Le **domande dell'IoT**: perché, cosa, quanto, quando, dove, come e soprattutto con chi

L'IOT è un tema complesso e dalle tante sfaccettature. Molte sono le domande. Ecco qualche risposta da parte di un osservatore di mercato

Primo Bonacina
Managing Partner
PBS – Primo Bonacina Services

www.primobonacina.com

Agenda

- IOT: numeri e scenari
- *The IOT journey*
- Il Go To Market

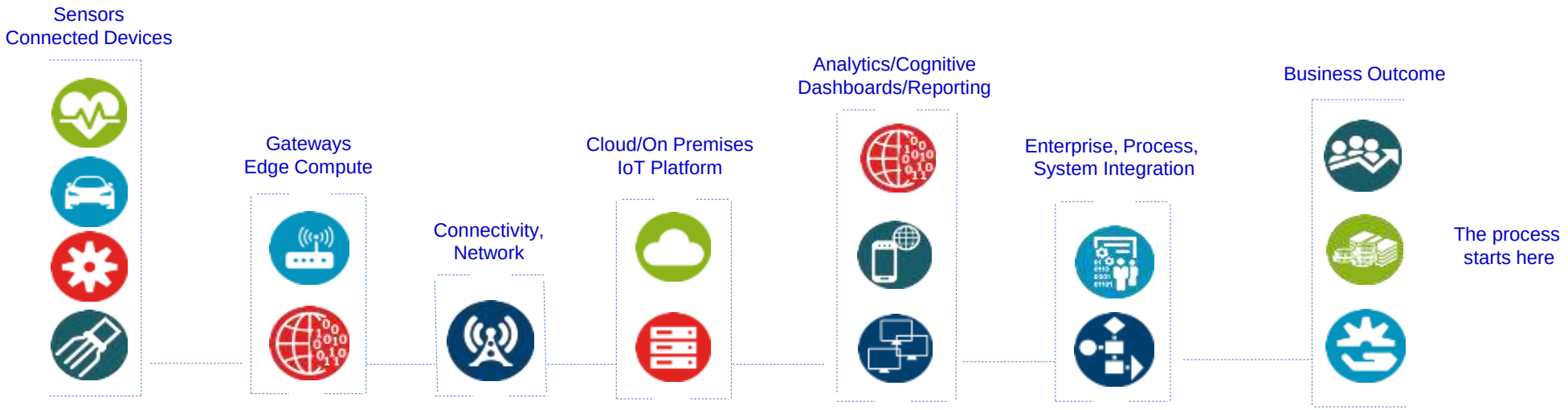
Che cos'è l'IOT e perchè ci cambierà la vita

Nota**: la **presentazione è ricca di numeri e dati** provenienti da diverse fonti, spesso utili e interessanti. La troverete sul sito di SOIEL a breve oppure **datemi un vostro biglietto da visita e l'avrete entro domani (condividetela con i colleghi!)

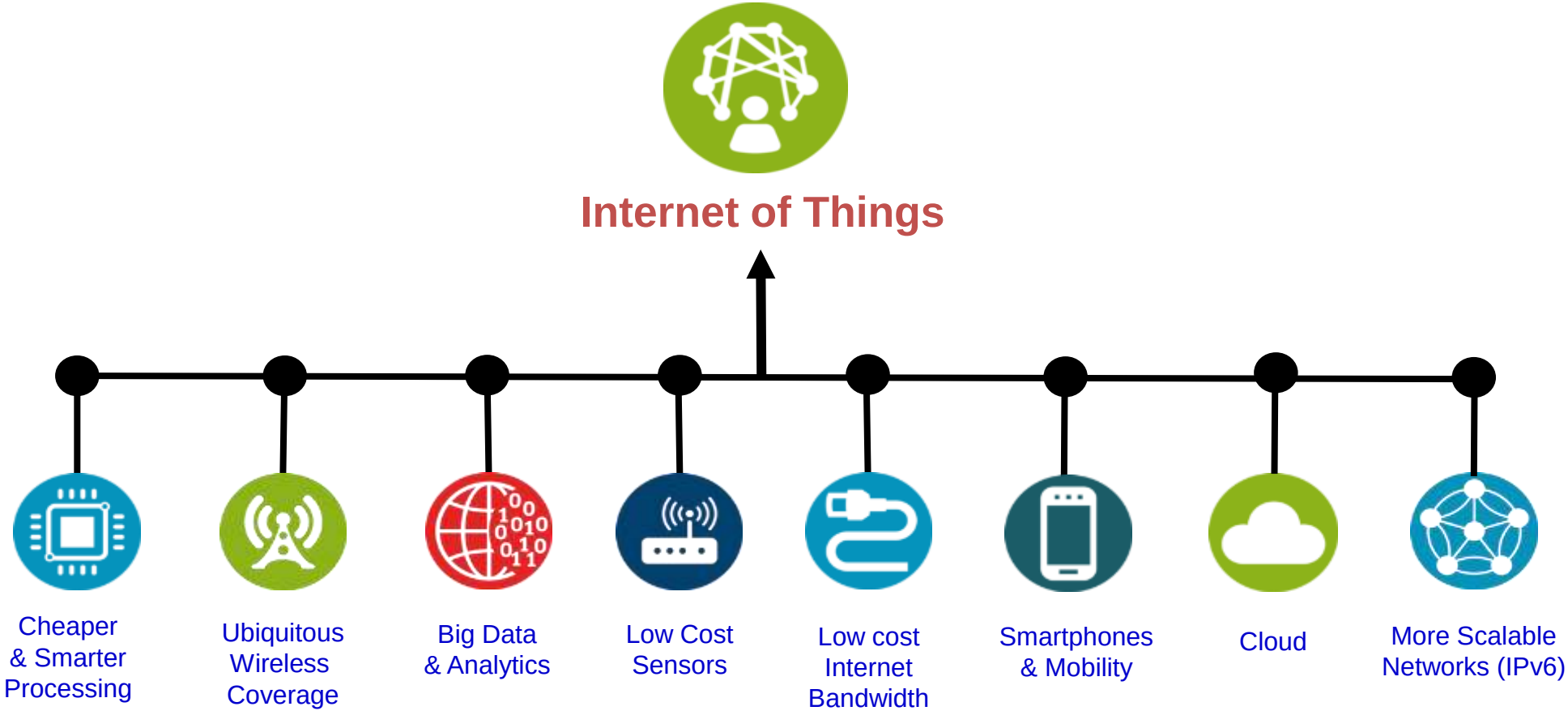
What is the Internet of Things?

