optimity ADVISORS

Digital Transformation with IoT

What is Internet of Things, Why it is Important, and How You Can Harness the Power of IoT in your Business

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ORANGE PAPER

Introduction

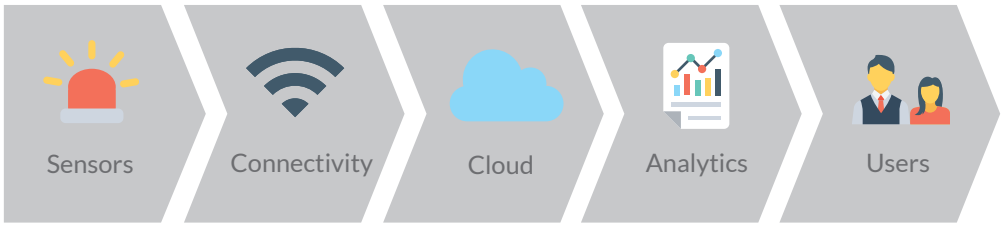
As the Internet has become more and more ubiquitous around the world, it has enabled a myriad of new possibilities. The Internet of Things (IoT) connects sensors to the Internet and utilizes software to translate data into actionable insight. These exciting technology developments create incredible new value propositions for both Business-to-Business (B2B) and Business-to-Customer (B2C) use cases.

This Orange Paper by Optimity offers:

1. An overview of what IoT is and why it is Important
2. Examples of solutions across a few use cases, both present and future
3. A conceptual approach for how you can implement IoT solutions in your business to achieve real value

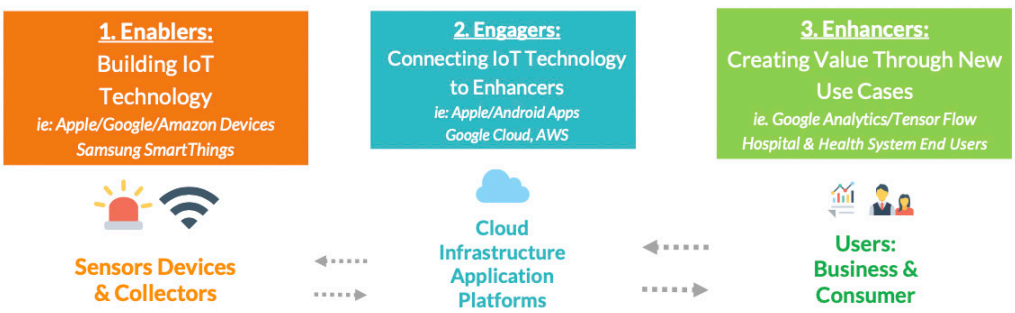
What is IoT: The System Components

As the diagram below shows, the "Internet of Things" is a system of Sensors that stream data through Internet Connectivity to the Cloud, which Analytics may then convert to knowledge, insight, and recommendations for Users:



The major industry players in the IoT space include many companies that are familiar to us, including Apple, Google, Amazon, and Samsung, to name a few.

The key roles these companies play are:



Why IoT is Important

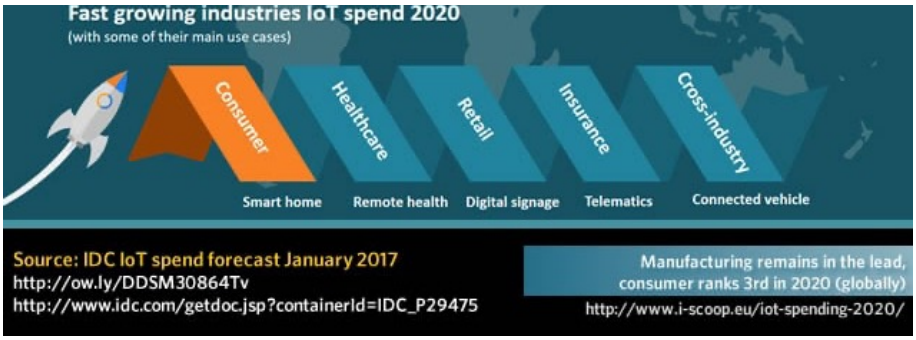
The Internet of Things is all around us and growing. Although we may not recognize it, IoT is already part of our everyday lives, within our cities, hospitals, highways, and factories.

Investment in IoT is Big

Worldwide IoT spending projecting to **surpass $1 trillion in 2022** (Source: https://www.i-scoop.eu/internet-of-things-guide/iot-2019-spending-trends/). In 2019, the industries that spent the most on IoT solutions were:

- Manufacturing (discrete and process) at $197 billion,
- Transportation at $71 billion,
- Utilities at $61 billion, and
- Consumer IoT at $108 billion.

