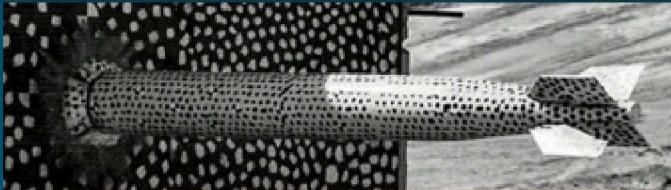




Maximo Anywhere at Sandia



PRESENTED BY

Maggie Sorensen and Jimmy Raymond

SAND2019-2572PE



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Agenda

- Background
- Implementation
- Use Cases
- Lessons Learned



Background

Sandia's Maximo Mobile History

- Maximo Mobile Suite (Prior to 2010-present):
 - Warehouse used Inventory Manager with much success
 - Implemented Asset Manager to three groups with limited success
 - Tried to implement Work Manager to 30 craftspeople; project failed
 - Core Maximo to be upgraded to 7.6, Maximo Mobile Suite no longer supported
- Maximo Everyplace (2014-present)
 - Because of the need to be connected, never was a viable solution for us
- Maximo Anywhere (2016-present)
 - 2016: Set up Maximo Anywhere servers and began testing and developing apps
 - 2017: Deployed Anywhere apps to replace Maximo Mobile Suite apps
 - Issues and Returns
 - Physical Count
 - Asset Audit
 - Asset Data Manager
 - 2017: Began implementation of Anywhere Work Execution with 15 craftspeople
 - 2018: Worked with users to identify and fix application and infrastructure problems
 - 2019: Rolling out Anywhere Work Execution to remaining 100 craftspeople

SNL Restrictions

➤ Allowed mobile devices:

- Laptops with full OS
- Apple iPhones and iPads

➤ Allowed connection types:

- No Bluetooth
- Wi-Fi acceptable in some areas
- Cellular acceptable in most areas
- Must use VPN to make a remote connection to our servers

➤ Geographical location

- On the outskirts of town
- Very large campus
- Cellular reception can be minimal

Why did we choose Maximo Anywhere?

- Upgrading to Maximo 7.6 meant that Maximo Mobile Suite was no longer supported
- Offered a disconnected or offline mode
- Out of the box apps Anywhere provided matched 90% of our needs



Implementation

The architecture and implementation of Anywhere

Anywhere Architecture

https://www.ibm.com/support/knowledgecenter/en/SSPJLC_7.6.0/com.ibm.si.mpl.doc/plan_deploy/c_plan_multiserver_deployment.html

Components to Maximo Anywhere

➤ Infrastructure

- MobileFirst Server
- MobileFirst Database

➤ Development Environment

- All Device Platforms
 - Eclipse
- For iOS apps
 - Mac
 - Xcode
 - Apple Enterprise Developer Account/Certificates

Anywhere Code

➤ XML files

- app.xml used for main application display
 - UI and resources
- Other layout XML files for tables

➤ JavaScript

- Platform code is the same for all apps
- Each app has its own code

➤ Uses Cordova (PhoneGap) to build for multiple device platforms

➤ Core Maximo

- Security groups
- Saved queries to limit data
- OSLC (Open Services for Lifecycle Collaboration) to “talk” with Maximo
 - Object structures
 - Integration resources
- Anywhere Admin application

Code Changes

➤ Easy

- Adding fields from existing resources in the app.xml
- Hiding UI components
- Moving UI components around

➤ Moderate

- Adding fields from a related table
- Adding views from existing resources

➤ Difficult

- Adding resources not already in app
- Changes to the JavaScript
- Code in Cordova libraries

Technical Support

- Apps require different levels of support
 - Work Execution has fewer problems
 - Not including maps or calibration
 - Other apps have more problems
- IBM provides basic training
 - Advanced training?
- Contract with a IBM Business Partner helped bridge knowledge gap
- IBM Technical Support
 - Regular Case (“PMR”) process
 - Our restrictions make this a slow process



Use Cases

How we use Maximo Anywhere

Warehouse Inventory and Storeroom Tracking

➤ Issues and Returns – Monitoring and controlling inventory items and tools

Issues and Returns

Site: SNMFAC

Storeroom *: Tap to enter

Issue To *: Tap to enter

Work Order: Tap to enter

Issue Reserved Items

Issue Additional Items

Return Items

Issues and Returns

Sort by: Bin 6

008644 EA	FILTER 24 IN. X 24 IN. X 2 IN. PLEA... H-15 20190145095	8.00
015683 EA	FILTER 20 IN. X 24 IN. X 2 IN. PLEA... H-4 20190145095	18.00
009593 EA	FILTER 12 IN. X 24 IN. X 2 IN. PLEA... H7 20190145095	

Cancel Complete

Issues and Returns

Sort by: Bin 6

Item: 006497

Item Description: DISPENSER SWD WRITE-ON TAPE

Bin: PC-CC-8

Unit of Measure: EA

Quantity Available: 0.00

Issue Quantity *: Tap to enter

Cancel Complete

➤ Physical Count – Perform inventory and record physical count

Physical Count

Sort by: Bin

029678 954_NMF	LAMP LINEAR FLU... 029678
048583 954_NMF	KEY BLANK NEW S... 040937
040941 954_NMF	KEY BLANK ILCO ... 040937
032333 954_NMF	LOCK-SMITH**PAR... 040937
040937 954_NMF	KEY BLANK ILCO 1... 040937
KEITHTEST2 954_NMF	Keith Test #2, Usin... 123456

