RFID enabled Solutions

HEALTHCARE

Typical System Architecture

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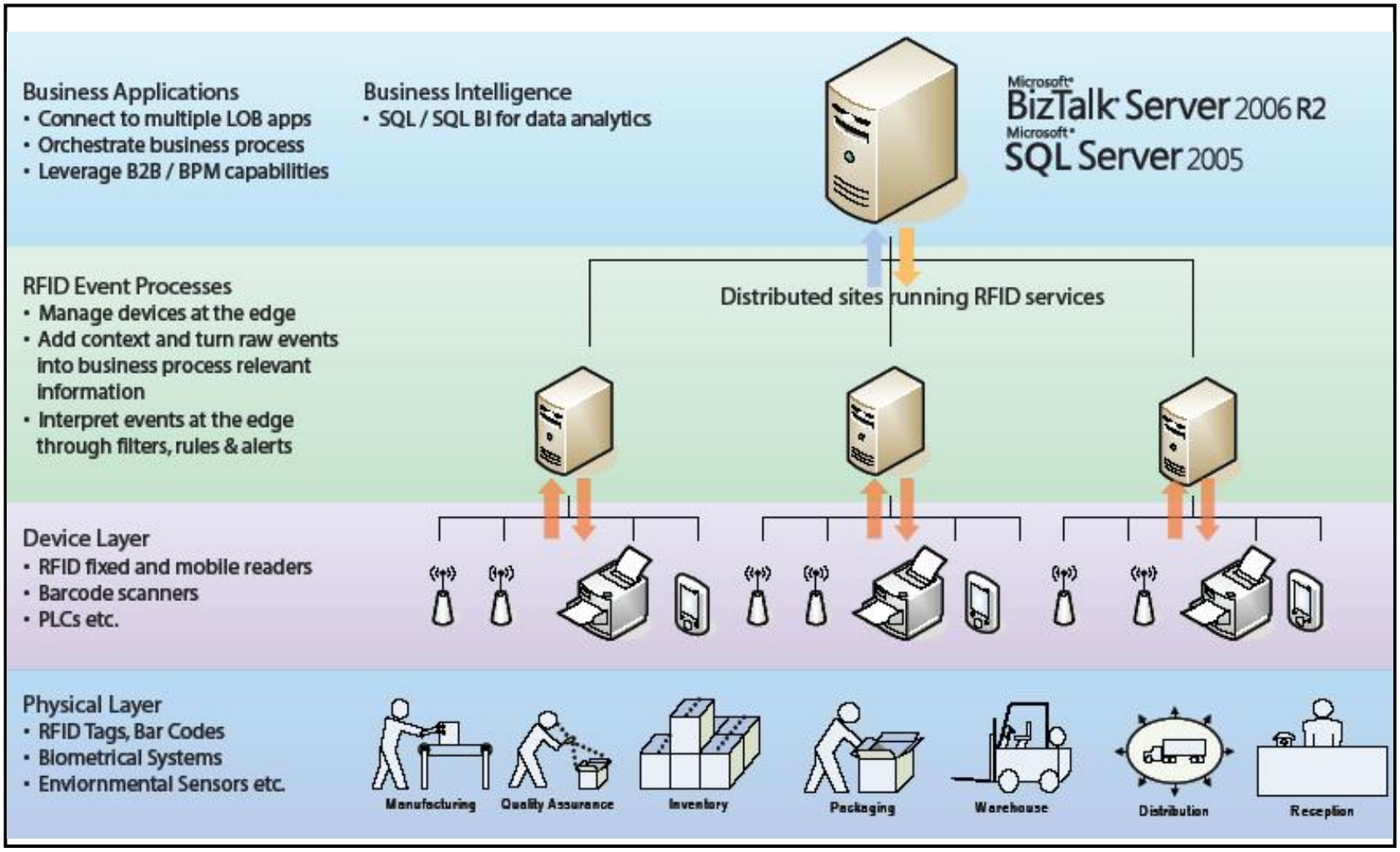

YOU CAN'T MANAGE WHAT YOU CAN'T MEASURE

Why RFID .....

