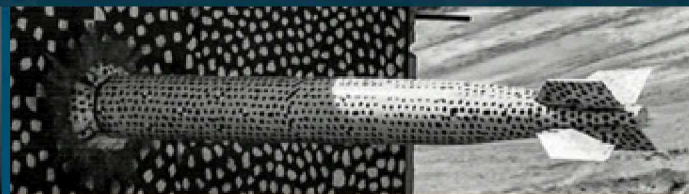


Maximo Anywhere at Sandia



PRESENTED BY

Maggie Sorensen and Jimmy Raymond

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_deployment/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

The first screenshot shows the 'Issues and Returns' screen with fields for Site (SNMFAC), Storeroom, Issue To, and Work Order, each with a 'Tap to enter' prompt and a search icon. Below are three buttons: 'Issue Reserved Items', 'Issue Additional Items', and 'Return Items'.

The second screenshot shows the 'Issue Reserved Items' screen with a 'Sort by: Bin' dropdown set to 6. It lists three items with their IDs, descriptions, and quantities:

Item ID	Description	Quantity
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	

At the bottom are 'Cancel' and 'Complete' buttons.

The third screenshot shows the 'Item Details' screen for Item 006497, Dispenser SWD Write-on Tape, Bin PC-CC-8, Unit of Measure EA, and Quantity Available 0.00. It includes an 'Issue Quantity' field with a 'Tap to enter' prompt and 'Cancel' and 'Complete' buttons at the bottom.

➤ Physical Count – Perform inventory and record physical count

The first screenshot shows the 'Physical Count' screen with a 'Sort by: Bin' dropdown. It lists several items with their IDs, descriptions, and quantities:

Item ID	Description	Quantity
029678 954_NMF	LAMP LINEAR FLU... 029678 EA	
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	

The second screenshot shows the 'Physical Count' screen for Item 029678, LAMP LINEAR FLUORESCENT 55 ... 954_NMF 029678 EA. It has a 'Physical Count' field with the value 45 and a 'Done' button at the bottom.

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



Verizon 3:44 PM VPN 55%

NMF FEX Assets

Sort by: Asset

FEX000001	1012/101A	Operating	>
FEX000002	1012/101	Operating	>
FEX000003	FEX SHOP	Operating	>
FEX000004	FEX SHOP	Operating	>
FEX000005	887	Operating	>
FEX000006	887	Operating	>



Verizon 3:10 PM VPN 100%

Asset Details

Asset
FEX000002

I certify that I have performed the required inspection, testing and maintenance tasks per NFPA 10.

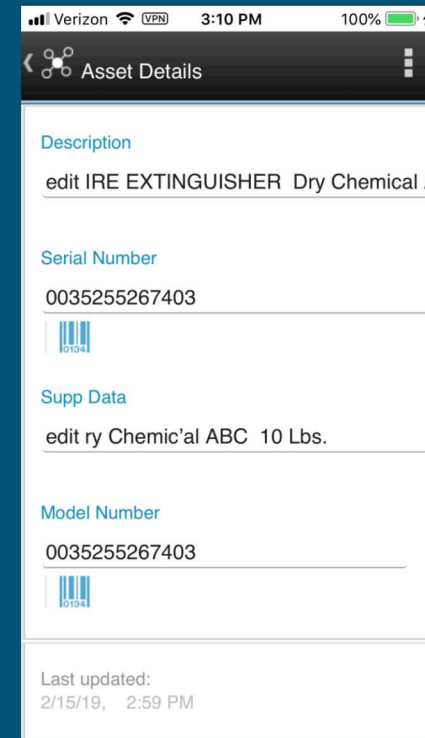
Meters 1

NMFFEXINSPC	2/12/19, 11:26 AM FAILED-PULLED	>
-------------	------------------------------------	---

Status
Operating >

Location
1012/101

NMF, Bldg 1012, Flr 1, Rm 101, Break Room



Verizon 3:10 PM VPN 100%

Asset Details

Description
edit IRE EXTINGUISHER Dry Chemical A

Serial Number
0035255267403

Supp Data
edit ry Chemic'al ABC 10 Lbs.