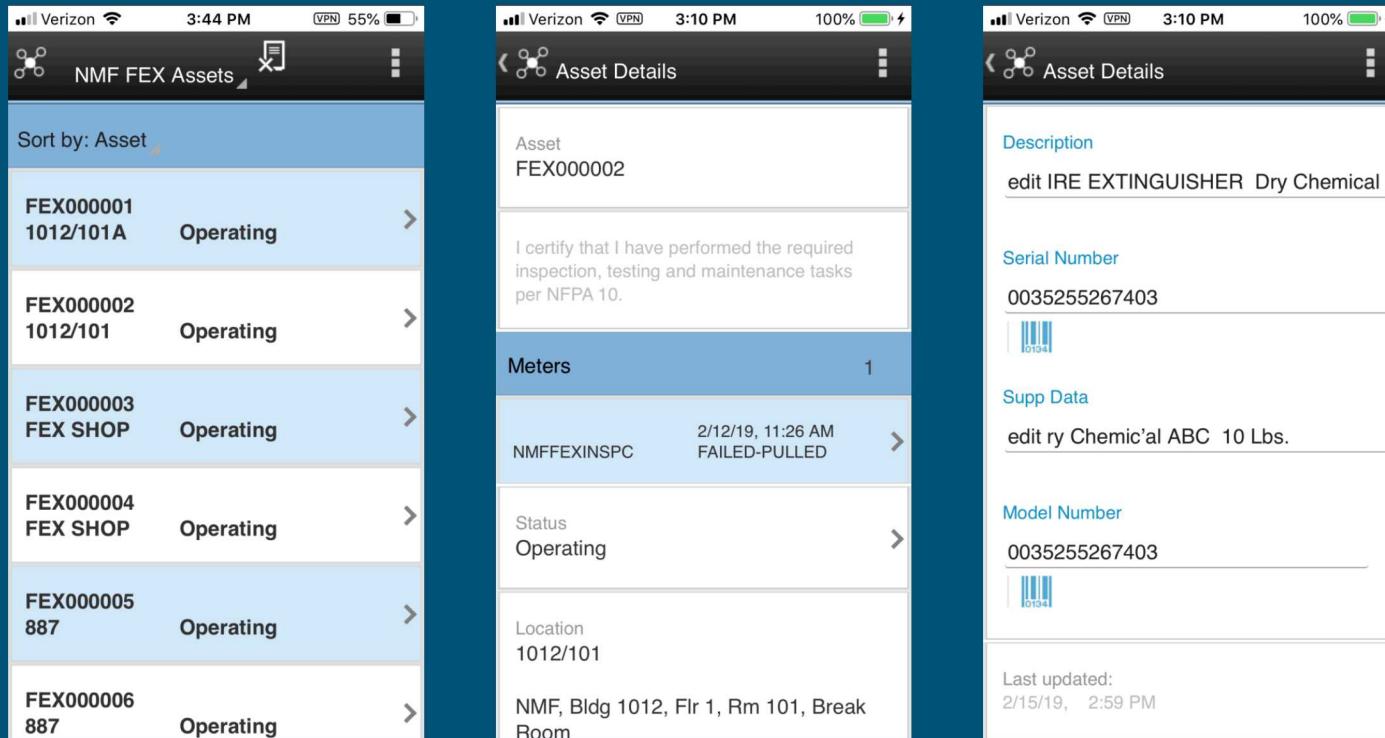
Physical Count: 45

Done

1 2 3 4 5 6 7 8 9 0
- / : ; () \$ & @ "
#+= . ? ! '
ABC space Go

Asset Data Manager for Fire Extinguishers Asset Inspections

- ~5000 extinguishers
 - Monthly and yearly inspections
 - 6 year and 12 year maintenance
- Facilities analyzing data to determine if monthly inspections are needed



Asset Data Manager – Asset Meter Reading

Verizon 3:05 PM 100% 

Meter Details

Meter
NMFFEXINSPC
NMF FEX Inspection Results

Meter Type
CHARACTERISTIC

Last Reading
FAILED-PULLED

Last Reading Date
2/12/19, 11:26 AM

Last Reading Inspector
MCSOREN

New Reading
Select from list 

Verizon 3:05 PM 100% 

Meter Details

FAILED-PULLED

Last Reading Date
2/12/19, 11:26 AM

Last Reading Inspector
MCSOREN

New Reading
Select from list 

New Reading Date
Select

Notes

Recorded By

Verizon 3:05 PM 100% 

Select Value

7

FAILED-PULLED

NO ACCESS

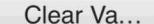
PASS-ANNUAL

PASS-FIELD REPAIR

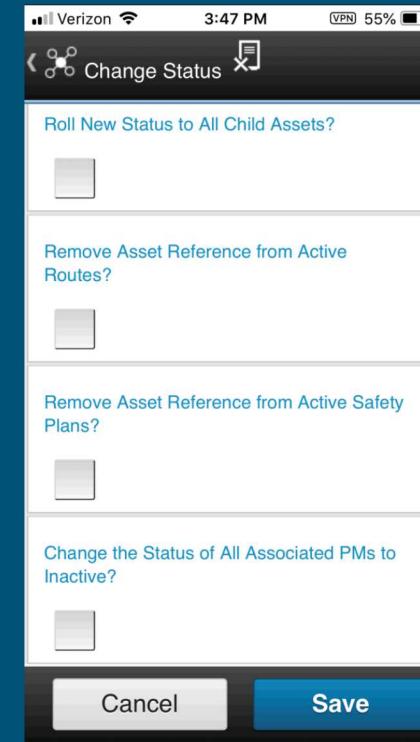
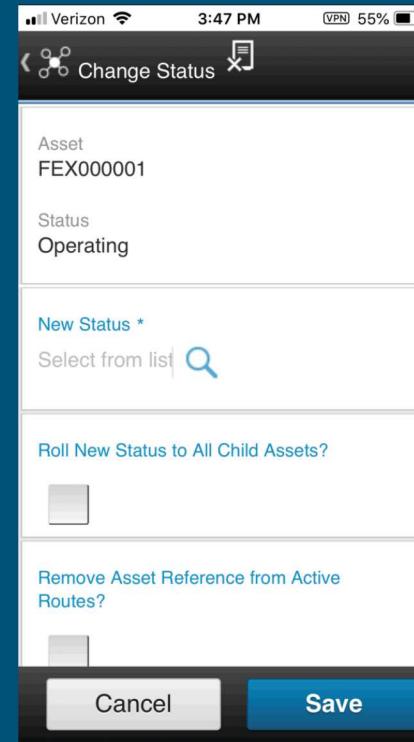
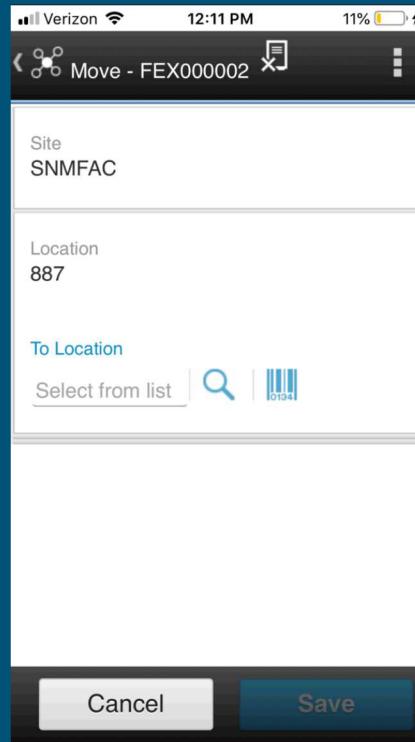
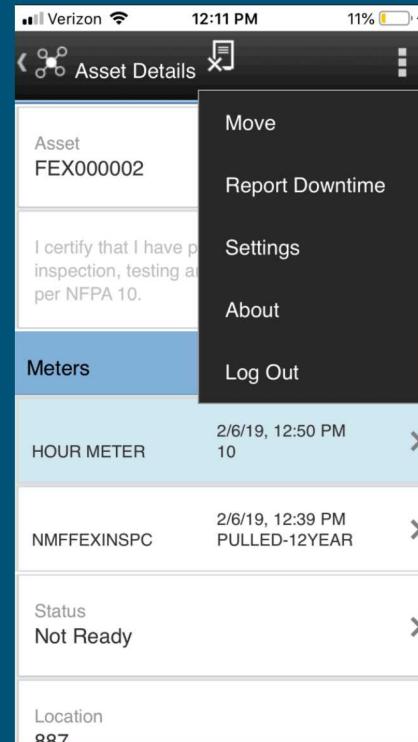
PASS-MONTHLY

