

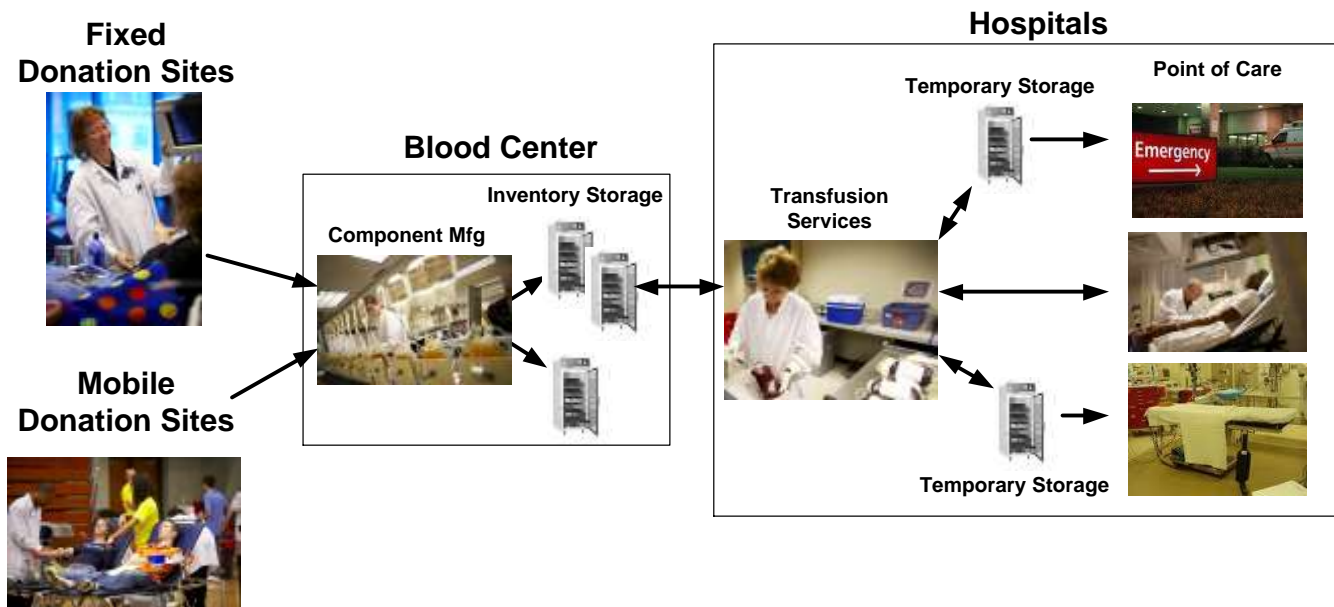
# OVERVIEW

- Objective

- Demonstrate an end-to-end tracking system for blood products from point of donation through point of transfusion

