



IoT Overview

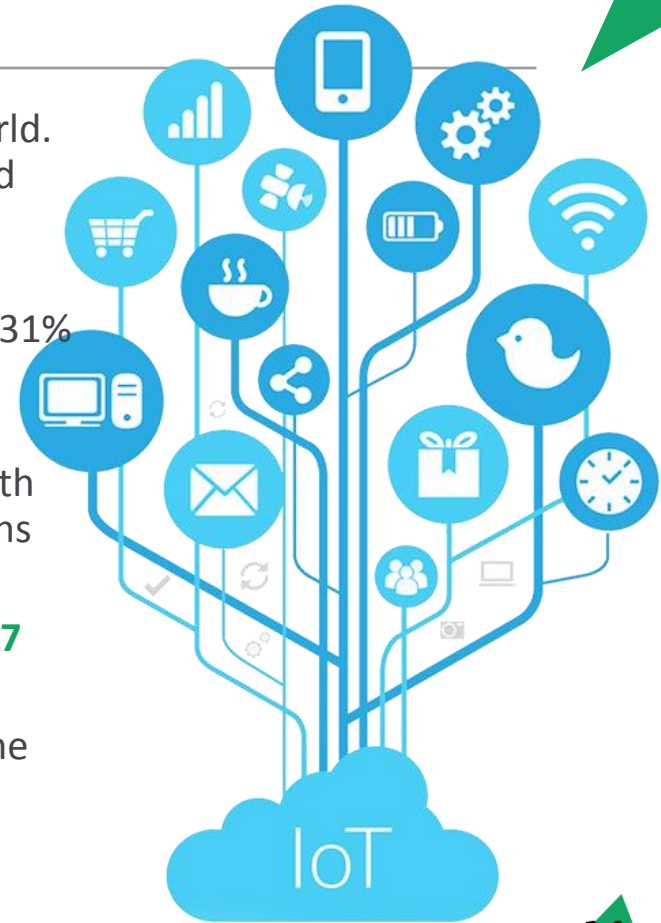
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IOT TODAY

IoT Trends

- ▶ The Internet of Things will be the largest device market in the world. **By 2020** – 10 connected devices for every household, 5 connected devices for every Internet user, 5 Billion Internet Users
- ▶ **8.4 billion connected things** will be in use worldwide in 2017, up 31% from 2016 and will reach **20.4 billion by 2020**
- ▶ The **consumer segment** is the largest user of connected things with **5.2 billion units in 2017**, representing 63% of Total IoT Applications
- ▶ Businesses are on pace to use **3.1 billion connected things in 2017**
- ▶ Enterprises and corporations continue to believe that IoT holds the promise to **enhance customer relationships** and **drive business growth** by improving quality and productivity



Customer Priorities



Data Management

Making sense from huge volumes of data generated through various devices from various locations