Model Number
0035255267403

Last updated:
2/15/19, 2:59 PM

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

Cancel Clear Va...

Asset Data Manager – Move Assets and Change Status

Verizon 12:11 PM 11%

Asset Details

Asset FEX000002

I certify that I have performed inspection, testing and maintenance per NFPA 10.

Meters

2/6/19, 12:50 PM 10

NMFFEXINSPC 2/6/19, 12:39 PM PULLED-12YEAR

Status Not Ready

Location 887

Move

Report Downtime

Settings

About

Log Out

Verizon 12:11 PM 11%

Move - FEX000002

Site SNMFAC

Location 887

To Location

Select from list

Cancel Save

Verizon 3:47 PM VPN 55%

Change Status

Asset FEX000001

Status Operating

New Status *

Select from list

Roll New Status to All Child Assets?

Remove Asset Reference from Active Routes?

Cancel Save

Verizon 3:47 PM VPN 55%

Change Status

Roll New Status to All Child Assets?

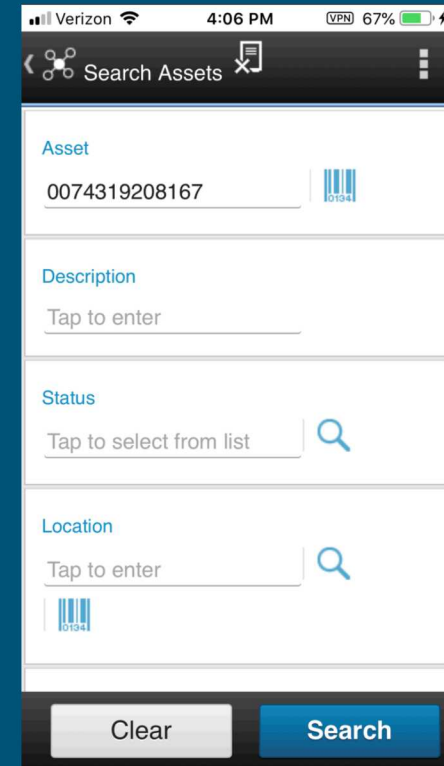
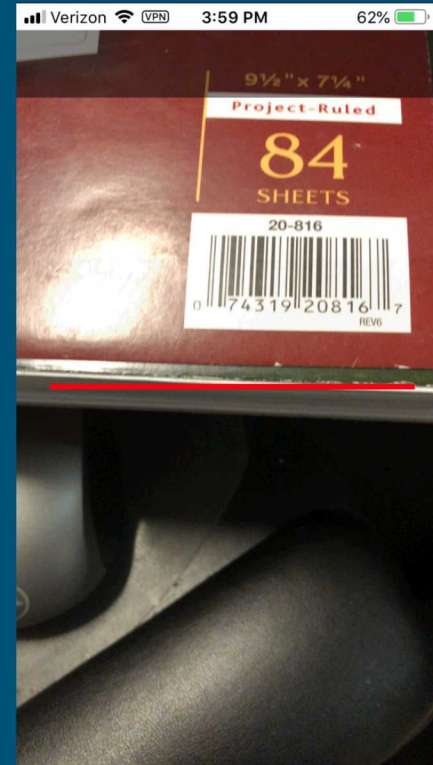
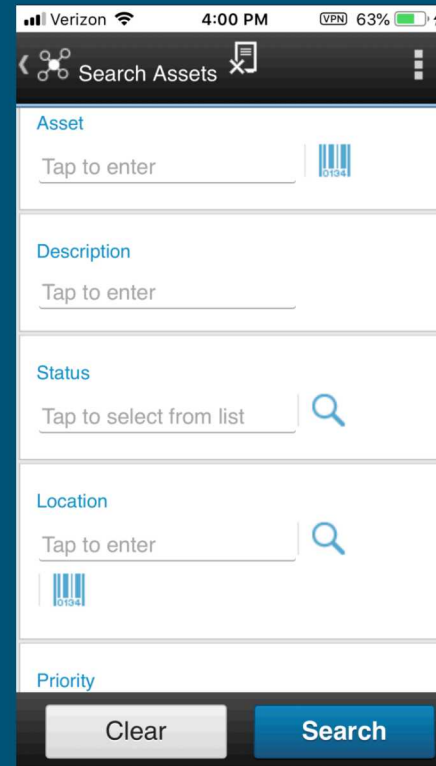
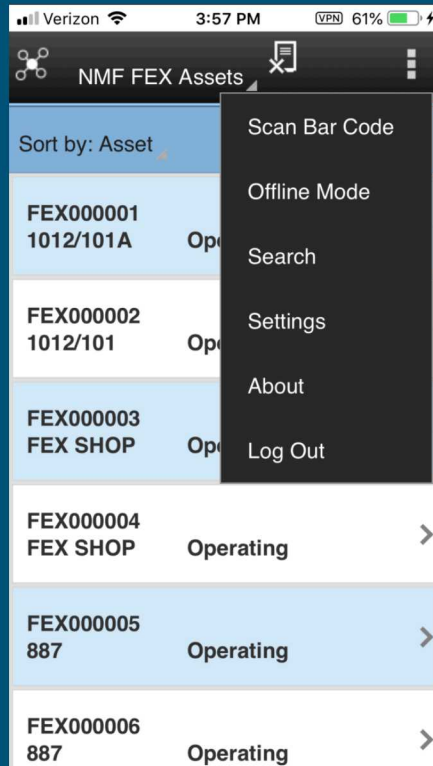
Remove Asset Reference from Active Routes?