PULLED-12YEAR

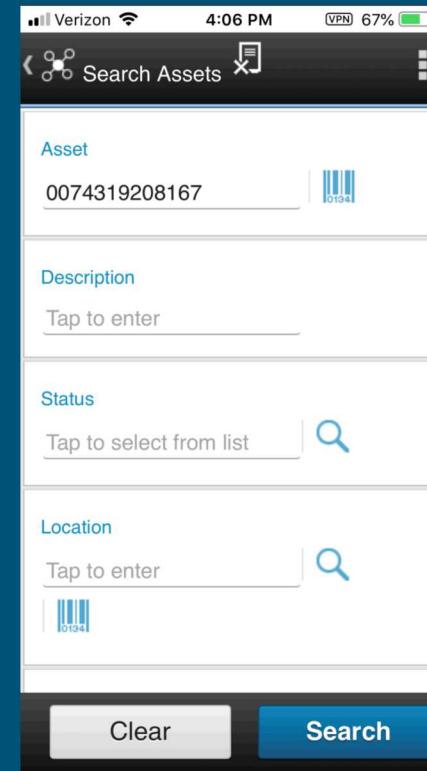
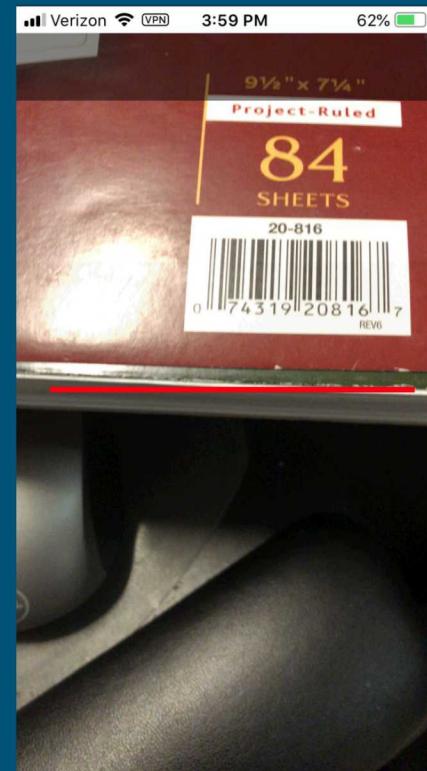
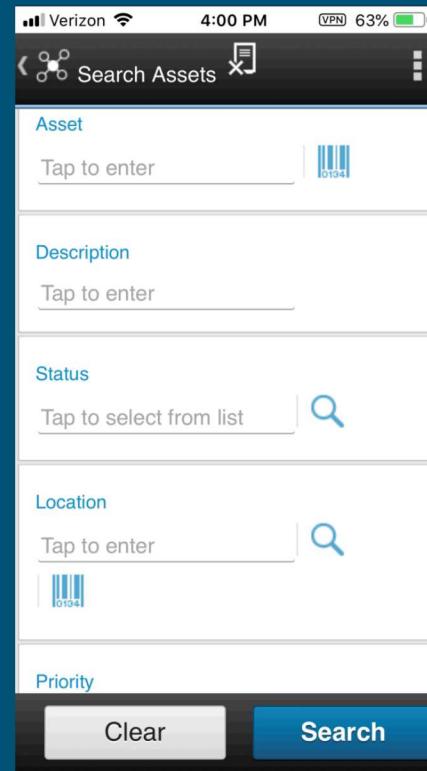
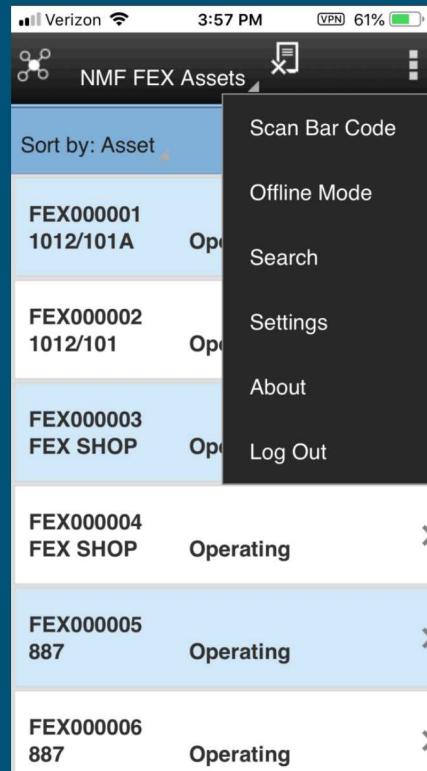
PULLED-6YEAR