IoT connects physical devices to the digital world to gain levels of insight, efficiency and innovation, allowing customers to:

- Improve Business Performance
- Establish new Revenue Streams
- Create new Innovative services
- Reduce Operational Cost
- Explore new Business models

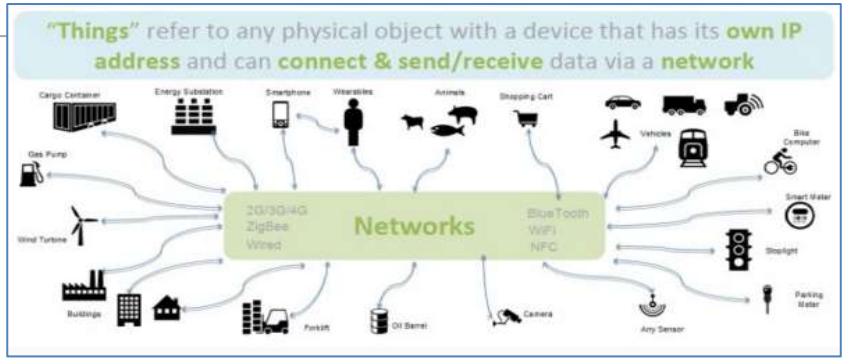


Technology Innovation that makes IoT a reality



Why does it matter?

The Internet of Things (IoT) is an economic transformation in which value is created via analysis of data collected from Internet-connected devices.



IBM Center for Applied Insights

"IDC defines the IoT as a network of networks of uniquely identifiable endpoints (or "things") that communicate without human interaction using IP connectivity." *IDC*

"In 2016, 5.5 million new things will get connected every day." *Gartner*

"If policy makers and businesses get it right, linking the physical and digital worlds could generate up to $11.1 trillion a year in economic value by 2025." *McKinsey*


Gartner

Press Release

STAMFORD, Conn., November 10, 2015

Gartner Says 6.4 Billion Connected "Things" Will Be in Use in 2016, Up 30 Percent From 2015

Gartner

The analysts at IDC believe the Internet of Things (IoT) will encompass nearly

30 billion connected devices by 2020[1]

That's 4X the global population.

All those devices will create an unprecedented amount of data—data that needs to be:

CAPTURED

TRANSMITTED

STORED

BACKED UP

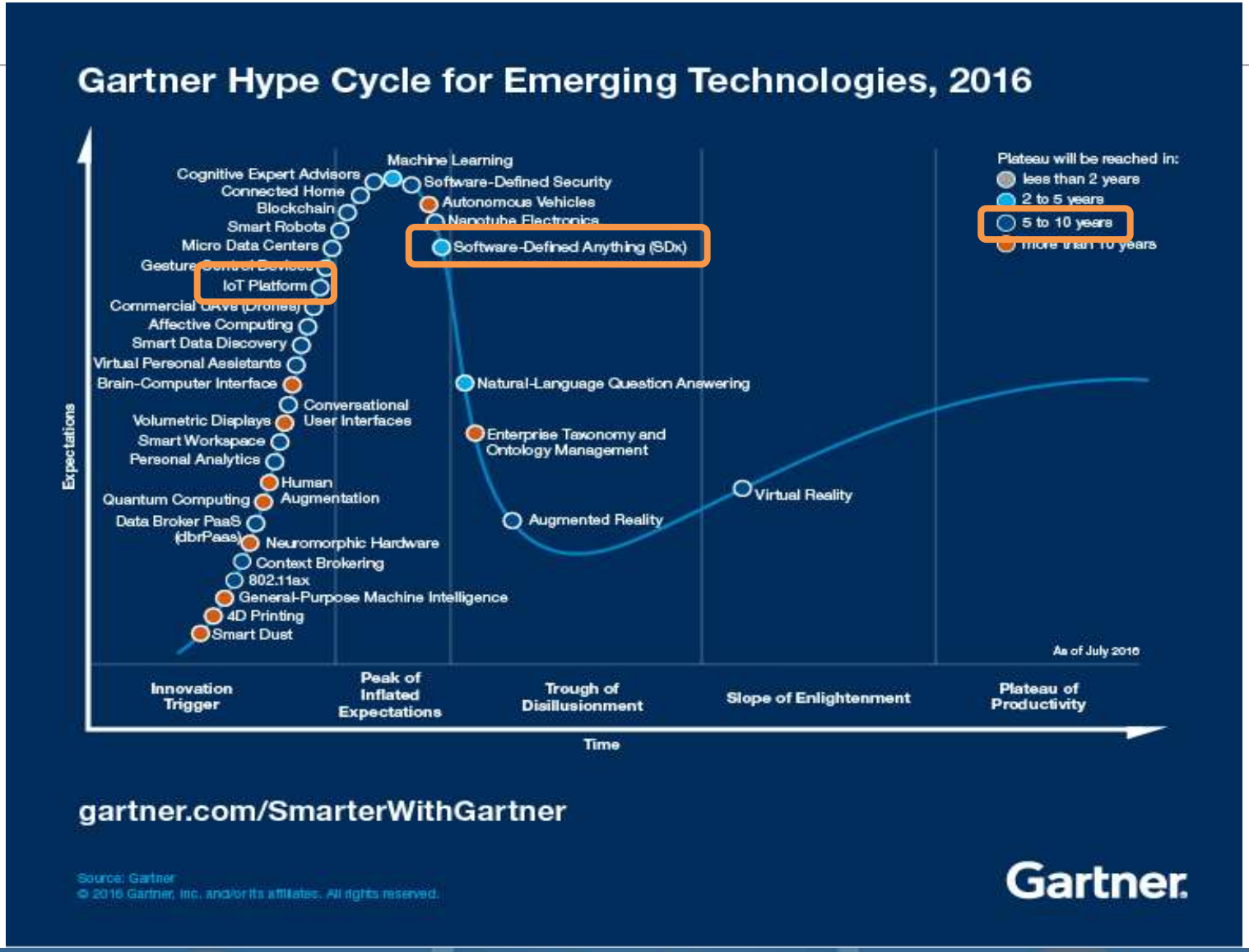
ANALYZED

DELIVERED

Dove siamo oggi? (“Are we past the hype?”)

Gartner®

Are we past the hype?



