

INCREMENTAL IMPROVEMENT TO MAINTENANCE OPERATIONS

WAI OPERATIONS SUMMIT & WIRE EXPO 2016
Uncasville, CT

Clay Li (clay.li@calemeam.com)
CEO
CalemEAM Inc.

CalemEAM
COMMERCIAL OPEN SOURCE





COMPANY

- Initiated in 2006.
- CalemEAM Version 1.0 Released in 2007.

MISSION

- To Deliver the Best EAM/CMMS Solutions through Business-Friendly Open Source Technologies and Superior Customer Services.

PRODUCT

- Calem Enterprise Subscription.
- The Subscription includes Calem Enterprise Products, Maintenance, and Support.

Asset and
Location

Maintenance
Schedules

Contract and SLA

Work Order

Service Request

Change Management

Inventory and
Warehouse

Requisition and
Purchase Order

Doc, Project,
Integration, etc.

Multi-Sites
Access Control

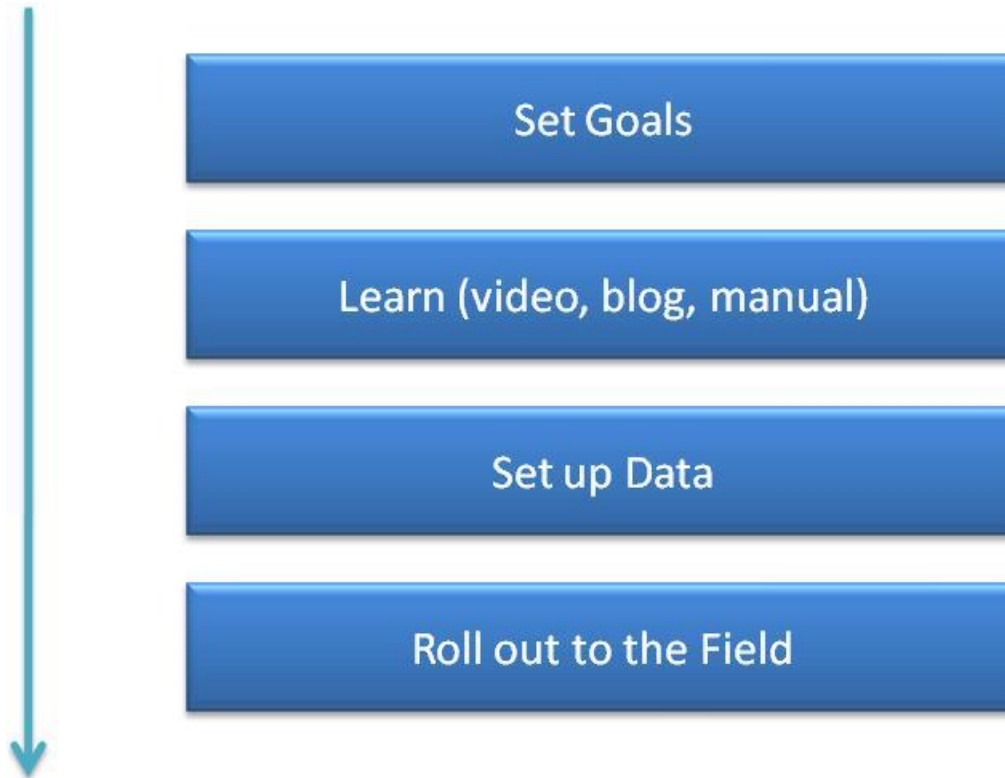
Screen and Data
Customization

Workflow
Scheduled Tasks

Web Client

Mobile Client

Offline Client



- **Vendor Training**
 - Training videos, blogs and manuals
 - Training classes
- **Vendor Support**
 - Support via email, phone, and web meeting

