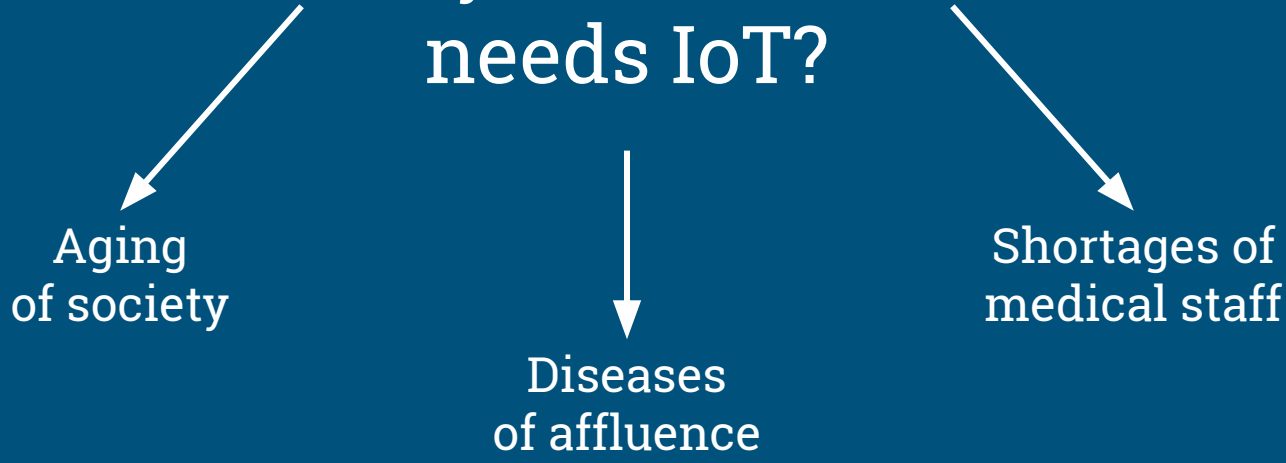
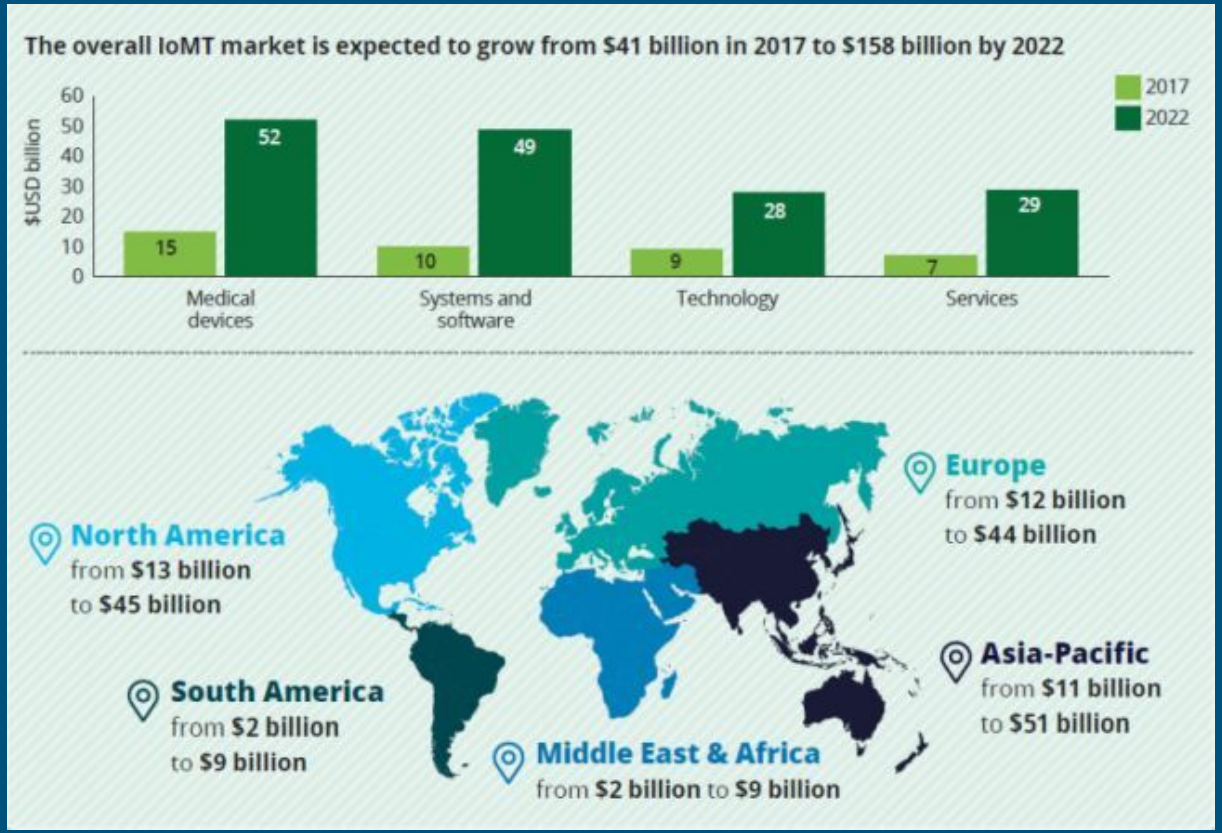
Internet of Things
Case study: Healthcare