- Benefits

- Safety/Compliance
- Operational Efficiency

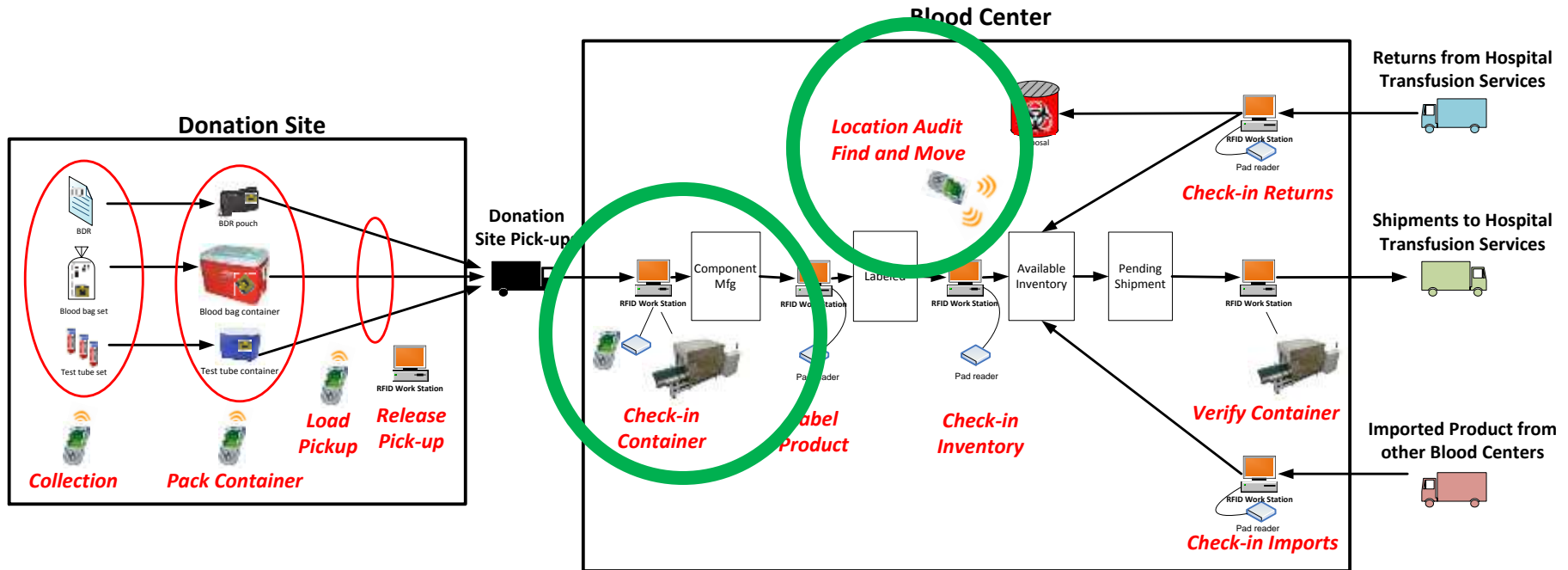


# KEY DESIGN OBJECTIVES

- **Augment** the existing blood environment computer system
  - All decision making logic remains with the BECS
  - Focus is on capturing and tracking the physical movement of items
- Minimize the disruption of the current processes - support both **bar-code-only** and RFID enabled products
- Designed to interoperate with a wide range of blood environment computer systems
  - Well defined set of integration points
  - Limit the touch points to those with significant & measureable benefits
- Designed to support with a wide range of RFID and auto-id technologies (handheld, pad, tunnel readers, etc.)

- Develop two packaged ***Solutions***
  - Blood Center Solution
  - Hospital Transfusion Services Solution
- Linked but can be deployed independent of each other
  - Transfusion Services solution does not require the use of the Blood Center solution
  - However, the full benefits are available only when both are used
- Each Solution is envisioned to include
  - ***Packaged Software*** – licensed on a perpetual or subscription basis
  - ***Deployment Services*** - configuration & customization, installation, BECS integration, training, and project management
  - ***RFID Devices and Tags*** – HF handheld, pad, tunnel, paddle readers and tags
  - ***Annual Support Services*** –hotline, bug fixes, feature releases, and device maintenance & repair

# BLOOD CENTER SOLUTION TOUCH POINTS



**Legend:**

- <RED TEXT> Function being performed
- ↔ Physical movement of items

# CHECK-IN CONTAINER USE CASE



- A packed container arrives at the blood center
- Each container and each blood bag has an associated RFID tag
- The operator scans the container tag and each item in the container
- The scan results are immediately displayed
  - Found, missing, and excess
  - Container min/max temperature
- The operator optionally adds notes, “Drops” missing items and “Adds” excess items prior to completing check-in
- Selecting “Check-in” completes the bulk check-in of all items into the BECS

# CHECK-IN CONTAINER

### Check-In Container

Container | Pickup Summary

Donation Site: \_\_\_\_\_

Pickup ID: \_\_\_\_\_

Notes:

Containers: /

Import pickup data from donation site(s):  Expected  Missing  Extra

Min Temperature:

Max Temperature:

Scan/Enter Barcode :