Remove Asset Reference from Active Safety Plans?

Change the Status of All Associated PMs to Inactive?

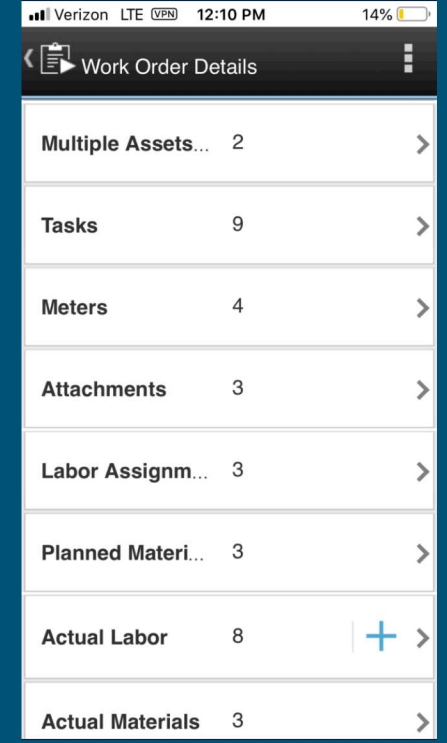
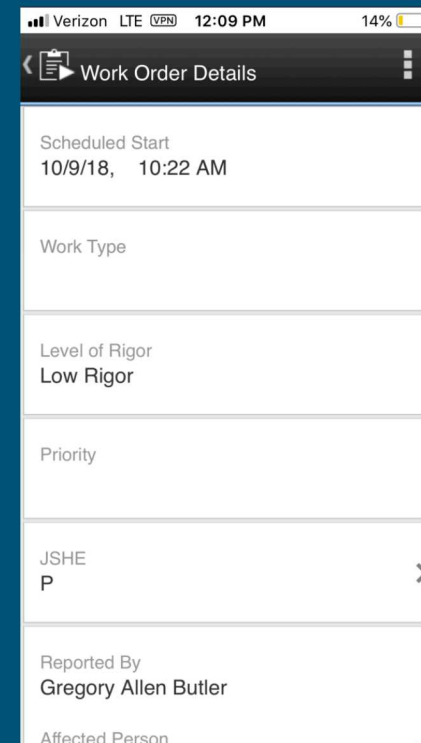
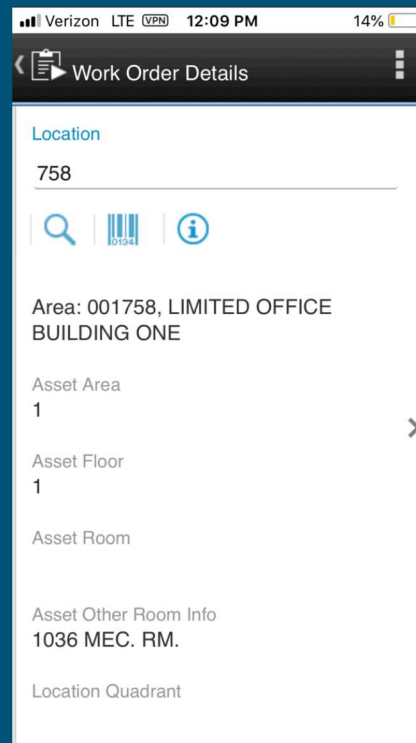
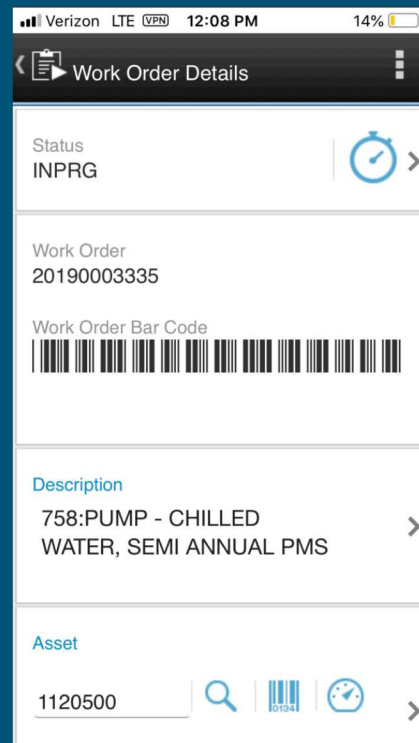
Cancel Save

