# Healthcare at the Edge: Balancing Operations and Outcomes in the Digital Era

**Daniel Angelucci**
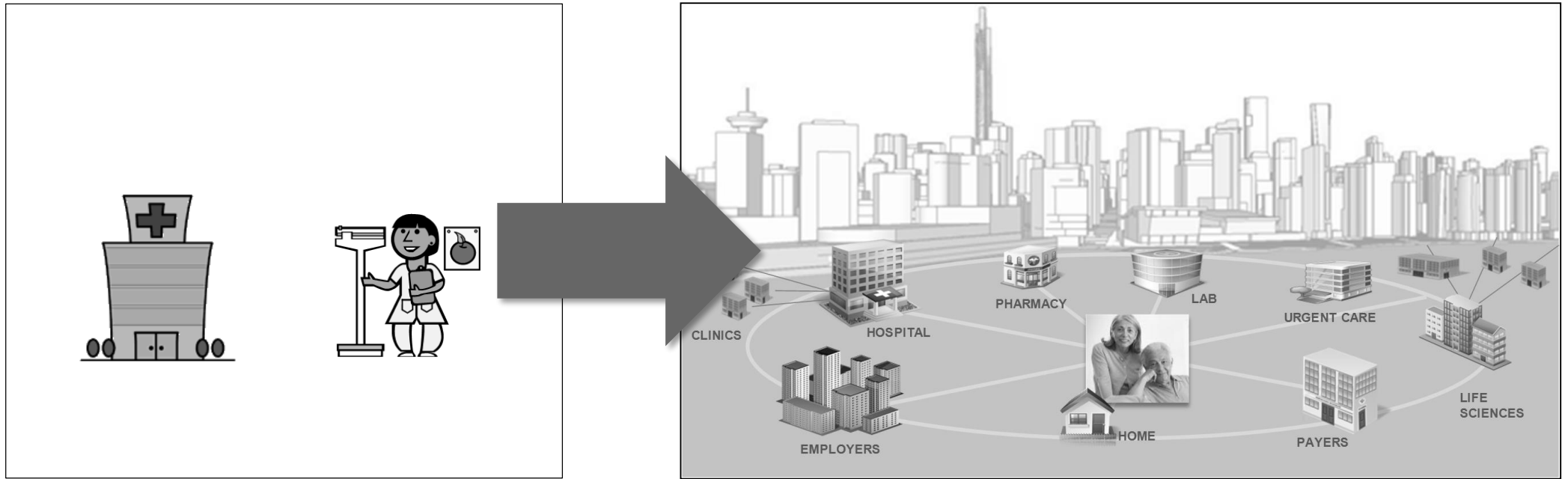**Chief Technology Officer – Asia, Middle East and Africa**
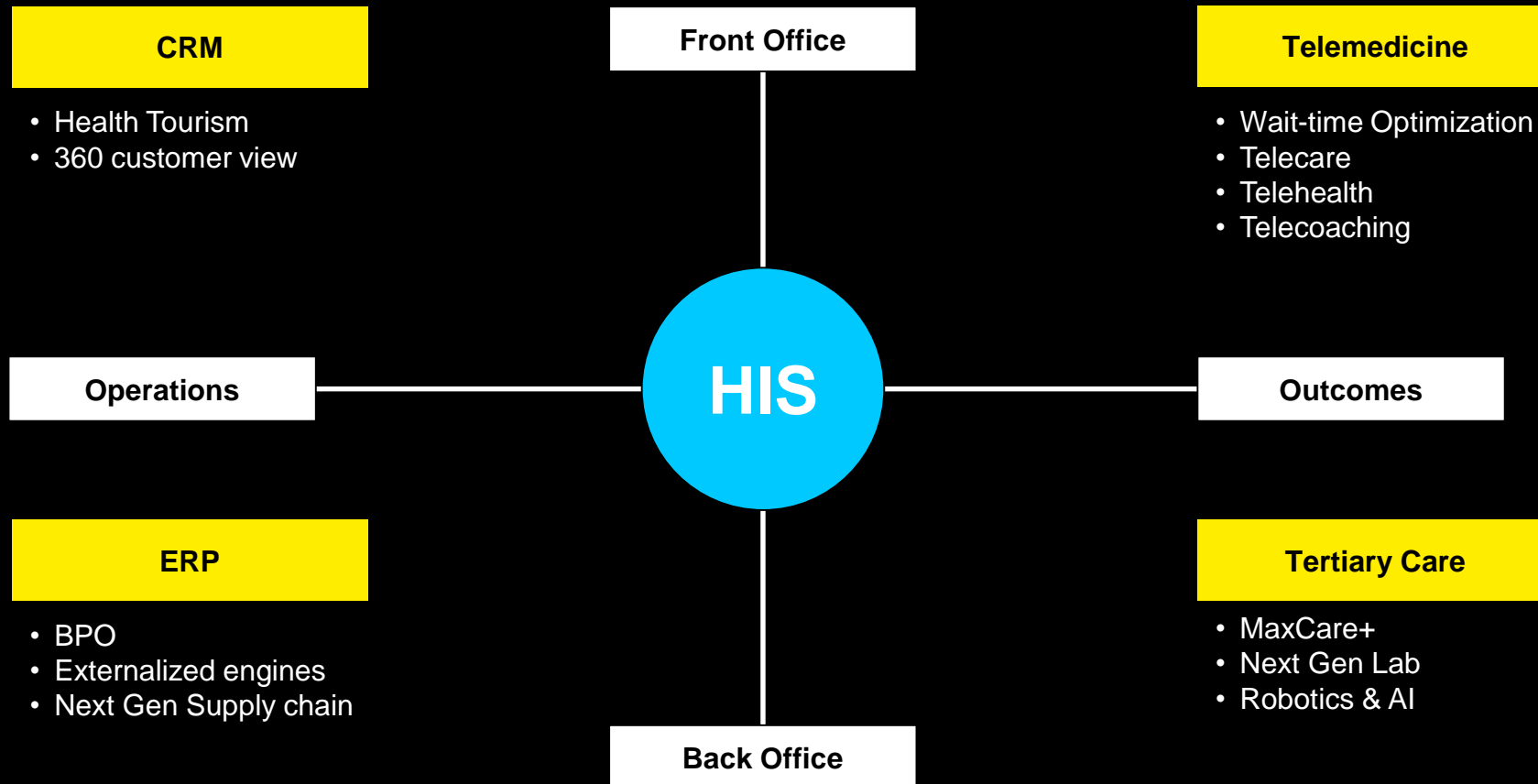
**DXC.technology**

