

Radio Frequency Identification: Impact on Tracking RBC Units in the Emergency Department Refrigerator & Blood Bank Inventory

Lejla Music Aplenc, M.D.

Gabriel Metzler, MLS, SBB

Kenzie Hurst, MT

Children's Mercy, Kansas City, MO



-
- No conflict of interest to disclose.

Outlines of the Presentation

- What is the Radio Frequency Identification, (RFID) System?
- What was the reason to implement the RFID system ?
- Study design
- Study results
- Study conclusion

Radio Frequency Identification (RFID) System

- Wireless system
 - Transmits and remembers data
 - Provides a unique identity
- RFID elements
 - RFID Tag
 - RFID Reader

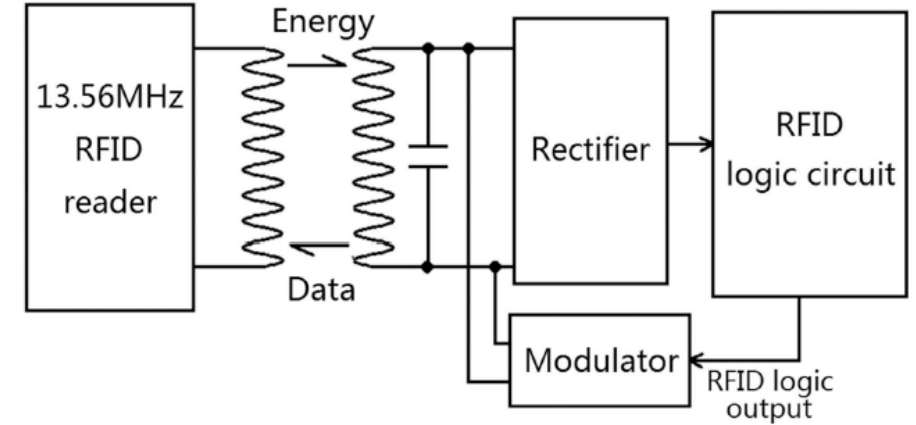
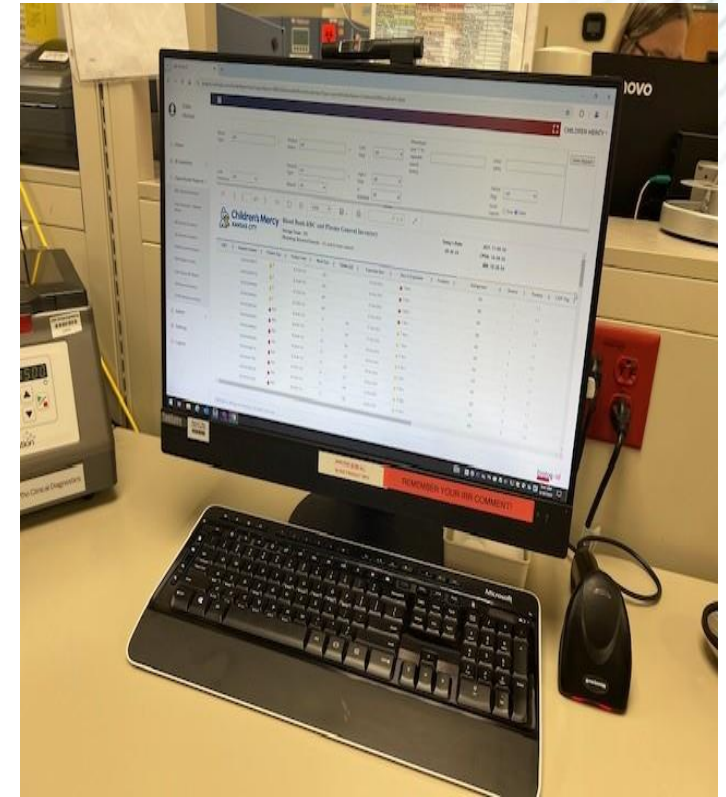