DIN : \_\_\_\_\_

Product Code : \_\_\_\_\_

Number of Items: \_\_\_\_\_

Status	Notes	Action	DIN	Is Rfid Enable	Last Location	Last Observed
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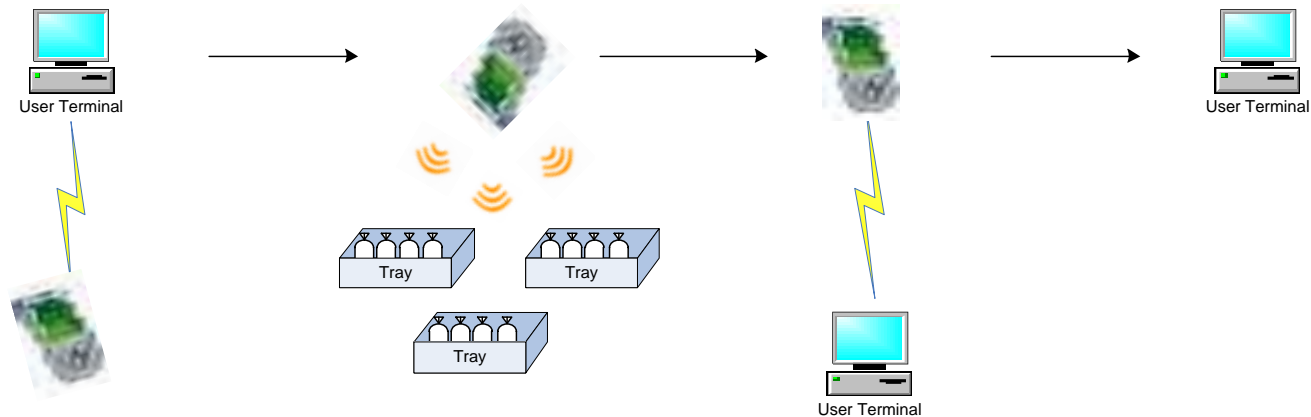
# FIND AND MOVE USE CASE

**Step 1:** The workstation “*Find and Move*“ application is used to select a BECS query (quarantine list, expired list, etc.) and a destination location (Refrig 1, Freezer-2).

The set of items that match the selection criteria is returned from the BECS and sent to a handheld RFID/bar code reader via the WiFi network.

**Step 3:** When desired set of items have been found, the operator submits the results.

The locations of the found items are changed to the specified destination location. The set of found items is also returned to the BECS so the items state and location can be updated appropriately.



**Step 2:** The list of items is displayed on the handheld device – all are initially shown as “missing”.

The handheld reader is passed over each item in an area - as each item is detected, an audible beep is signaled indicating either it is either on the list of items to be found and moved or that the item scanned is not on the list of items to be moved. As each “expected” item is found, the operator moves the item into a temporary tray.

Details of the “found” and “missing” items can be viewed at any time on the handheld device.

