

Simplifying the “Internet of Things”

“If you can’t explain it simply, you don’t understand it well enough.” – Albert Einstein

What is most overlooked in Einstein’s quote is most people would rather settle on an explanation that is simplest to explain, rather than challenge themselves to try and simply explain something complex or unknown.

Understanding the background to connecting places, people & “things”

The Networked Society is an extraordinary revolution that is transforming our world. It has created new fads such as “Internet of Things” (IOT) and Big Data Analytics.

Before the invention of the telephone the only way for people to communicate with each other was through F2F communication, word of mouth and information written in a letter sent to someone else. This type of communication could take from days to months to deliver a message to the intended receiver.

This was all changed with the invention of the telephone. It took about 100 years for the telephone to connect One Billion Places. Then with the advancements in telephony, wireless networks were able to connect 5 Billion people in about 25 years. The next evolution, “IOT” is estimated to connect 50 Billion devices in as little as 15 years.

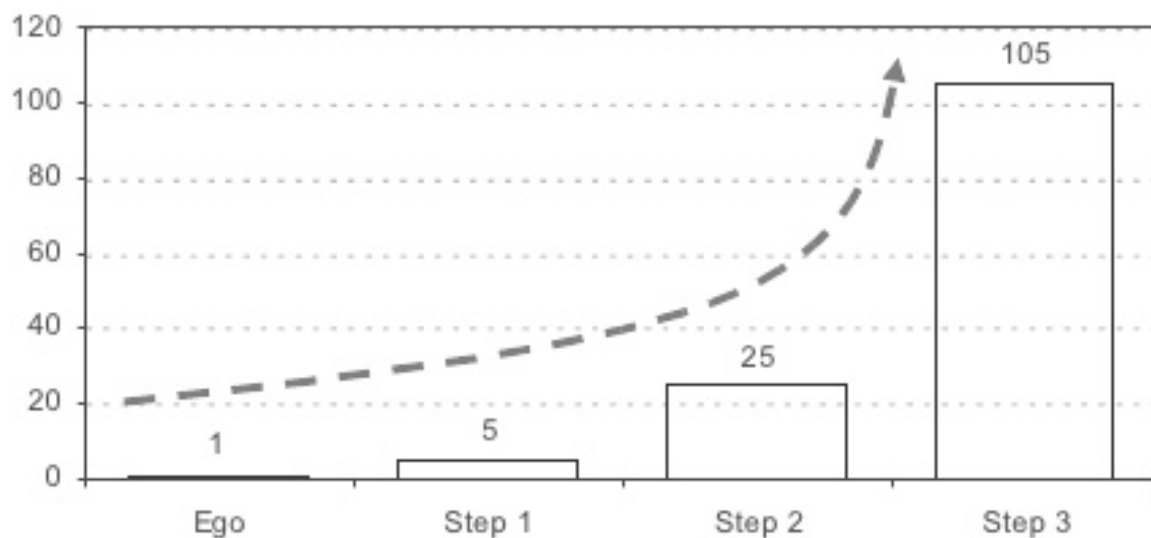


“Internet of Things” will revolutionize our lives and business models. When smart products are connected, we can have a connected life that opens doors to new business opportunities and disruptive ideas involving things yet to be named, and markets yet to be discovered.

Understanding the Big Picture of IOT

Simple can be harder than complex: You have to work hard to get your thinking clean to make it simple. But it's worth it in the end because once you get there, you can move mountains.” – Steve Jobs “

Sometimes it is best to take a step back and look at the big picture. The easiest way to simplify something of great complexity is to understand the “connectors” that can simplify the total amount of information presented.



