A Journey of Innovation and Enhancing the Patient Experience

The Roy and Patricia Disney Family Cancer Center at Providence Saint Joseph Medical Center

By Raymond Lowe

Providence Health and Services – Calif Region Information Systems

Email: raymond.lowe@providence.org
Today’s Presentation

- About Providence Health and Services
- Beginning the Journey - RTLS
  - Key Healthcare Requirements for RTLS
  - Healthcare IT Infrastructure
- Continuing the Journey to Innovation – RTLS Maturity Curve
- Providence Health & Services – Disney Family Cancer Center
  - RFID Environmental Controlled Rooms and Patient Tracking
  - Integration and outcomes
Providence Overview
Our Mission
As People of Providence, we reveal God’s love for all, especially the poor and vulnerable, through our compassionate service.

Our Core Values
Respect  Compassion  Justice
Excellence  Stewardship
- 29 hospitals and more than 35 non-acute facilities, physician clinics, a health plan, a liberal arts university, a high school, and numerous other health, housing and educational services
- AA-Bond Rated
- 47,000 employees
- Providence in Alaska, Washington, Oregon and Montana is sponsored by the Sisters of Providence religious community
- In California, the ministry is co-sponsored by the Sisters of Providence and the Sisters of the Little Company of Mary
How can RFID and RTLS improve efficiency in hospitals

- Management of mobile assets in a hospital is an enormous task.
- Improved staff efficiency: nurses, techs and support staff spending time looking for equipment throughout the day to care for patients
- Alerts: Temperature monitoring for Pharmacy, lab and bloodbank
- Visibility: Thousands of pieces of equipment - from IV pumps to wheelchairs - constantly move around the hospital.
- Finding what you need when you need it is imperative to patient care and clinical outcomes, and can affect staff productivity and job satisfaction.
Common Denominator: Inadequate Resource Awareness

• **Where** Resources are **Located** (Assets, People)
• **What** Resources are **Doing**
• **When** Resources are **Used**
• **How to Improve**
Where do most start?

- Rx, Lab, blood bank refrigerator monitoring
- Passive Tracking of expensive consumables, e.g. Cath Lab
- RTLS Tracking of assets
Key Healthcare Requirements

- Accuracy
- Reliability
- Planning, Deployment and Operational Concerns
- Ongoing Maintenance
- Cost
Balancing Business and IT Needs

Clinical & Financial Needs

• Knowing location, status and movement of things is what RTLS is all about
  – Must provide enterprise-wide coverage
  – Must offer room-level location accuracy throughout an organization

IT Needs

• What ongoing upkeep is required?
  • Will are interference concerns?
    – Select a low maintenance solution
    – Must co-exist with LAN’s, WLAN’s (Wi-Fi), network-enabled and wireless equipment
Technology Choices:

- What is the technical infrastructure / backbone for my RTLS System? (802.11a vs 802.11g vs. Zigbee)

- What will that network be used for – Voice, wifi, RFID, RTLS?

- Can your facility use an existing wifi network, how robust, density of Aps, etc? Expanding the wifi network can be costly?

- How is the physical plant of your facility?

- Should you implement a separate network?

- How will Ongoing support will require dedicated monitoring, system administration and possibly specialized support agreements
Hospital IT Infrastructure

**DAS**  A multi-function antenna system that distributes any RF from 400mhz to 2.4ghz throughout a building.

**Cellular**  Supports a variety of applications (voice, data, internet browser, pictures, video, music, personal information, custom applications, etc.).

**Wi-Fi**  Data, voice (VoWLAN, Spectralink, Vocera), imaging, RTLS.

- **Paging**
- **1st Rspndr**
- **Walkie Talkie**
- **Distributed Antenna System**
- **Cellphone**
- **Cellular**
- **Dual-modes (phone or PDA)**
- **PDA**
- **Laptop**
- **Vocera Badge**
- **Cisco VoIP**
- **WLAN (Wi-Fi)**
- **Desks**
- **Cabling**
- **WMTS Vitals**
- **Tags**
- **Sensors**
- **RTLS Bldg Sys Proximity**
- **Telemetry**
- **LAN**

Product/Service Delivery Processes & Spectrum Management
Deployment Lessons Learned

• Understand actual installation, configuration and testing of the system
  – How and where are receivers actually installed?
  – How will this integrate or interfere with existing systems?
  – What is deployment time?
  – Will it provide location accuracy that meets the requirements of all your constituents (clinical, biomed, materials management)?
Cost Lessons Learned

Three Main Components:

1. Actual labor + hardware and software
   - Significant variable in receiver installation
   - Power and network connections – how connections are made greatly impacts costs
   - Receiver density required to achieve positioning accuracy

2. Ongoing maintenance and support costs

3. Purchase can be packaged as a capital purchase, lease or rental
   - How RTLS is packaged can greatly impact future costs and the degree of risk you may assume over the life of the system
Continuing the Journey to Innovation – RTLS Maturity Curve

Validate  Adopt  Integrate  Institutionalize  Optimize

TIME

VALUE

Business Improvement
Revenue Cycle Mgmt
Clinical Workflow
Beyond the Care Facility

Enterprise Workflow (Six Sigma)
Patient Flow
Throughput
Staff Efficiency

Departmental Apps
Biomed / Clinical Engineering
OR / ED
Central Services / MM
Security

Asset Management
Shrinkage
Rental
Utilization

PHASE ONE

PHASE TWO

PHASE THREE

PHASE FOUR
Providence Health & Services - Roy and Patricia Disney Family Cancer Center (DFCC)
Disney Family Cancer Center
The Roy and Patricia Disney Cancer Center is the latest addition to the Providence health system.