**Step 4:** An authorized user can view the Find and Move results at any time.

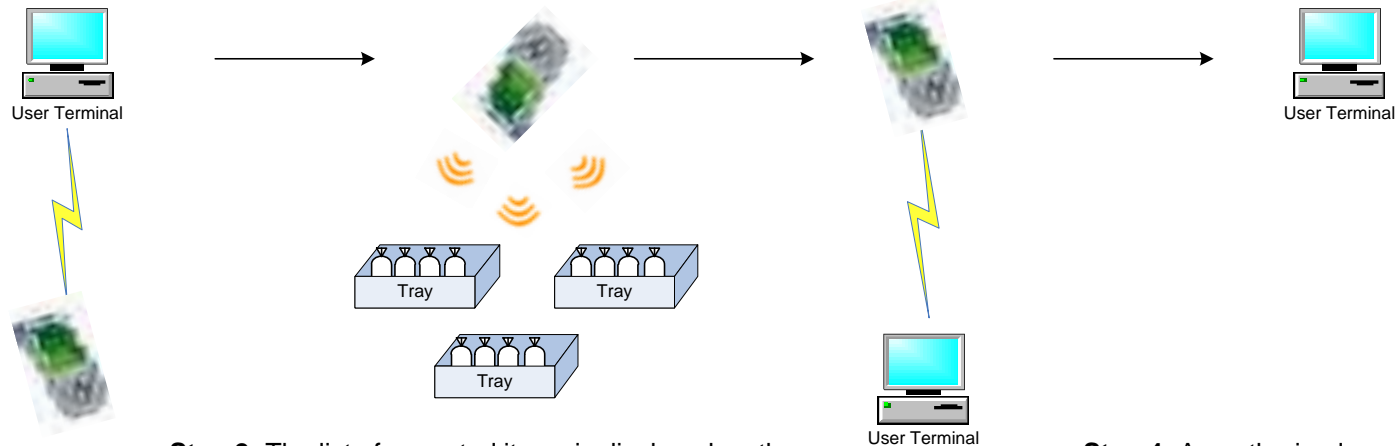
# LOCATION AUDIT USE CASE

**Step 1:** The “*Location Audit*” application on a workstation is used to select a location to be audited (Refrig 1, Freezer-2) - a set of items the system believes are currently in that location is returned.

The Location Audit task is sent to a handheld RFID/bar code reader via the WiFi network.

**Step 3:** When all the items in the location have been scanned, the operator submits the results.

The locations of the found items are unchanged, the locations of the missing items are set to “**unknown**”, and the locations of the excess items are set to the location being audited.



**Step 2:** The list of expected items is displayed on the handheld device – all are initially shown as “missing”.

The handheld reader is then passed over each item in the location - as each item is detected, an audible beep is signaled indicating an “**expected**” item has been found or that an “**extra**” item has been detected.

Details of the “**found**”, “**missing**”, and “**extra**” items can be viewed at any time.

**Step 4:** An authorized user can view the location audit results at any time.



# LOCATION AUDIT

Location Audit

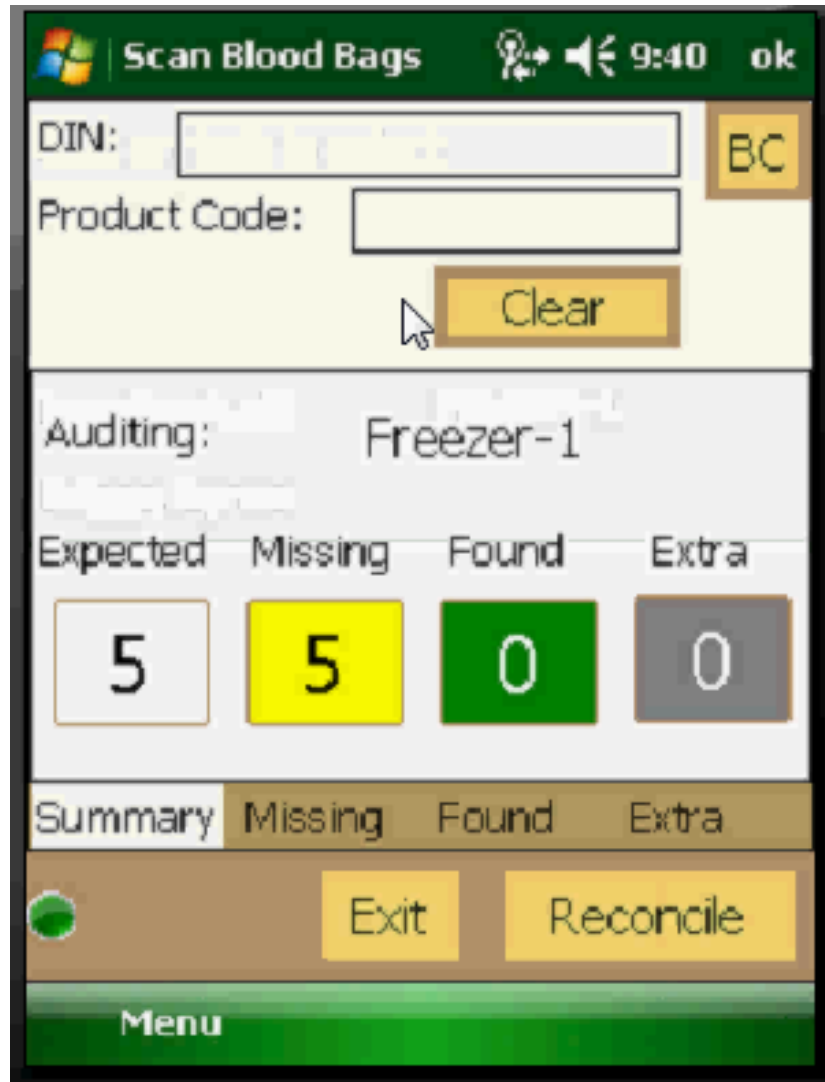
Select Location:

Select Operator:

List of Active Tasks:

Details Action	Cancel Action	Task Creation Time	Operator	Expected Bags	Actual Bags	Task State	Task Finish Time
[Empty Table Area]							

# LOCATION AUDIT



Scan Blood Bags 9:40 ok

DIN:  BC

Product Code:

Clear

Auditing: Freezer-1

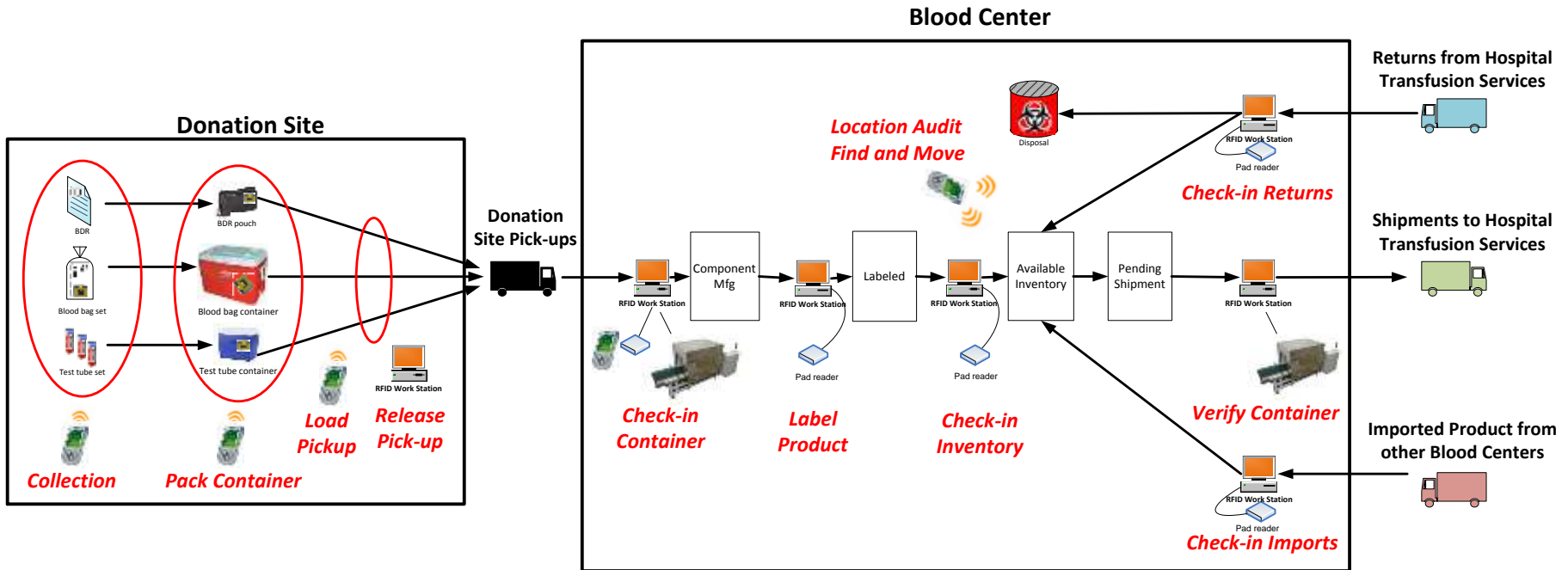
Expected	Missing	Found	Extra
5	5	0	0

Summary Missing Found Extra

Exit Reconcile

Menu

# BLOOD CENTER SOLUTION TOUCH POINTS

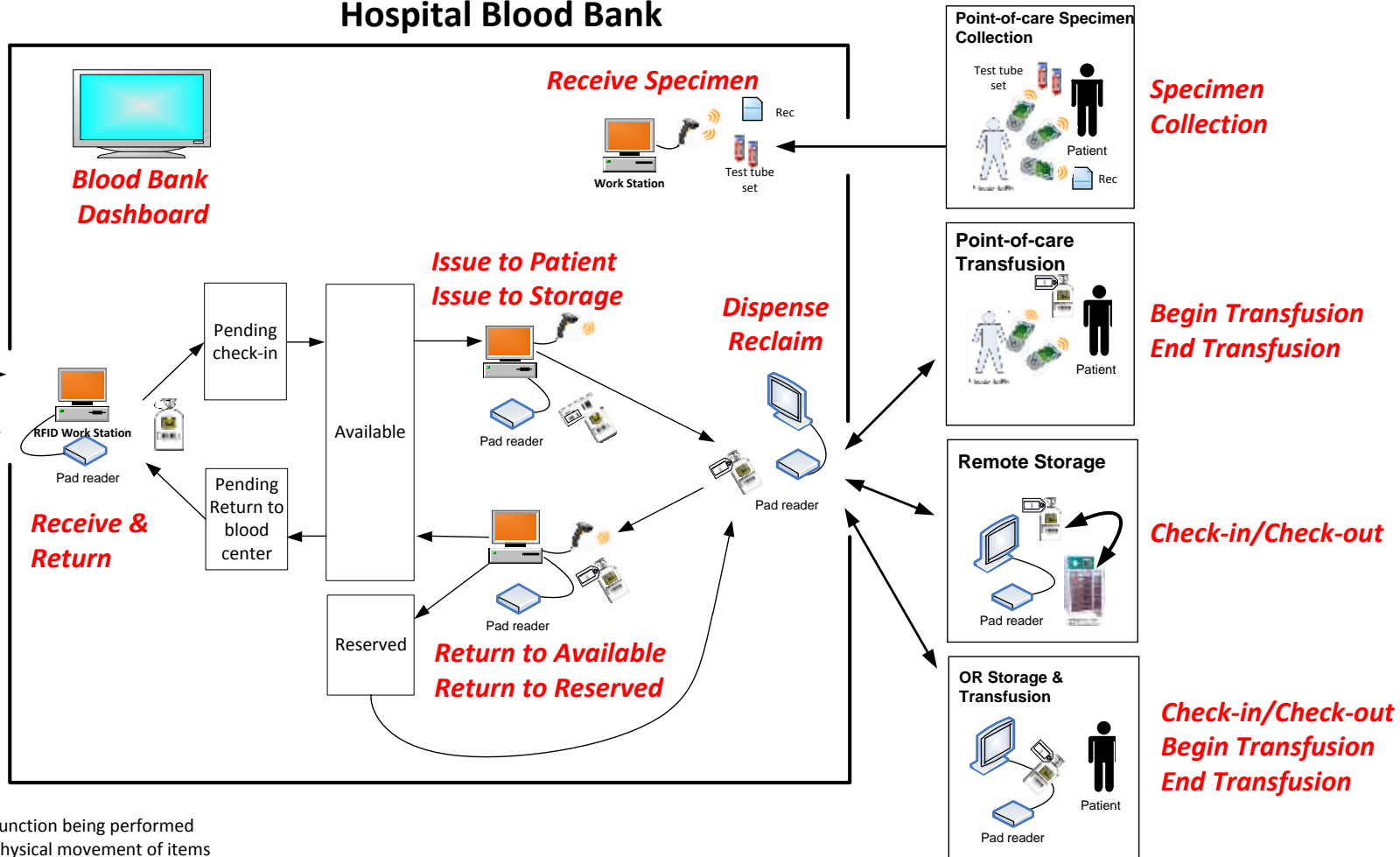


**Legend:**

- <RED TEXT> Function being performed
- ↔ Physical movement of items

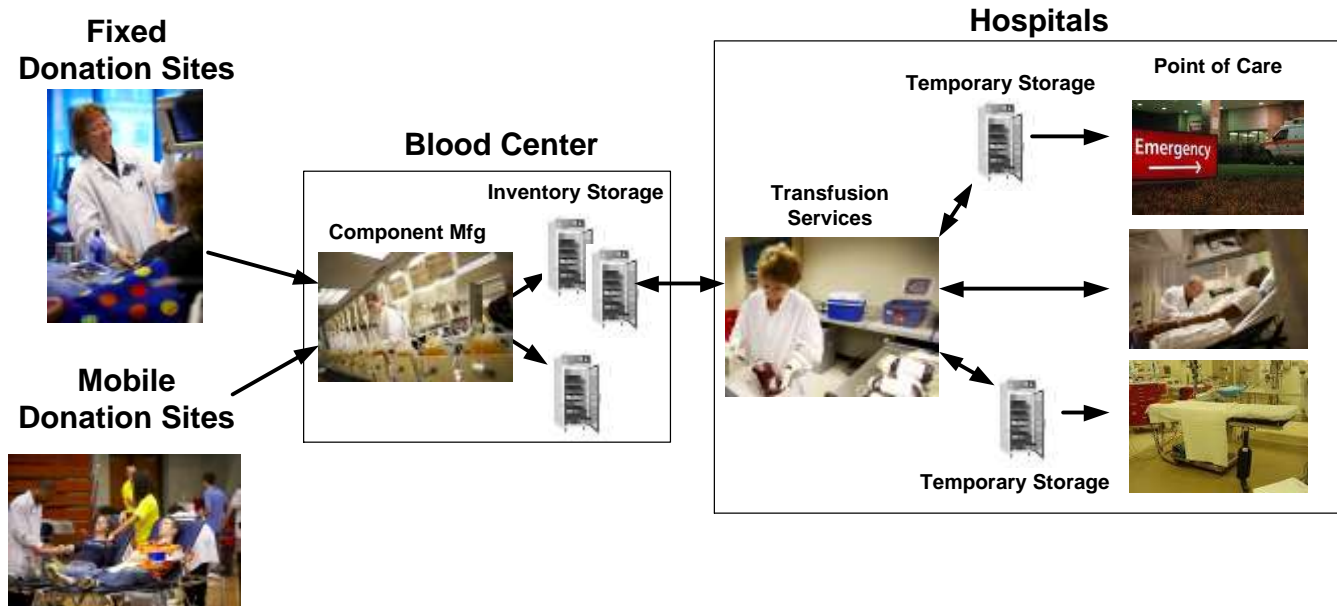
# TRANSFUSION SERVICES RFID-ENABLED TOUCH POINTS

## Hospital Blood Bank



# LESSONS LEARNED

RAM VENKATESH – S3EDGE, INC.



# TAG DECISIONS IN A GREAT PLACE NOW



- HF RFID technology choice is holding up well
  - Could be even more beneficial in the future, more on this later
- We think of tags as “smart pointers” than as databases
