The Industrial Internet of Things in 2017: Which Way is Up?

Alain Louchez
Managing Director
Georgia Tech Center for the Development and Application of Internet of Things Technologies (CDAIT)
www.cdait.gatech.edu
"The focus is no more on just people plus technology but is emphatically on technology. This requires that tomorrow’s managers are preferably (and more likely) engineers." (Nayar, p. 43)

"Companies are starting to cast the net farther afield, taking on graduates from a far wider range of disciplines. [Global Consultancy] Virtusa often looks for people with a background in the arts, says Gabrault [Head of Connected Experience at Virtusa], because alongside their analytical skills they are creative and can play a key role in user experience, and make sure a product is actually something people want to interact with.” (Hillsdon, The Guardian)
Yet in the IoT world, smooth sailing is rare.

Only...

26%

of all surveyed companies are successful with their IoT initiatives.

Source: Cisco Survey, May 2017
https://www.slideshare.net/CiscoBusinessInsights/journey-to-iot-value-76163389

Operators are still wrestling with service differentiation and asking ‘Who will make the money in IoT?’

"Robin [Kent, director of Adax] suggests that many people come up with a good idea every day but how many people come with a good idea that actually makes money every day?

‘I do think that is part of the problem with IoT at the moment. You can sit down and you can think of all the great things you can do with IoT-enabled devices but which one of them, not even which ones of them, could actually make money?’

‘IOT Analytics’

Only 7% Of IoT Platforms With More Than $10M+ Revenue

Source: June 2017

Businesses struggling to deliver on digital, losing £555,000 per failed project

Fujitsu’s research has found that the vast majority of businesses recognise the impact of digital, but most are losing substantial amounts of money on failed projects.

Source: October 18, 2017
http://www.information-age.com/businesses-struggling-deliver-digital-123469200/

Source: July 2017
https://iot-analytics.com/iot-platform-comparison-how-providers-stack-up/
“When the Industrial Internet Consortium (IIC) started up a little more than three and a half years ago, it introduced the concept of the Industrial Internet of Things (IIoT) to differentiate connected technologies from consumer-related IoT. Now almost every major manufacturing company is pursuing some kind of IIoT project—at least that’s what it feels like if you attend vendors’ user group meetings or IIoT-focused events, or follow any of the IIoT-focused websites.

The data coming from LNS Research paints a somewhat different story. Our research shows that only 40 percent of companies have actually started an IIoT project and only 24 percent more plan to do so within the next year. That leaves more than a third (36 percent) of the market with no IIoT projects or plans. The same survey also reveals that the top three challenges associated with an IIoT initiative are funding, building a business and understanding how IIoT applies to the specific business. Despite the hype and all the proof-of-concept projects apparently happening, progress has been slow.”


“Why the Slow Adoption of IoT? It’s Because IoT is Hard

The adoption of IoT is off to a slow start and there’s a reason—it’s hard. Gartner predicts that 75% of IoT projects will take 2x as long as planned.”

“Disconnect between IIoT optimism and readiness

At its Minds + Machines conference [October 26-27, 2017, San Francisco, CA] this week, GE unveiled new research highlighting an emerging gap between executive outlook for digital transformation and initiatives companies have put in place. The survey of Information Technology (IT) and Operations Technology (OT) decision-makers found that while companies see the Industrial Internet of Things (IIoT) as presenting significant opportunities for future growth and competitiveness, the vast majority are not taking the actions required to benefit from those opportunities.” (*)

“Companies can see the benefits of IIoT but are slow to transform”

from GE Digital Industrial Evolution Index Executive Summary, October 2017 (**)


The Internet of Things: A matter of definition?

2017 Hewlett Packard Study on IoT: "But while IoT grows, it is important to tread carefully. Our research found conflicting definitions of what IoT means, what IoT devices are connected and how to extract value from them.”

2017 GE Study on IIoT: "The Industrial Internet of Things (IIoT) has great potential. Stakeholders are open to the opportunity, but need further resources to understand what it is, what it can enable and what's the best path to success.”

2017 CompTIA Study on IT architectural planning ["Internet of Things is future driver”]: "IoT activity declined year over year, reflecting a phenomenon also seen in the cloud market: initial enthusiasm inflates adoption numbers, but improved understanding brings a reality check. As companies build a better understanding of IoT systems, they recognize that some ongoing efforts do not fit the definition. The uncertainty over the meaning of IoT is also seen in the substantial jump of companies reporting they don’t know if there are IoT activities or plans.”