Are we past the hype? **Le opinioni degli analisti**

"62 percent of executives surveyed say they have already adopted IoT-based systems or have plans to do so." *Business Insider*

"73% of IoT decision makers have already deployed IoT solutions or plan to deploy in the next 12 months." *IDC*

"28 percent of software developers say they are currently working on applications for IoT-connected devices." *Evans Data*

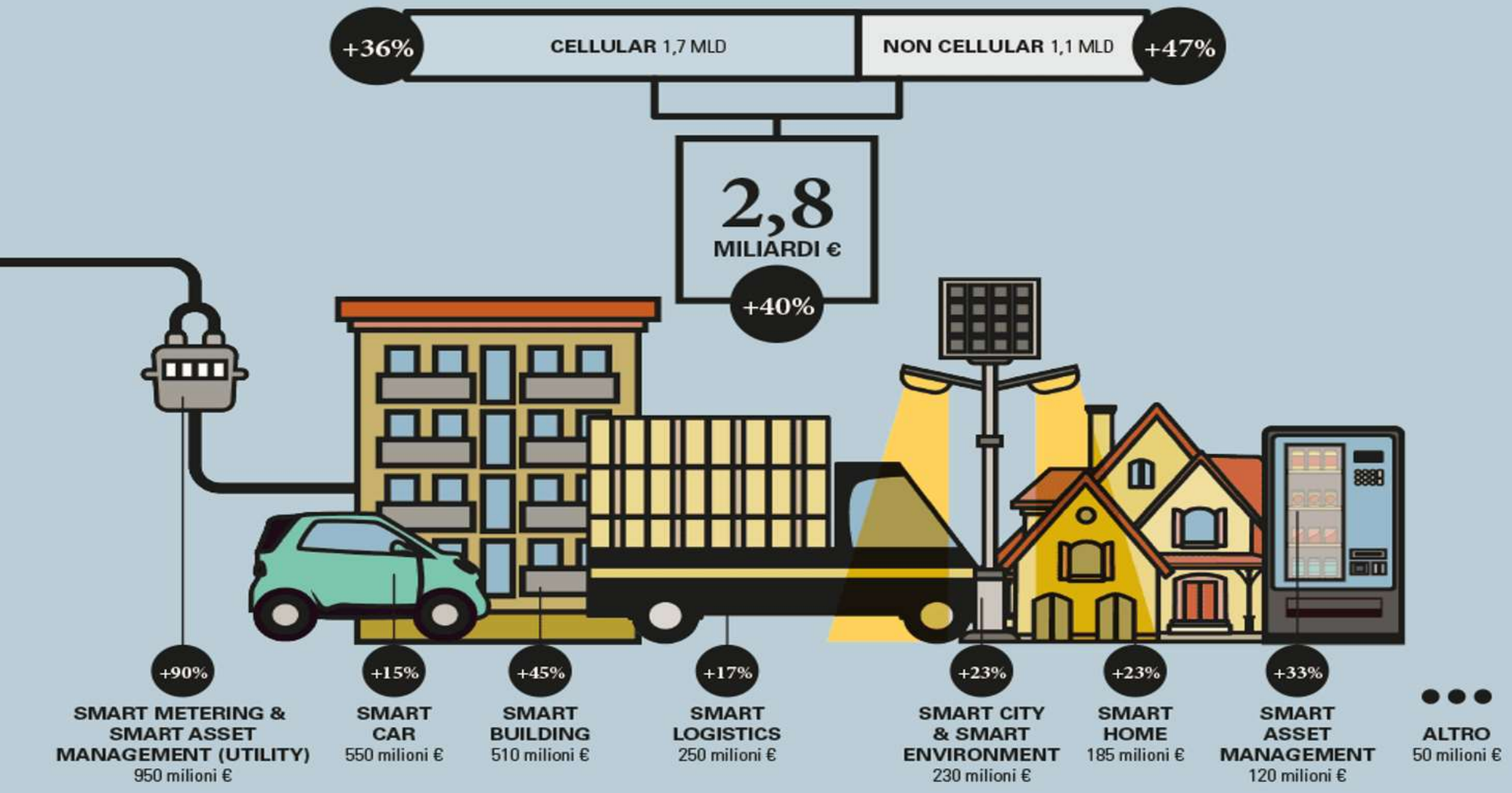
"65 percent of Internet of Things (IoT) apps in production today are generating real revenue. Developers expect this figure to rise to 80 percent by 2018." *Harbor Research*

IDC

Gartner

"IoT momentum continues to grow and our survey shows that it is seen as strategic to the enterprise. A full 58% of respondents consider the IoT a strategic initiative, with a further 24% viewing it as transformative " *IDC*

Mercato IoT in Italia nel 2016



Fonte: Politecnico di Milano, 2017

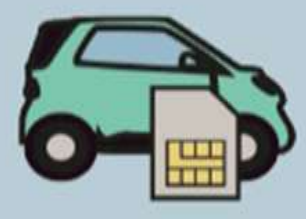
Diffusione IoT in Italia nel 2016

36 MILIONI
CONTATORI
ELETTRICI

450 000
CONTATORI GAS
INDUSTRIE/CONDOMINI

3,3 MILIONI
CONTATORI GAS
PER IL MASS MARKET

5,9 MILIONI
BOX
ASSICURATIVI



1,6 MILIONI
AUTO NATIVAMENTE
CONNESSE

800 000
MEZZI PER IL
TRASPORTO MERCI

+650 000
LAMPIONI
CONNESSI

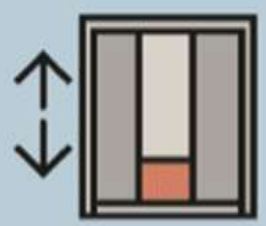
200 000
MEZZI PER IL
TRASPORTO PUBBLICO

+1 MILIONE
TELECAMERE
E SENSORI

530 000
IMPIANTI
FOTOVOLTAICI

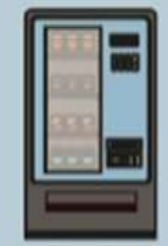
160 000
LAMPADINE

180 000
TERMOSTATI



350 000
ASCENSORI

420 000
GAMBLING
MACHINE



80 000
VENDING
MACHINE

Fonte: Politecnico di Milano, 2017

3 important insights about how the IoT will transform industries and drive demand for new solutions and services

1. **IoT data is the new currency:** Data acquired through Internet of Things (IoT) can and will be used by third parties, requiring a new kind of IoT business: the data broker

"Ultimately the goal of IoT connections is the data, and the IoT data and analytics market is set to grow the fastest of any of the major IoT revenue categories." *ABI Research*