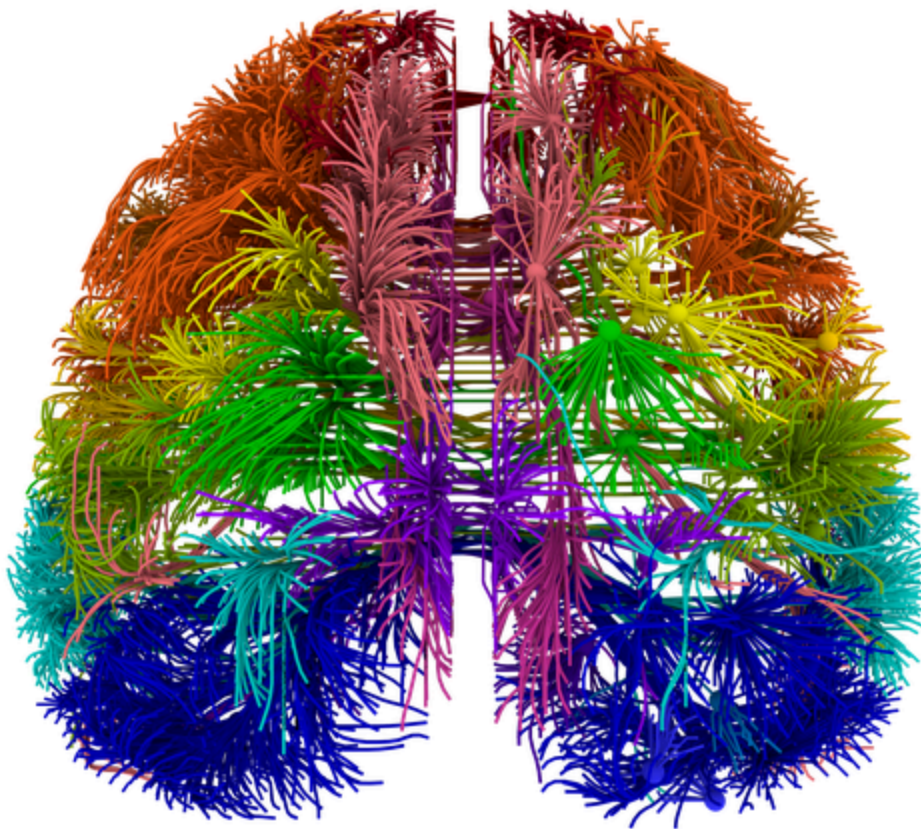
If you look at the exponential growth of “things” connected, you will see that people and places were the first connections to help lead us to the growth of eventually 50 billion devices.

- Person – Peer to Peer Communication
- Places (Wireline) – One Person could connect to 1 Billion Places
- People (Wireless) – One Person could connect to 5 Billion People
- Devices (IOT) – One person could connect to 50 billion Devices

To connect any person, place or device an actual person has to be involved for anything to connect thereafter. This means before wireless, 5 billion people were able to connect to each other by traveling to the 1 billion fixed locations in the world. (Places) Then with the introduction to the wireless devices, 5 Billion people were able to connect through the 1 billion places scattered throughout the network. (Wireless cell sites)

Comparing IOT to the human brain

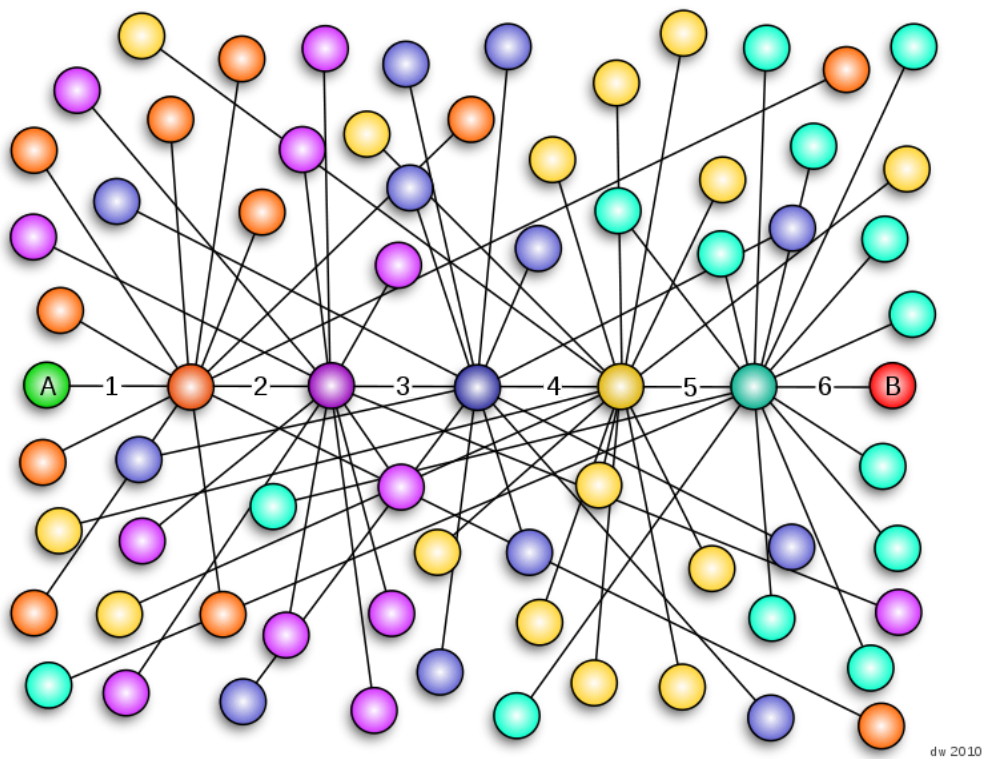
“The human brain has 100 billion neurons connected to 40 thousand individual connections. (called synapses) Sitting on your shoulders is the most complicated object in the known universe.” Michio kaku