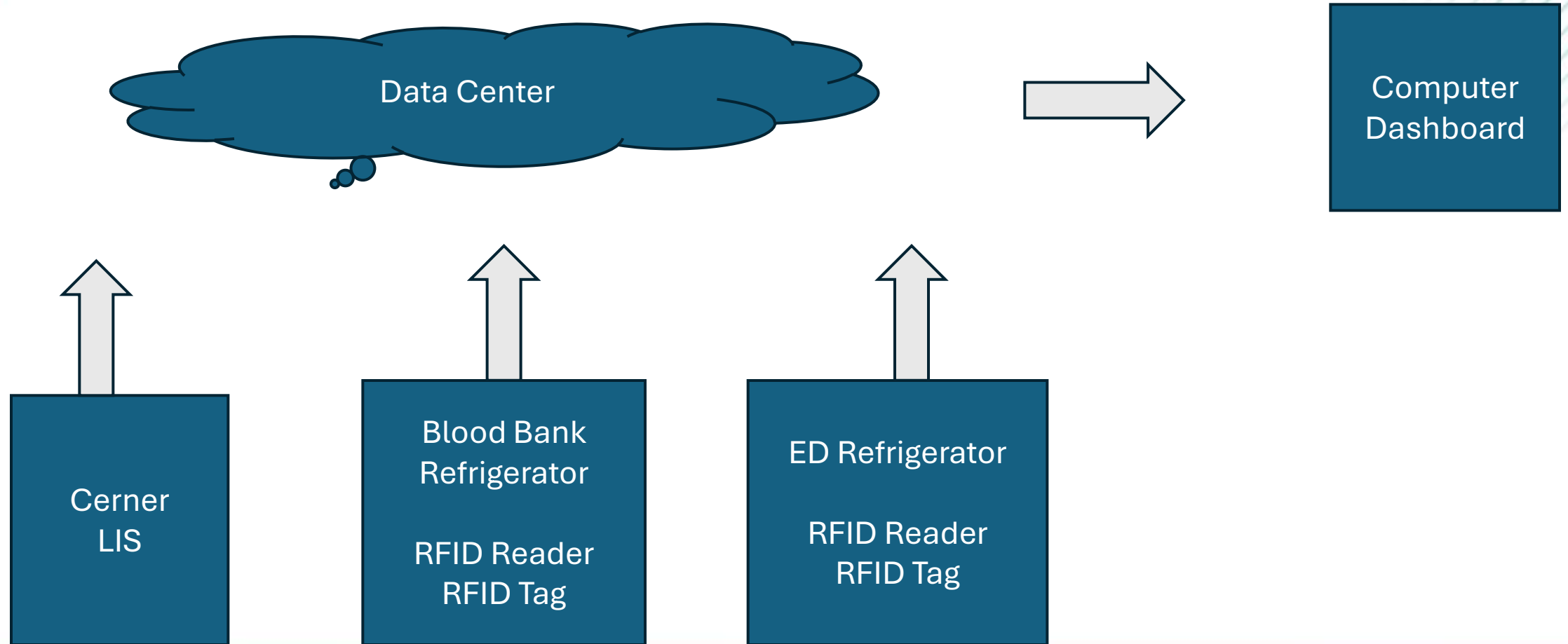
Fig. 1 *Architecture of RFID system*

IET Circuits Devices Syst., 2018, Vol. 12 Iss. 6, pp. 771-776
© The Institution of Engineering and Technology 2018

RFID System, Working Principles



RFID System: Working Process in the Hospital



RFID System: Why!

- Tracking RBCs in the remote ED refrigerator:
 - RBC units taken out without RBC orders
 - Tracking forms not filled out

Study Design

ED Refrigerator RBC Units

- **Tracking time**
- Removed, number
- Wasted, number
- Returned, number
- Counts and inspection, time

Blood Bank Refrigerator RBC Units

- Temperature changes
- Dispensed, number
- Wasted, number
- Returned, number
- Counts and inspection, time
- Selection, time

Study Results: ED Refrigerator

ED REFRIGERATOR		
Tracking RBCs	January –June 2023	July –December 2023
Time from removal to ordering the RBC unit, estimated time in minutes	75	1