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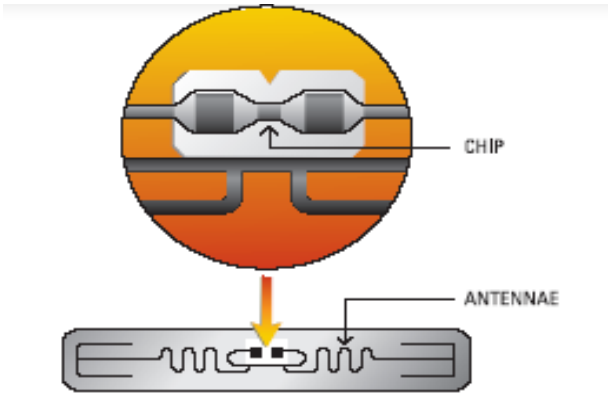
Bar Code	RFID
Requires Line – of - Site	Does not require Line – of – Site
Requires correct orientation	Does not require orientation
Easily obscured by dirt	Not affected by dirt
Easily scratched or damaged	Unaffected by scratches (encapsulated)
Contents cannot be modified	Can modify data stored in tag
Can only read one label at a time	Can read multiple tags at once



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Typical Read Stations

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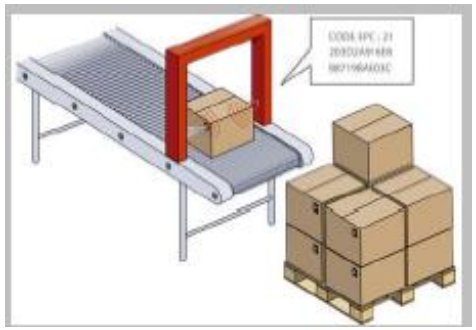
GATE / DOCK DOOR

PORTAL

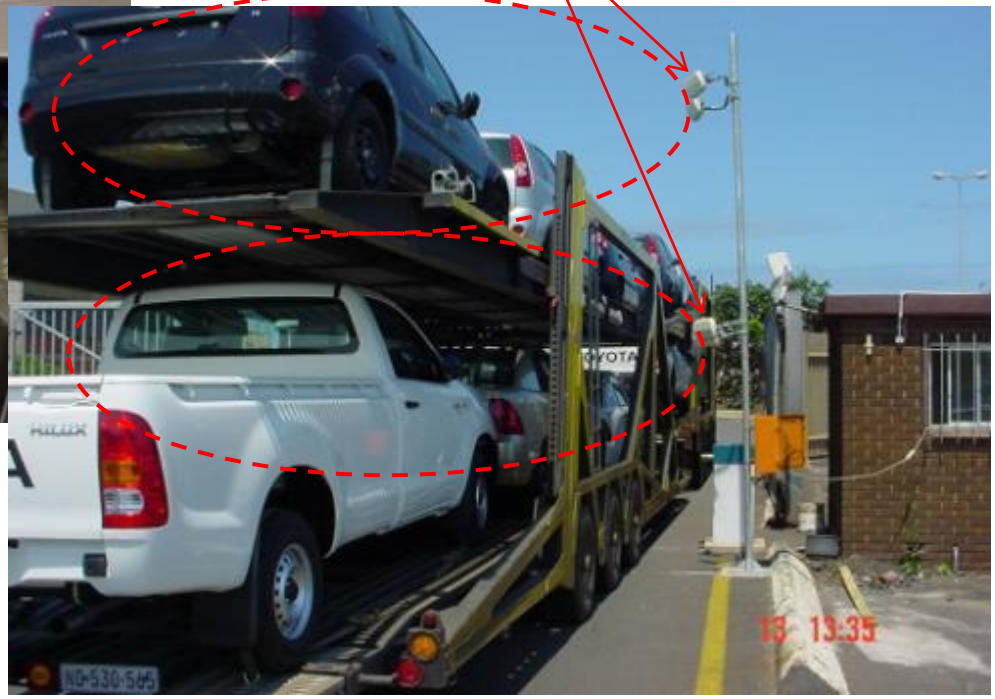
HAND HELD

CONVEYOR



RFID Label

Antenna



UHF Passive Tags

Uses of RFID

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❖ Security and Authentication

RFID stores data within identity badges, key chains and other items that provide access control for a secure area, thereby allowing only authenticated entry.

❖ Track and Trace

Tracking the location of a particular object helps you monitor its movements. You can track critical items, pallets of products, personnel, and other items within the daily work process.

❖ Real Time Locating (RTLS)

By placing readers at strategic designated zones, tags are automatically read and the location reported real time.

❖ Environment Sensing and Monitoring

You can integrate RFID technology with devices that sense and monitor various environmental conditions.

General Benefits of RFID

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- **Serialisation**

  Each item has a unique ID, therefore each item can be individually tracked.