Asset Data Manager – Move Assets and Change Status

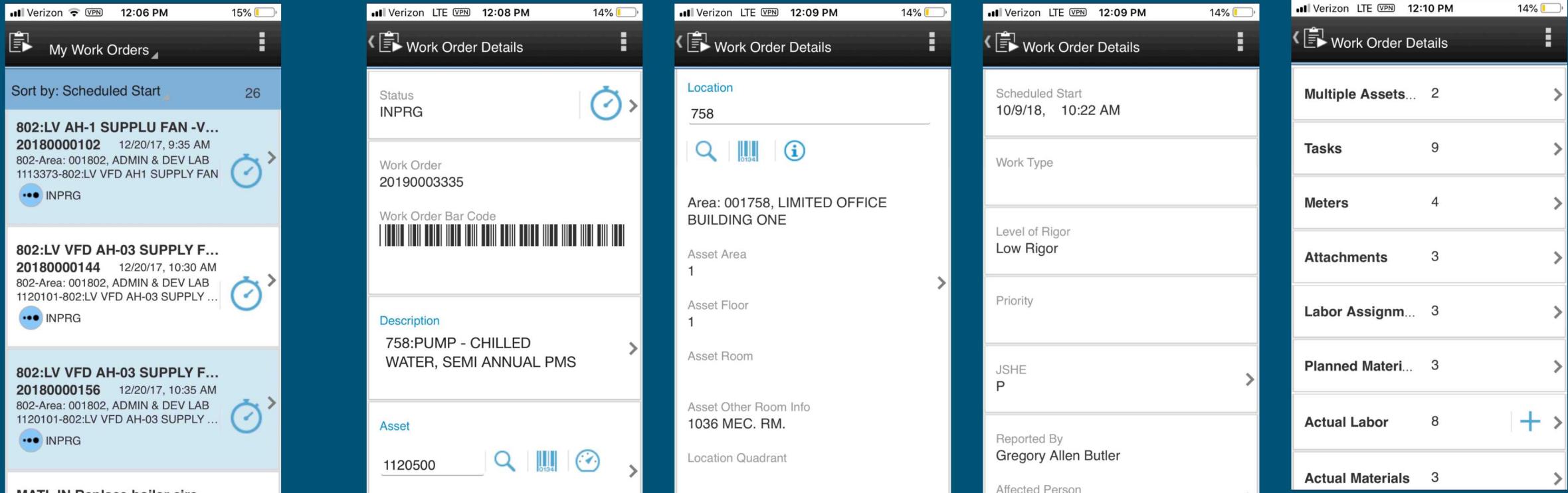


Asset Data Manager – Search



Work Execution for Work Order Data Tracking

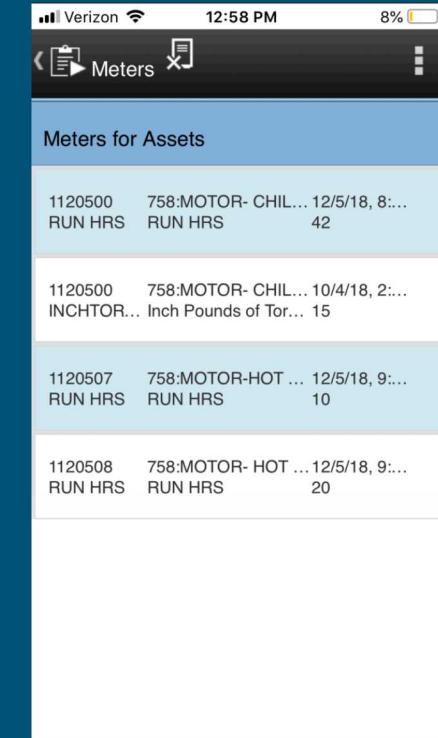
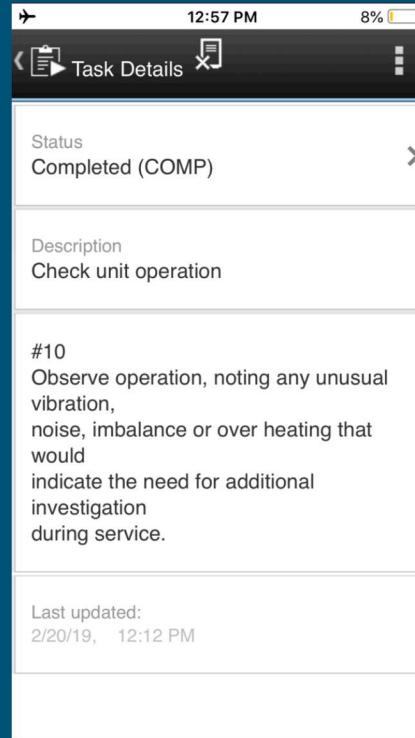
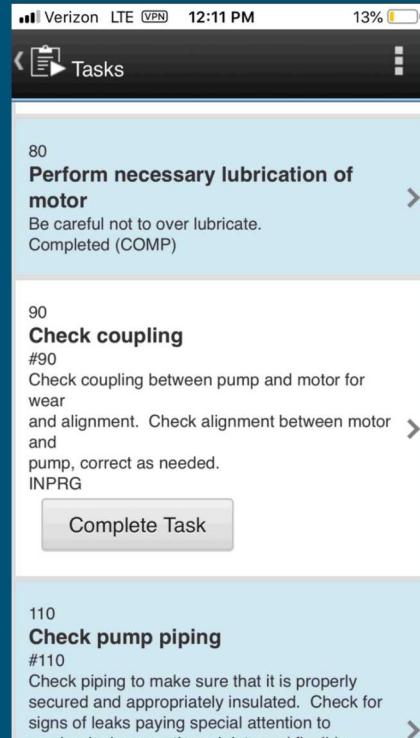
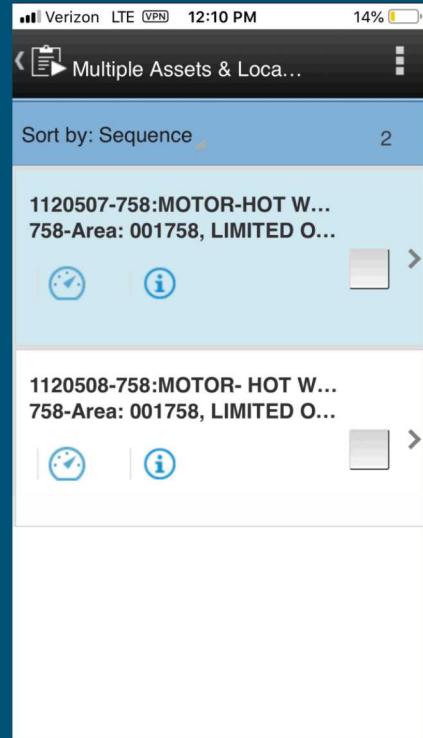
- Rolling out to 120+ craftspeople
- 5-30 work orders assigned at one time
- Mostly transactional data recorded (work logs, labor transactions, meter readings)