Calem Enterprise Training Videos

- <http://eam.calemeam.com/index.php/training>

Iteration 1: Use Work Orders for Repairs

CalemEAM



Iteration 1: Learn

CalemEAM

- Assets and Locations
- Work Orders

1 New

2 Planning

3 Execution

4 Review

5 Close

History

DataView

Customize

Work Order (5 of 725)

Start Clock

More

Customize

Wo #:

5500

PM #:

[InspectionPM](#)

Asset #:

[200-001](#)

Asset note:

Production system Mercury s2 - wm003

Location:

[HQ.BLD001](#)

Site:

[MySite](#)

Priority:

P1

Service site:

[MySite](#)

Status:

In-process

Flag:

Subject:

Completion

Actual start:

Fri, 2/12/16 4:51 PM

Actual finish:

Repaired?:

☐

Repaired in Workshop?:

☐

Ready for use?:

☐

Area cleanliness:

Iteration 1: Upload Data

CalemEAM

- Upload users in excel template
- Upload locations in excel template
- Upload assets in excel template

User name (username)	Full name (full_name)	Site (site_id__site)	Is EAM crew? (is_eam_crew)	Job role (job_role_id__job_role)	Job title (job_title)
john.freeman	John Freeman	MySite	1	Admin	IT Manager

Site (site_id__site)	Location (location)	Note (note)	Loc group (type_id__type)	Owner user (owner_user_id__full_name)	Dept (dept_id__dept)	Description (d
MySite	10 - ServerRoom	Server room 10	IT			

Asset Group (in_id__in_no)	Model No (model_no)	Note (note)	SERIAL NO (serial_no)	Asset no (asset_no)	Location (location_id__loc	Manufacturer (manufacturer_
CRC-UNIT	GG199A-C10	GG199A-C10	400848-011	CRU-6	10-PROD	ACME

Iteration 1: Roll Out to the Field

CalemEAM

- Write work orders prior to repairs
- Write work orders for completed repairs

The screenshot displays the CalemEAM software interface. At the top, a header bar shows the CalemEAM logo, the text 'Welcome, Administrator. Sat, 6/4/16 12:50 PM Central', and 'Calem Enterprise 10c'. Below the header, a navigation bar includes 'Work Order', 'Open WO', 'Create WO' (highlighted with a red box), 'Create WO' (with a dropdown arrow), 'My Assignment' (with a dropdown arrow), 'Open' (with a dropdown arrow), and 'Report' (with a dropdown arrow). A dropdown menu for 'Create WO' is open, showing options: 'Create from PM Plan', 'Create from PM', 'Create request', and 'Create completed WO' (highlighted with a red box). Below the navigation bar, there is a search bar and a button labeled 'My assignment (22)'. A toolbar contains various icons for actions like add, delete, print, and search. Below the toolbar is a table with the following columns: #, Wo #, Flag, Asset #, Location, Status, Priority, PM?, and Subject. The table contains three rows of data.

#	Wo #	Flag	Asset #	Location	Status	Priority	PM?	Subject
1	8722		200-001	B02.HQ	In-process	P1	<input checked="" type="checkbox"/>	
2	76331		0911-2345	B02.HQ	Approved	P1	<input checked="" type="checkbox"/>	Meter-based PM job for 0911...
3	4461		200-001	B02.HQ	In-process	P3	<input checked="" type="checkbox"/>	test sub