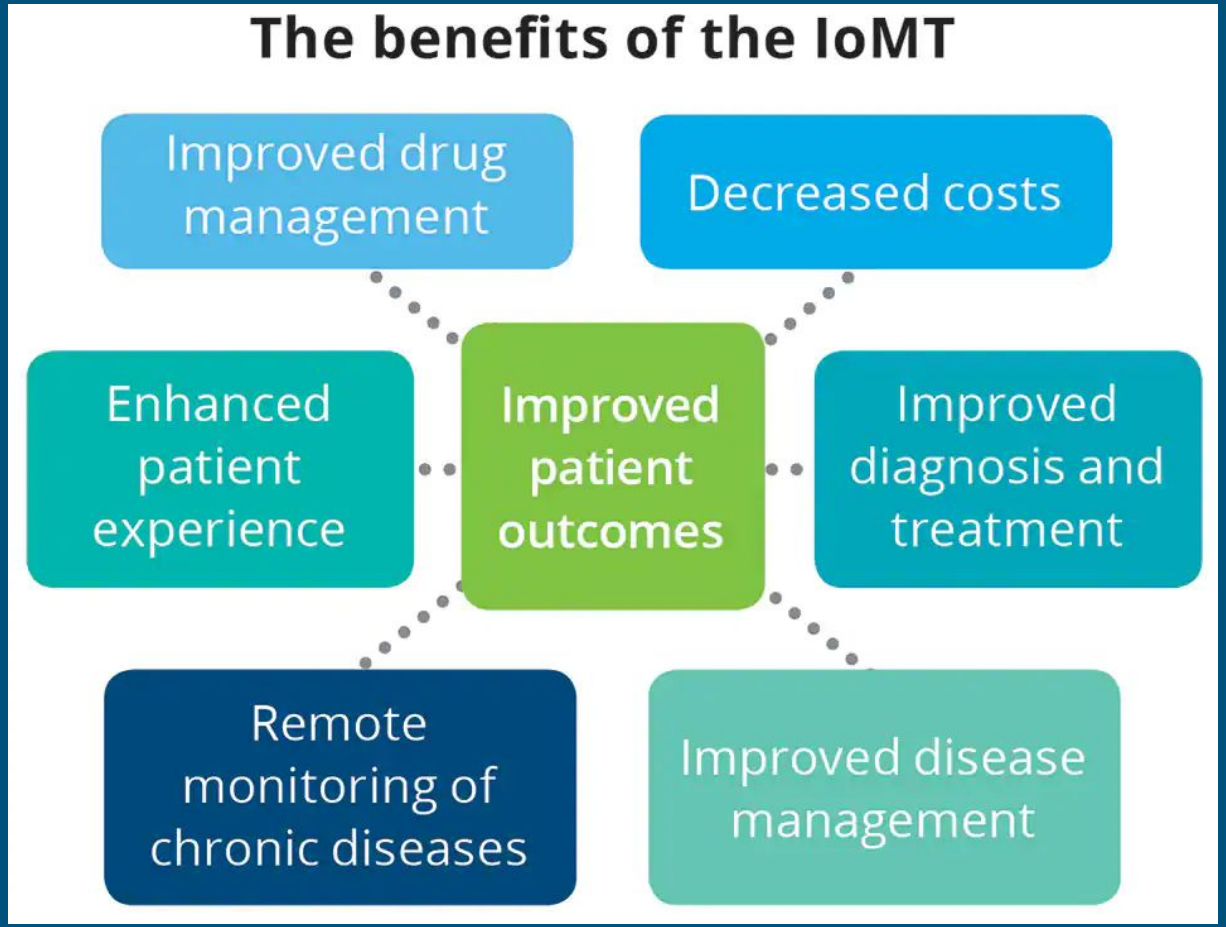
Anna Biadasiewicz

Introduction

Why healthcare needs IoT?




The overall IoMT market is expected to grow from $41 billion in 2017 to $158 billion by 2022
$USD billion
60
50
40
30
20
10
0
2017
2022
15
52
10
49
9
28
7
29
Medical devices
Systems and software
Technology
Services
North America
from $13 billion
to $45 billion
Europe
from $12 billion
to $44 billion
South America
from $2 billion
to $9 billion
Asia-Pacific
from $11 billion
to $51 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

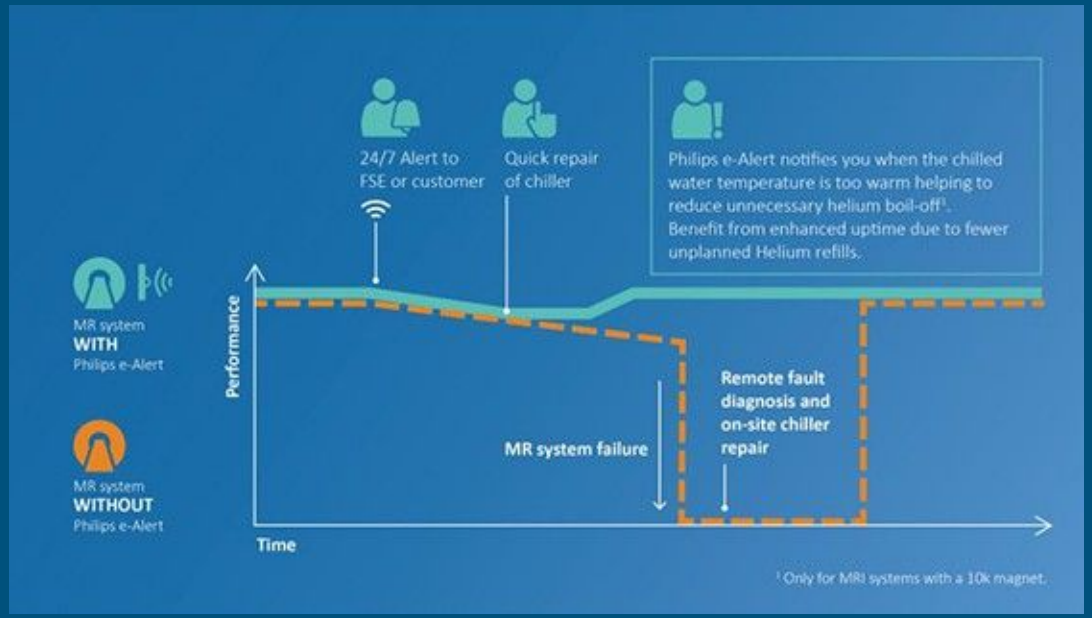
Use case: PocketECG

- 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.