# Agenda

1. **Moving to the Edge: The Digital Mandate**

2. **The Healthcare Enterprise Balance**

3. **Use Case #1 – Remote Dispensary**

4. **Use Case #2 – Infant Tracking**

5. **Use Case #3 – Fall Detection**

6. **Smart Patient Care System**

7. **The Integration Story – Open Health Connect**

8. **Why DXC?**

# Moving to the Edge: The Digital Mandate

# The Healthcare Enterprise Balance

**CRM**
- Health Tourism
- 360 customer view

**Front Office**

**Telemedicine**
- Wait-time Optimization
- Telecare
- Telehealth
- Telecoaching

**Operations**

**HIS**

**Outcomes**

**ERP**
- BPO
- Externalized engines
- Next Gen Supply chain

**Back Office**

**Tertiary Care**
- MaxCare+
- Next Gen Lab
- Robotics & AI

**DXC.technology**

# Use Case #1 – Remote Dispensary

**Clinical applications:**

# Drug cabinet hardware with RFID based inventory management system



- RFID antenna design for each tray case
- Each drug has RFID tags mounted on them
- Every time when tray is opened RFID calculations of tags is done
- Based on RFID tag calculation drug inventory is managed via web application
- Certified for multiple geographies
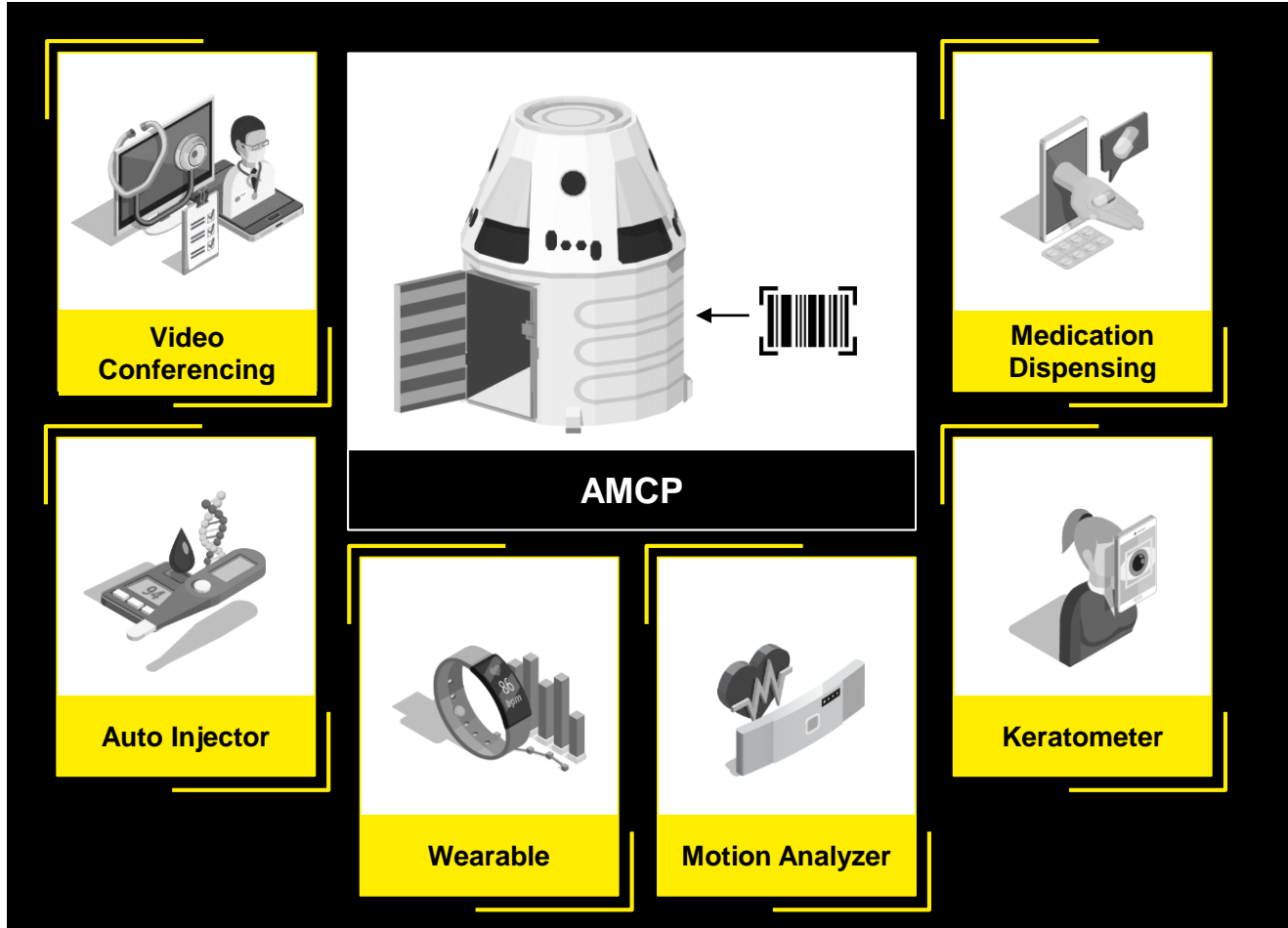- Integration with inventory management software for ease of operation

Solution: Pharmacy inventory management system

**DXC.technology**

July 25, 2017

# DXC's Anytime Medication Counselling Pod (AMCP)



Video Conferencing

AMCP

Medication Dispensing

Auto Injector

Wearable

Motion Analyzer

Keratometer

## Capabilities
- Video Counseling with Healthcare Provider
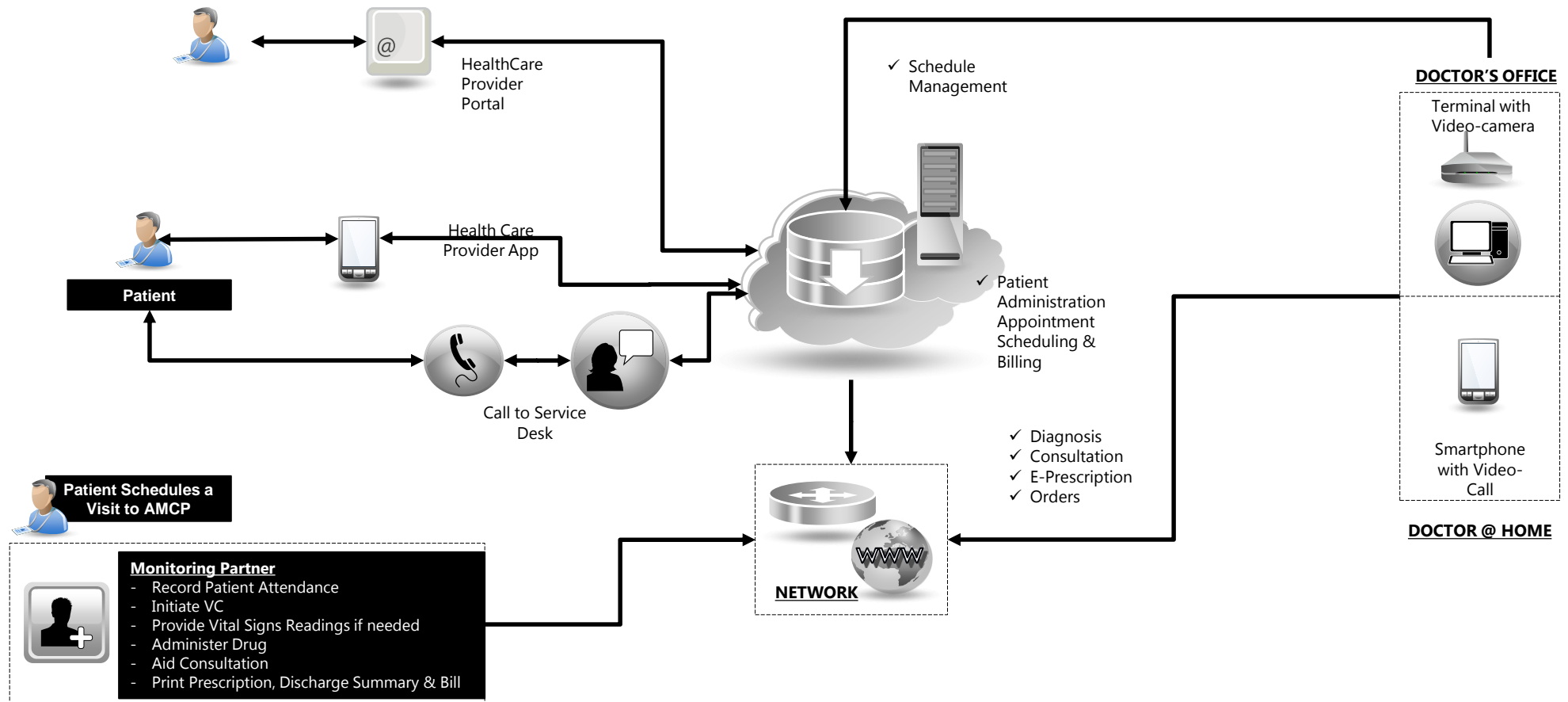- Remote Medication
- Devices to capture symptoms