[The Importance of Connections - Lydia Denworth](#)

Six Degrees of Separation Theory

Six Degrees of Separation is the theory that everyone and everything is six or fewer steps away, by way of introduction, from any other person in the world, so that a chain of “a friend of a friend” statements can be made to connect any two people in a maximum of six steps.



dw 2010

https://upload.wikimedia.org/wikipedia/commons/8/88/Six_degrees_of_separation_01.png

Forget 'six degrees of separation' - thanks to Facebook it's now just FOUR

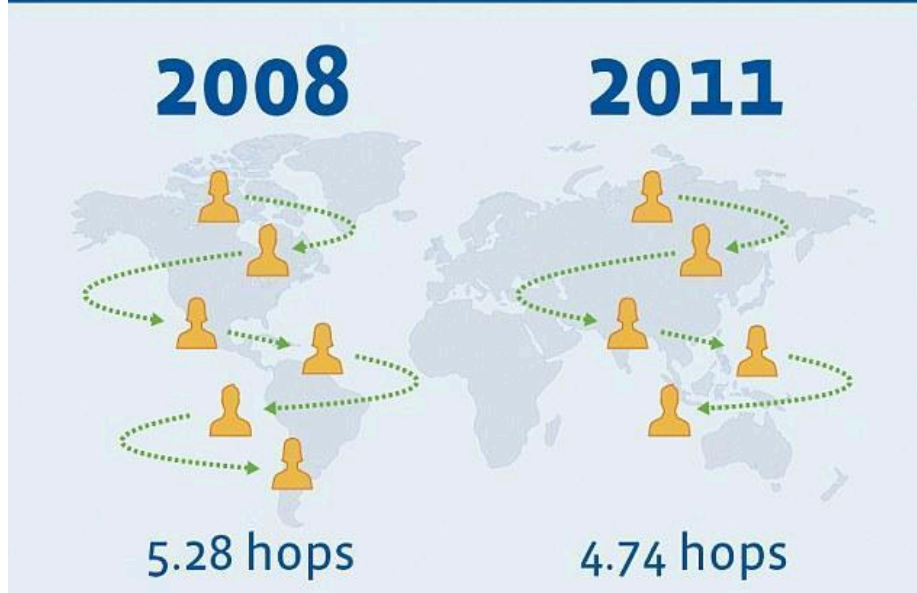
Read more: <http://www.dailymail.co.uk/sciencetech/article-2064746/Facebook-shrinks-degrees-separation-just-FOUR.html#ixzz3iONc0vel>
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https://www-304.ibm.com/connections/blogs/socialbusiness/entry/4_74_degrees_of_separation?lang=en_us

http://www.nytimes.com/2011/11/22/technology/between-you-and-me-4-74-degrees.html?_r=0

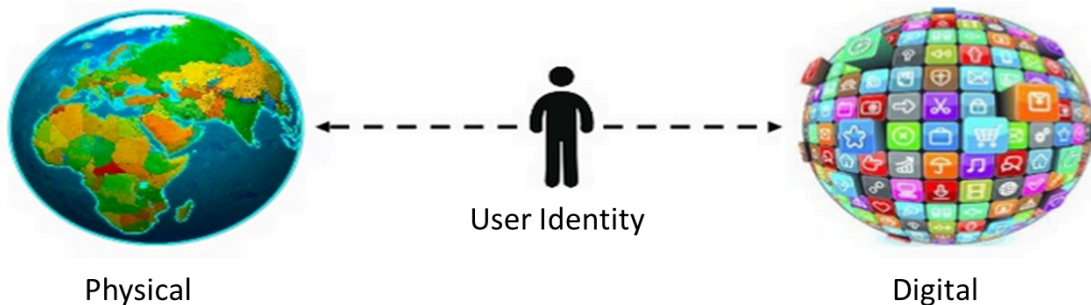
According to the study, “They found that the average number of links from one arbitrarily selected person to another was 4.74. In the United States, where more than half of people over 13 are on Facebook, it was just 4.37.” ([link](#))