  - Privacy, safety, communication, security and data integrity concerns addressed
  - Usability and ergonomics – significant improvements made
  - Data is written to the tag ONLY for field and disaster response scenarios
- Off-the-shelf “commodity” tags are the way to go
  - Price, performance, volume, capacity, lead times, ...
- Conclusions
  - Off-the-shelf commercially available tags address **all** the application scenarios
  - New rev of the tag data structure that fits on 1kb is available now for discussion

## RFID AND BATCH OPERATIONS

- Enabling batch-oriented RFID operations considered for three spots
  - Container check-in, inventory check-in and shipment verification
  - The processes in question are six sigma already with low error rates
- Issue: 100% detection is not possible without doing a physical count – (not unique to blood, any RFID scenario)
  - Item with no tag or damaged tag, or a tag that was “shielded” and not read
- Solutions identified
  - Using “grocery store checkout” approach with a pad reader matches the physical flow where bag at a time processing is done
  - Visual aids such as trays with slots for quick verification of counts (egg rack model)
- Conclusion
  - Processes support both models, the pilot will explore efficiency and accuracy

# BECS INTEGRATION: LIGHT AT THE END OF THE TUNNEL



- The primary goal of the RFID system is better tracking and eliminating data entry – decisions are completely controlled by the BECS
- Significant progress has been made defining a clear set of touch points between the BECS and the RFID system
- However... touch points may have to be refined based on the capabilities of the BECS
- Conclusion
  - One working BECS connector now
  - Interested in working with other **blood center BECS vendors** to add RFID tracking capabilities to their solutions