Research methodology
A total of 3,100 IT and business decision makers were interviewed in November and December 2016. The respondents were from organizations with at least 500 employees, and were from both public and private sectors, but with a focus on the industrial, government, retail, healthcare, education, construction, finance, and IT/technology/telecommunications sectors. Interviews were conducted both online and via telephone using a rigorous multi-level screening process to ensure that only suitable candidates were given the opportunity to participate. Respondents were interviewed in the UK, Italy, Germany, France, the Netherlands, Spain, Sweden, Norway, Turkey, UAE, Saudi Arabia, the US, Singapore, Japan, Australia, India, Brazil, Mexico, China and South Korea

The Internet of Things: A matter of definition? (Cont’d)

What is it?

Survey Sent in August 2017 – Results released on November 1, 2017: “nearly 190,000 people around the world responded. People from the tiny islands of Tuvalu to the huge landmass of China and everywhere in between. (Mozilla released the survey in six languages: English, Spanish, German, Italian, French, and Portuguese.)”

“The language of the connected future isn’t yet well known

Fewer than 30% of respondents said they could explain IoT (Internet of Things), botnets, blockchain, RFID, or Zero Day Vulnerability to a friend. Fewer than 40% of respondents said they could explain DDOS attacks or TOR. The only two things more than half of the respondents said they could explain to a friend were VPN (Virtual Private Network) and connected devices.”

What tech terms are people comfortable explaining to a friend?

Source: November 1, 2017, Mozilla Foundation Survey https://blog.mozilla.org/blog/2017/11/01/fascinating-things-we-learned-when-we-asked-the-world-how-connected-are-you/
The **Internet of Things**: What is it?

We suggest:

**Interconnection of Intelligent Things**

The expression *Internet of Things (IoT)* is best understood as a metaphor that encapsulates the immersion of almost anything and everything (previously “out of scope”) into the communications space thanks to the timely convergence of scientific, technological, and societal advances and trends. Through embedded intelligence, it will transform the dimensions of the economy and society on a scale not experienced before:

Nothing will be forever fixed: inert will become active; delayed, instantaneous; offline, online; and static, dynamic.

**Industrial Internet of Things**: Use of IoT technologies in industrial environments that generate productivity gains, minimize risk and enhance business performance (B2B)

**Consumer Internet of Things**: Use of IoT technologies for consumer-centric experiences (B2C)
The **Internet of Things** will give rise to a world in constant change, i.e., a “**pulsating world**”. Why “pulsating”? Because things will continuously be sending and receiving data.

“When wireless is perfectly applied the whole earth will be converted into a huge brain, which in fact it is, all things being particles of a real and rhythmic whole.” Nikola Tesla (*)

Still “miles to go”…

"IoT is still in its very early phases.

Any IoT plan will need to have long time horizons.

... the technical issues facing IoT – in terms of standards and security – are secondary to the more-basic issue of helping enterprises to understand the potential benefits of IoT."

The Internet of Things for Manufacturing

- Operational Efficiencies
- Regulatory Compliance

Costs Down

Profitability Up

Revenue Up

- Product as a Service (outcome-based)
- Brand new ecosystems (tied to the delivery, maintenance, upgrading, and leveraging of "smart goods", i.e., products born with embedded intelligence.)
2017 Vodafone IoT Study: “The most commonly seen benefits of implementing IoT are: better business insights, reduced costs, and improved employee productivity.”
Intelligent (IoT-enabled) Products still in early adoption stage

The MPI Study (*) on the Internet of Things released in May 2017 evaluates the readiness of global manufacturers to incorporate smart devices and embedded intelligence within their plants and into their companies’ products. In November and December 2016, 374 manufacturers participated in the study.

Conclusion regarding intelligent products:

“Despite executive interest in IoT-enabled products, challenges in developing them remain considerable. Just as in 2016, the biggest problem for most manufacturers is simply identifying opportunities to develop these products.”

The PwC/Manufacturers Alliance for Productivity and Innovation (MAPI) Survey (**) on Monetizing the Industrial Internet of Things - Creating New Business Models for the Industrial Internet of Things released on August 15, 2017 interviewed 56 publicly held companies with a combined $287 billion in annual revenue.