Degrees of Separation on Facebook

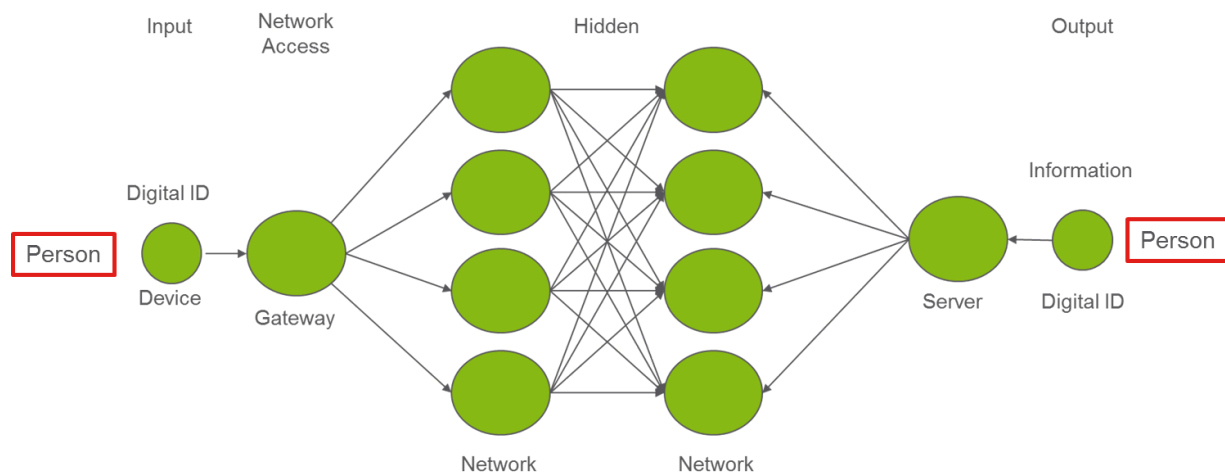


What is overlooked in this study

What is overlooked in this study is that they forgot to include the location of the two physical end points that link back to the person who created the original account on Facebook. For anything to exist in the digital world, it has to tie back to a person on the physical network.

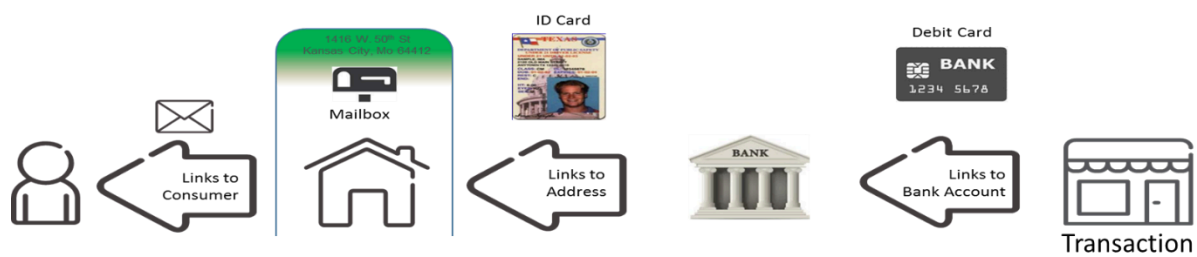


As you can see below, adding the identity of the physical user who created their facebook account brings the degrees of separation back to around six degrees of separation.



What other industries hold the six degrees of separation rule?

How about the banking



- 1) Retail Store >> 2) Debit Card >> 3) Bank >> 4) Identification Card >> 5) Home Address (Physical) >> 6) Person

To truly understand how something works, it is best to understand all points that exist and how those

