29th ANNUAL

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STATE AND LOCAL TAX FORUM

VANDERBILT UNIVERSITY LAW SCHOOL

Internet of Things: The convergence of everything…including taxes.

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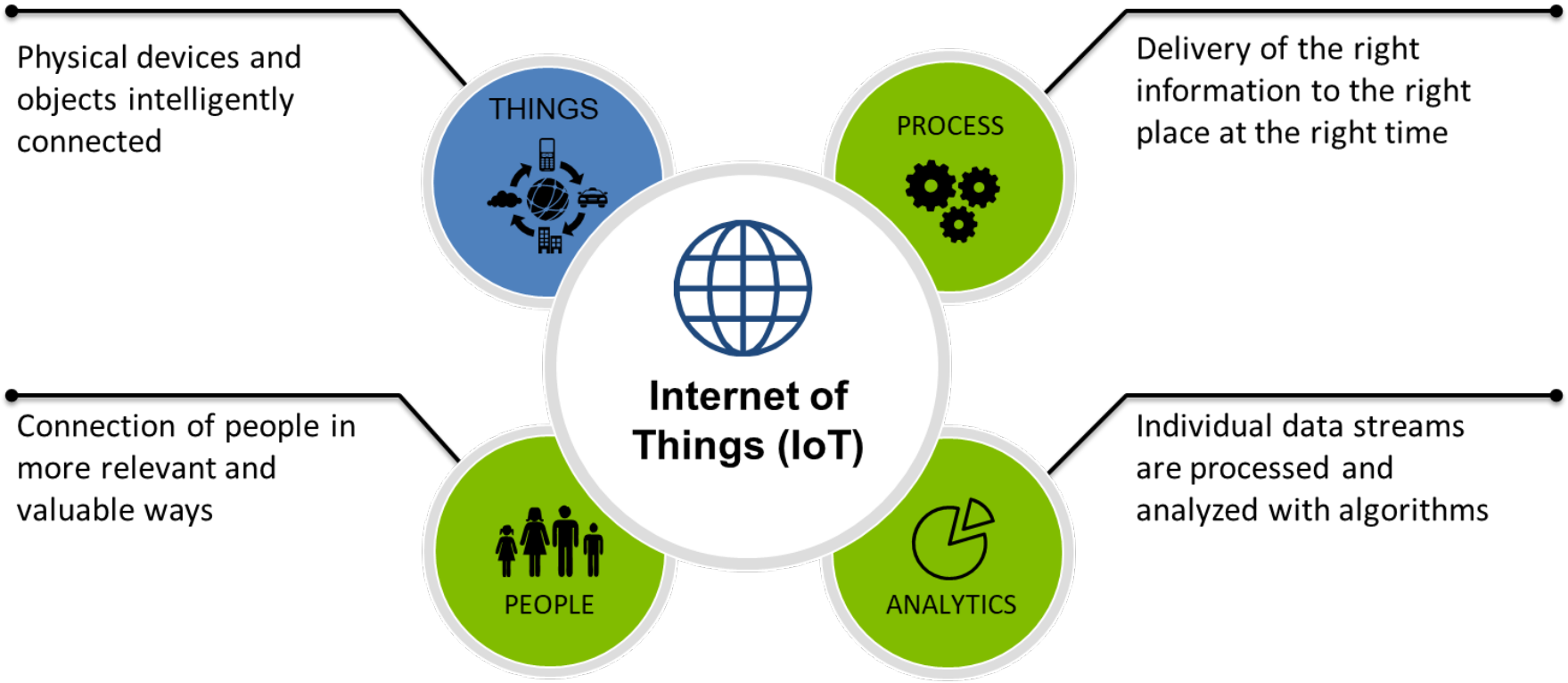