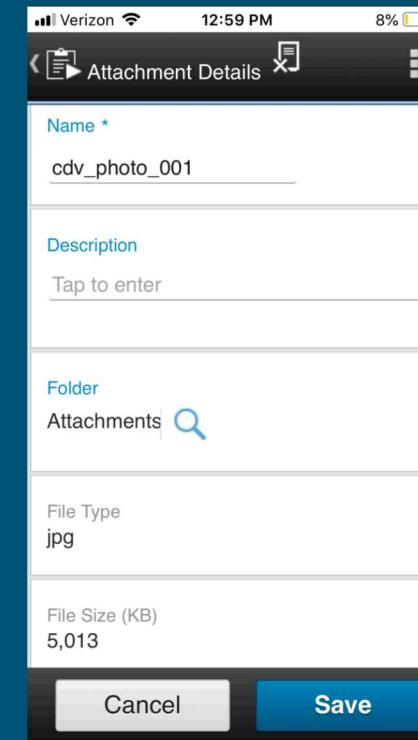
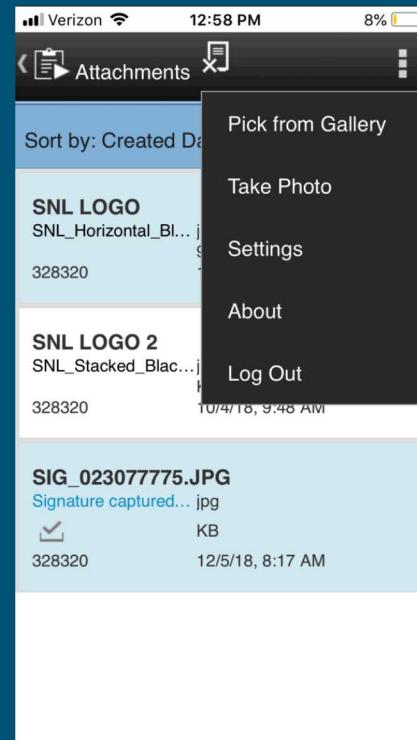
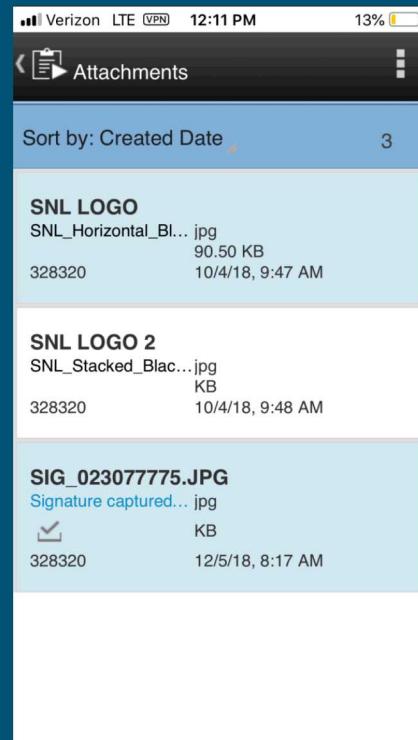
The image displays five screenshots of a mobile application interface for work order management, showing the flow from a list of work orders to detailed work order details.

- My Work Orders:** Shows a list of work orders. The first item is 802:LV AH-1 SUPPLU FAN - V... (20180000102), scheduled for 12/20/17 at 9:35 AM, located in 802-Area: 001802, ADMIN & DEV LAB. The second item is 802:LV VFD AH-03 SUPPLY F... (20180000144), scheduled for 12/20/17 at 10:30 AM, located in 802-Area: 001802, ADMIN & DEV LAB. The third item is 802:LV VFD AH-03 SUPPLY F... (20180000156), scheduled for 12/20/17 at 10:35 AM, located in 802-Area: 001802, ADMIN & DEV LAB.
- Work Order Details (1):** Shows the work order 20190003335. Status: INPRG. Work Order Bar Code: 1120500. Description: 758:PUMP - CHILLED WATER, SEMI ANNUAL PMS. Asset: 1120500.
- Work Order Details (2):** Shows the location 758. Asset Area: 1. Asset Floor: 1. Asset Room: 1036 MEC. RM. Asset Other Room Info: 1036 MEC. RM. Location Quadrant: JSHE P.
- Work Order Details (3):** Shows the work order details. Scheduled Start: 10/9/18, 10:22 AM. Work Type: (empty). Level of Rigor: Low Rigor. Priority: (empty). JSHE P.
- Work Order Details (4):** Shows a summary of work order details. Multiple Assets: 2. Tasks: 9. Meters: 4. Attachments: 3. Labor Assignments: 3. Planned Materials: 3. Actual Labor: 8. Actual Materials: 3.

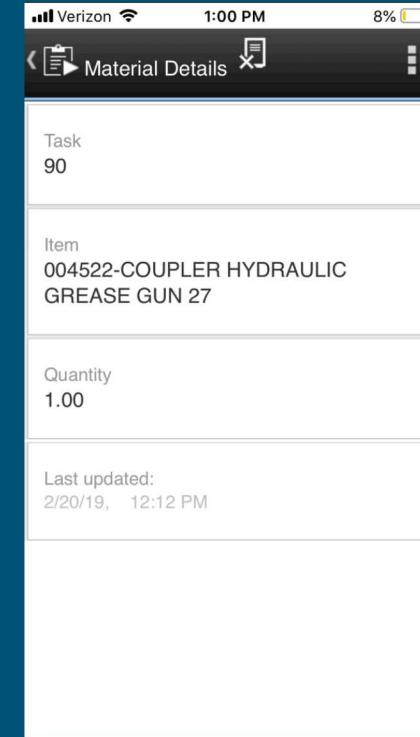
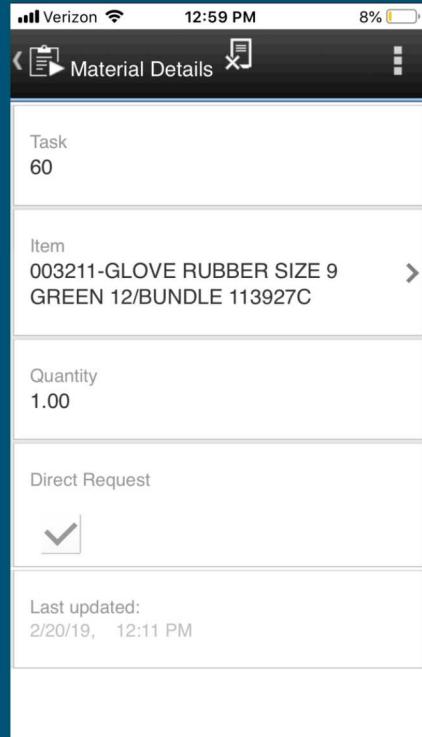
Work Execution – Multi Assets, Tasks, and Meters