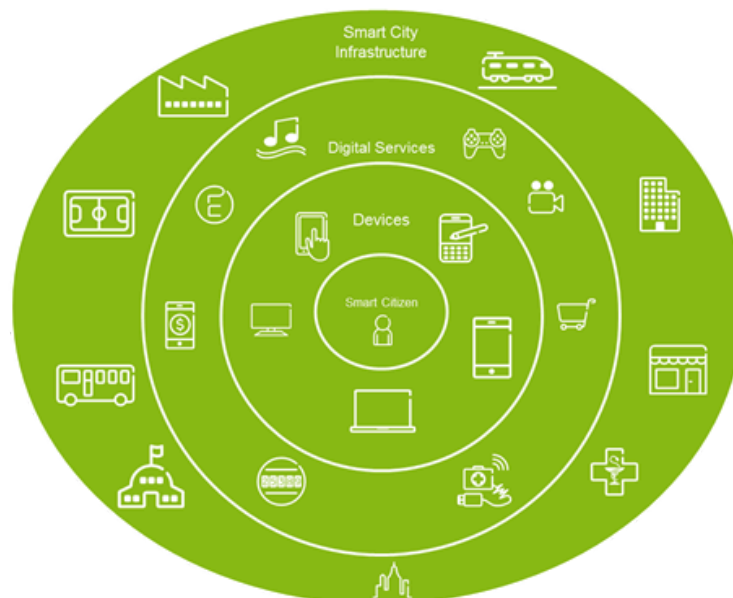
Key Learnings from IOT

1. IOT is nothing new
 - Six degrees of separation
2. First comes M2M then comes IOT
- 3.

“The user experience now entails four things: the hardware, the operating system, the applications, and the Net. We want to do all four uniquely well for our customers.” – Steve Jobs

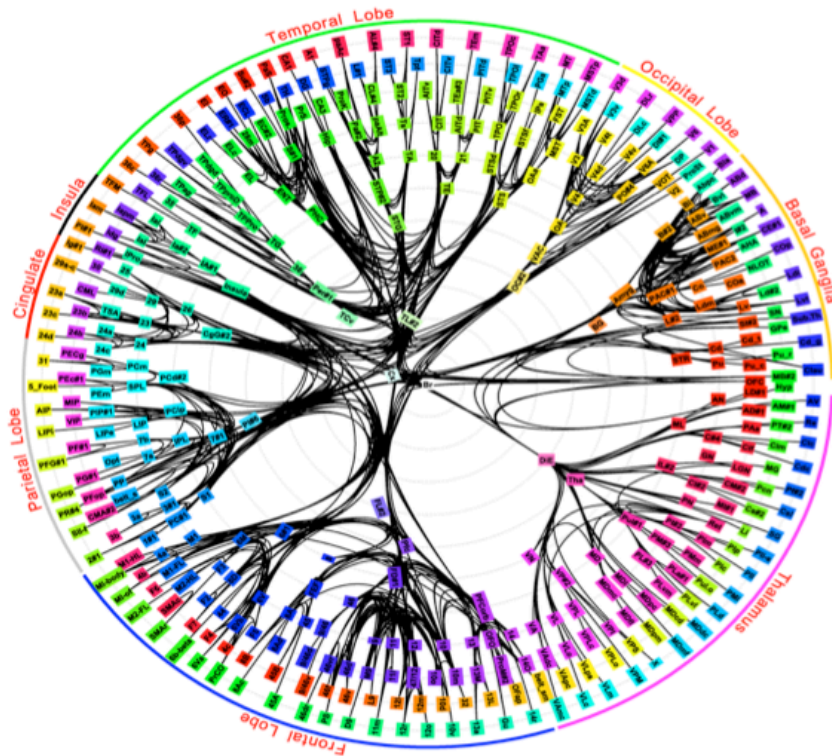
Source: [Fortune, Jan. 24 2000](#) | Tagged in: Apple

	What	Who	Where
Hardware	List of physical components of the system	Individuals who use it Individuals who manage it	Physical location
Software	List of programs, applications, and utilities	Individuals who use it Individuals who manage it	What hardware it resides upon and where that hardware is located
Networking	Diagram of how hardware and software components are connected	Individuals who use it/ Individuals who manage it/Company service obtained from	Where the nodes are located, where the wires and other transport media are located
Data	Bits of information stored in the system	Individuals who use it Individuals who manage it	Where the information resides



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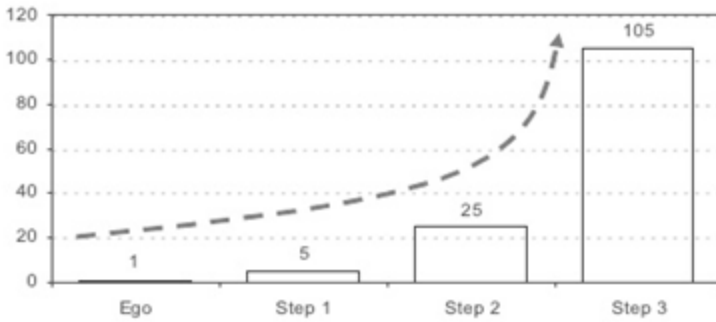
<http://multiverseaccordingtoben.blogspot.com/2011/06/unraveling-modha-singhs-map-of-macaque.html>

Misconception with “IOT”

“IOT” is not a new concept. If you look at how communication has evolved since the introduction of the telephone, you can start to see a pattern. “IOT” is really about connecting people to the information they want in the simplest way possible.