Study Results: Blood Bank RBC Inventory

BLOOD BANK REFRIGERATOR Temperature changes

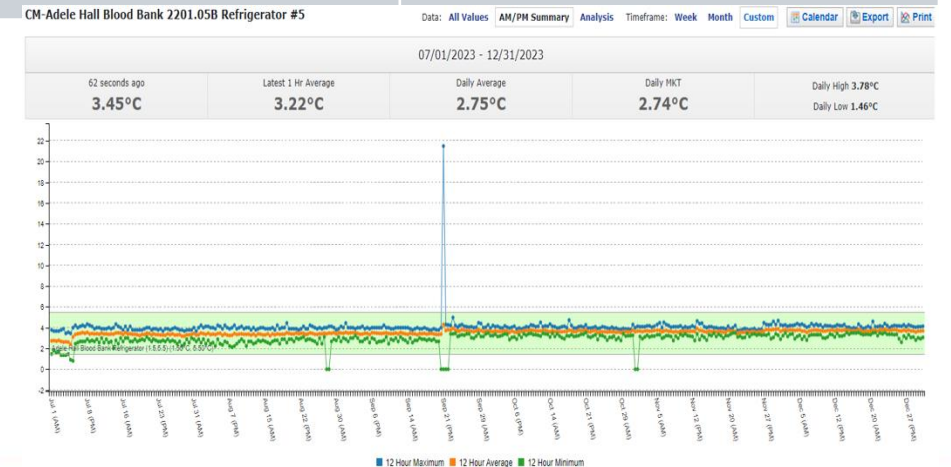
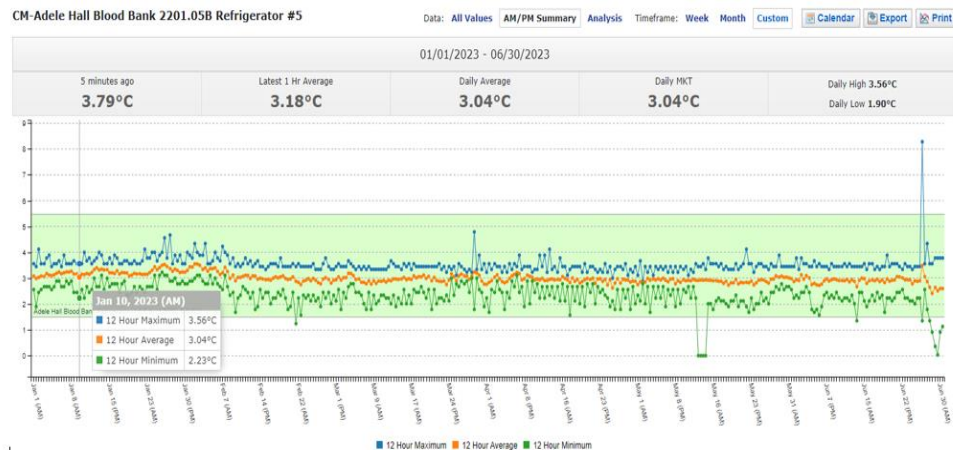
12 hrs. average temp, dg. Celsius
Standard deviation

January –June
2023

3.4
0.344852113

July –December
2023

3.4
0.195253112



Study Results: Blood Bank RBC Inventory

BLOOD BANK REFRIGERATOR		
RBC Inventory	January-June 2023	July to December 2023
Dispensed, number of units	2703	2938
Wasted, number of units	17	28
Returned to Blood Ctr., number of units	115	99
Counts and inspection, estimated time in minutes	5	1
Selection, estimated time in minutes	5-10	1

Study Results: ED Refrigerator

ED REFRIGERATOR	January –June 2023	July –December 2023
Removed from the refrigerator, number of units	14	15
Wasted, number of units	2	1
Returned to Blood Bank, number of units	38	37
Counts and inspection, estimated time in minutes	5	5

Study Conclusion

- Time required to track RBC units in the remote ED refrigerator was significantly improved.
- Functioning and utilization of the blood bank refrigerator was greatly enhanced.
- Blood Bank staff work burden was reduced.