## Use Case
- Reach underserved populations
- Extend the reach of specialists
- Post-operative care
- Serve corporate clinics
- Reach Geographical challenged areas Ships, Planes

## Benefits
- Improved healthcare
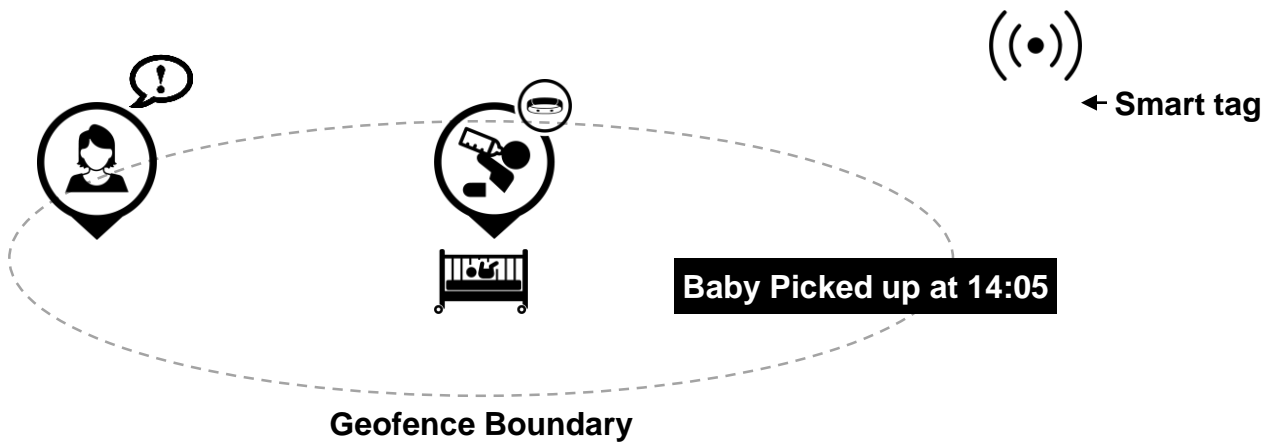- Reduce A&E
- Unplanned admissions or readmissions

# Scenario Based Process Flow – AMCP



HealthCare Provider Portal

Health Care Provider App

**Patient**

Call to Service Desk

✓ Schedule Management

✓ Patient Administration Appointment Scheduling & Billing

✓ Diagnosis
✓ Consultation
✓ E-Prescription
✓ Orders

**NETWORK**

**Patient Schedules a Visit to AMCP**

**Monitoring Partner**
- Record Patient Attendance
- Initiate VC
- Provide Vital Signs Readings if needed
- Administer Drug
- Aid Consultation
- Print Prescription, Discharge Summary & Bill