Asset Data Manager – Search

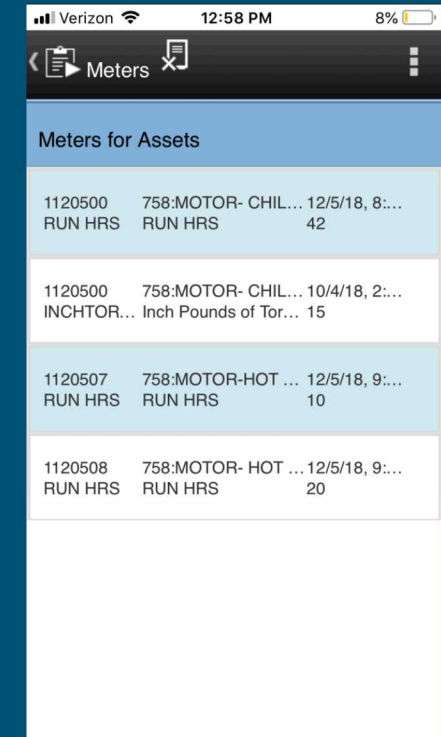
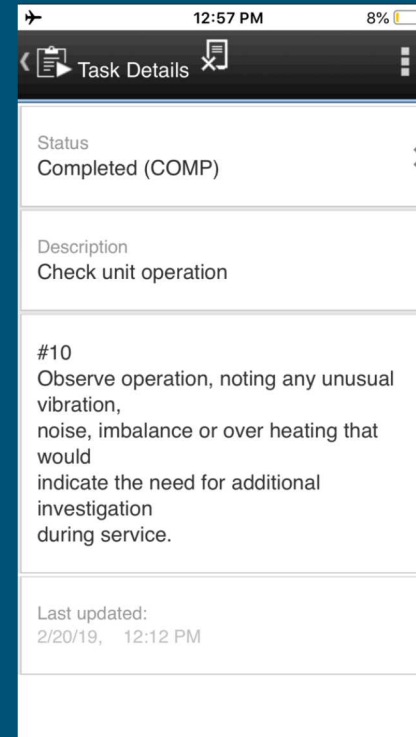
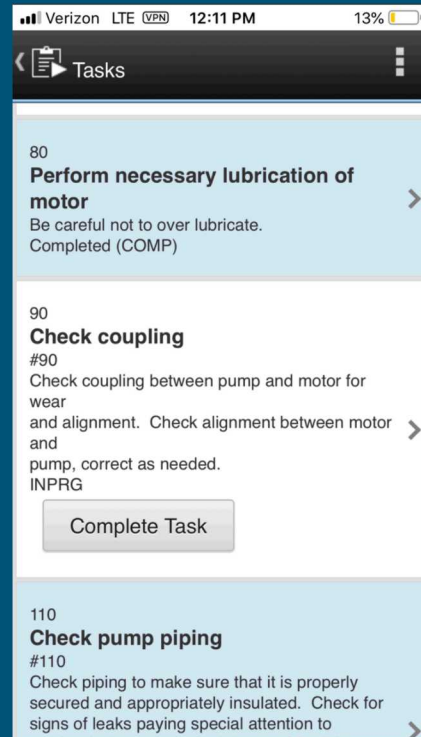
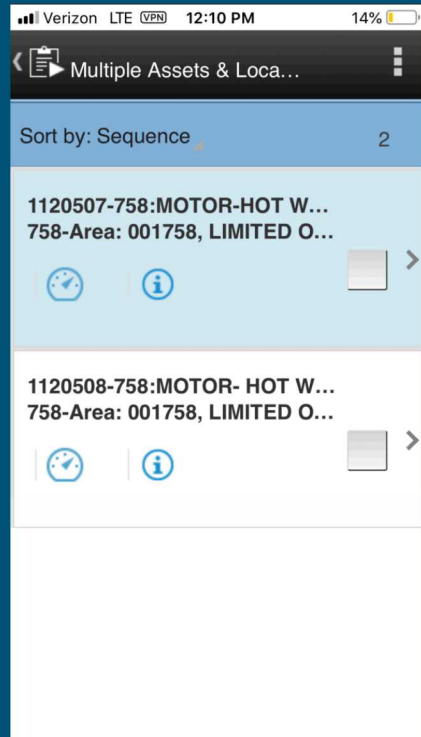