I think the person who truly understood the core concept of the Internet of Things and how to capitalize the “Things” connected was Steve Jobs.

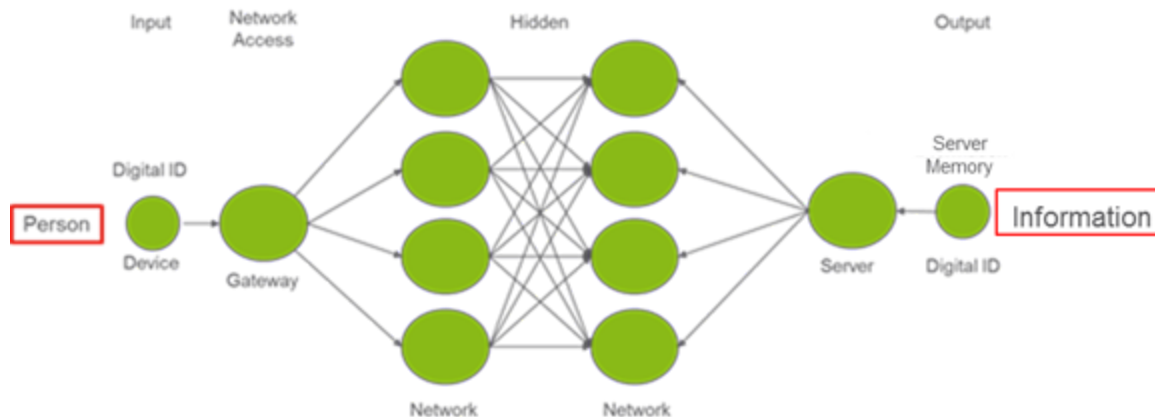
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Comparing the exponential growth rate to Apple core business.

- Ego – (Hardware) iPod, iPhone, iWatch, iHome, iCar
- Step 1 – (Applications) – iTunes at first now the App Store
- Step 2 – (Operating System) – iOS Platform
- Step 3 - (Net) – One person could access any piece of information on the network

I think what makes Apple so successful with this strategy and the “secret ingredient” others in the industry missed is that without a user, none of the other components in Steve Jobs' statement matter. The “User Experience” is not possible without a person, and any information the person is trying to access, cannot be accessed unless the location of the information stored is known. (Physical Server in the Network)



If you look at the evolution of communication, we went from P2P communication, to sending messages (information) through a carrier (postal service), Fixed Access, to communicating wirelessly. At every point of transition the access point creates a new kind of “IOT.” We moved from Fixed Access connecting places, to wireless connecting people around those places connected. In my opinion, the next opportunity in “IOT” is connecting Things at a more micro level.

This moves away from the idea of improving the customer experience by connecting people to information faster and toward personalizing information based on their network location. (Venue, Home, Workplace, School, etc...)

personalizing the “user experience” based on user location in the network.

simplifying the amount of information pushed to the end user

ones who can focus their strategy around leveraging

effectively leverage their existing access points, local relationships, and enable a platform fixed carrier providers who can leverage their existing network assets,

focus their IOT strategy around personalizing the experience around specif

“things” connected around the access point.

The “Lost” Steve Jobs Speech from 1983; Foreshadowing Wireless Networking, the iPad, and the App Store

<http://lifelibertytech.com/2012/10/02/the-lost-steve-jobs-speech-from-1983-foreshadowing-wireless-networking-the-ipad-and-the-app-store/>

The only thing I see to be different than everything else I've found is that Steve Jobs refers to an "iPad." Remember, this was 1983 before anyone knew what a mobile phone was. I believe he is referring to an iPad the same as everyone refers to an iPhone today.

“He compares the nascent software development industry to the record industry. He says that most people didn't necessarily know what computer they wanted to buy. In contrast, when walking into a record store they definitely knew what music they liked. This was because they got free samples of songs by listening to the radio. He thought that the software industry needed something like a radio station so that people could sample software before they buy it. He believed that software distribution through traditional brick-and-mortar was

archaic since software is digital and can be transferred electronically through phone lines. He foresees paying for software in an automated fashion over the phone lines with credit cards. I don't know about you, but I think this sounds incredibly similar to the concept of the Apple App Store. Plus his comparison to the music industry just might be foreshadowing the iTunes store. You need to listen to the speech to hear the entirety of this passage for yourself."