- **Reduced Human Intervention**

  No human intervention is required. This reduces the error cost and labour involvement.

- **Better Time Management**

  As this is scanned automatically, many items are scanned simultaneously, thus more items are accurately scanned in less time.

- **Real Time information flow**

  The scanned information is updated "real – time" across the supply chain

RFID IN HEALTHCARE

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- The healthcare sector is one of the most affected worldwide in terms of the impact of RFID enabled applications.
- The real-time visibility of people, materials, equipment, machinery and processes are facilitating the following…

- Asset Management
- Patient Tracking & Locating
- Pharmaceutical Dispensing
- Condition Monitoring
- Personnel & Patient Safety
- Time, Access & Security
- Pathology Track and Trace
- Incident Investigation
- Operational Efficiency & Productivity
- H.I.S. & e-HR Enhancement
- Environmental Monitoring
- Laundry Management
- Supply Chain Management
- Etc…

"YOU CAN'T MANAGE WHAT YOU CAN'T MEASURE"

Healthcare Solutions

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YOU CAN'T MANAGE WHAT YOU CAN'T MEASURE

Hand Hygiene

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The problem is clear, but the solution isn't simple. It has been demonstrated that using technology such as RFID is beginning to address this age long issue and the cause of so much of today's Hospital Acquired Infections (HAIs).

According to the World Health Organization there are key times when healthcare professionals should wash their hands, called "My 5 Moments for Hand Hygiene" and recommends that healthcare workers to clean their hands:

- Before touching a patient
- Before clean/aseptic procedures
- After body-fluid exposure or risk
- After touching a patient
- After touching patient surroundings

Hand Hygiene

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Monitoring the hand cleaning stations at touch points is a way of improving compliance to hand washing protocols.

- Healthcare workers wear an RFID badge.
- Hand wash stations are equipped with an RFID reader
- When a hand wash station is used the reader records the user's identify and length of stay in front of the reader
- The system can alert staff in Real Time when they forget to wash their hands
- . The accumulated data allows an organization to see how well hand washing protocol is being followed.

A hand washing reporting system can be designed to be stand alone or integrated with existing health care management systems.

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Laundry

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Whether the laundry service is outsourced or in-house RFID is being used to manage this massive and essential service.

Healthcare facilities use 100's of thousands of garments. The logistics of cleaning, ironing, folding, shipping and storing laundered items would be unmanageable without RFID.

RFID UHF laundry applications are being used because of read distance being greater and tag costs being lower.

Laundry

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RFID provides Real Time data on garment logistics.

- Stock reduction.
- Automatic re-ordering of garments.
- Garments always available in required sizes.
- Wards can be accurately charged.
- Moving generic garments sorted by size, is much easier to manage.
- Total control over garment flow and traceability.
- Better control over hygiene requirements.

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System Overview

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All hospital employees who intend to be monitored regarding hand hygiene will be issued with a RFID enabled identification badge. Fixed RFID readers will be installed at all 15 hand wash stations and two at the Intensive Care Unit (ICU).

The RFID enabled identification badge will contain a unique staff identification number for each respective employee, which is programed on the staff ID Card. When a staff member uses the hand wash station, their badge is read by the fixed RFID reader, which logs the details of the person event, including time, location of the hand-washer.

Any tagged item can be read at any read station throughout the organisation and identified as such due to a prefix code on the tag.

Track & Trace System

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The RFID enabled hand hygiene tracking system may be considered a small application within a potentially larger **RFID enabled "track and trace"** system.

The system required for the track and trace function can host several applications, i.e. asset management and tracking. Thus, any application large or small will require the host system and "backbone" in the form of software development and middleware.

The software structure of the "track and trace" is designed to accommodate many applications, of which in this instance the hand hygiene tracking system can be considered a relatively expensive "micro application" if deployed in isolation. However, once the **host system** has been installed, it is reasonably straightforward to build on to the existing system for other applications which will in turn make the system cost effective.