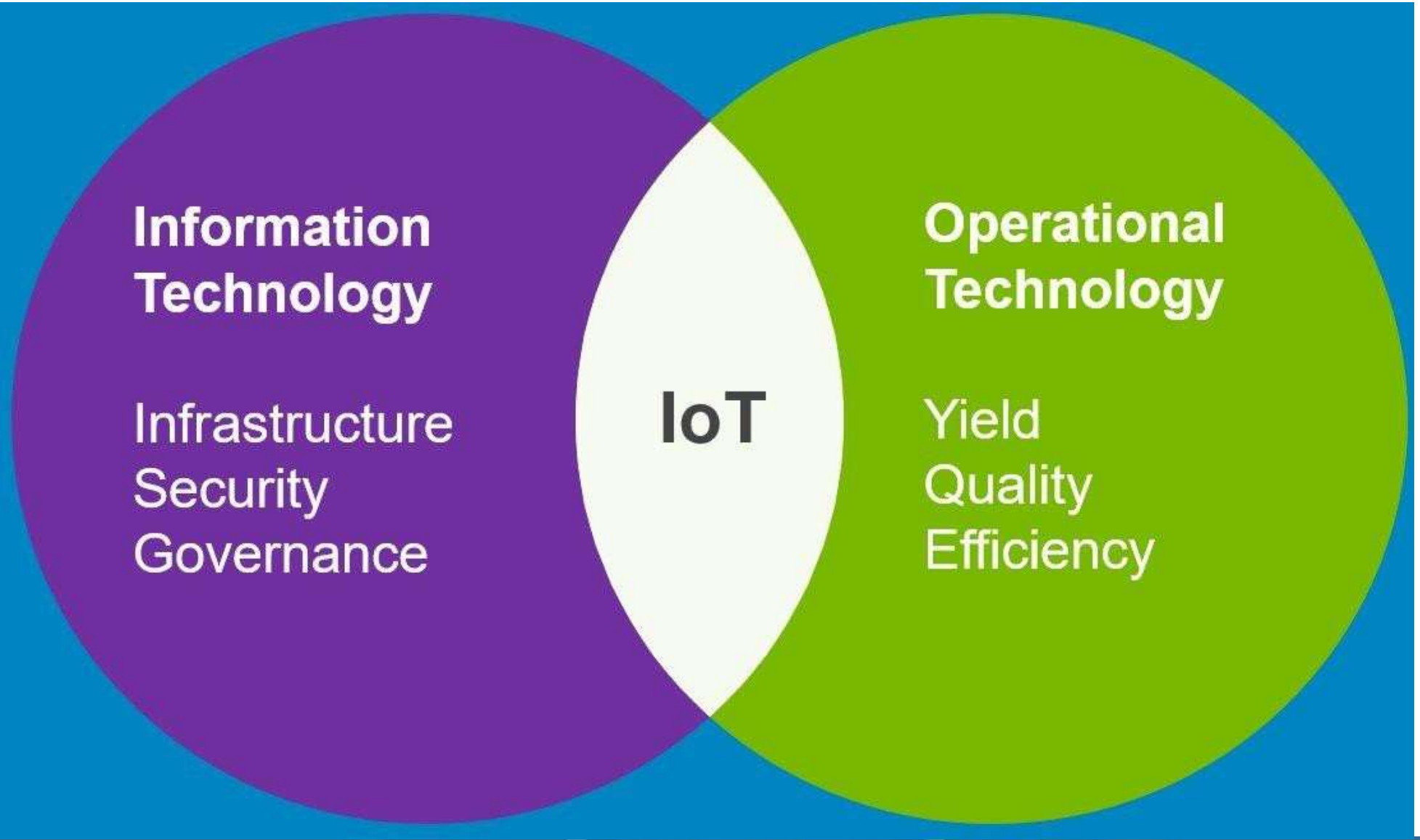
2. **Today's small IoT projects pave the way for future transformation:** The increasing availability of low-cost, intelligent sensors and devices, networks and gateways has enabled a new path to IoT: small IoT projects, a relatively inexpensive approach to IoT with specific goals and planned rapid ROI

"While large transformative Internet of Things (IoT) projects grab headlines, an increasing number of IoT projects are smaller in scale, less expensive and less risky." *TBR: 2016 Internet of Things Predictions*

3. **IoT drives business integration opportunities by marrying IT & OT.** Business integration occurs when IoT vendors, business leaders and technologists team to drive a new outcome, creating solutions that coordinate customers' business needs, their operational technologies (OT) and IT

"IoT is as effective as the sum of its parts. Mere connections create data; however, this does not become information until it is gathered, analyzed and understood. The analytics back-end systems of the IoT will therefore form the backbone of its long-term success." *Juniper Research*

IOT = IT + OT


Information Technology
Infrastructure
Security
Governance
IoT
Operational Technology
Yield
Quality
Efficiency

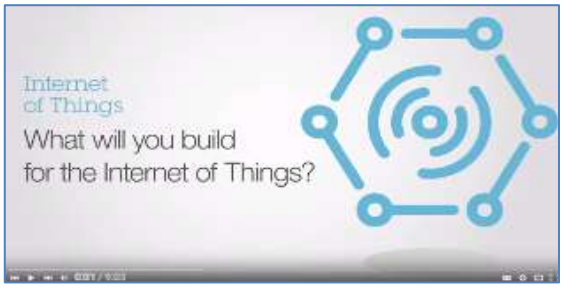
12 IOT Trends to Watch, #1

1. **Small IoT is a big thing.** Not all IoT projects are sweeping and transformative

2. **IoT requires IT/OT integration:** Strong collaboration between IT and OT teams are required for IoT success

3. **Increased focus on edge computing and analytics.** Increasingly, analytics capabilities will be pushed to the edge of networks

4. **Drones/UAVs and robots**. These devices are quickly becoming part of the IoT solution stack for agriculture, asset management and physical security applications



"By 2018, 60% of global 1000 companies will integrate IT and OT at the technology, process, security, and organization levels to fully realize the value of their IoT investments." *IDC FutureScape: Worldwide Internet of Things - 2016 Predictions*

"IoT processing at the edge of the network (compared to processing back at the enterprise) is a clear requirement and will challenge many IoT architecture designs." *IDC*

12 IOT Trends to Watch, #2

5. **A data brokerage industry emerges.** IoT generated data is bought, analyzed and sold. Example: IBM buys The Weather Company data

6. **Interoperability trumps standards:** Industry alliances ensure vendor-partner solutions work together and reduce the need for underlying technology standards

7. **Security:** The increased security risk of IoT over pure IT systems remains a key challenge for IoT implementations

8. **The rush to win over developers:** Developers are a pivotal element to building a viable partner ecosystem around IoT.

IDC

"Developers put their long-term bet on industry and infrastructure IoT apps as the foundation for revenue generation." *Harbor Research*

"S&R professionals in all industries must understand the tremendous risk associated with IoT enabled, -connected solutions and help their organizations adopt such technologies safely with a comprehensive security strategy." Forrester: An S&R Pro's Guide To IoT Security

12 IOT Trends to Watch, #3

9. **IT services will be a major driver and beneficiary of IoT.** Business consulting services are in particular demand, followed by IT consulting and implementation services

10. **IoT drives demand for analytics.** IoT data must be managed, integrated and analyzed to realize the greatest possible value

11. **IoT drives demand for cloud computing.** New cloud platforms are often part of IoT solutions. Cloud development lends itself to new projects, with availability of a breadth of resources for development, integration and analysis.