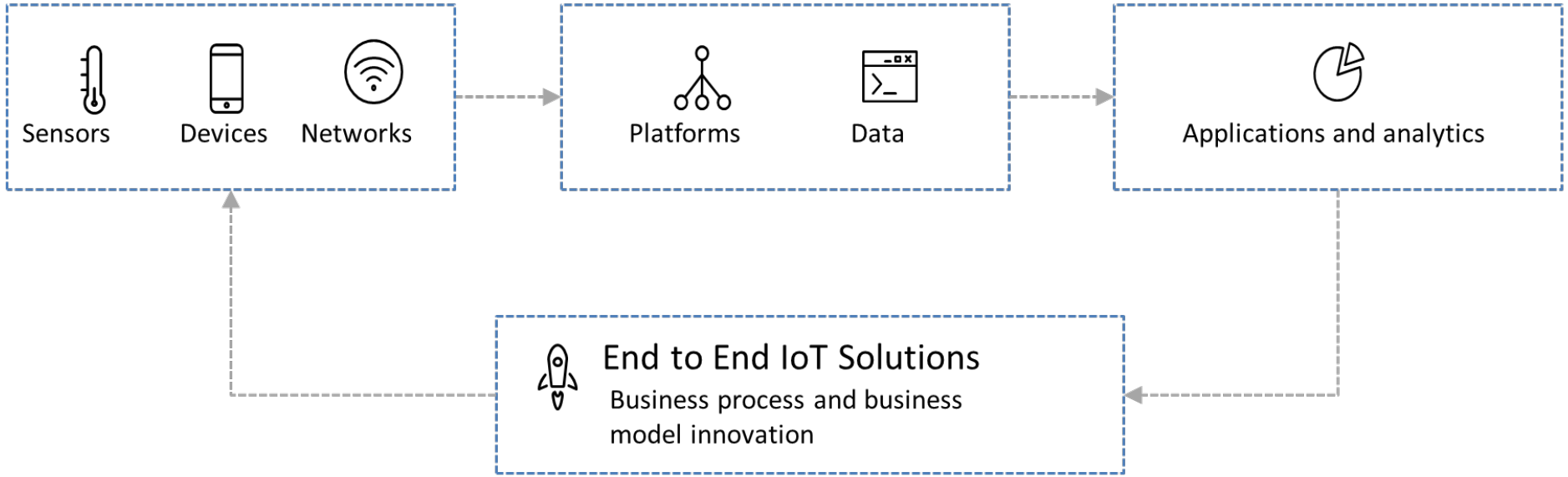
- Overview of IoT: What is the internet of things?
- Tax evolution from products to services economy
- IoT taxation and implications
- What's on the horizon and XaaS (Everything as a Service)