Track & Trace Architecture

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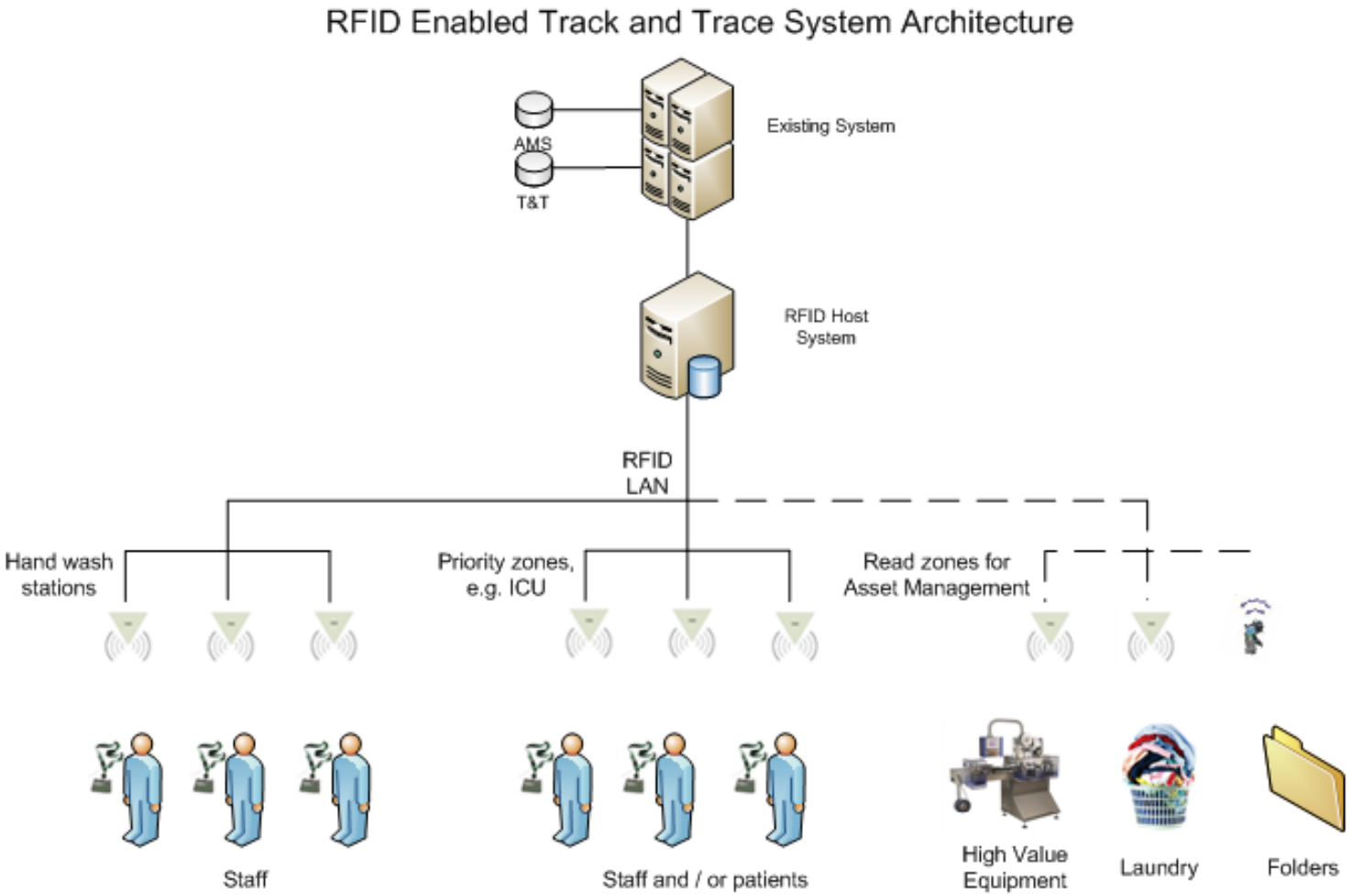