The fastest growing industry segments are in Consumer, Healthcare, Retail, Insurance, and Cross-Industry solutions such as connected vehicles.



Powerful Underlying Technology Trends Support the Rise of IoT

This explosion of investment in IoT is driven by powerful underlying strategic technology trends that support the growth of IoT Solutions. As Peter Diamondes writes in Sensors and the Rise of IoT, "We see this triple trend—of plummeting size and cost, alongside mass increases in performance—everywhere."

The Empowered Edge of new sensor technologies, Distributed Cloud platforms, and new Autonomous Things exemplify the rise of new IoT solutions in the market today. (Gartner: Top 10 Strategic Technology Trends for 2020 https://www.gartner.com/en/newsroom/press-releases/2019-10-21-gartner-identifies-the-top-10-strategic-technology-trends-for-2020.)

The Empowered Edge

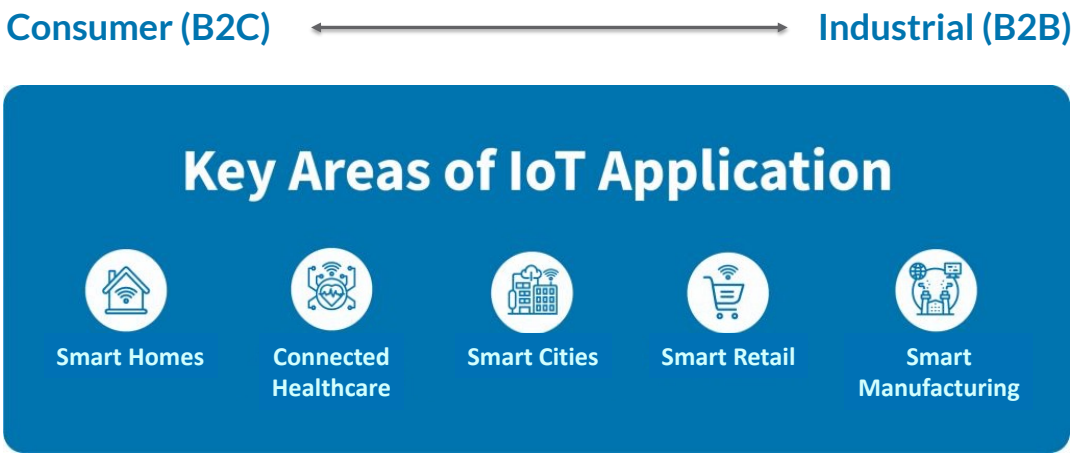
The Distributed Cloud

Autonomous Things

In addition, the developing 5G network is another key enabler for fast data transmission from IoT Sensors moving forward, widening the data transmission "pipe" and bringing superfast speeds – up to 20 Gigabits-per-second – a 100x improvement over today's network. The faster data speed from 5G will help Smart Cities provide reliable connectivity across urban areas, healthcare to distribute point of care into homes and smaller clinics, retail to enhance warehousing, logistics, and delivery operations, manufacturing to accelerate automation, and insurance to utilize more quantified, connected data for rapid automated scoring and claims processing. (Source: https://www.morningbrew.com/emerging-tech/guides/5g-in-2020?utm_source=etb_5g)

Examples of IoT Use Cases Present and Future

IoT solutions are already having a significant impact on our lives. With innovation, we will use IoT more and more. A simple set of IoT Applications spanning Consumer (Business to Consumer, or B2C) and Industrial (Business to Business, or B2B) which we will use to describe five IoT Use Case areas, and examples within each of these areas, are depicted in the diagram below.



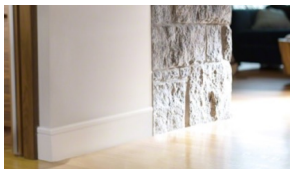
1. SMART HOMES

Smart Home are equipped to provide solutions such as monitoring for safety, energy and water efficiency, and clean air and clean surfaces. Today, Smart Homes use IoT-enabled security systems; personal voice-activated assistants to manage, turn on and off electronics; robotic vacuum cleaners; and App-enabled Smart air filters, temperature, and humidity home monitoring.

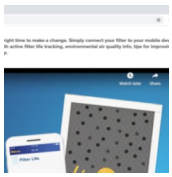
Security Systems

Personal Assistants

Robotic Vacuums



Smart Air, Temp & Humidity Sensors



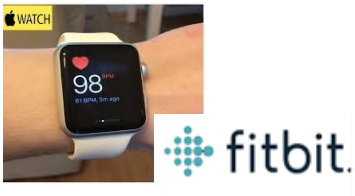
In future, we can expect Smart Homes to enable:

1. Artificial Intelligence to track people's location to accommodate and anticipate needs, adjusting everything from heating and cooling to music and lighting, to optimize resource usage
2. Elderly people to live in their homes, by offering a helping hand to make sure day-to-day tasks are completed successfully and safely and aid them in other ways, such as reminding them to take their medication or restock the fridge. In case anything happens, emergency services can be notified and automatically allowed inside to help.
3. Increased home monitoring of systems like water, temperature, humidity, etc., reporting unprecedented incidents to the homeowner and alerting emergency services.