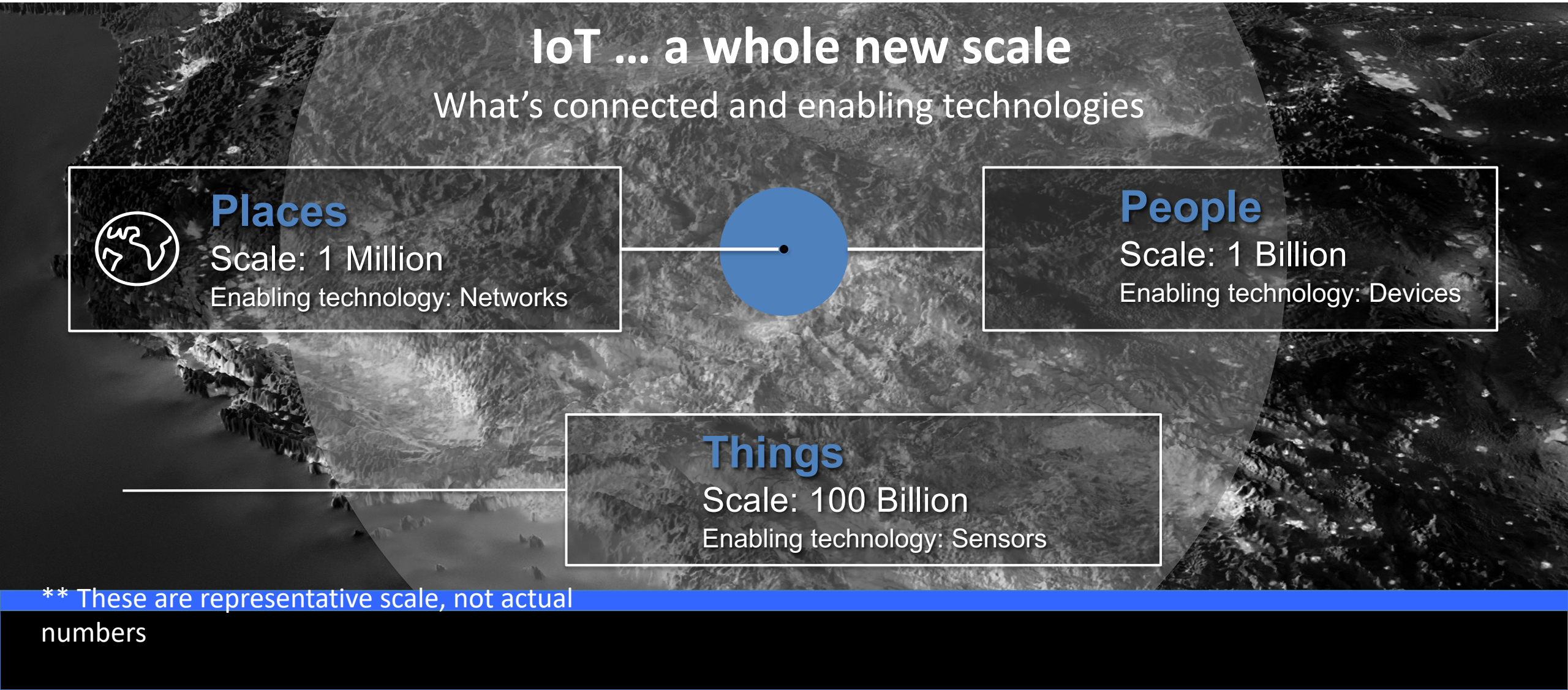
Internet of Things (IoT) refers to a world of intelligent, connected devices that generate data for automating business processes and enabling new services