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Reader Layout

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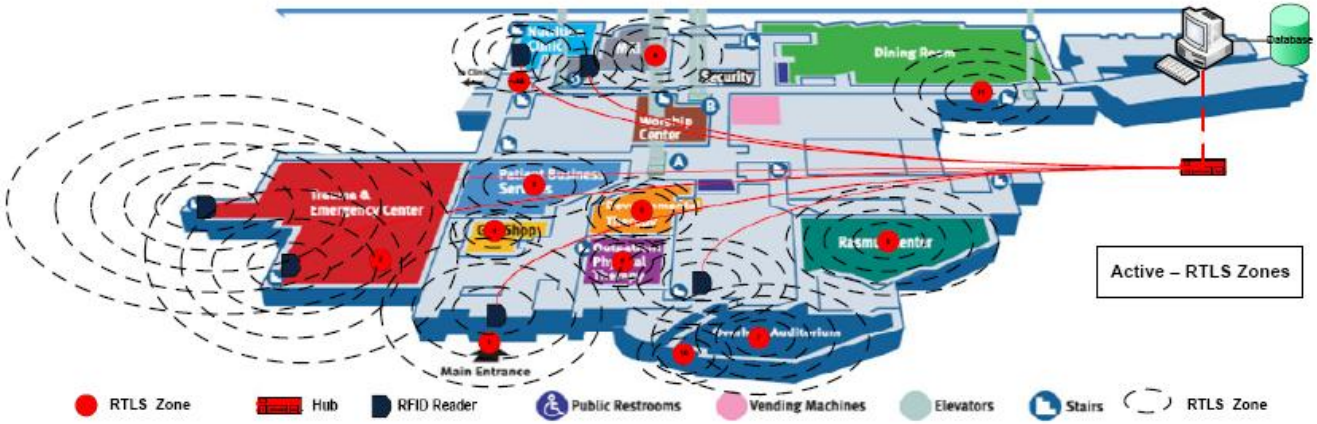

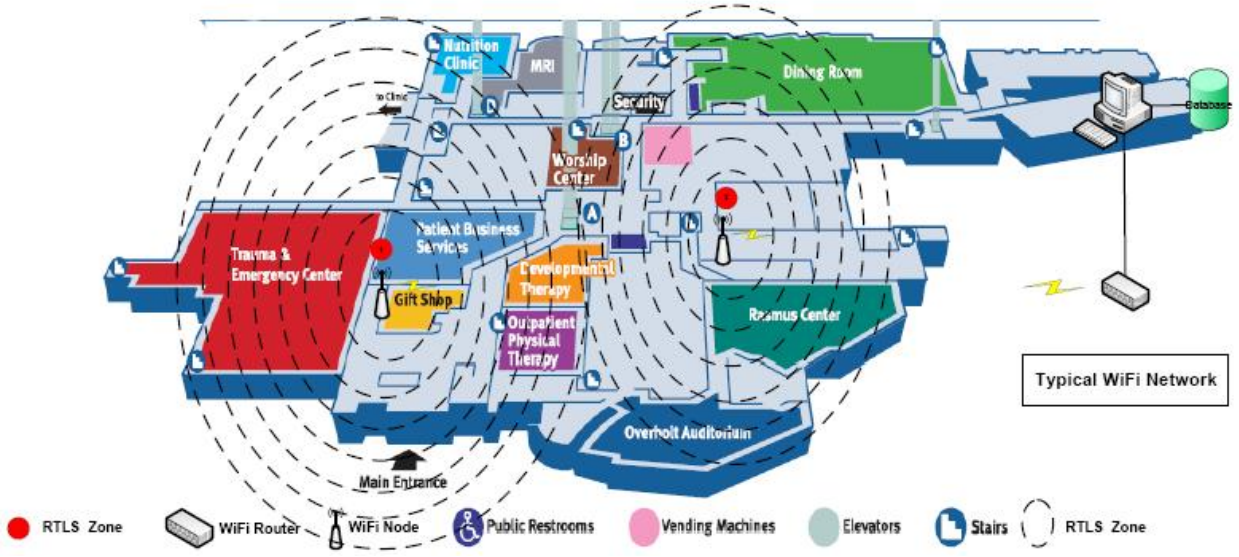

Asset Management

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Asset tracking and management solutions enables materials managers, nurses, distribution and transport services to:

- Reduce over-purchasing and equipment rental costs
- Improve staff efficiency and workflow
- Increase equipment utilization
- Automate inventory management
- Reduce equipment shrinkage and loss

The solution automates and optimizes the current manual processes that most hospitals have for managing their capital and rental equipment and enables rapid deployment with the lowest total cost of ownership.

Asset Management

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- **Par Level Management**
  Enables equipment tracking, in real time.
- **Order Fulfillment**
  Allows distribution services staff to rapidly fulfill orders and reduce wait times.
- **Inventory Management**
  Staff can be alerted, in real-time, when equipment is leaving a certain area to help prevent shrinkage and loss.
- **Integration to Medical Device Management Systems**
  RFID integrates with medical device management systems, such as infusion pump management servers.
- **Rental Management**
  Rental equipment tracking ensures that items are returned in a timely manner. Utilisation analysis enables optimisation of the balance between capital and rental equipment.