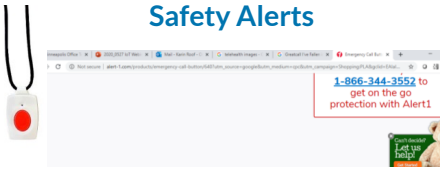
2. CONNECTED HEALTHCARE

Connected healthcare is about enabling better outcomes, increasing the capacity of Caregivers, and making Healthcare more efficient. Health and Healthcare are two distinct segments of the Connected Healthcare market, with Consumers embracing technologies for their personal use, and the Healthcare system adopting IoT solutions that work at the Care Delivery level. Some examples of **Consumer Health IoT solutions** include:

Wellness Wearables



Safety Alerts



Diabetes Monitoring

In **Connected Healthcare**, significant progress has been made to use IoT to monitor patient conditions remotely and intervene when necessary; provide remote visits through Telehealth solutions, using the computer as the interface; and make hospitals operate more efficiently with efficient management of patient flow, staffing and equipment.

Remote Monitoring

Telehealth

Smart Hospitals - Real Time Location of Patients, Staff, and Equipment

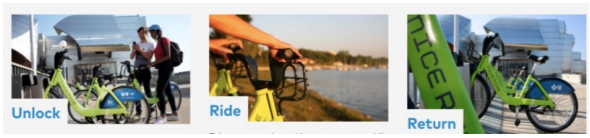
In the future, we expect that Healthcare will incorporate Analytics such as Artificial Intelligence and Machine learning to increasingly automate data interpretation and provide actionable insight, for Caregivers and Patients alike. Also, the power of Big Data can be harnessed along with Analytics to enable Real-Time Population management by Healthcare networks.

3. SMART CITIES

Smart Cities have invested in Digital solutions for a more liveable future. Better modern communities include more efficient water, power, sanitation, and waste management services; transportation and urban mobility solutions; public safety; and energy and environmental management. Some examples include:

Smart Traffic Control

Public Self-Serve Rentals



Smart Waste Management

In the future, McKinsey forecasts that communities will invest in digital solutions for public quality of life to address Safety (traffic, emergency response, policing), Health (data-driven public health, digital tools for patient experience, improved chronic disease management), Environment (energy and water use, air quality, waste), Connectedness with plus WiFi and Apps, plus Time, Cost of Living, and Jobs. https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/smart-cities-digital-solutions-for-a-more-livable-future

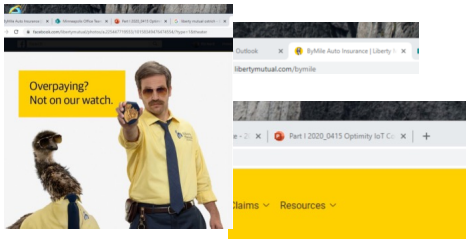
4. SMART RETAIL

Retail is an area where all of us have experienced the tremendous power of IoT in making our lives easier, more effective, and efficient in accessing the goods and services we need. IoT has enabled new Customer channels, with remote ordering, transactions, and delivery. IoT is used to manage inventory with real-time inventory tracking, smart shelves, just-in-time promotions, and reducing fraud. It also plays a key role in enabling strategic supply chain management through smart production, warehousing, and transportation solutions. As consumers, we experience many Retail IoT solutions directly. Here are a few that many of us use every day:

Shopping & Entertainment

Remote Banking

Need-Based Insurance



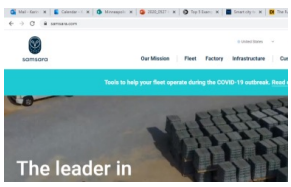
In the future, we anticipate that **IoT will help Retail:**

1. Bridge fast-moving supply and demand with sophisticated inventory management and supply chain operations
2. Predict Customer behavior to provide them with products and services they want and need – connect "learn" to drive "purchase" – e.g. Just-In Time Coupons
3. Integrate Customer Touchpoints – so that retailers know their customers in all environments and can provide a seamless customer experience in-store, online, social media, and mobile.