IoT is about interconnected technology architectures

Sensor networks feed data architectures which can then be analyzed to reveal hidden insights that inform decisions and actions

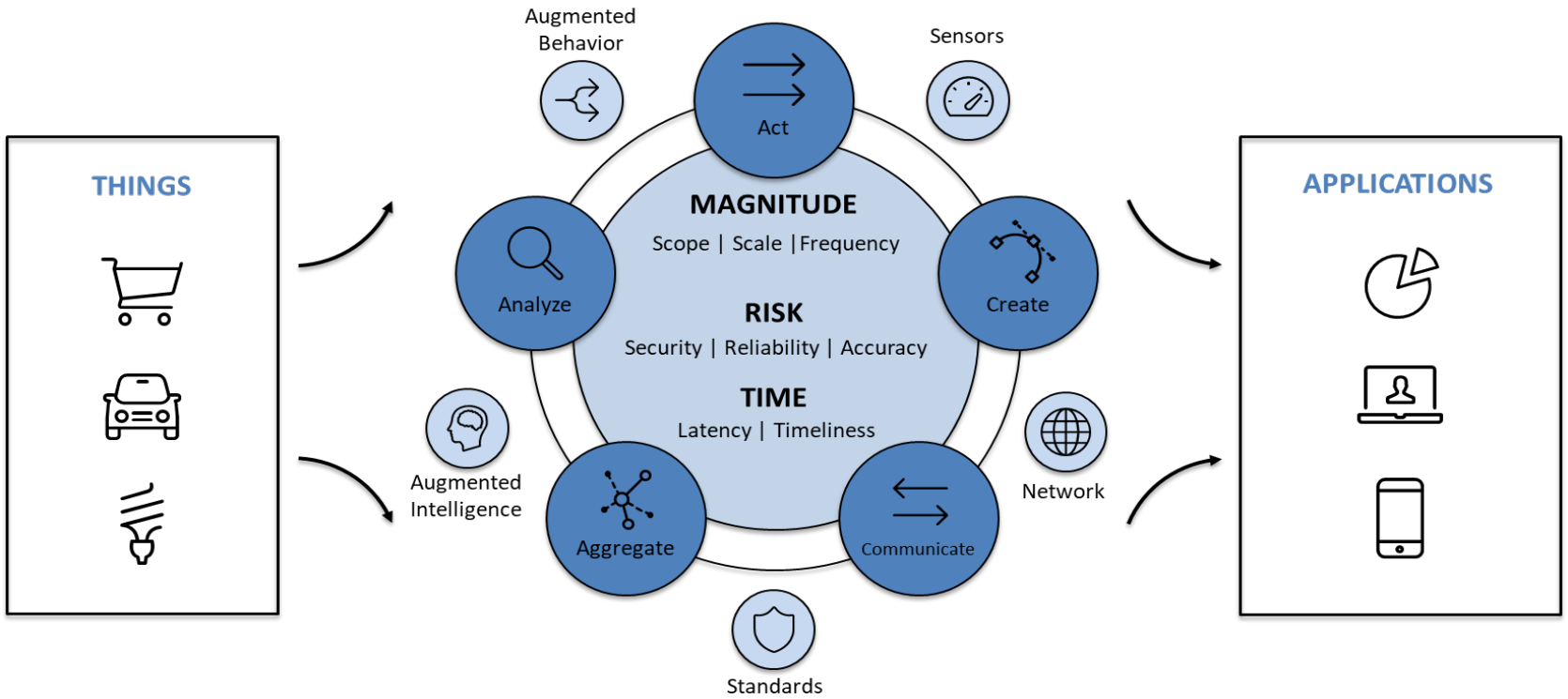




** These are representative scale, not actual numbers

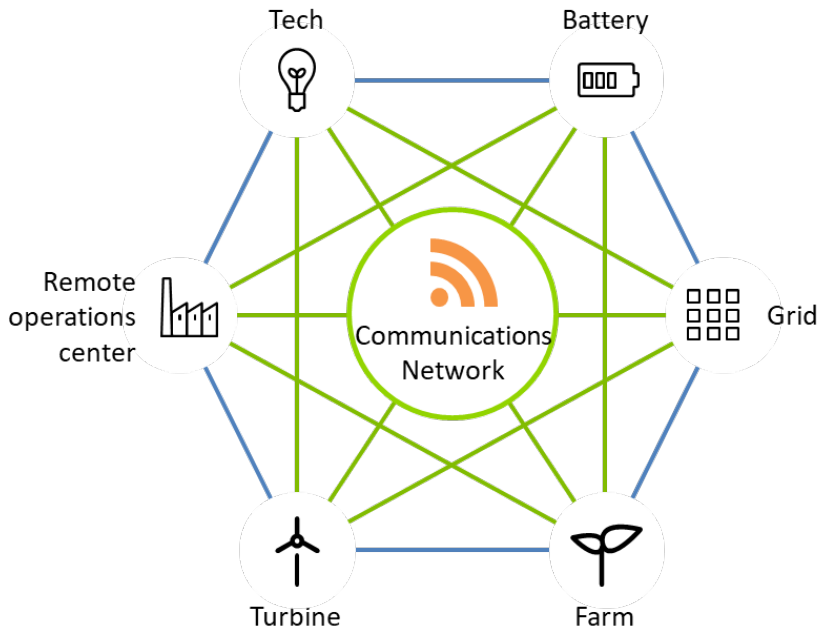
Information value loop

This is a framework for thinking about IoT solutions and is based on recognition that value lies in the DATA generated by sensors and connected devices