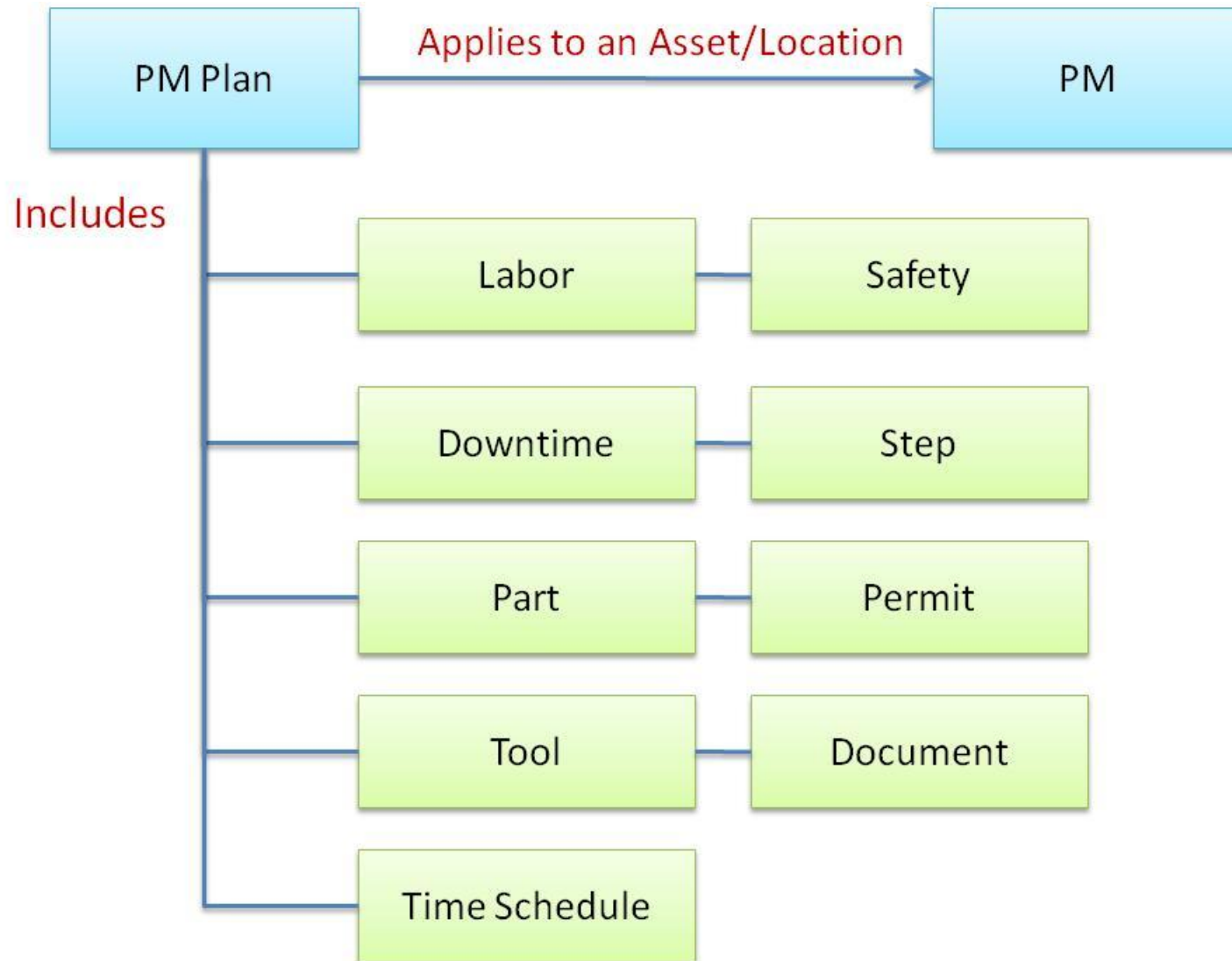
- **Learn and improve based on practice from Iteration 1**
- **Repeat Iteration 1 to add more users, locations and assets**

Iteration 2: Formalize Jobs and Schedules

CalemEAM



Iteration 2: Learn PM Plan and PM



Iteration 2: Set up PM Plans and PMs

CalemEAM

- Set Plan #, Subject
- Set “Schedule type”
- Set “Release type”
- Set “Repeat Schedule”

[PM Plan list List](#) > PM Plan Create

PM Plan

Save Cancel Customize

Value is required: Plan #

Plan #:

Subject:

Status: Active

PM type:

Category: Preventive

WO type:

Duration (hours):

Schedule type: By time

Release type: Fixed

PM pattern:

PM seq:

Review reqd?: ☐

Reference?: ☐

Site access?: ☐

No default steps?: ☐

Sort #:

Repeat schedule:

☐ Weekly ☐ Sun ☐ Mon ☐ Tue ☐ Wed ☐ Thur ☐ Fri ☐ Sat

☐ Every weeks on

☒ Every months on

☒ Day of week

☐ Day of month

☐ Every days

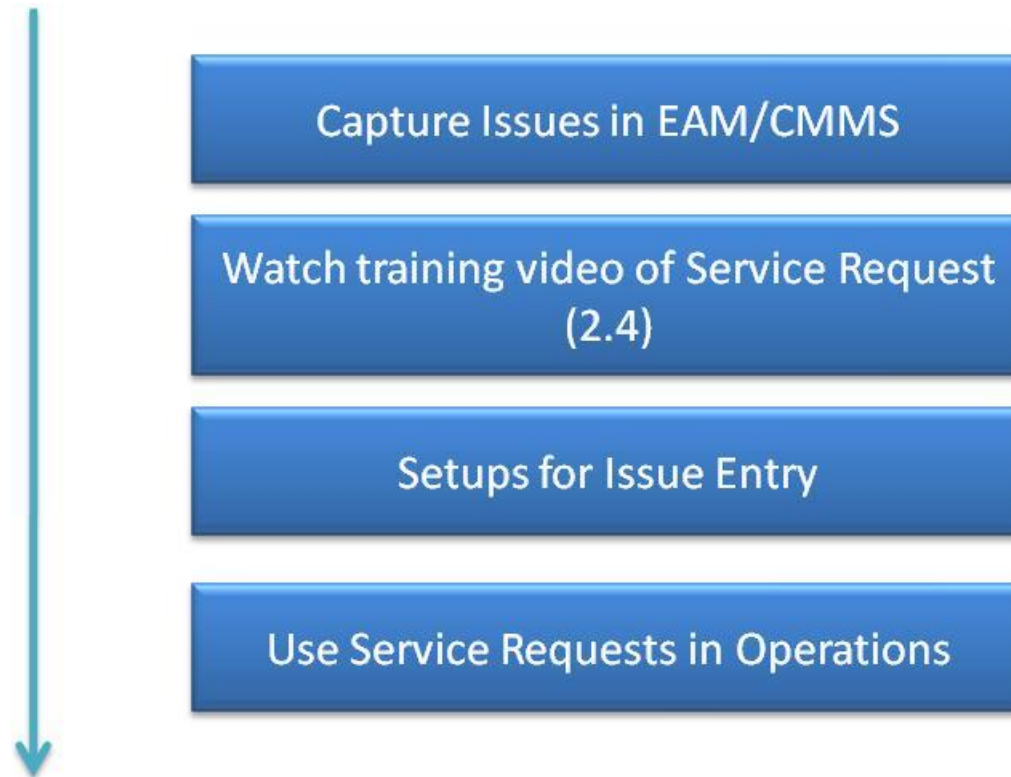
Start from: Until:

- Generate work orders from PMs
- Create work orders from PM Plans or PMs manually

The screenshot displays the CalemEAM software interface. At the top, a header bar shows the CalemEAM logo, the text 'Welcome, Administrator. Sat, 6/4/16 12:50 PM Central', and 'Calem Enterprise 10c'. Below the header, a navigation bar includes 'Work Order' and several icons for 'Open WO', 'Create WO', 'My Assignment', 'Open', and 'Report'. A left sidebar contains a list of menu items: Favorite, Dashboard, Admin, Analysis, Asset, Change Mgmt, Contract, Document, and Failure. The main content area is titled 'My assignment (22)' and features a search bar, a toolbar with icons for adding, deleting, and printing, and a table of work orders. A dropdown menu is open, showing options to 'Create from PM Plan', 'Create from PM', 'Create request', and 'Create completed WO'. The table lists three work orders with columns for #, Wo #, Flag, Asset #, Location, Status, Priority, PM?, and Subject.