Security

Security of devices, applications and network



Point Solutions

IoT users need customized, readily accessible and actionable solutions



Integration

Real-time integration to connect legacy ERP systems

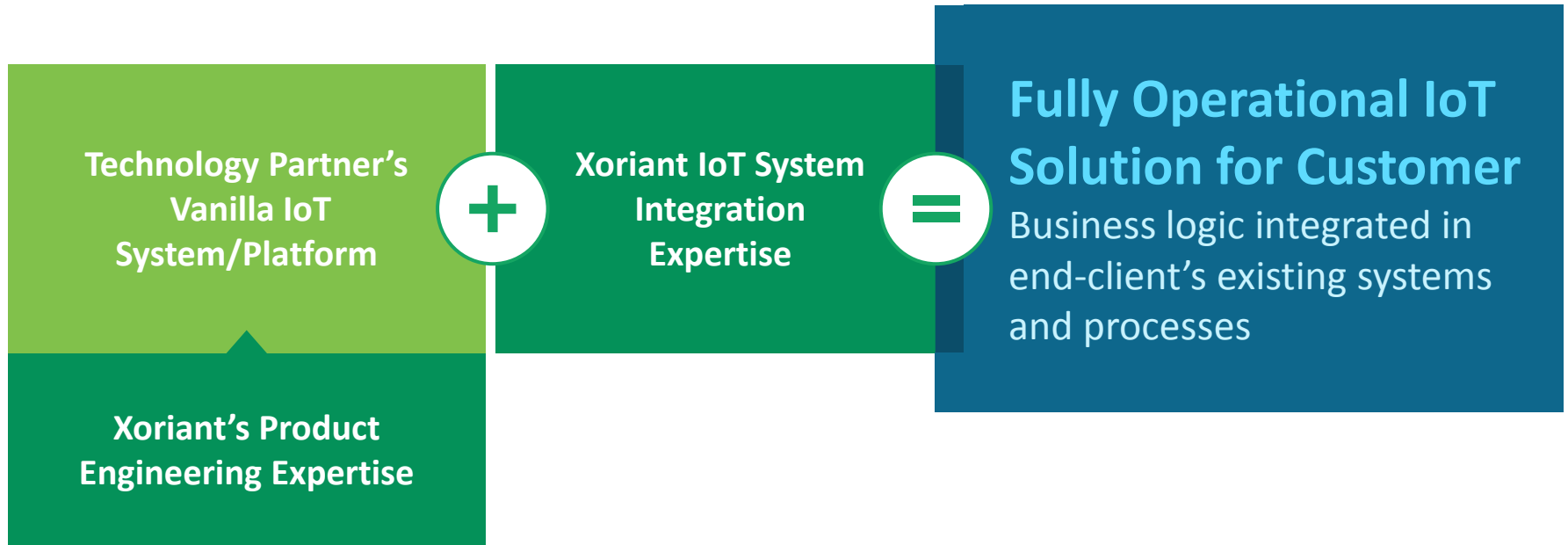




XORIAN'T'S IOT PRACTICE

Our IoT Focus

Xoriant enables our technology partners to develop fully operational IoT solutions for their products and their customers.



Expertise Across Key IoT Components

Systems Integration



Devices

- Sensors
- MCUs
- Gateways
- Protocols



Infrastructure

- Cloud
- Data Center
- Edge
- Network



Analytics

- App Development
- Machine Learning on Sensor Data
 - Real Time Analytics
 - Predictive Analytics



Control & Communicate

- UI, UX
- Optimized Outcomes with
 - Triggers
 - Alerts



Why Xoriant for IoT ?



IoT CoE Fostering Innovation for Partners & Clients



In Depth Expertise Across Latest IoT Protocols



IP Creation Focused on Entire IoT Stack



Dedicated Big Data and Analytics Practice

- ▶ Next-Gen IoT Platforms skill sets
 - ▶ Dedicated IoT lab showcasing live IoT solutions in action and new PoC development
-
- ▶ HTTP, Serial Peripheral Interface (SPI), Phidget, Zigbee, MQTT, OPCUA, UCAM, Websocket, AMQP, etc.
-
- ▶ Xoriant IoT App Accelerator provides device ready, technology agnostic, tested functionalities across connected applications
 - ▶ Automated tools and IP for key functions: Organization Setup, Device Management, Applications, Data Storage, Visualizations/Reports, Security, Triggers/Alerts and Protocols
-
- ▶ Experience Big Data practice to help unlock value from sensor data and optimize business outcomes

IoT Offerings



DEVICE INTEGRATION & CONNECTIVITY

- Device provisioning, management and connectivity
- Cloud migration, customization and deployment/integration
- Sensor and device configuration, testing, firmware upgrade



PLATFORM INTEGRATION

- Device connectivity with IoT protocols
- Application integration



APPLICATION DEVELOPMENT

- UX/UI design
- Use case development and delivery across domains
- Multiplatform consumer and enterprise app development on various devices
- Web services



ADVANCED ANALYTICS & BIG DATA

- Predictive and real-time analytics
- Business logic integration to derive business insights
- Data management



REMOTE MONITORING & SUPPORT

- IoT infrastructure monitoring
- IoT applications support
- Incident management



IoT Expertise Across the Technology Stack

Areas

Platforms Supported

- ▶ Linux, Windows, WINRT

MCUs, Devices and Sensors

- ▶ Beaglebone Black, Intel Edison, Raspberry Pi, Arduino, PLC's, Temp Sensor, Potentiometers, Proximity, Gyroscope, Flow Meter, Soil Moisture, IR, Photo Detector, Bio Detector, Cameras, Motors, Servos, etc.

Standards/Protocols

- ▶ HTTP, Serial Peripheral Interface (SPI), Phidget, Zigbee, MQTT, OPCUA, UCAM, Websocket, AMQP

Data Management & Storage

- ▶ Hadoop, MongoDB, R, HBASE, Cassandra, Hive

Data Analytics

- ▶ QlikView, MicroStrategy, Tableau, Pentaho, Informatica, Talend

Applications

- ▶ Northbound application on any IoT solution, Monitoring Dashboards

Languages & UI Frameworks

- ▶ C#, .NET Framework 4.0, Java Script and supported UI frameworks such as Node, AngularJS, MoqRT Library, XML, Bootstrap, Highcharts, Matrix embedded browser

Cloud

- ▶ AWS, Windows Azure, OpenStack, VMware, Google Cloud Platform

Simulation

- ▶ Simulators of all types of sensors and devices for data generation and testing of IoT application