Work Execution for Work Order Data Tracking

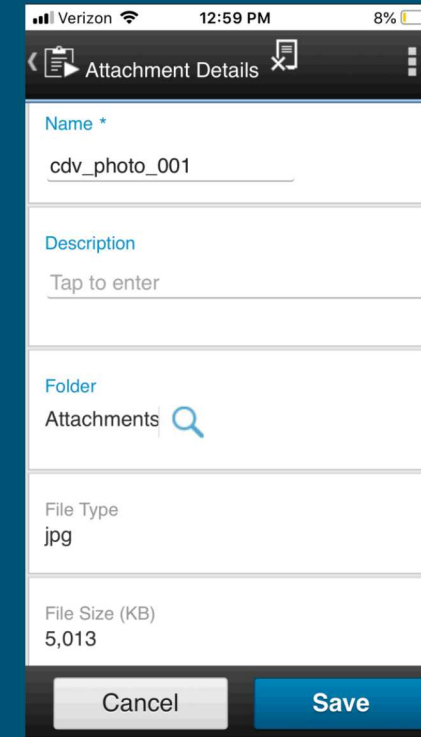
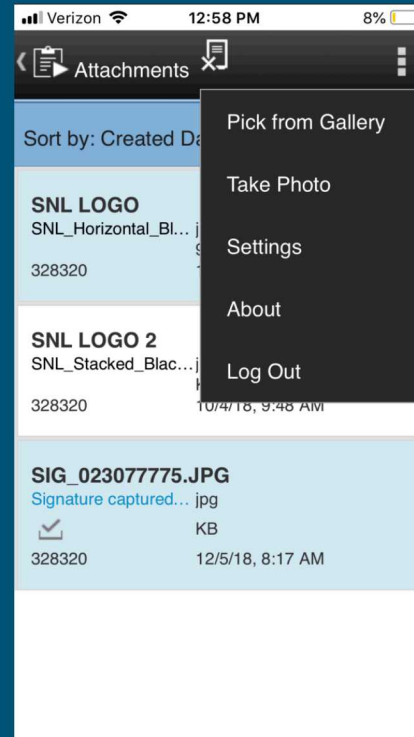
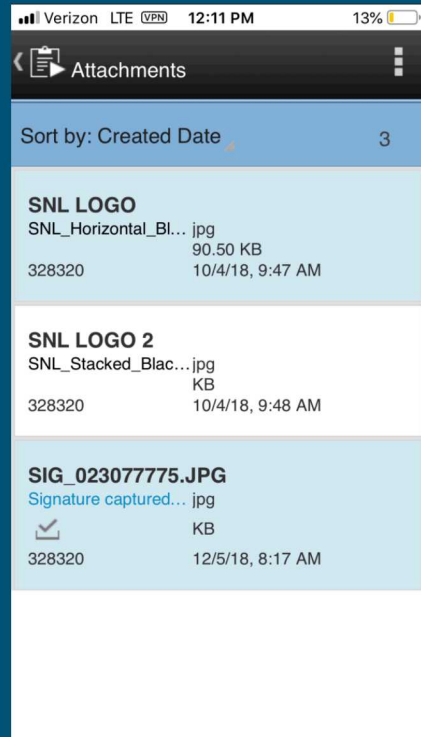
- Rolling out to 120+ craftspeople
- 5-30 work orders assigned at one time
- Mostly transactional data recorded (work logs, labor transactions, meter readings)



Work Execution – Multi Assets, Tasks, and Meters



Work Execution – Attachments



Work Execution – Planned and Actual Materials

Verizon LTE (VPR) 12:11 PM 13%

Planned Materials

Sort by: Task ID, Item 3

60	003211-GLOVE RUBBER SIZ...	1.00	>
80	005359-GREASE LITHIUM 10...	4.00	>
90	068293-COUPLER GREASE ...	6.00	>

Verizon 12:59 PM 8%

Material Details

Task	60
Item	003211-GLOVE RUBBER SIZE 9 GREEN 12/BUNDLE 113927C >
Quantity	1.00
Direct Request	<input checked="" type="checkbox"/>
Last updated:	2/20/19, 12:11 PM

Verizon LTE (VPR) 12:12 PM 13%

Actual Materials

Sort by: Task ID, Item 3

60	048701-GLOVES PROFLEX ...	8.00	>
80	005359-GREASE LITHIUM 10...	1.00	>
90	004522-COUPLER HYDRAUL...	1.00	>

Verizon 1:00 PM 8%

Material Details

Task	90
Item	004522-COUPLER HYDRAULIC GREASE GUN 27
Quantity	1.00
Last updated:	2/20/19, 12:12 PM

Work Execution – Labor Assignments and Transactions

Verizon LTE VPN 12:11 PM 13%

Labor Assignments

Sort by: Task ID, L... 3

198962-Marguerite Sorensen M-FE	>
328320-Gregory Allen Butler M-FE	>
328320-Gregory Allen Butler M-R	>

Verizon 12:59 PM 8%

Labor Assignment Det...