# AN EXCITING DEVELOPMENT ON THE HORIZON

## SMARTPHONES WITH RFID BUILT-IN

- “NFC” technology in Android smartphones includes HF RFID capabilities
- 10 Million NFC phones by year-end
- 40 Million projected for 2012
- Spotlight for Android is a set of apps and services that connect to Spotlight Server
- Available on the Google Nexus S today

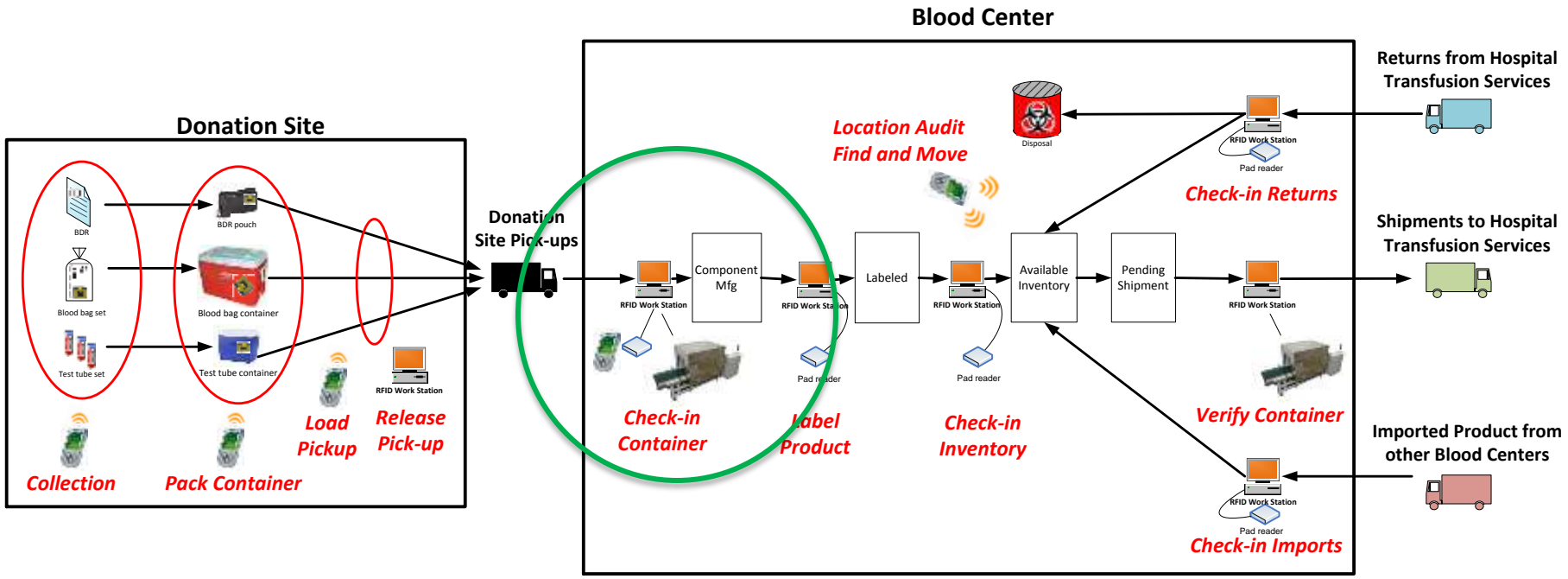


# HOW MIGHT RFID ENABLED SMARTPHONES HELP



- GPS for automatic location tracking and continuous visibility
- Network connectivity, mobile data services and Wi-Fi will simplify mobile collection scenarios
- Consumer device ergonomics – touch, screen resolution, weight, battery life, shipping volumes
- Ease adoption for nursing staff at bed-side point of care
- You can make calls too 😊

# CONCEPT DEMO – SMARTPHONE CONTAINER CHECK-IN



# QUESTIONS?

For more information go to  
[www.transfusionmedicineRFID.org](http://www.transfusionmedicineRFID.org)  
[www.s3edge.com](http://www.s3edge.com)