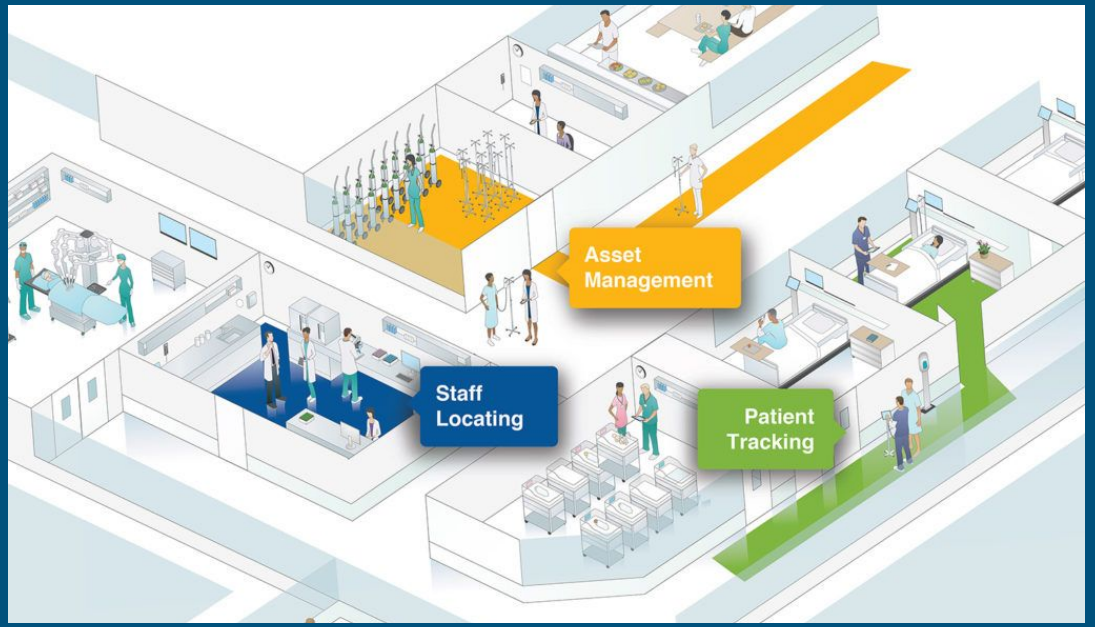
Use case: Philips e-Alert



- Rapid insight into key MRI parameters
- Automatic alerts via mobile messaging
- Engineers can take fast action to solve problems before they escalate