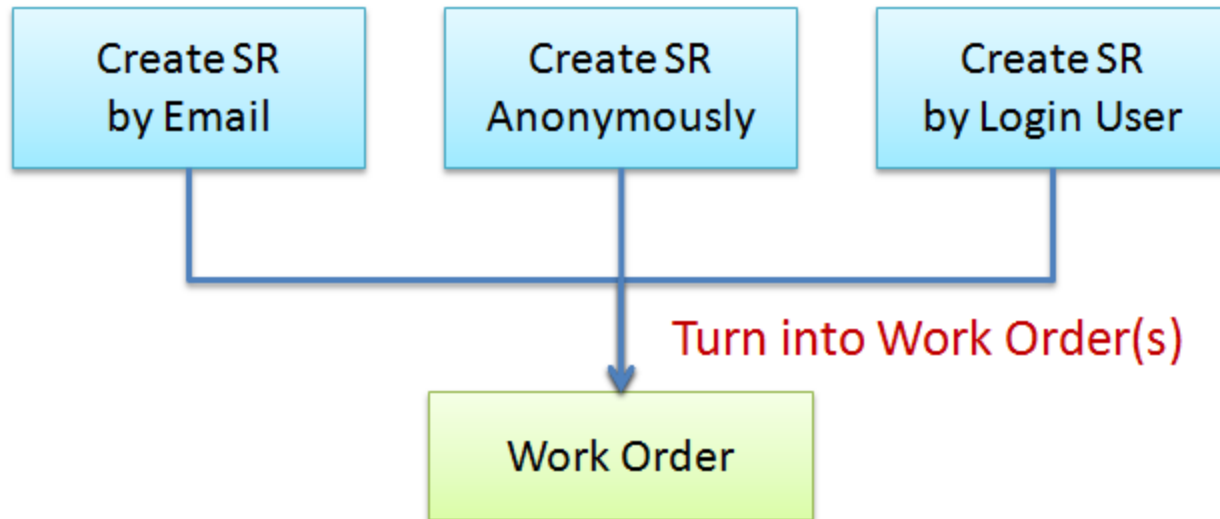
	#	Wo #	Flag	Asset #	Location	Status	Priority	PM?	Subject
<input type="checkbox"/>	1	8722		200-001	B02.HQ	In-process	P1	<input checked="" type="checkbox"/>	
<input type="checkbox"/>	2	76331		0911-2345	B02.HQ	Approved	P1	<input checked="" type="checkbox"/>	Meter-based PM job for 0911...
<input type="checkbox"/>	3	4461		200-001	B02.HQ	In-process	P3	<input checked="" type="checkbox"/>	test sub

- **Learn and improve based on practice from Iteration 2**
- **Repeat Iteration 2 to add more PM Plans and PMs**



Iteration 3: Learn Service Request

CalemEAM



Iteration 3: Service Request Setup

CalemEAM

- Anonymous Submission from Calem
- Embed Anonymous SR submission into your web site



CalemEAM
COMMERCIAL OPEN SOURCE

Calem Enterprise

User name:

Password:

Language:

 [Calem Touch](#)

 [Service Request without Login](#)

Copyright © 2006-2016 CalemEAM Inc. All rights reserved.

Iteration 3: Roll out to the Field

CalemEAM

- Create WO for SR
- WO completion will turn SR to completed

MainWork OrderCommentLogCustomize

Service Request (2 of 228)

Create WO

More

Customize

SR #: 5961SR type:

Flag:State: Open

Asset #:forum_3Location:StyleBeds.HQ

Priority: P5Site:StyleBeds.HQ

Status: NewService site: MySite

Resolution: OpenWO type:

Category: Corrective

Parent SR:

Subject: test

Duplicate SR:

Description:

Origination

Requester: Calem EamTime requested: Sun, 11/29/15 7:51 PM Central

Need by:

Contact:



Sample KPIs to Start

- Unplanned Downtime
- Assets with the most work orders and man hours

Asset and
Location

Maintenance
Schedules

Contract and SLA

Work Order

Service Request


Change Management

Iteration 4: Select and Roll Out






CalemEAM

- Set KPI goals
- Review KPIs regularly
- Identify areas for improvement

[WO Summary Edit](#) > WO Summary by Asset List



WO Summary by Asset (74)

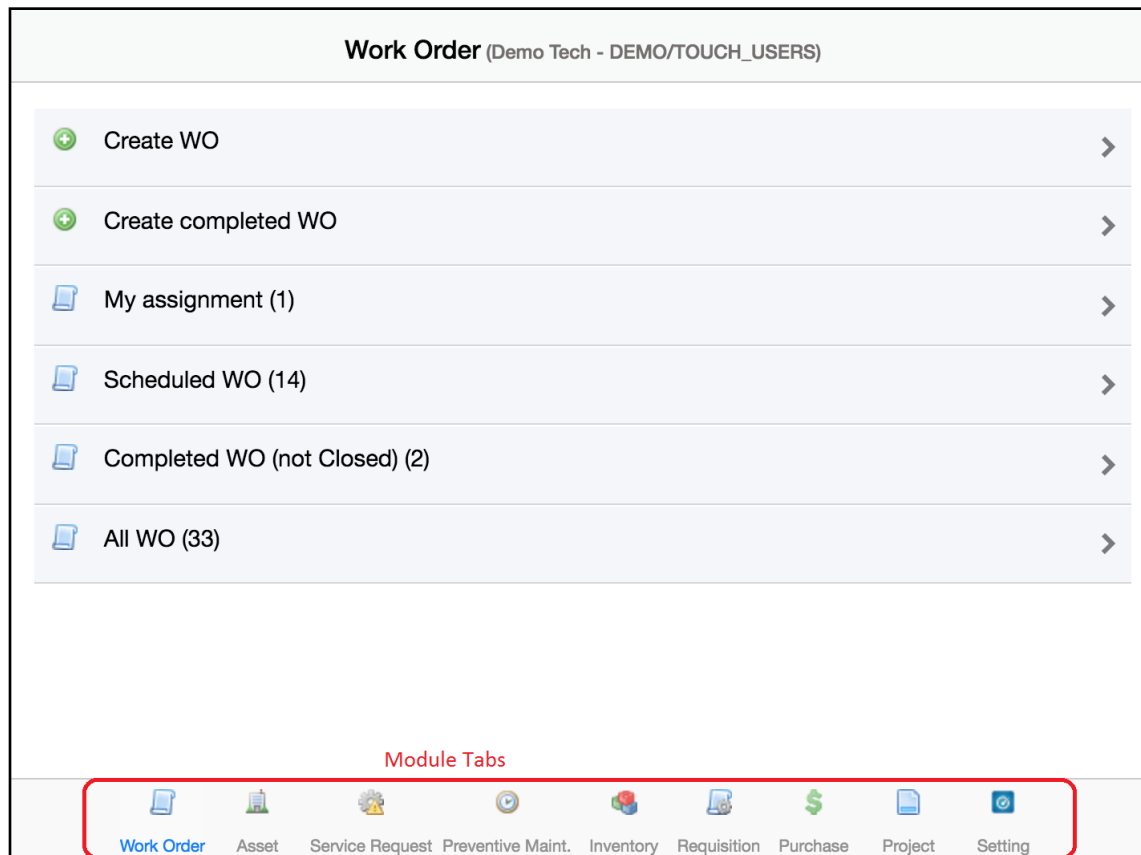
     Customize

Asset #	PM?	Count ▼	Total cost (USD)	Actual Hrs	Planned Hrs	Sched. Hrs	
100HP-008	<input checked="" type="checkbox"/>	278	140.00	2		105.5	
233-455-901	<input checked="" type="checkbox"/>	54					
401402-17	<input checked="" type="checkbox"/>	52					
SHIP-V2-001	<input checked="" type="checkbox"/>	40			28	13.5	