**DOCTOR'S OFFICE**

Terminal with Video-camera

Smartphone with Video-Call

**DOCTOR @ HOME**

DXC.technology

# Use Case #2 – Infant Tracking

← Smart tag

Baby Picked up at 14:05

**Geofence Boundary**

## Capabilities
- Real-time Monitoring of Baby Location using smart tag attached to the Baby's leg
- When Baby is picked up and leave it's bed, notification can be sent.
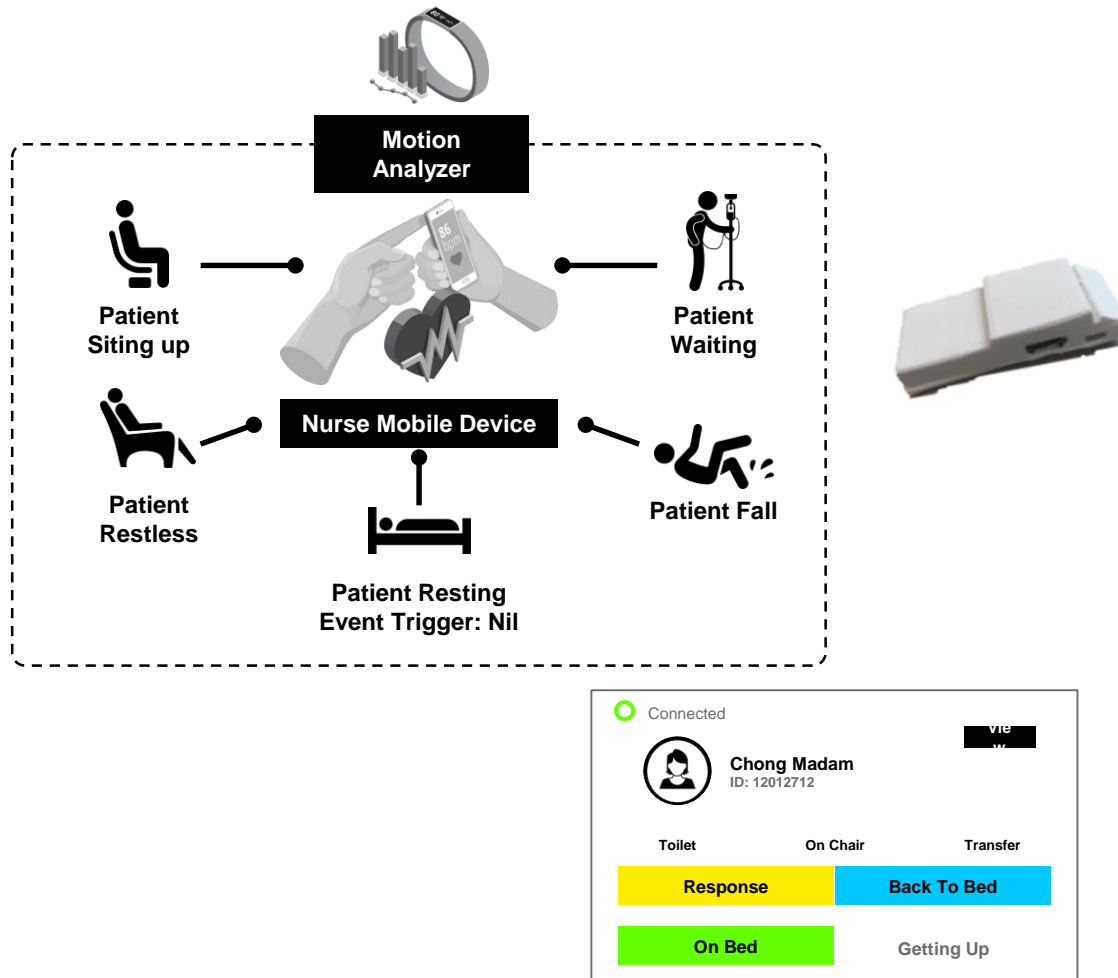- If baby is carried and crossed geofence boundary, Alert/Alarm will be activated

## Benefits
- Track and Record the time spent when the baby is not in the bed
- Prevent Baby take away from control area

## Technology
- Active Smart Tag w/Motion Sensor
- Active Reader to trace baby location

# Use Case #3 – Fall Detection



**FRONT OFFICE**    **OUTCOMES**

## Capabilities
- Real-time detection algorithm embedded inside the patient worn device. The algorithm process motion data with high accuracy and low false alarm rate.
- Based on the typical motion detected real-time alert events will be sent wirelessly by the device to healthcare givers.
- The Personalized Motion Analyzer (PMA) worn by patient is developed using our propriety hardware design embedded with real-time motion analytics algorithm.