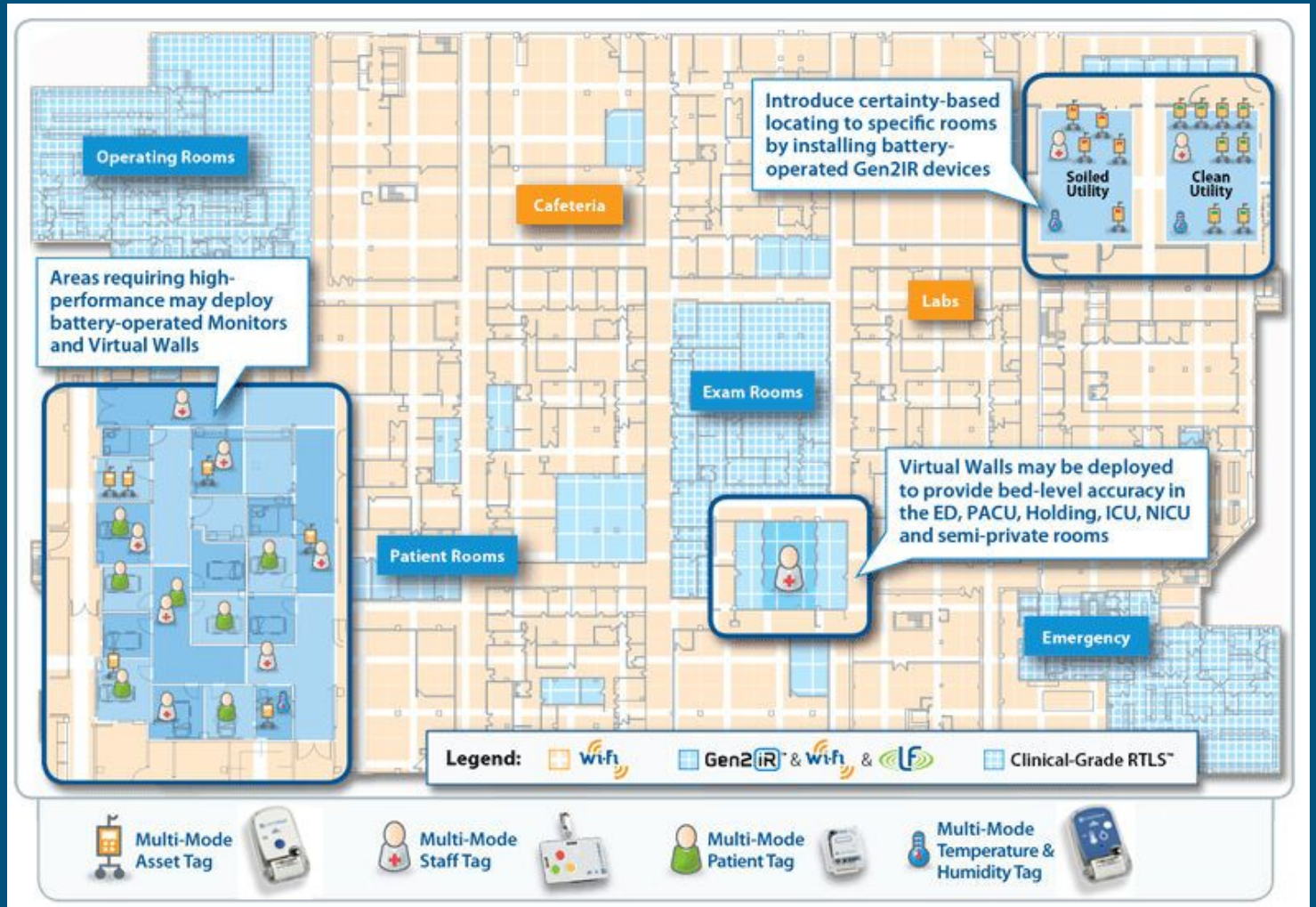
Tracking Staff, Patients and Inventory

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


Operating Rooms
Cafeteria
Introduce certainty-based locating to specific rooms by installing battery-operated Gen2IR devices
Soiled Utility
Clean Utility
Areas requiring high-performance may deploy battery-operated Monitors and Virtual Walls