12. **IoT is propelling enormous growth in smart devices.** Device and sensor types are proliferating. Processor, chipmakers and sensor manufacturers are driving lower prices, lower power requirements and greater capabilities.

IBM

"IoT demands new analytic approaches. New analytic tools and algorithms are needed now, but as data volumes increase through 2021, the needs of the IoT may diverge further from traditional analytics." *Gartner*

"IoT services are the real driver of value in IoT, and increasing attention is being focused on new services by end-user organizations and vendors." *Gartner*

Un nuovo mondo connesso migliorerà le capacità di operare di **molti settori**

Building Automation

Connected Home / Connected Products

Smart Factory

Smart Agriculture

Automotive & Transport

Utilities & Energy

Manufacturers will use IoT to improve processes, reduce costs, generate revenues, improve customer satisfaction

- **Production:** IoT generated data brings benefits in areas such as production output, product quality, workforce safety, predictive maintenance, energy management, asset optimization and cost management.
- **Supply chains:** Benefits include tracking raw materials, finished goods and other assets (containers, vehicles, etc.) to optimize supply chain execution and improve business planning.
- **Products:** Benefits include capturing detailed information on products in the field, access to remote diagnostics, and the ability to perform remote maintenance and perhaps even remote operations.
- **Intelligence:** IoT data collected can be fed into analytics tools and cognitive systems that enable knowledge workers and decision makers to analyze and compare performance, build smarter algorithms and drive process improvements based on lessons learned.

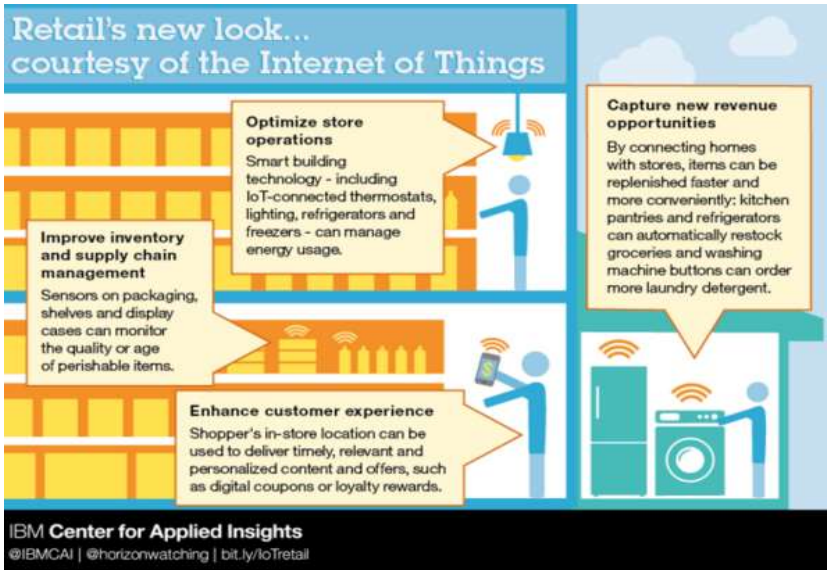
IBM Center for Applied Insights

"Industrial devices, the manufacturing floor, logistics, and machinery are the most ripe areas for IoT and that's where we see the most IoT developers focusing their energy." *Evans Data*

"The IoT market in manufacturing operations will grow from $42.2 billion in 2013 to $98.8 billion in 2018, a five-year compound annual growth rate (CAGR) of 18.6%. Growth will be driven by ongoing efforts to increase efficiency and link islands of automation." *IDC*

Retailers leverage IoT to improve front- and back-office process efficiencies, earn the loyalty of the next-generation consumer

- **Enhanced customer experience:** Combining data from IoT devices with shopping history and other customer data, retailers can create a single view of each customer, find patterns and deliver a **more relevant shopping experience in real time**
- **Optimized store operations:** The IoT not only can help retailers better manage store assets, employee labor and energy usage, but also improve in-store marketing efforts.
- **Improved inventory management:** Where is my inventory? What products are selling… and why? Who is buying what products? Where in the store do products perform the best?
- **Capture new revenue opportunities:** Leading-edge retailers will learn how to leverage the Internet of Things to seek out new methods of acquiring customers and increasing revenues.



IBM Center for Applied Insights

"Global spending on retail IoT initiatives is expected to grow from $14.3 billion in 2015 to $35 billion by 2020." *MarketsandMarkets*

"Eighty percent of retail decision makers believe IoT technologies will drastically change the way companies do business in the next three years." *RSR Research*

Energy & Utility firms use IoT to gain greater visibility into assets/resources, reducing management costs and empower stakeholders

- **Smart grids:** Smart grid sensors allow physical assets to be connected to other machines, systems and people.. These smart grid sensors will collect and create large volumes of data that enable utilities to improve utility operations and customer engagement
- **Smart meters:** Smart meters to monitor power, gas and water consumption in real time. These smart meters will provide a wealth of information that can help utilities and their consumers in many ways – from allowing fully automated billing based on time of use or network status (e.g., with prices rising and falling according to peak and trough usage) to enabling meter-to-appliance communications to help change consumer energy behavior.
- **Asset monitoring and maintenance**: Using drones, small robots, embedded cameras and other IoT sensor devices, utility operators can better understand the condition of the entire asset network in real time. They can collect a variety of data, including temperatures, pressures, flow rates, vibrations and calibration. Maintenance workers can use this information to help plan for preventative maintenance on both above-ground assets as well as those below ground, such as buried cables, wires or pipes.

IBM Center for Applied Insights

"Utility companies that invest in the Internet of Things are doing so to improve asset performance, reduce costs, lower supply chain risks and empower employees and consumers." *MarketsandMarkets*

"By the end of 2015, annual smart grid spending in China could total $20 billion, with smart meters comprising $2 billion of that total." *McKinsey*

Accelerating the transformation of **healthcare** industry

- **Consumer-driven healthcare.** Consumers are taking more responsibility for their own heath. As they do, they will demand better access to their data and improved health technology solutions that allow them to manage their own healthcare.
- **Key solution areas.** Look for improvements in IoT solutions related to remote patient monitoring services, mobile health technologies, telemedicine, medication management, clinical operations, employee workflow management and inpatient monitoring.
- **Remote patient monitoring.** Expect new remote patient monitoring devices, wearable clothing and smartphone apps that analyze the data collected. We are at the beginning of a new era of remote patient monitoring that will automatically feed patient records with real-time data, perform analysis and send coaching notifications to both providers and patients. This will make healthcare easier, convenient, 24/7, web-enabled and personalized.