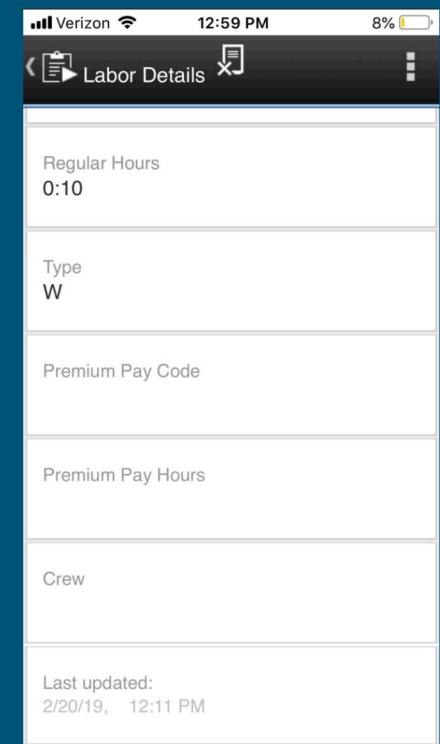
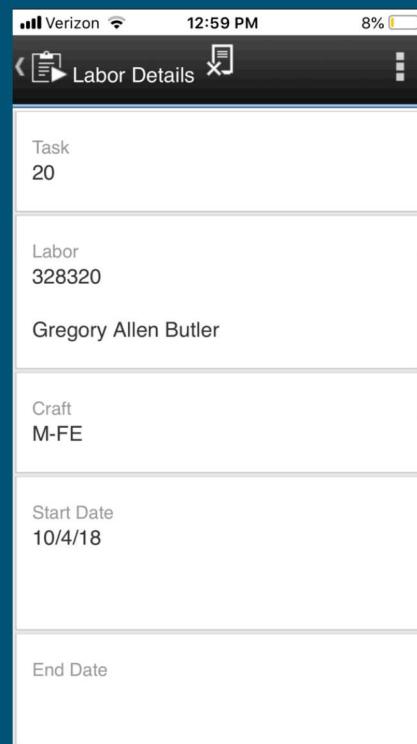
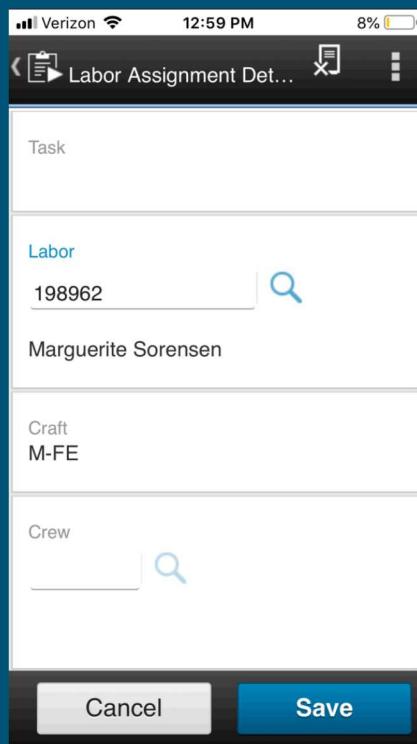
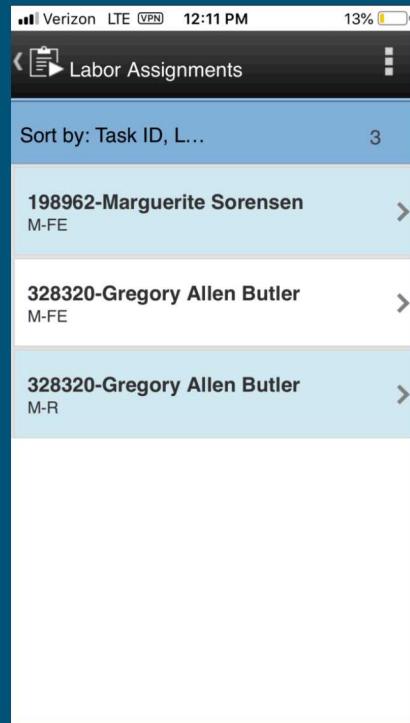
Work Execution – Attachments



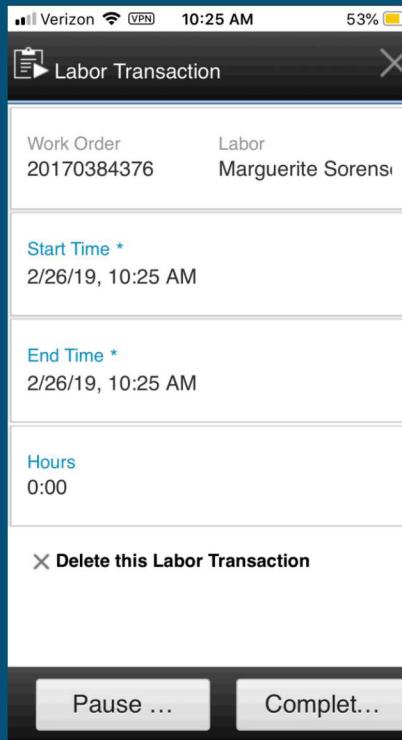
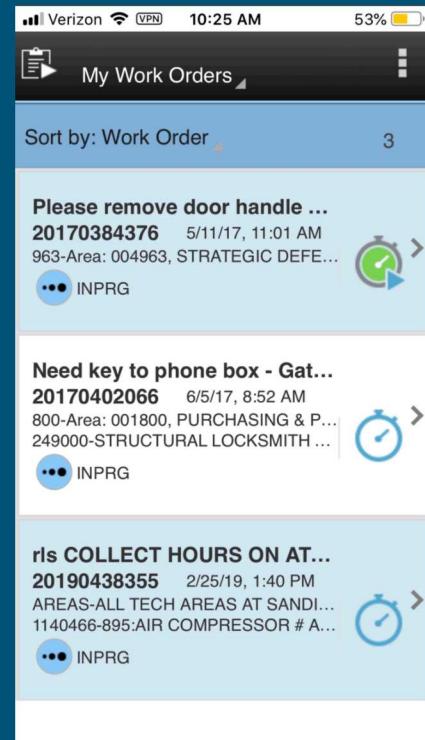
Work Execution – Planned and Actual Materials