Task

Labor

198962

Marguerite Sorensen

Craft

M-FE

Crew

Cancel Save

Verizon LTE VPN 12:12 PM 13%

Actual Labor

Sort by: Task ID, L... 8

20	328320	Gregory Allen Butler M-FE	10/4/18	>
20	328320	Gregory Allen Butler M-FE	10/4/18	>
	198962	Marguerite Sorensen M-FE	12/5/18	>
	328320	Gregory Allen Butler M-FE	10/5/18	>
	328320	Gregory Allen Butler M-FE	10/3/18	>
	328320	Gregory Allen Butler M-FE	12/5/18	>

Verizon 12:59 PM 8%

Labor Details

Task

20

Labor

328320

Gregory Allen Butler

Craft

M-FE

Start Date

10/4/18

End Date

Verizon 12:59 PM 8%

Labor Details

Regular Hours

0:10

Type

W

Premium Pay Code

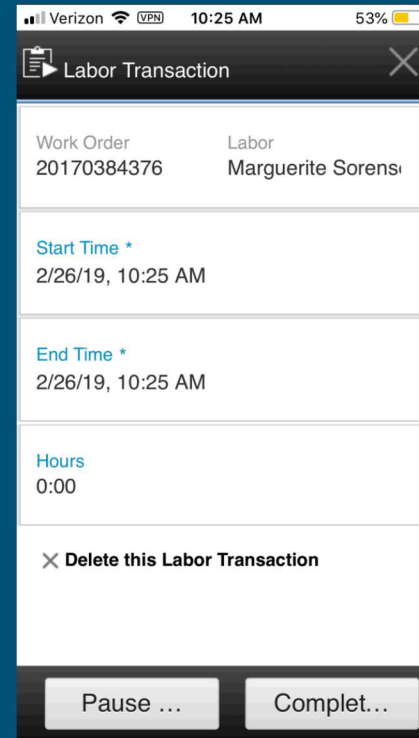
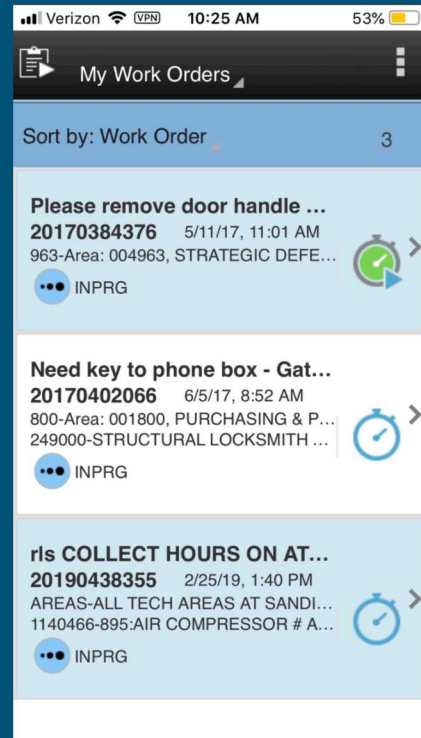
Premium Pay Hours

Crew

Last updated:

2/20/19, 12:11 PM

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

Cancel Create

Verizon LTE VPN 12:12 PM 13%

Labor Details

Start Date *
2/20/19

Change Date

Date

+ + +
Feb 20 2019
- - -

Cancel Clear OK

Select

Cancel Create

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

Cancel Create

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

Cancel Create

Work Execution – Work Log

Verizon LTE VPN 12:12 PM 13%

Work Log

Sort by: Created Date 6

10/4/18, 10:11 AM	328320	>
10/4/18, 10:22 AM	328320	>
stuff happened		
12/3/18, 8:54 AM	328320	>
Testing		
12/3/18, 8:59 AM	328320	>
12/5/18, 8:13 AM	328320	>
summification of work		
12/5/18, 8:15 AM	328320	>
Testing XSS		

Verizon 1:00 PM 8%

Work Log Entry

12/5/18, 8:13 AM

Created By
328320

Display to Client
☒

Type
WORK

Summary
summification of work

Details
A little bit more detail to paint a better picture.

Verizon LTE VPN 12:13 PM 13%

Work Log Entry

2/20/19, 12:13 PM

Created By
198962

Display to Client
☐

Type *
CLIENTNOTE

Summary
Tap to enter

Cancel Create

Verizon LTE VPN 12:13 PM 13%

Work Log Entry

Display to Client
☐

Type *
CLIENTNOTE

Summary
Tap to enter

Work Log Details
Tap to enter

Cancel Create



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