## Benefits
- Analysis patient's activity
  - Sitting up
  - On bed
  - Fall detect
- Provide instant health care service according to different patient's activity detected

## Technology
- Active Smart Tag w/Motion Sensor

# Smart Patient Care System

**User Experience:**

**Pendants for Assisted Living**
- Fall detection techniques that instantly alerts the care givers
- Panic button to raise alarms or place calls on single press

**Wrist band for Child Tracking Solution**
- Smart wearable that can track your child and alert you when the child crosses a geofenced boundary

**Wrist band for Personnel Tracking**
- Smart wearable that can track and alert your employees

**Asset Tags for your Movable and Non-movable Assets**
- Attachable smart tags to track the real-time location of your assets

**Press to Call Buttons**
- Smart buttons that can be attached to anything and make phone calls in just a press

**Sensing Solutions**

# The Integration Story – Data at the Edge
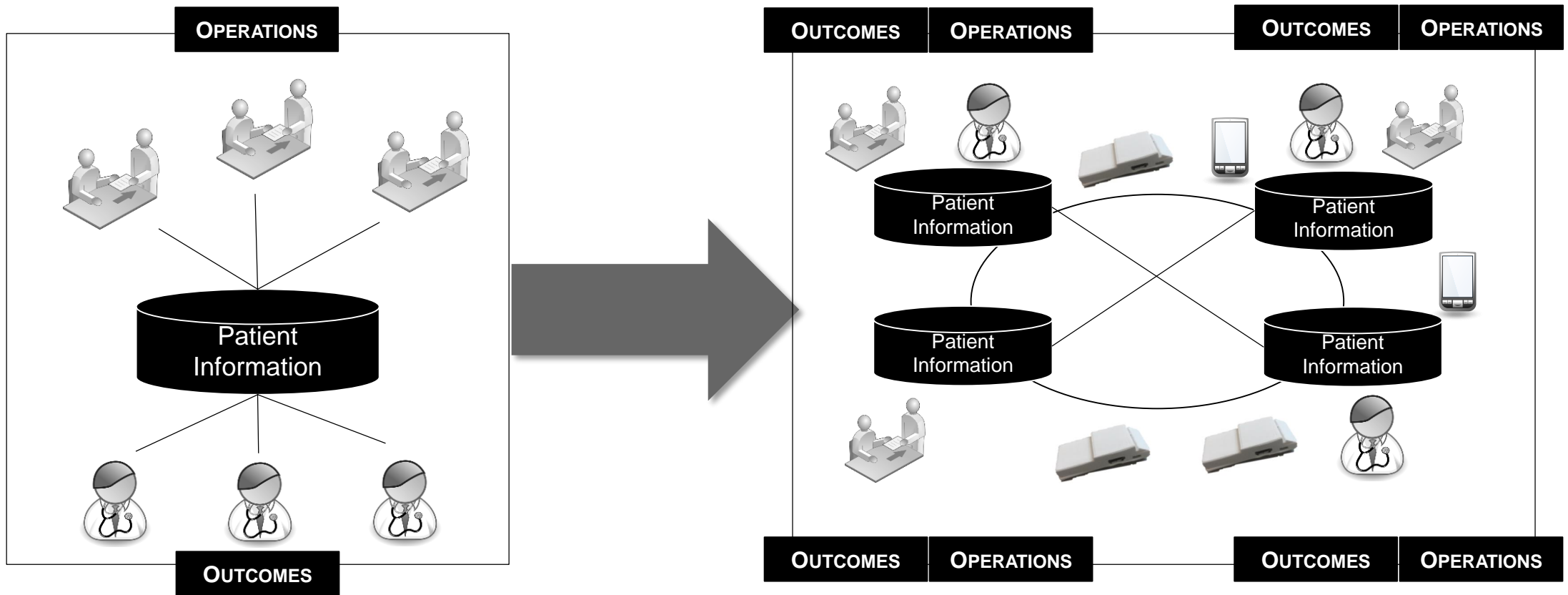
# Open Health Connect (OHC)
## Cloud Based, Open Platform

**OHC is an integrated set of tools optimized to deliver improved outcomes for patients and reduce variation in care**

**…as a platform OHC enables vendor neutral data acquisition & integration platform supported with built-in operational and clinical surveillance**

**…as an innovation enabler, orchestrates inteliigent routing of contextual and pre-curated information to deliver improved patient care**

### ENABLER FOR POPULATION HEALTH MANAGEMENT

**SOE Solutions**
- Population Health Management Solutions
- Population Health Management Analytics Solutions
- Patient Engagement Tools
- Clinical and Operational Analytics

### RAPID SOLUTION DEVELOPMENT

**Innovate Without Lock-in**
- Exploit connectivity to broad spectrum of data services
- Enable Digital enterprise landscape
- Curated data for upstream value
- Smart on FHIR Apps

### API Director

CREATE | RUN | SECURE | MANAGE

**API Gateway**
- Portfolio of published API (FHIR)
- Build composite APIs and applications based on internal API and external APIs.
- Data Stewardship and Governance

### SMART DATA FABRIC SERVICE

**Store, Parse & Index**
- Federated Longitudinal patient record
- Schema-less data-store
- Surveillance and alerting
- Curated data for upstream value

### INTEGRATION BUS

**Vendor Neutral Connectivity**

VINDUCT interoperability

- Provides any-to-any connectivity to on-prem and cloud applications
- Support for FHIR, API, IOT and non-compliant applications via virtual data integration

**External SORs** | Other EPR/HIS Systems | Allscripts | Cerner | Epic | DXC.technology

DXC.technology

# Add Value to Existing Investments in IoT

**Embrace and Extend IoT**

Our value is in orchestrating across different service operations. We help clients move from predicting the healthcare events to managing population health.