Think – managing wind turbines with IoT

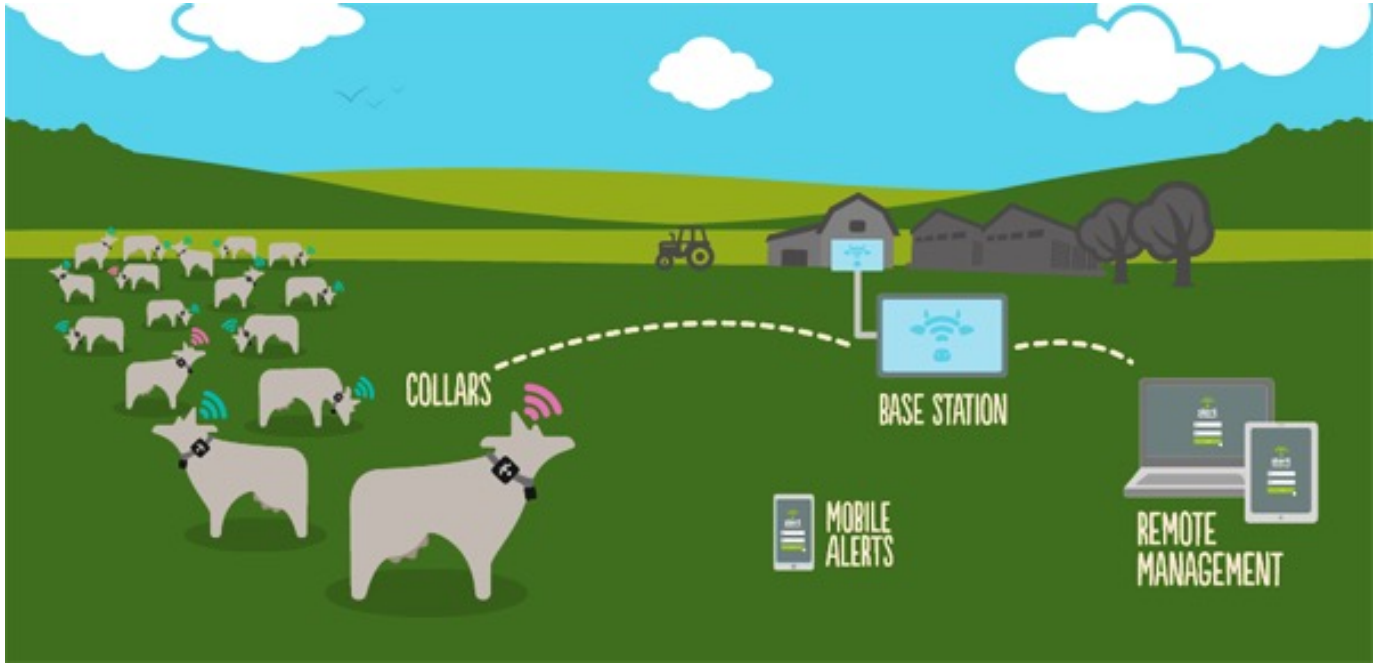
The system analyzes tens of thousands of data points every second to integrate hundreds of megawatts into the grid



The wind farm analyzes information to optimize

- Power production
- Operations and maintenance costs
- Flexibility

The connected cow??



Which industries does it impact…

Manufacturing
- Predictive Maintenance
- Supply chain optimization
- Asset tracking
- Automate workflows
- Personnel safety

Energy &Resources
- Smart grid
- Leakage prevention
- Wellhead optimization
- Asset optimization
- Personnel safety

Retail/Consumer Products
- Consumer marketing
- Reimagined store front
- Intelligent replenishment
- Supply chain management
- Memorable experiences

Life Sciences/Healthcare
- Clinical trials
- Patient experience
- Equipment tracking and diagnostics
- Remote monitoring
- Inventory management
- Supply chain management

Auto/Transportation
- Dealership of the future
- Remote diagnostics
- Fleet management
- Autonomous vehicle

Military
- Connected battlefield
- Supply chain
- Fleet tracking

Financial Services
- Perf-based insurance
- Personalized risk profiles
- Retail banking

Smart Cities
- Smart lighting
- Transportation/Energy management
- Smart parking
- Smart waste

Customers are benefitting from IoT right now

IOT can make life easier, more convenient and more enjoyable

SPEED & CONVENIENCE

Optimized shopping experiences

Convenience of payment

Ease of identifying product and location

PERSONALIZATION

Tailored shopping experiences

Meaningful recommendations

UNIQUE EXPERIENCE

Surprise and delight the customer

Experience aligned with customer passions

What does it mean?

- IoT and tectonic shifts in technology lead to a real redefining of company boundaries
  - New business models
  - New products
  - New partners, ventures, relationships
  - New customers
  - New competitors
  - New markets
  - New industry implications/concerns
  - Unclear/Undefined marketplace
  - Faster change in product mix, focus, strategic direction

TAX

Wh… mea…

- IoT and tecto… …gy lea… redefining of … …ries
  - New busin… …s
  - New produ…
  - New partn… …es, rela… …s
  - New custo…
  - New comp…
  - New mark…
  - New indus… …tions
  - Unclear/U… …arke…
  - Faster cha… …duct mix, focus, strategic direction

Tax Evolution Basics

The foundation of U.S. tax law was constructed during the 1950s, 1960s and early 1970s when the economy was driven by location-specific manufacturing

Over the course of the last few decades, the economy both in the U.S. and worldwide has transformed to a more service-based and ubiquitous marketplace

Tax law has been slow to react, particularly at the state and local level. Rapid pace of technological change has exposed these frailties even further

Introduction and adoption of IoT concepts has further stretched the boundaries of guidance. Nature of IoT as “things” communicating/transmitting opens the door to communications taxation, leading to “square-peg, round hole, big hammer” method of taxation

IoT Taxation and Implications

Transaction taxation

- What is being sold?
- Jurisdictions could characterize into any of the following taxable categories
  - Enumerated service ("cloud" or application service providers)
  - Sale, rental, or access to prewritten software
  - Data processing
  - Data storage service
  - “Digital automated service”
  - Computer service, computer exchange service
  - “Canned” information service, "personalized" information service
  - Communications service
  - Digital equivalent to traditional tangible personal property ‘aka’ digital goods

Not only important to define what it is not, but must also be able to identify what it is!!!