Verticals/Domains

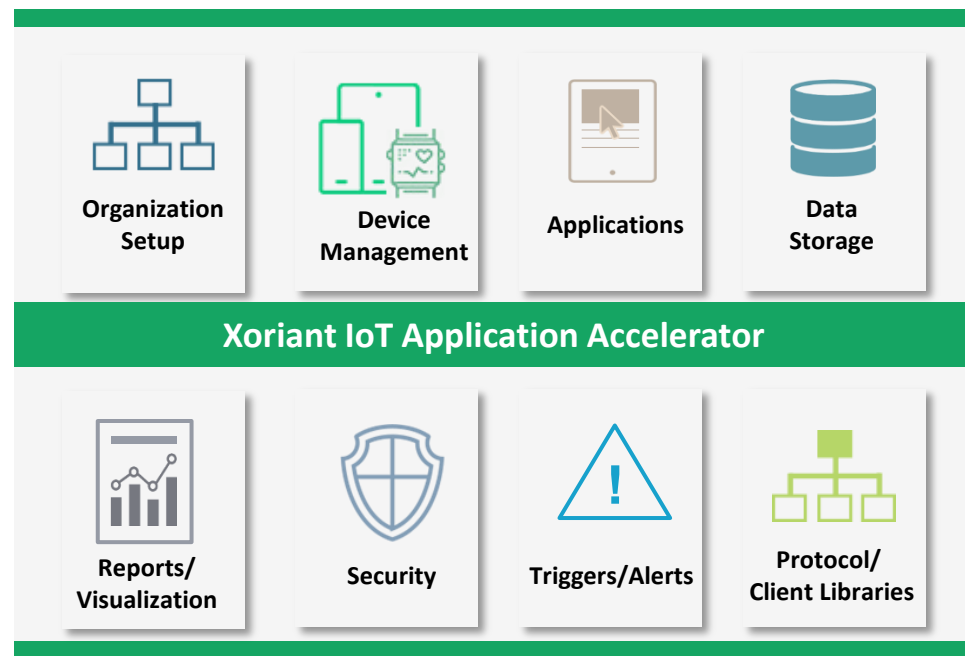
- ▶ Agriculture, Manufacturing, Healthcare, Enterprise, Utility, Freight, Energy

Tools



Xoriant IoT Application Accelerator

Provides device ready, technology agnostic and most commonly used IoT application functionalities.



High levels of scalable, secure and flexible APIs that enable:

- Quick development and delivery of custom IoT applications for the most demanding requirements
- Integration of IoT data into key enterprise applications and systems
- Reduction in development time by 40-60%





OUR IOT EXPERIENCE

Experience Across Domains

We have helped develop the following solutions for our technology partners and end clients.

Agriculture

- Smart Farm

Energy

- Digital Tank
- Smart Energy

Manufacturing

- Factory Automation
- Chemical Safety

Enterprise

- Smart Meeting Rooms

Freight

- Cargo Tracking System
- Supply Chain Management

Healthcare

- Blood Flow Monitoring
- Clinician Programmer Application
- Drug Delivery System

Utilities

- Smart City Platform
- Home Automation



Product Engineering Success Examples

Computer Data Storage Company

IoT platform development and infrastructure support

Xoriant built components of the IoT management software platform, including the modules for data center automation (the foundation of the client's IoT infrastructure).

Networking Hardware Company

Smart Cities platform development and implementation

Xoriant developed water management, power management and traffic management modules for the client's service delivery platform and implemented the smart solutions in several cities including Dubai and Chicago.

Digital Industrial Company

IoT platform designed to build and run various IoT applications while enabling end customers to derive insights from IoT data

Xoriant developed various modules of the client's IoT platform, including the UI/UX environment along with edge implementations of the client's locomotive, power and healthcare products on the platform. We also built data models to analyze the IoT data in customer implementations.



Customer Solutions Success Examples

Supply Chain Solutions Provider

Cargo tracking solution to improve position estimation

Xoriant enabled a global logistics tracking solution provider to overcome delays in data transmissions by developing a system to estimate the container locations continuously, improving position estimation with 40% accuracy.

Medical Devices Innovator

Solution to monitor cerebral blood flow and avoid tragedies

Xoriant implemented a solution that takes inputs from the Transcranial Doppler Ultrasound system and graphically plots the signals on a tablet computer to diagnose various brain health parameters.

Energy Management Service Provider

Smart energy solution for commercial building energy optimization

Xoriant enabled a leading energy solution provider to monitor and optimize energy consumption across various devices used in commercial buildings (lights, A/C, power backup, etc.). The result was a 20% cost reduction and competitive advantage for the client.



IoT Proofs of Concept (PoCs)



Smart Meeting Rooms

Solution provides real time status of meeting room availability/occupancy to optimize the use of meeting rooms in any office

- Accommodates heterogeneous devices and sensors
- Continuously monitoring
- Auto triggers based on sensor data



Smart Home

Working PoC with sensors and actuators creates a physical model smart home

- Smart entrance system using USB cameras
- Smart parking using proximity sensors and Servo motors
- Smart light system
- Smart gas detection for kitchen modules
- Water level monitoring and planning for gardens

Leveraging...

Resources

- Training
- Hardware Engineers
- Software Engineers
- Network Engineers
- Domain Experts

Devices/Sensors/MCUs

- Potentiometers , Photo Detector, Bio Detector, Cameras, Motors
- Humidity, Sound, Temp, Ultrasonic Sensors
- Raspberry Pi, Arduino
- Location GPS, Grove Pi

Labs

- Environment for PoC development
- Live solution showcase





THANK YOU!

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