We help build and analyse the data set that truly enables end-to-end evidence based diagnosis and treatment.



Network of Things

Physical Complexity

Single Device

Simple Rules

Digital Complexity

AI

DXC's analytics-driven transformation

Automate Operations

Augment Business Decisions

Improve Service Quality

Monitor and Alert
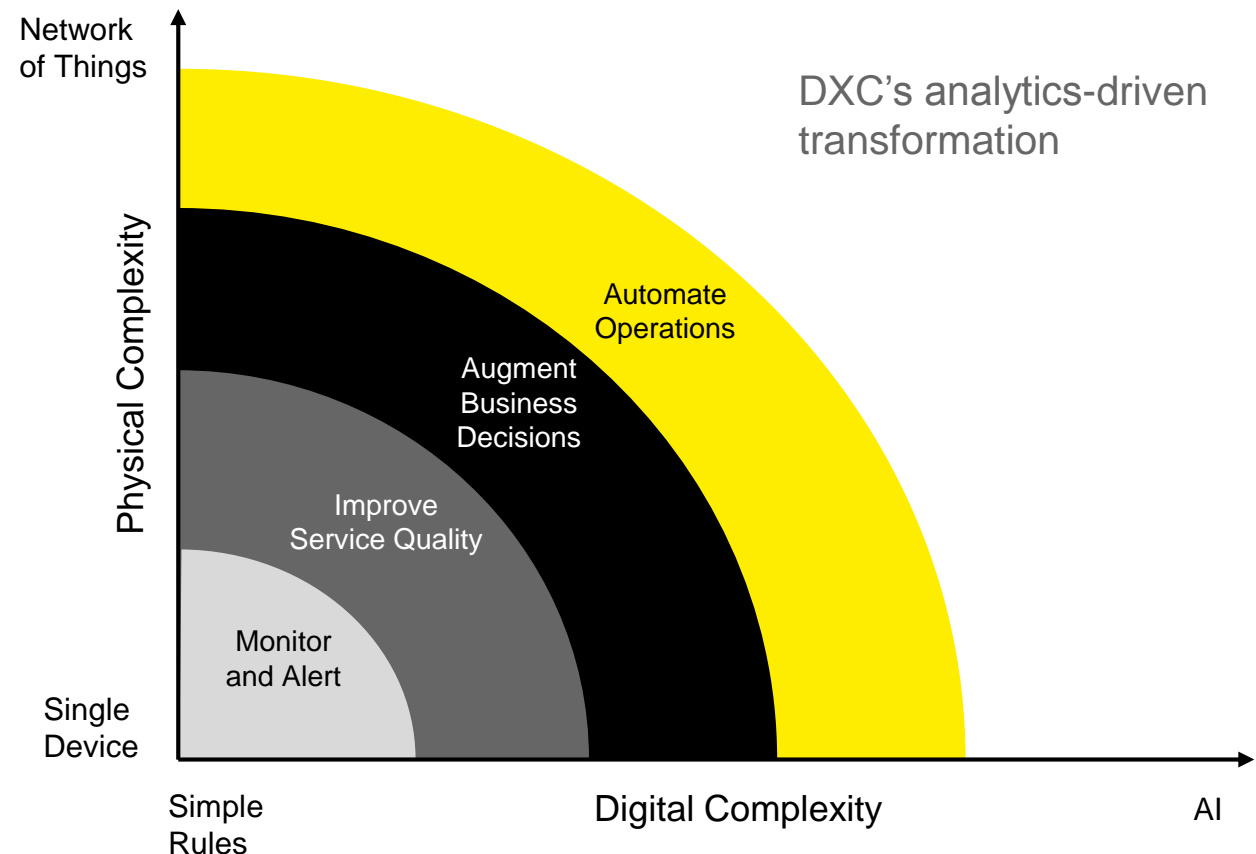
# Breaking the Iron Triangle