Work Execution – Labor Assignments and Transactions



Work Execution – Timer



Work Execution – Add Labor Transaction

Verizon LTE VPN 12:12 PM 13% 

Labor Details

Task
Tap to enter 

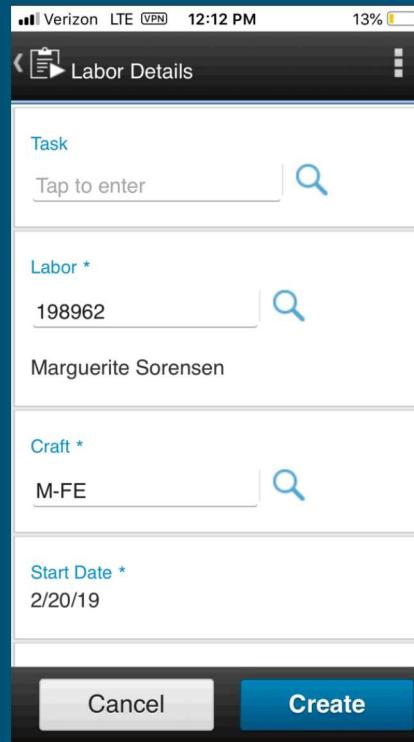
Labor *
198962 

Marguerite Sorensen

Craft *
M-FE 

Start Date *
2/20/19

Create **Cancel**



Verizon LTE VPN 12:12 PM 13% 

Labor Details

Start Date *
2/20/19

Change Date

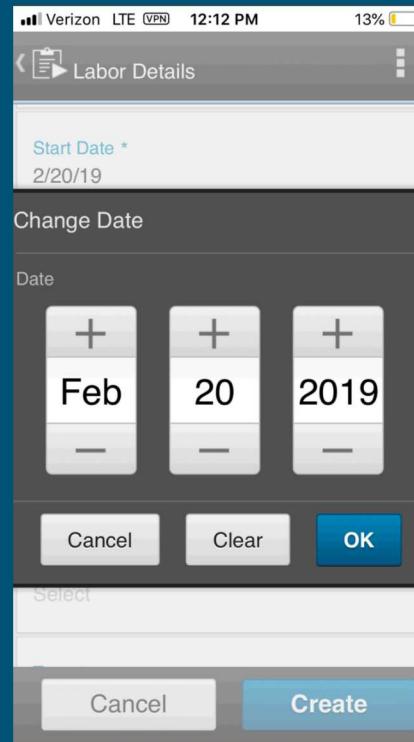
Date

Feb 20 2019

Cancel **Clear** **OK**

Select

Create **Cancel**



Verizon LTE VPN 12:12 PM 13% 

Labor Details

Start Date *
2/20/19

Change Duration

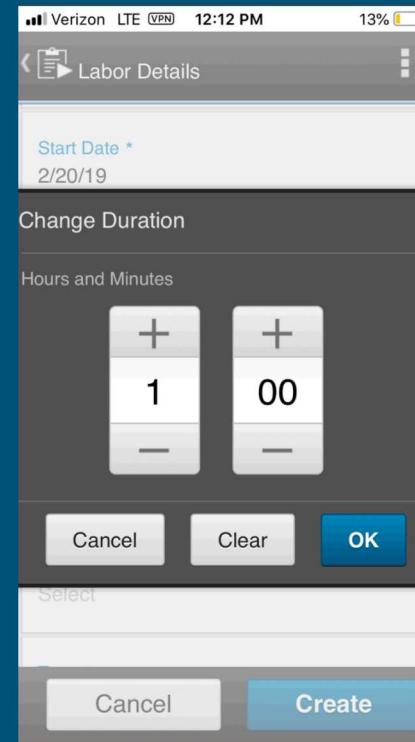
Hours and Minutes

1 00

Cancel **Clear** **OK**

Select

Create **Cancel**



Verizon LTE VPN 12:12 PM 13% 

Labor Details

1:00

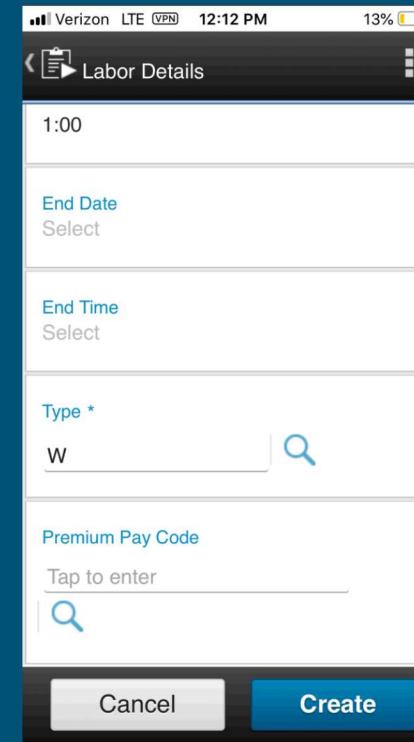
End Date
Select

End Time
Select

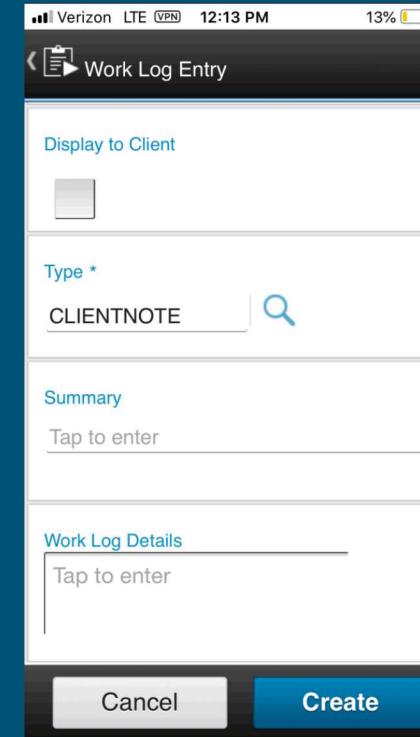
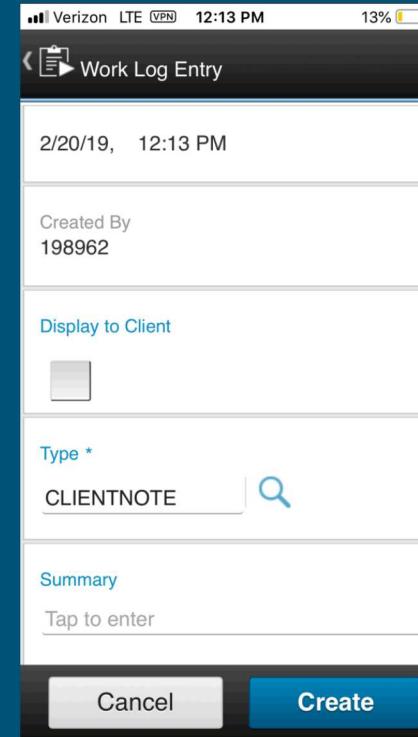
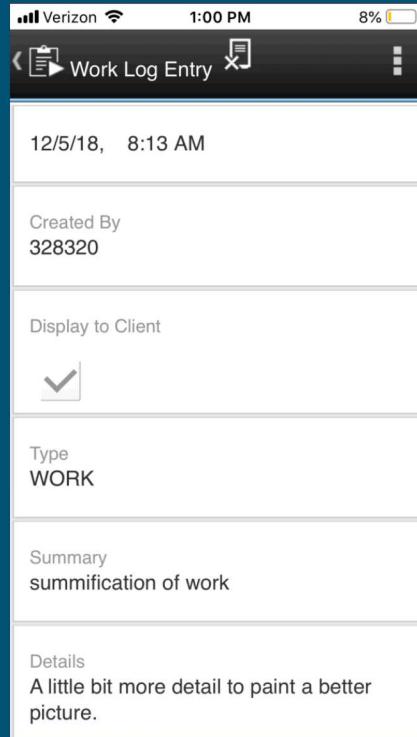
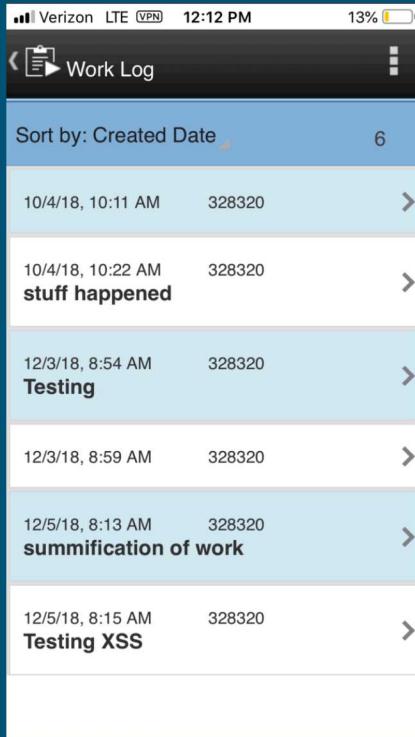
Type *
W 

Premium Pay Code
Tap to enter 

Create **Cancel**



Work Execution – Work Log





Lessons Learned

Watch out for these problem areas when implementing mobile

No Pain, No Gain

- Understand implementing mobile WILL be a painful process
- Many moving parts and pieces makes it difficult to get right the first time
- Users have difficulty changing everyday processes and will resist
- Include embedded mobile support

Strong Leadership is Required

- Leadership outside the IT organization must be committed to going mobile
- Strong leadership:
 - Provides a vision for why they are adopting mobile
 - Learns the software first to help the adoption process along
 - Ensures users are trying to use the software
 - Understands that productivity may decrease temporarily while users learn
 - Understands the need for one-on-one support with the craft

Recognize Infrastructure Challenges

- Each infrastructure is unique and may not be adequate which requires different solutions
- Examples:
 - Our Wi-Fi is not an extension of our main network and the user must use VPN to create a connection to the server
 - Some areas do not allow devices and users must follow a non-mobile process
 - We had to reconfigure our Wi-Fi Access Points in the warehouse after they were installed because we had giant metal storage units blocking the signal that were not in any floor plans