5. SMART MANUFACTURING

The Manufacturing sector, which is where the majority of IoT investment and Use Cases are operating now, gains tremendous value in three key areas: 1) Remote monitoring – Is it running? 2) Predictive maintenance – Fix it before it breaks, and 3) Autonomous operation – It runs on its own. Some key IoT technologies in use for Manufacturing today include:

Real-Time Inventory Tracking



Manufacturing Process IoT

Food & Beverage Sensors for temp & humidity

As IoT and complementary technologies mature, Manufacturing will forge ahead with new industrial solutions with expansion in the systems of Remote monitoring > Predictive Maintenance > Autonomous production, continuing the journey to increase quality while reducing the cost of manufactured goods.

A Conceptual Approach for Implementing IoT in Your Business

Now that we have whetted your appetite with the incredible potential that IoT presents to provide value to both Consumers and Businesses, we would like to touch on a conceptual approach for implementing IoT in your business.

Evolving Your Strategy

All organizations need to evolve, strengthening their current business models and creating solutions for the future. In developing the strategy for change, it is helpful to ask three critical questions:

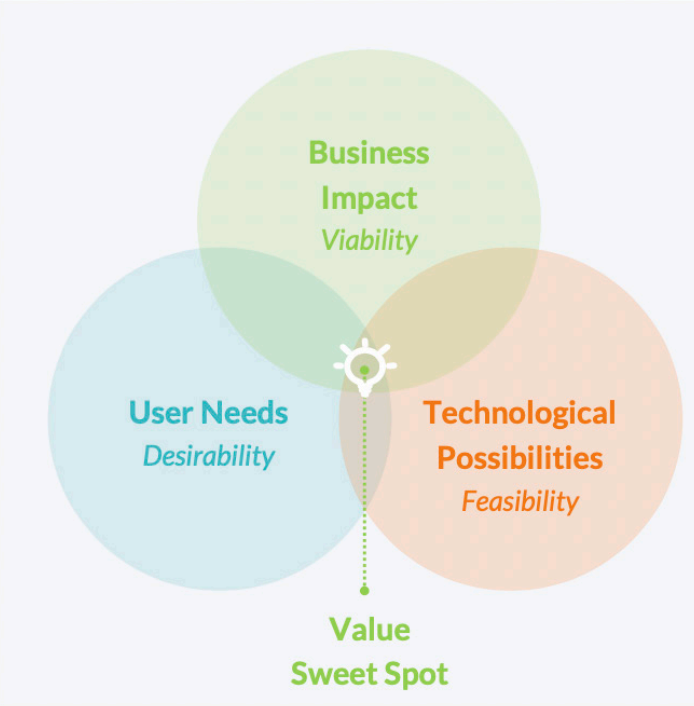
1. What are your business imperatives now?
2. What will your business need to look like in 5-10 years?
3. What will happen when your industry is fully digital and networked? Will your position be disrupted if you do not evolve?

Implementing Valuable Solutions

Once the strategic context for change is understood, we understand that creating valuable solutions means first and foremost, addressing meaningful business problems. People do not invest in IoT for its own sake. They buy a solution to a problem. As an overall approach, we recommend following a logical, three-step innovation process to find the "Value Sweet Spot" at the intersection of Business Needs, Technological Possibilities, and User Needs:

Implementing IoT in Your Business

1. **Define the Business Problem to Solve**
   - Revenue or Cost?
   - Customer, Process, Data?
2. **Understand the Technology Possibilities**
   - What IoT technology exists that could address the problem you want to solve?
3. **Design Solutions that Work for Users**
   - Use a "human-centered" Design Approach



Our team can help you with each of these Innovation steps, leading and guiding your team through analysis, research, and solution design to create truly valuable solutions. Let us know if we can explore your situation with you and identify opportunities for Digital Transformation.

Meet the Author

Karin Roof, Manager

Karin Roof brings years of experience in management consulting and skills in strategic and product planning, design thinking, and business acumen to the team, as well as industry experience in healthcare and financial services. Having earned her MBA from the MIT Sloan School with a focus on Technology and Innovation Management, Karin has focused on how companies create value through innovation and business process re-engineering throughout her career. She is known for being both broad and detailed, leading with clear articulation of objectives, strategies, tactics, and plans. Karin strives to help clients achieve real change through thoughtful analysis and teamwork at all levels. She is a natural leader and values accomplishment for her clients and teams.

Scot Alexander, Managing Director in Optimity's Minneapolis Office

Scot has 25 years of experience delivering solutions impacting customer, partner, and employee experience He focuses on the engagement management and business architecture within health payer, provider, and life sciences industries. Scot has led multiple programs redesigning benefit products, broker sales channels, and core administration platforms. Specifically, he has led engagements to stand up new healthcare payer operational models, IT systems, and business processes - implementing customer intake to enrollment, medical management, claims payments, and customer service. Additionally, Scot brings cross-industry Industrial Engineering perspective and solutions from consumer goods manufacturing, distribution, and retail operations.

THANK YOU

Thank you for your valuable time. For further information, please contact:

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