Comment on IoT adoption speedbump:

“We are at a crossroads, with a camp of manufacturers still sitting on the sidelines. Consider that more than half of those companies not yet offering IoT services cite "no customer demand" as the reason for not doing so, and nearly half cited "unclear return on investment" or "no proven solutions."


(**) Survey can be downloaded for free from the MAPI website: [https://www.mapi.net/forecasts-data/monetizing-industrial-internet-things](https://www.mapi.net/forecasts-data/monetizing-industrial-internet-things)
“Internet of Things” technologies will enable the manufacturing focus to evolve from delivering a stand-alone product to ensuring a business (personal) effect/result, i.e., creating value through use (See “outcome economy” and “circular economy”)

“The organization must learn to think of itself not as producing goods or services but as buying customers, as doing the things that will make people want to do business with it.”


Focus shifts to the delivery, maintenance, upgrading, and leveraging of “smart goods”
“This is the radical implication of the Internet of Things—a fundamental shift in the relationship between customers and companies.

In the old days, you might buy a washing machine or a refrigerator once a decade or so. Appliance-makers are built to profit from that one, rare purchase, focusing their marketing, customer research, and internal financial analysis on brief, sporadic, high-stakes interactions. The fact that you bought a particular company’s stove five years ago has no value today.

But, when an appliance is sending a constant stream of data back to its maker, that company has continuous relationships with the owners of its products, and can find all sorts of ways to make money from those relationships. If a company knows, years after you bought its stove, exactly how often you cook, what you cook, when you shop, and what you watch (on a stove-top screen) while you cook, it can continuously monetize your relationship: selling you recipe subscriptions, maybe, or getting a cut of your food orders.

Appliances now order their own supplies when they are about to run out. My printer orders its own ink; I assume my next fridge will order milk when I’m running low.”
Critical challenge for IIoT technologies: "time-proofing"

TIMELESS RELEVANCE

Legacy? (dealing with the past)

Obsolescence? (dealing with the future)
## Growing Attention of Lawmakers on IoT and Smart Technologies in 2017 (a sample of initiatives)

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Details</th>
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<tbody>
<tr>
<td><strong>Developing Innovation and Growing the Internet of Things (DIGIT) Act</strong></td>
<td>- <strong>S. 88: DIGIT Act</strong> introduced in the Senate on January 19, 2017 [Bill passed in the Senate on August 3, 2017 and goes to the House next for consideration.]</td>
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<td>- <strong>H.R. 686: DIGIT Act</strong> introduced in the House on January 24, 2017</td>
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<tr>
<td><strong>Smart Manufacturing Leadership Act</strong></td>
<td>- <strong>S. 768: Smart Manufacturing Leadership Act</strong> introduced in the Senate on March 29, 2017</td>
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<tr>
<td><strong>Internet of Things (IoT) Cybersecurity Improvement Act of 2017</strong></td>
<td>- <strong>S. 1691: Internet of Things (IoT) Cybersecurity Improvement Act of 2017</strong> introduced in the Senate on August 1, 2017</td>
</tr>
<tr>
<td><strong>Smart Cities and Communities Act</strong></td>
<td>- <strong>H.R. 3895: To promote the use of smart technologies and systems in communities, and for other purposes</strong> introduced in the House on October 2, 2017</td>
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<tr>
<td></td>
<td>- <strong>S. 1904: A bill to promote the use of smart technologies and systems in communities, and for other purposes</strong> introduced in the Senate on October 2, 2017</td>
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### The Teddy Bears & Toasters Act

**California - SB 327 (Jackson)**

- Introduced on March 20, 2017 placed on inactive file on June 1, 2017

### Cyber Shield Act of 2017

- **H.R. 4163 and S. 2020** introduced on October 27, 2017 - In addition to a labeling scheme that compliant IoT devices would bear, if passed it would also be responsible for establishing a best-practices advisory committee.
Conclusion: the way up

“A fundamental shift in the relationship between customers and companies”

Create and leverage IIoT Technologies Awareness

Build business/use case(s) [↓cost/↑revenue]

Develop/acquire relevant skills [data analytics/security/creativity]

Align organizational structure with digital industrial transformation

Time-proof IIoT solutions [legacy/obsolescence]

Move from “product selling” to “customer buying”

Conclusion: the way up

“...A fundamental shift in the relationship between customers and companies...”
THANK YOU!

aisal.louchez@gtri.gatech.edu

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