 - We have remote areas that do not receive any network signal so the software we have must operate in a disconnected mode by storing required data and syncing changes later

Start Simple

➤ Evaluate Connectivity

- Run tests to identify problems early on and determine reliability
- Set expectations early on of what can and cannot be accomplished with current infrastructure

➤ Implement the simplest version of your software to:

- Allow IT to focus on troubleshooting infrastructure, software environment, and user needs
- Allow IT and leadership to set up processes regarding mobile solutions

➤ Select 2-3 users as your “Champions” to adopt the software early to:

- Provide IT feedback without hindering many people if something is broken
- Prevents bad reputation of product
- Allows time to evaluate infrastructure and server needs
- Allows Champions to eventually support others in their group

➤ Plan to roll out the software to remaining users slowly

- Supporting a few users at a time won’t be overwhelming
- Requests generated for each group of users won’t be overwhelming
- Allows you to monitor the infrastructure as you go

Provide Adequate Post-Production Support

- Understand that users will have different levels of confidence with technology
 - Some users may already know how to use a mobile device, others may have never used one before
 - Training must be done for basic device use before training for specific applications
 - Recruit “early adopters” to help train others
- Provide adequate one-on-one support to other users
 - After changes are made to the mobile software, we set up a time and place that users can stop by if they need help with updating the software or need help understanding the changes that were made
 - Be willing to walk with the users to see how they actually interact with the device
 - For example, there was a group of users who used their device to sign tags on and would accidentally hit a button that would cause an issue for them. Without walking with them, we would not have known that they were accidentally tapping the button.
 - Hire someone to help support users full-time if needed
- Ensure there is a backup paper process in case something goes wrong with the network