IBM Center for Applied Insights

"The global IoT healthcare market is expected to grow from $32.47 billion in 2015 to $163.24 billion by 2020." *MarketsandMarkets*

"The healthcare industry leads the field with 72% of respondents identifying IoT as strategic, followed by transportation and manufacturing at 67% and 66%, respectively." *IDC*

Transportation, public and telecom are ripe for adoption

- **Transportation:** The future transportation system will save lives and property, reduce emissions and cut commuting time and effort. This will all be enabled by a transition to IoT networks.
- **Public:** Smarter cities and smart grids are among the major drivers of public IoT adoption as organizations look to improve infrastructure management, leading to more efficient and proactive maintenance and traffic management.
- **Telecom:** As IoT is adopted by more businesses, demand for machine-to-machine (M2M) communications will grow. Carriers are in a unique position to provide M2M and will drive revenue from the expansion of IoT.

IoT: The engine that will transform transportation - IBM Center for Applied Insights

"When asked which industries are key to IoT app development, developers expect healthcare (14%), smart city (13%) and automotive (12%) as the top three industries for IoT app development and revenue generation.." *Harbor Research*

"ABI Research believes that "verticalized" platforms will continue to hold the largest share of the IoT software platform market with new growth provided by the smart home and healthcare segments." *ABI Research*

Quale **Go To Market?**

Dal Cliente Digitale al Cliente Connesso

La convergenza di Cloud, Mobile, Social, IoT dà forma al nuovo paradigma del Connected Customer, che pone nuove sfide e permette nuove opportunità alle aziende su Ingaggio e Retention

Fonte: NetConsulting cube, 2016

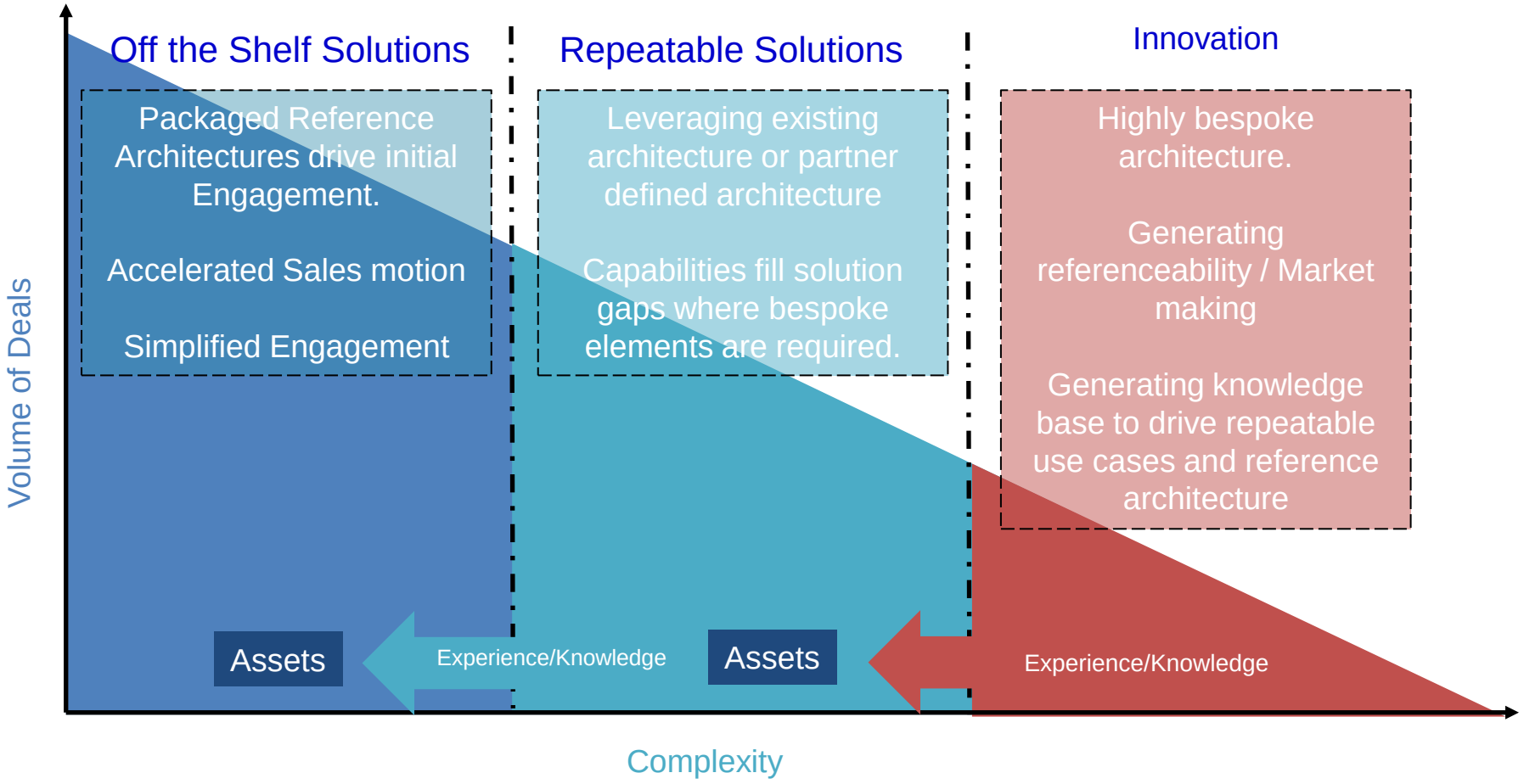
L'impatto del **Digitale** sui principali **processi**

	Amm.ne e Finanza	Human Resources	Acquisti	R&D	Produzione	Logistica	Marketing	Vendite	Post Vendita
Mobile									
Cloud									
Big Data									
Social									
IoT									
Security									
e-Business									
Dematerializzazione									

