Internet of Things
Case study: Healthcare

Anna Biadasiewicz
Introduction
Why healthcare needs IoT?

- Aging of society
- Diseases of affluence
- Shortages of medical staff
The overall IoMT market is expected to grow from $41 billion in 2017 to $158 billion by 2022.

- **Medical devices**: $15 billion in 2017, $52 billion in 2022
- **Systems and software**: $10 billion in 2017, $49 billion in 2022
- **Technology**: $9 billion in 2017, $28 billion in 2022
- **Services**: $7 billion in 2017, $29 billion in 2022

**Geographical Breakdown**

- **North America**: from $13 billion to $45 billion
- **South America**: from $2 billion to $9 billion
- **Asia-Pacific**: from $11 billion to $51 billion
- **Europe**: from $12 billion to $44 billion
- **Middle East & Africa**: from $2 billion to $9 billion
The benefits of the IoMT

- Improved drug management
- Decreased costs
- Enhanced patient experience
- Improved patient outcomes
- Improved diagnosis and treatment
- Remote monitoring of chronic diseases
- Improved disease management
Applications of IoMT
Real-time monitoring of patients

- Reducing the time needed for patient care in the hospitals
- More places in hospitals for people in the greatest need
- Improved patients’ comfort
- Alerts in event of life-threatening circumstances
Use case: PocketECG

- Diagnostic technology for cardiac arrhythmia detection
- Access to a full ECG signal for physicians
- Diagnostic report with full statistical analysis of the data
Ensuring the Availability and Accessibility of Critical Hardware

Virtually monitoring medical hardware and alerting hospital staff members if there’s a problem.
Use case: Philips e-Alert

- Rapid insight into key MRI parameters
- Automatic alerts via mobile messaging
- Engineers can take fast action to solve problems before they escalate
Tracking Staff, Patients and Inventory

Real-time tracking and management of medical equipment, staff and patients.
Use case: Clinical-Grade Visibility

- Able to achieve room, bed, bay and even shelf-level tracking
- Location sensors that are attached to various assets
- Combines Wi-Fi locating, CenTrak’s Gen2IR™, Bluetooth Low Energy and Low Frequency RF into one platform
Introduce certainty-based locating to specific rooms by installing battery-operated Gen2IR devices.

Areas requiring high-performance may deploy battery-operated Monitors and Virtual Walls.

Virtual Walls may be deployed to provide bed-level accuracy in the ED, PACU, Holding, ICU, NICU and semi-private rooms.

Legend:
- WiFi
- Gen2IR & WiFi
- Clinical-Grade RTLS™
- Multi-Mode Asset Tag
- Multi-Mode Staff Tag
- Multi-Mode Patient Tag
- Multi-Mode Temperature & Humidity Tag
Some healthcare applications of RTLS

- Tracking the physical movements of patients who are prone to wander due to Alzheimer’s or dementia
- Staff can request emergency assistance
- Ensuring compliance with hand hygiene protocols
- Tracking and documenting the amount of care each patient receives
- Nurse call automation and the automatic documentation of rounding compliance
- Locking doors when a patient moves near an unsafe or restricted area
Drug Management

- A continuous glucose monitor and an insulin pump
- Notifications about taking prescriptions
- Smart pills
Use case: Proteus Discover

- An ingestible sensor the size of a grain of sand and a small wearable sensor patch
- An application on a mobile device and a provider portal
Challenges of IoMT

- Privacy
- Security
- Integration
- Cost
- Data overload
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