Located in Burbank, Cali., the state-of-the-art center offers fully integrated care.

Combines western and eastern medicine to holistically treat patients – physically, mentally and spiritually.
Create an ambient experience/environment that lets the patient take back control

- Reduced Patient Anxiety While Receiving Treatment
- Improved Workflow Between Clinicians, Patients & Administrators
- Plan for future upgrades that leverage RFID systems & incorporate new technology
Fundamental Principals

- Leverage Existing Infrastructure
- Open Architecture / Industry Standards
- Collaborative Planning & Implementation
Needed an innovative RFID solution that maximizes RFID technologies with other clinical, building and administrative systems.

**Traditional Approach**
- Multiple control networks and systems
- Disparate building networks
- Proprietary & Redundant
- Sub-optimal information usage

**Converged Approach**
- Interoperability
- Efficient and Scalable
- Lower TCO
- Maximize ROI

Needed an innovative RFID solution that maximizes RFID technologies with other clinical, building and administrative systems.
Outcome of Design

- RFID integration with system integrator application:
  - Automated check in
  - Room environmental control
  - Patient tracking within facility

- Solution that is modular, scalable and defined interoperability that support growth strategies.

- Integrated solution from leading technology vendors to improve workflow between clinicians, patients and hospital administrators.

- Platform for addressing key areas of hospital operation: patient visibility, asset management/utilization, compliance, security, and environmental controls.
## Major Systems

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<thead>
<tr>
<th>Vendor</th>
<th>Services/Product</th>
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<tbody>
<tr>
<td>Avaya</td>
<td>VOIP Phones, Servers, IP Browsers Display</td>
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<tr>
<td>Aeroscout</td>
<td>Mobile View display application</td>
</tr>
<tr>
<td>Cisco</td>
<td>Wireless Switches, WCS, WLC, LAN Administration</td>
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<tr>
<td>Globestar ConnexALL</td>
<td>SOA Platform processes message and alerts between systems via Gateway for the JCI P2000 / RTLS / Avaya system</td>
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<tr>
<td>Johnson Controls</td>
<td>JCI ITS system processes RFID and AMX triggers and sends to environmental systems.</td>
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<tr>
<td>Reva Systems</td>
<td>Sends RFID Tag ID and location to SOA Gateway</td>
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<tr>
<td>Thing Magic</td>
<td>RFID Readers</td>
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## Ambient Experience

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<tbody>
<tr>
<td>Alien</td>
<td>Passive RFID Tags</td>
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<tr>
<td>AMX</td>
<td>RFID Activates Lighting and sound systems</td>
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<tr>
<td>Color Kinetics</td>
<td>AMX Controlled for Lights Systems</td>
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<tr>
<td>Phillips</td>
<td>Ambient Experience Systems – RFID Activated</td>
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RFID Solution Outcomes

**Patient Outcomes:**
- Reduced Anxiety
- Environment Control
- Personalized, Holistic Treatment

**Clinician Outcomes:**
- Increased Workflows
- Reduces Human Error

**Operational Efficiencies:**
- Future Ready Design / ROI
- Asset Tracking
- Recruitment & Retention
RFID Passive/Active Integration

- AeroScout MobileView
- Connexall P2000 Avaya
- Reva Appliance
- Mobility Services Engine
- ThingMagic Readers
- Wi-Fi AP’s
- Exciters
- Passive Tags
- Wi-Fi Clients
- Wi-Fi Tags

[Diagram showing integration of RFID systems with various components such as AeroScout MobileView, Connexall P2000 Avaya, Reva Appliance, Mobility Services Engine, ThingMagic Readers, Wi-Fi AP’s, Exciters, Passive Tags, Wi-Fi Clients, and Wi-Fi Tags.]
Disney Family Cancer Center Deployment

Passive RFID readers installed in reception, hallways & patient rooms. Patient location tracked to adjust room settings & provide enhanced experience.

Solution Partners:
Trend…Multiple Location Technologies Combined

... Passive RFID & Wi-Fi/RTLS

- Mobile unit is tracked using wifi based Active RFID
- Passive RFID Reader embedded in mobile unit identifies patient, caregiver, medication and their location is inferred

WLAN Active Tag or WLAN computer provide real time location

Zigbee Active Tag provide real time location

Passive RFID Reader Module

Passive RFID Reader embedded in cart

Passive RFID tags on patients, caregivers, medication
The *Most* Innovative Use of RFID

• First of its kind RFID solution designed to reduce patient anxiety.

• Integrated solution from leading technology vendors to improve workflow between clinicians, patients and hospital administrators.

• Platform for addressing key areas of hospital operation: patient visibility, asset management/utilization, compliance, security, and environmental controls.
Awards and Recognition

• 2010 Cisco Technology & Solutions Excellence Award

• Most Innovative Use of RFID
  • JCI Project: The Roy and Patricia Disney Family Cancer Center at the Providence Saint Joseph Medical Center

2010 EPA ENERGY STAR Partner of the Year Award

2009 Security Distributing Marketing (SDM) System Integrator of the Year

2009 Newsweek No. 11 Greenest Big Companies in America

2009 Cisco Partner Award
  • Solution Innovation Partner of the Year
  • Solutions Awards - Connected Real-Estate

2007 Alcatel Lucent Partner Recognition Award
THANK YOU