M2M and telematics

- Machine-to-Machine or M2M is a subset of IoT and represents the world of "connected devices" and information
  - What is the service? Information service, data transport or communications service or…?
  - Who pays for what service – at what point in the stream of commerce does the transaction take place?
  - Where is the service provided or enjoyed?

- MO LR 6320 (07/1/2010)
  - A GPS tracking service provider for vehicle fleets must collect and remit Missouri sales tax on its airtime charges to Missouri customers. The provider is selling the services of transmitting and receiving vehicle location information and text messaging to its customers. Its airtime charges are for telecommunications services that are subject to tax.

M2M and telematics (cont'd)

- Taxpayer v. Commissioner, Court of Appeals of Tennessee, No. M2006-01398, 2007 (9/26/2007)
  - A service allowing commercial trucking companies to locate and determine the status of individual vehicles as well as communicate with its drivers was not subject to Tennessee sales and use tax. Telecommunication was not the true object or primary purpose of the service.

- Taxpayer v. DOR, Washington Supreme Court, No. 83673-6, 171 Wash.2d 125 (3/10/2011)
  - The Supreme Court reversed the Court of Appeals, which had held that the truck tracking service was taxable as "network telephone service," and therefore subject to retail sales tax. The court determined that the primary purpose of the purchasers of the truck tracking service was to obtain the data generated by the system.

Is it bundled with telecom?

- SSTA Guidance
  - In the case of a bundled transaction that includes any of the following: telecommunication service, ancillary service, internet access, or audio or video programming service
    - ➢ If the price is attributable to products that are taxable and products that are nontaxable, the portion of the price attributable to the nontaxable products may be subject to tax unless the provider can identify by reasonable and verifiable standards such portion from its books and records that are kept in the regular course of business for other purposes, including, but not limited to, non-tax purposes.

What's on the "Horizon"?

- IoT and AI (Artificial Intelligence)
- IoT and Blockchain
- IoT and 5G Edge Computing
- Everything as a Service (XaaS)

What's on the "Horizon".....or is it already here?

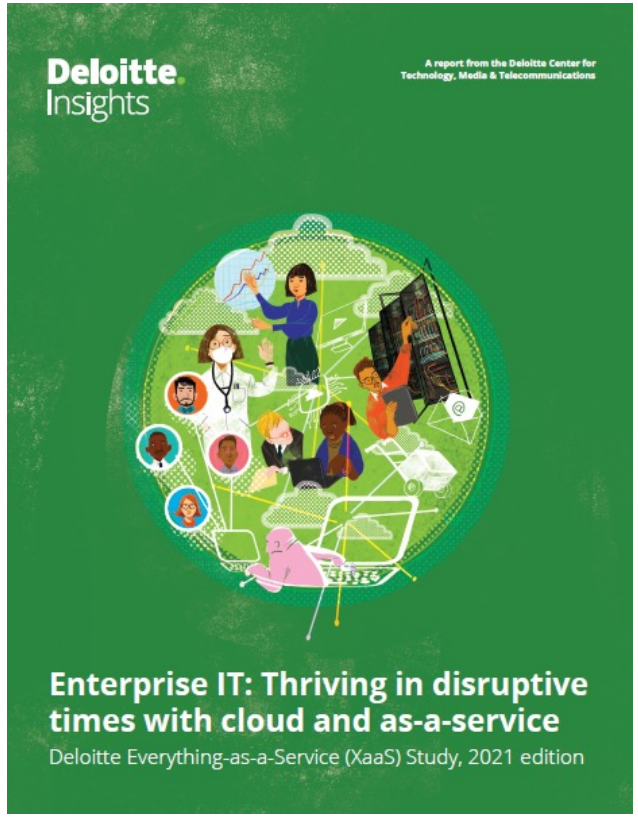
- IoT and AI (Artificial Intelligence)
  - Video telematics
- IoT and Blockchain
  - Sensors and so much more
- IoT and 5G Edge Computing
  - Gartner® predicts that "By 2025, more than 50% of enterprise-managed data will be created and processed outside the data center or cloud."