Labs
Exam Rooms
Virtual Walls may be deployed to provide bed-level accuracy in the ED, PACU, Holding, ICU, NICU and semi-private rooms
Patient Rooms
Emergency
Legend:
Wi-Fi
Gen2iR & Wi-Fi & LF
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

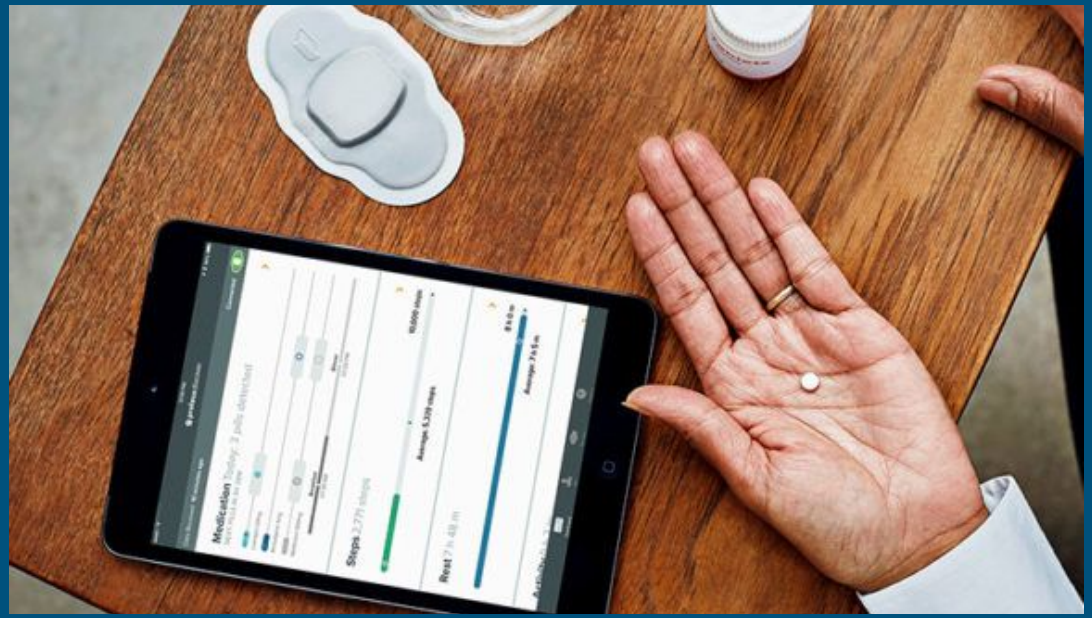
Nurse call automation and the automatic documentation of rounding compliance