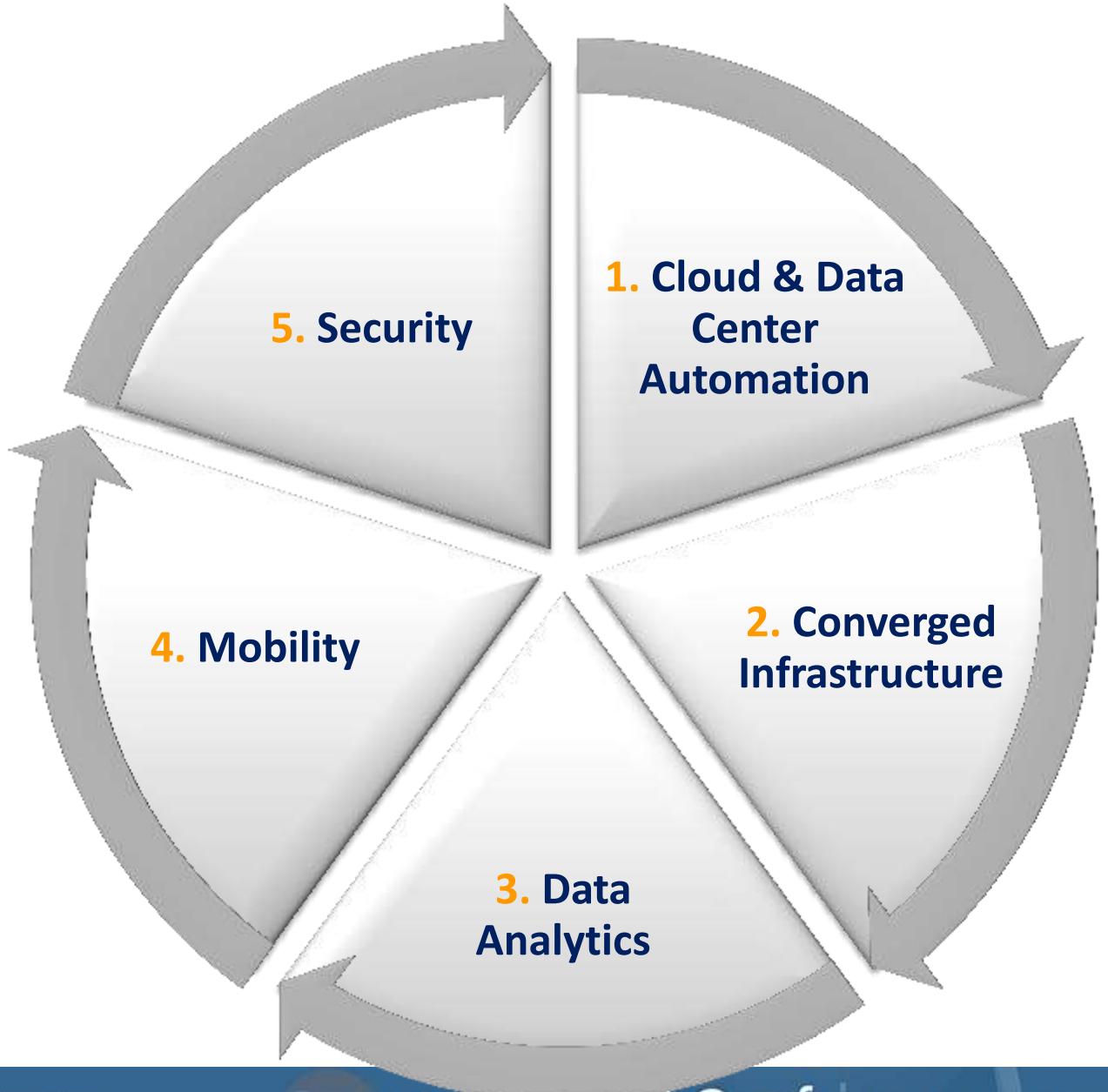
Fonte: SIRMI e NetConsulting cube, 2016

Intensità di impatto da = nullo a = elevato

Quale IoT **Go to Market Strategy?**



5 principali aree di **opportunità per i VAR**



1. Il **traffico** dell'IOT

1 Cloud & Data Center Automation

Data center leaders like IBM and cloud vendors like Amazon are racing to roll out platforms designed to capture and integrate data streams from thousands of connected devices simultaneously.

Whether these platforms are hosted in the cloud or on premises, they need to be tightly integrated with the existing data center environment. This creates a wealth of opportunity for VARs to deliver consulting and integration services to help bridge the gap.

2. Organizzare il **(Software-Defined) Data Center**

Converged Infrastructure

2

IoT is expected to generate an unprecedented volume—and velocity—of data that will certainly overwhelm legacy data center architectures.

Converged infrastructure solutions that tightly integrate computing, storage and networking cores into a single appliance that can deliver the rapid scalability and next-generation speed and throughput that the data centers need to thrive in the IoT age.

3. Trarre informazione e conoscenza dal **dato**

3 Data Analytics

The true business value of the IoT doesn't come from the massive influx of raw data: **value is only unlocked once that data has been converted to actionable, timely information.**

If this data analytics capability is delivered through an external IoT platform, it still needs to be tightly integrated with the data center environment. If the enterprise wants to bring this capability in house, it requires a significant investment that creates a transformational opportunity for the VAR.

4. Un mondo **mobile**

Mobility

4

Once the data has been analyzed and converted into information, it needs to be delivered to the business users when and where they want it. More often than not today, that information is being delivered to a mobile device.

The mobile delivery opportunities go beyond static reports to business leaders to include alerts and warnings sent to operators and service technicians, real-time status checks for regional managers and much more.

As the number of mobile devices increases and the Bring Your Own Device movement spreads, enterprises will need assistance deploying, managing and securing the breadth of devices along with the apps and data they contain.

5. Un mondo **sicuro**

5 Security

Enterprise data has tremendous value to malicious hackers, identity thieves and cyberespionage actors alike. **With the number of connected devices increasing exponentially due to the Internet of Things, so too will the number of potential vulnerabilities that can be exploited.**

Enterprises will need expert assistance from VARs to secure not only the IoT devices themselves, but the entire chain of delivery, stretching from the device to the data center and back out to the mobile phones and tablets on the network's edge.

Il problema dello Skill Gap: Nuove professioni emergono - ***IOT Architect***

Smarter With Gartner

The Internet of Things (IoT) requires strong executive sponsorship, but the will of the organization isn't sufficient to make IoT a reality. Someone has to have the complex role of understanding the needs of affected groups, identifying the target architecture that can address those needs and steering the organization toward that target state. This is the IoT architect.

"These individuals are hard to find," says Erik T. Heidt, research vice president at Gartner. "As with any emerging technology, the recipe for success involves a mix of technical knowledge, business acumen and delivery skills. The possession of superior capabilities in any one of these three areas will distinguish technical professionals from their peers. Those having such capabilities in two or more of these areas will be in extremely high demand."

> **Because an IoT solution has so many integrated components, creating a target IoT architecture is particularly important.**

We expect to see 20 billion internet-connected things by 2020. As these things generate increasing volumes of data, organizations will seek to exploit the potential business value gathered from them and will deploy an increasing number of IoT solutions to capitalize on this opportunity. The successful planning and deployment of these solutions will take a special kind of leader. A recent Gartner survey found that 76% of respondents in organizations with an IoT architect feel that their organizations are prepared to address their IoT needs. Only 31% of respondents in organizations without an IoT architect say the same.