XaaS – Everything as a Service

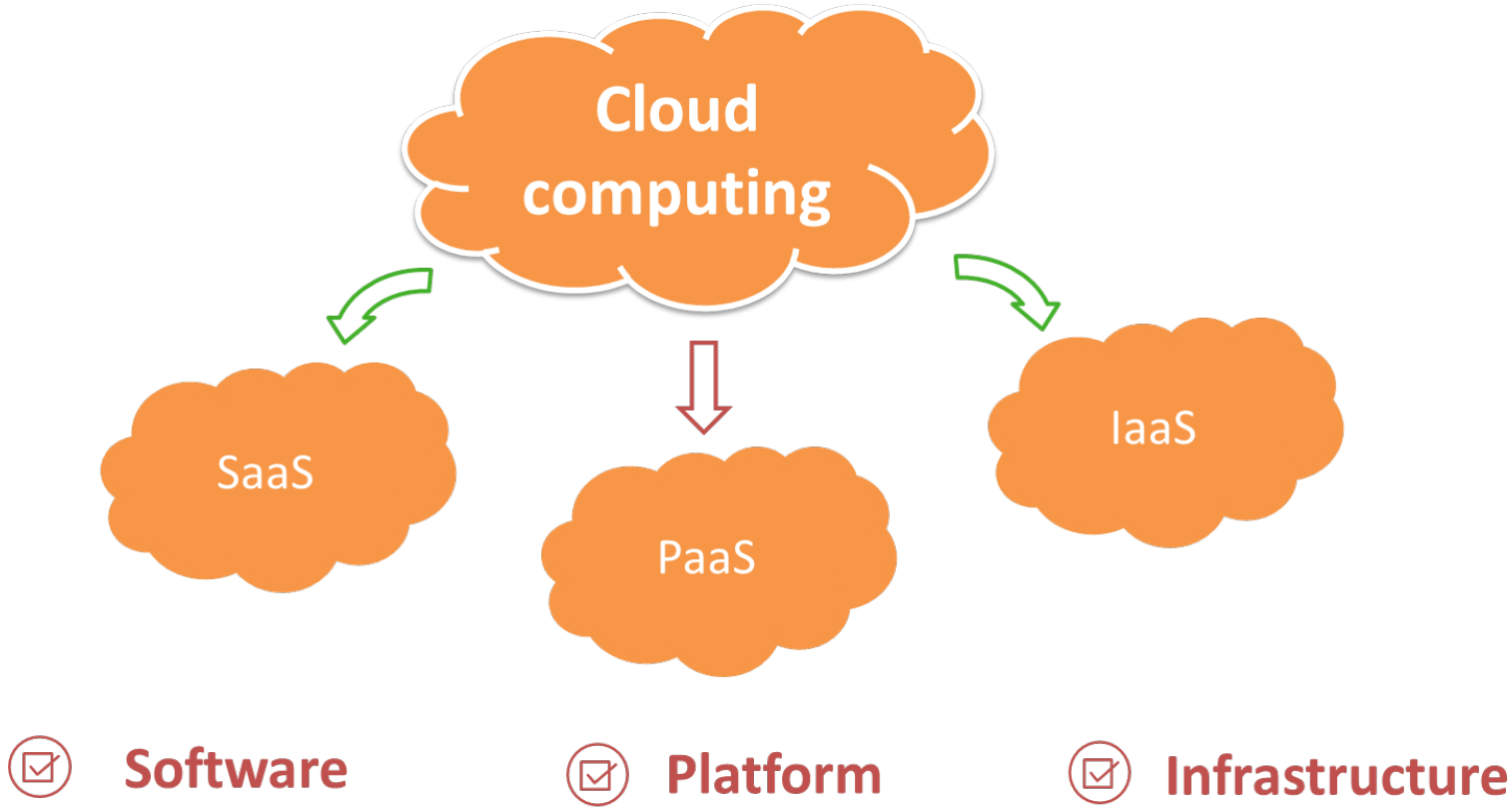
- The term XaaS came into use after certain technologies and innovations were connected over networks and converged to become productized.
- The XaaS industry is evolving and will likely be a growing focus in future years to come. It has been transformative to the way many businesses operate