Locking doors when a patient moves near an unsafe or restricted area

Drug Management

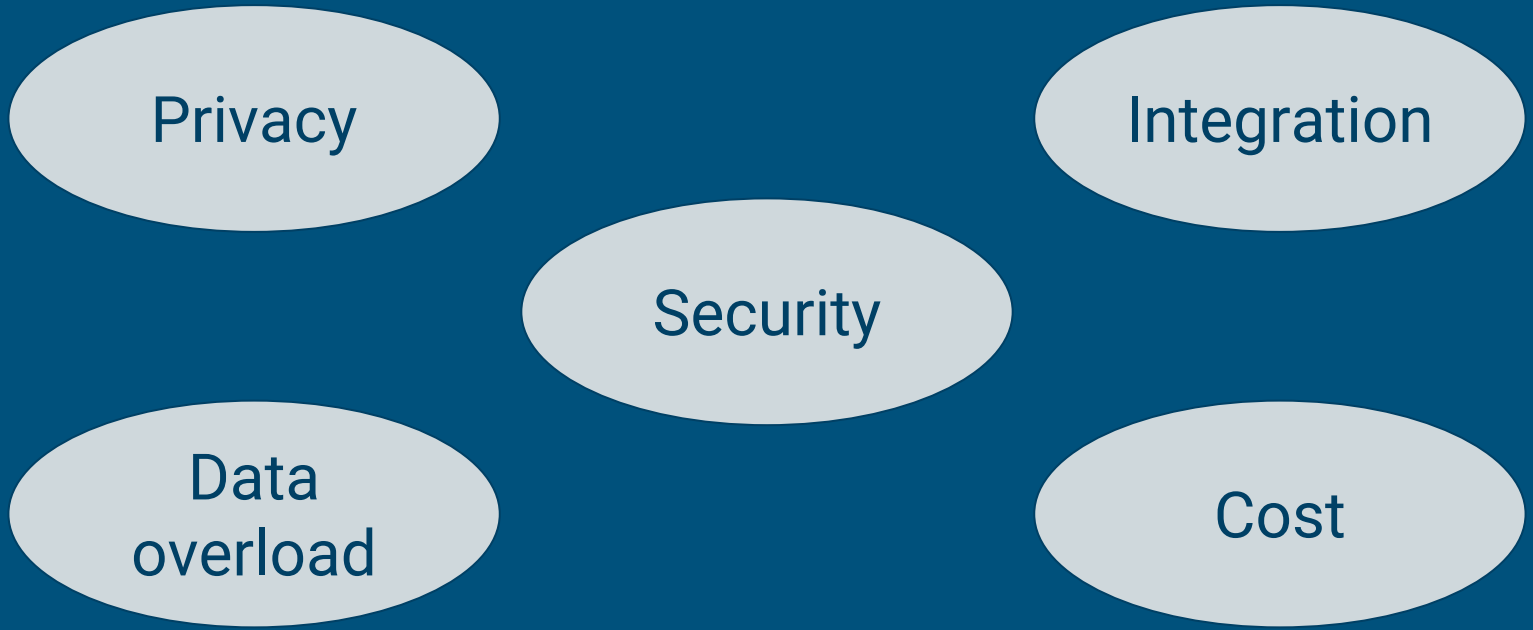
- A continuous glucose monitor and an insulin pump
- Notifications about taking prescriptions
- Smart pills

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



Bibliography

- https://elektronikab2b.pl/biznes/35568-czy-iomt-zrewolucjonizuje-opieke-zdrowotna
- https://www.iotforall.com/exciting-iot-use-cases-in-healthcare/
- https://www.pocketecg.pl/
- https://www.philips.co.uk/healthcare/product/HC895000/philips-ealert-alerting-solution-for-mri-systems
- https://www.centrak.com/intro-to-rtls/
- https://www.proteus.com/
- https://www.peerbits.com/blog/internet-of-things-healthcare-applications-benefits-and-challenges.html
- https://www.forbes.com/sites/bernardmarr/2018/01/25/why-the-internet-of-medical-things-iomt-will-start-to-transform-healthcare-in-2018/#5dbe4d934a3c
- https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Life-Sciences-Health-Care/gx-lshc-medtech-iomt-brochure.pdf