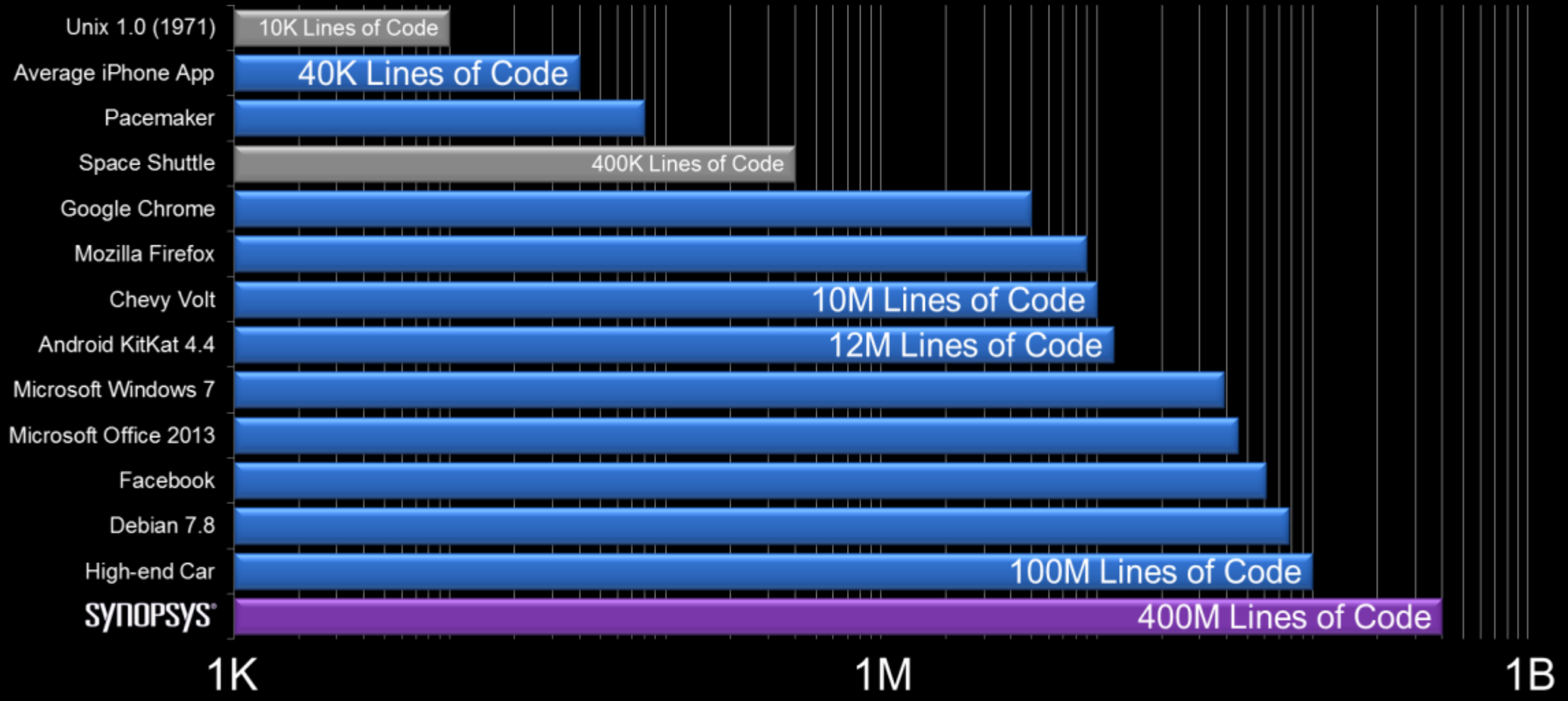
Tomorrow Will Be Nothing Like Today!

Besides Hardware, [Embedded] Software…

Some Codebase Size Sample… at $10-20 per Line of Code



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Source: www.informationisbeautiful.net, 2014; Synopsys Research, 2015

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