The IoT architect has five main responsibilities:

1. **Spearhead development of the IoT vision and technical strategy**
   The IoT architect must work with key business and IT leaders to develop an IoT vision that sets objectives for the business to shoot for and to communicate that vision to key stakeholders. Part of this involves documenting the business's critical success factors, and part of it entails using the business value to drive engagement. An effective IoT vision is not merely aspirational; it's rational and deliberate.

2. **Design an end-to-end IoT architecture**
   The IoT architect must identify and document the IoT target state for the organization and ensure that the target architecture will address current and future business requirements. An end-to-end IoT solution typically spans a wide variety of technology areas ranging from data collection sensors, equipment or appliances at the edge all the way to integration with enterprise applications and systems. "Because an IoT solution has so many integrated components, creating a target IoT architecture is particularly important — especially if the organization is likely to create and deploy multiple solutions over time," Heidt says.

3. **Enable the design and construction of IoT solutions**
   The IoT architect collaborates with and enables solution architects in their design and implementation of IoT solutions. The target architecture is a valuable asset, but not the only one the IoT architect has to contribute. IoT architects bring lessons learned and design experience from across the portfolio of implementations in which they have participated.

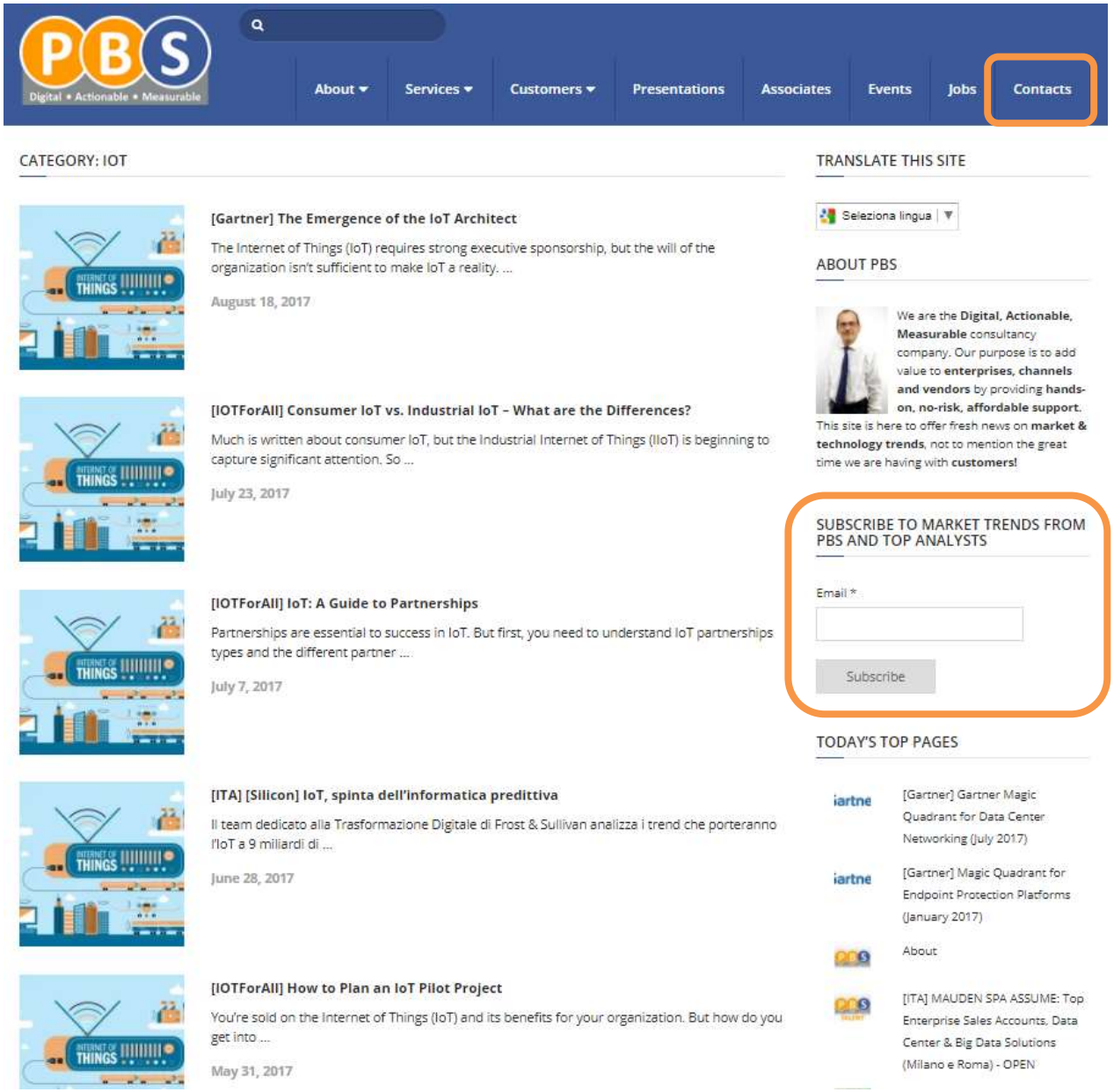
4. **Create a process to build IoT solutions**
   Developing and standardizing the process for building IoT solutions and then guiding the evolution and improvement of that process is key. This will help make the organization's creation of IoT solutions easier and more reliable because these initiatives will follow a process that incorporates the organization's experience and accrued best practices in IoT solution development.

5. **Collaborate with diverse enterprise groups to deliver value**
   IoT unites business activities in the physical world with back-end processes while increasing the involvement of IT and non-IT groups, such as business units and operational technology (OT) teams. The IoT architect needs to engage effectively with teams across the organization to develop clear business objectives for IoT solutions and to ensure they integrate well with existing operations.

In conclusione: IOT = SENSE

S-E-N-S-E	What the Internet of Things does	How it differs from the Internet
Sensing	Leverages sensors attached to things (e.g. temperature, pressure, acceleration)	More data is generated by things with sensors than by people
Efficient	Adds intelligence to manual processes (e.g. reduce power usage on hot days)	Extends the Internet's productivity gains to things, not just people
Networked	Connects objects to the network (e.g. thermostats, cars, watches)	Some of the intelligence shifts from the cloud to the network's edge ("fog" computing)
Specialized	Customizes technology and process to specific verticals (e.g. healthcare, retail, oil)	Unlike the broad horizontal reach of PCs and smartphones, the IoT is very fragmented
Everywhere	Deployed pervasively (e.g. on the human body, in cars, homes, cities, factories)	Ubiquitous presence, resulting in an order of magnitude more devices and even greater security concerns

Grazie e vi aspetto su www.primobonacina.com/iot



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