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Patient Flow

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Solution Highlights

- At-a-glance map view displays room status, patient tracking information, whether the patient has arrived, which staff members are in the room and if the required medical devices are in place
- Automated indications of room cleaning status
- Real time location of critical equipment ensures on-time start of procedures
- Analysis of patient wait times
- Analysis of patient-staff interaction times for scheduling optimisation
- Alerts regarding missing equipment in a specific department/unit

Document & File Tracking

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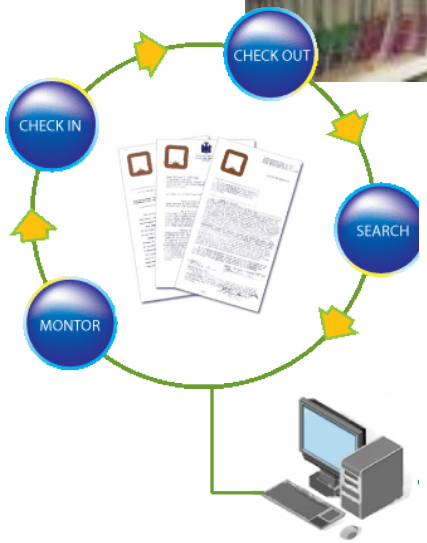
Patient & Document identification and location assistance are often needed to ensure patient safety when urgent medical attention is needed. Patient tags with RFID chips will meet this need.

The RFID system will be able to do the following:

- Real time notification of all events
- Log and record patient and folder movements – Date/ Time / Location
- Log and update all events (any tag read)
- Link a file to a person
- Store historical data per patient / folder
- Report service time
- Create reports on patients / folders



PATIENT, PERSONNEL & VISITOR TAGGING		↑ = enhanced	↓ = reduced
#	Application Description	Anticipated Benefit Description	Priority
1	Manage and control patient flow	↑ safety ↑ security ↓ wait time ↑ capacity utilisation	Medium Medium High High
2	Manage appointments	↓ empty slots ↓ wait time ↓ congestion	High High High
3	Real time service audits	↑ service quality	High
4	Access control	↓ spread of disease ↑ compliance ↑ safety ↑ security	High High Medium Medium
5	Emergency evacuations	↑ safety ↑ compliance	Medium Medium
6	Patient location	↓ spread of disease ↑ service quality ↓ wait time	High High High
7	Visitor location	↓ spread of disease ↑ security ↑ loss control ↑ compliance	High Medium Medium Medium
8	Staff location	↑ service quality ↓ wait time	High High
9	Tag and marry mothers and babies	↑ security	High

DOCUMENT TAGGING		↑ = enhanced	↓ = reduced
#	**Application Description**	**Anticipated Benefit Description**	**Priority**
10	Real time location of patient folders	↓ wait Time	High
11	Real time location of specific documents (e.g. lab results)	↑ correct filing of external lab results	Medium

ASSET TAGGING		↑ = enhanced	↓ = reduced
#	**Application Description**	**Anticipated Benefit Description**	**Priority**
12	Fixed asset register maintenance	↑ FAR compliance	Medium
13	Asset track and trace	↑ service quality ↑ loss control	High Medium
14	Pharmacy and stores stock measurement	↓ stock-outs ↑ stock control ↑ loss control	High High Medium
15	Pre-packaged medicine management	↑ dispensing accounts	High

Services

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EDUCATION

Africa's educator and gold partner of CompTIA RFID certification

> Understand RFID Technology
> Qualified Overview of RFID
> Product Demonstration
> RFID + Certification - Academy

ANALYSIS

Identify the feasibility of deployment and the impact that the technology will have.

> Site Survey - Identify application criteria
> Identify all potencial aplications
> User requirement analysis
> Establish deployment cost & benefits

DESIGN

Provide a professional experienced total system design that will integrate with existing systems and processes.

> Assign best fit technology
> Compile specifications hardware / software
> System layout and architechture design
> Design processes and business integration

PILOT

A small scale representative of the implementation prior to full system roll out.

> Define objectives and key criteia
> Loan of all RFID components
> Full Implementation
> Test and measure deliverables.

DEPLOYMENT

Turnkey project deployment. Years of RFID project expertise by RFID certified personnel.

> Project Management
> Quality Control Procedures
> Test and comissioning
> RFID component optimization

Recommendation

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It is the recommendation of the RFID Institute that the services of the Institute be employed to design an RFID System which takes into full account the End User current and future RFID application requirements, which integrates fully with the End User ERP and other systems and which applies those technologies most appropriate to the End User.