**OUTCOMES**

**COST**

**Access**
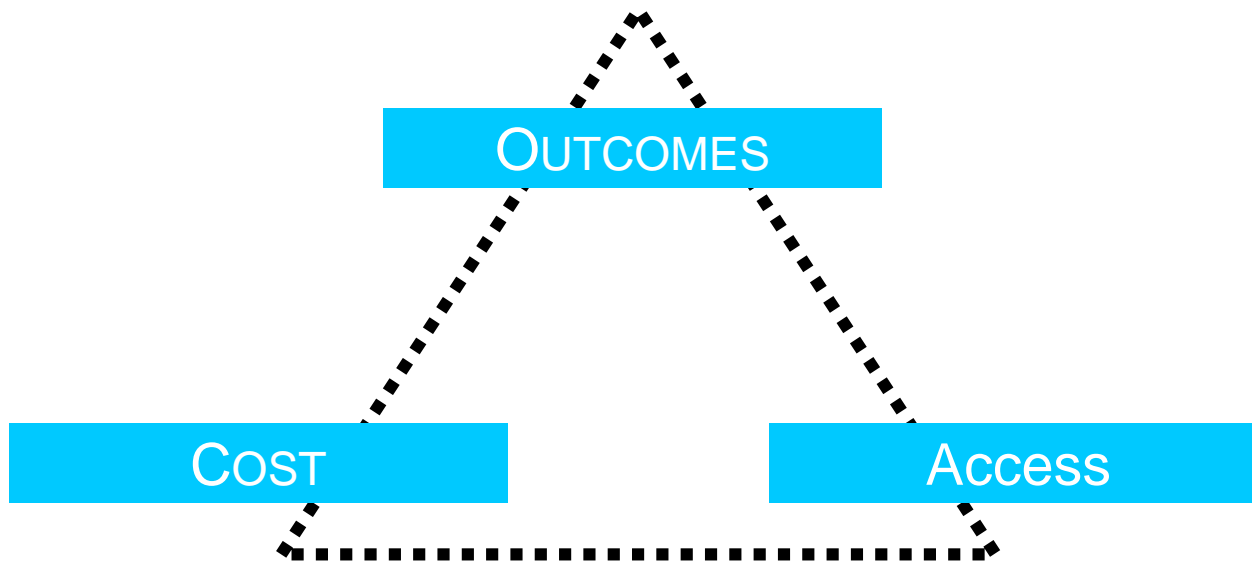
Digital Healthcare creates a unique opportunity to rebalance competing priorities

By reducing the cost and increasing the efficiency of healthcare processes, digital can finally break the iron triangle

# Why DXC?

**A Unique, Highly Differentiated Value Proposition**

- **Industry Expertise**
- **Technology independence**
- **World-class talent**
- **Confident guidance**

# Example Global References

| | | | | |
|---|---|---|---|---|
| **Cabrini** — Access to real-time clinical information through a single, mobile interface designed for iPad and iPhone. | **NHS Trafford Clinical Commissioning Group** — Care coordination service comprising patient communication, clinical workflow management and analytics | **GCS e-Santé Bourgogne** — Regional Care coordination service comprising clinical workflow management and analytics patient communication, | **NHS** — Hosted Electronic Patient Record service with 25 million patient records and 500,000 registered users. | **CMS** — Chronic Care Management BPO for Senior Citizens with Two or More Chronic Conditions |
| **SERGAS** — Comprehensive Business & Health Analytics solution, supporting population health ; regional E-Prescribing system ; Citizen Health & Wellness Multi-Channel Portal | National big data platform supporting clinical research | **UniversitätsSpital Zürich** — Co-Innovation with Zürich University Hospital, automated recognition of ICD-10 codes thru machine learning | **Ohio Department of Medicaid** — Value based care : Analyze & benchmark providers' performance on Episode of Care to improve outcomes, define incentives | **NHS Trafford Clinical Commissioning Group** — Risk based predictive analytics and patient stratification supporting population management |
| **NewYork-Presbyterian** — Integration service allowing real-time information exchange across diverse clinical and administrative systems | National HIE platform supporting cross setting collaboration | National EMR implementation supporting cross setting clinical workflow management and analytics | **/LATAM** — National Health Service (ES) – 127 public hospitals (3 at HIMSS EMRAM level 6, regional primary care solutions | **Bristol-Myers Squibb** — Regulatory information management BPS leveraging CSC's Total Regulatory Solution Suite. |
| **Penn Medicine** — Enterprise-wide data center, managed compute and service desk supporting Epic EHR and Lawson ERP. | **Intermountain Healthcare** — Strategic technology partner providing agile IT services underpinning a major Cerner EHR implementation. | **KAISER PERMANENTE** — Application management, modernization and testing supporting Epic EHR and other software. | **Queensland Government Queensland Health** — New Generation Digital hospital infrastructure and EMR transformation program | **SMITH** — Managed hybrid cloud solution using CSC Agility Platform to reduce capital costs and improve pace of operation |

# Thank you.

**DXC.technology**