Thriving in disruptive times with cloud and as-a-service

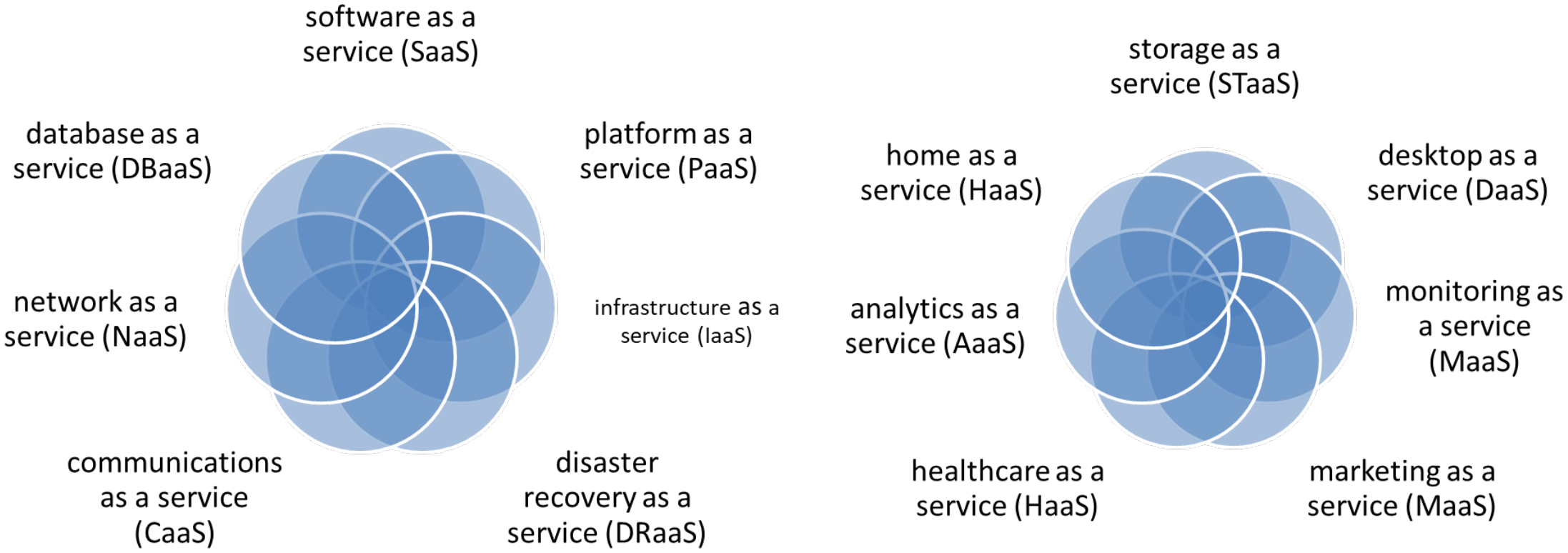
- 8 in 10 adopters surveyed regard XaaS as very/critically important to their business success, and 6 in 10 believe it gives them a competitive edge
- 75% of respondents say at least half their enterprise IT is service-based, and 87% believe they'll reach that point within 5 years
- Organizations use XaaS to achieve business agility, including accelerated innovation—not just operational efficiency
- 93% of respondents have challenges scaling up, citing data security, skills, cost, and integration as top issues
- 83% of respondents agree XaaS has improved their customer experience, but fewer than 3 in 10 say they're content to stick with current providers—they're seeking more consultative partnerships



Then…


Cloud computing
SaaS
PaaS
IaaS
Software
Platform
Infrastructure

Now…


software as a service (SaaS)
database as a service (DBaaS)
platform as a service (PaaS)
network as a service (NaaS)
infrastructure as a service (IaaS)
communications as a service (CaaS)
disaster recovery as a service (DRaaS)
storage as a service (STaaS)
home as a service (HaaS)
desktop as a service (DaaS)
analytics as a service (AaaS)
monitoring as a service (MaaS)
healthcare as a service (HaaS)
marketing as a service (MaaS)

The Issues?

- They haven't changed…they just got more complex
  - ✓ What is it?
  - ✓ How to tax it?
  - ✓ How to source it?

Questions???

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