- **Learn and improve based on practice from Iteration 4**
- **Repeat Iteration 4 to add more KPIs to track**



- Learn Calem Touch
- Install and practice Calem Touch Apps

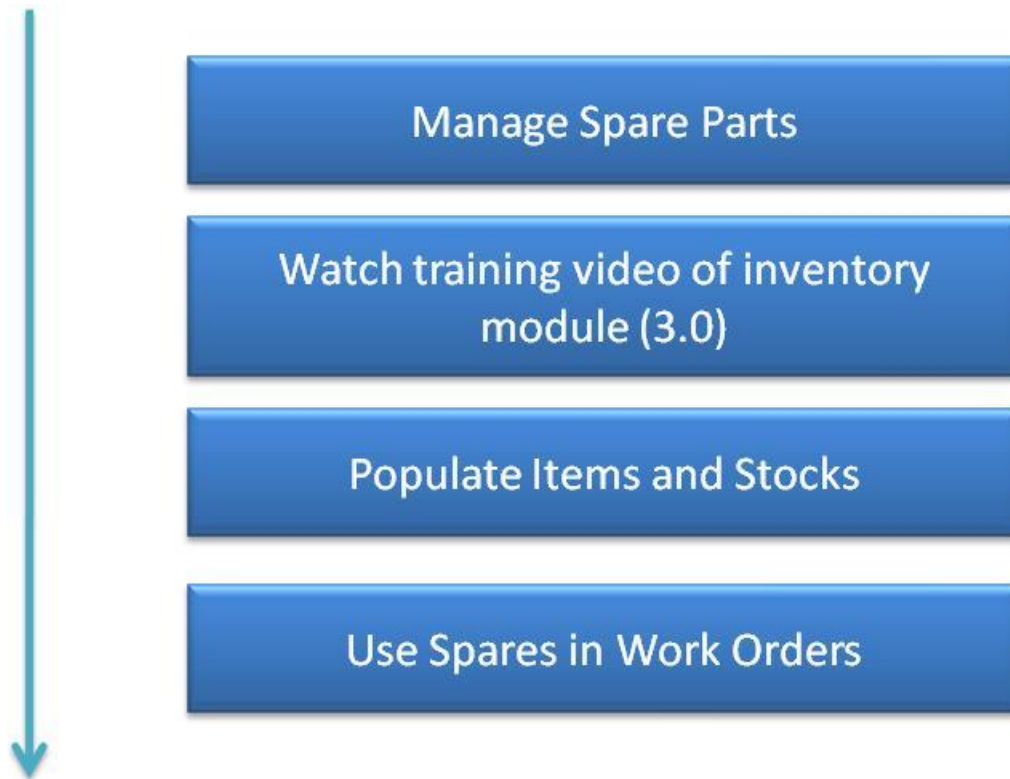


- Identify devices to start
 - iPad/Tablet, or iPhone/Android phones
- Start with selective users



Calem Touch Apps for iOS and Android

- **Learn and improve based on practice from Iteration 5**
- **Repeat Iteration 5 to add more users/devices**



Iteration 6: Learn Inventory Module

CalemEAM

- Global Items
- Site Inventory
- Stores and Locators
- Transactions

Receive

Receive Adjustment

Receive Asset

Checkout

Return

Move

Physical Count

Unit Price

Iteration 6: Upload Data

CalemEAM

- Upload Items in excel template
- Upload Site Items in excel template
- Upload Stores in excel template
- Upload Locators in excel template
- Upload Physical counts in excel template

Item # (in_no)	Note (note)	Uom (uom_id__uom)	Manufacturer (manufacturer_i	Description (description)	Model (model_no)
10.01.22.33	Sona fish finder		FishMagic	Deep sona fish finder	DP0H22343

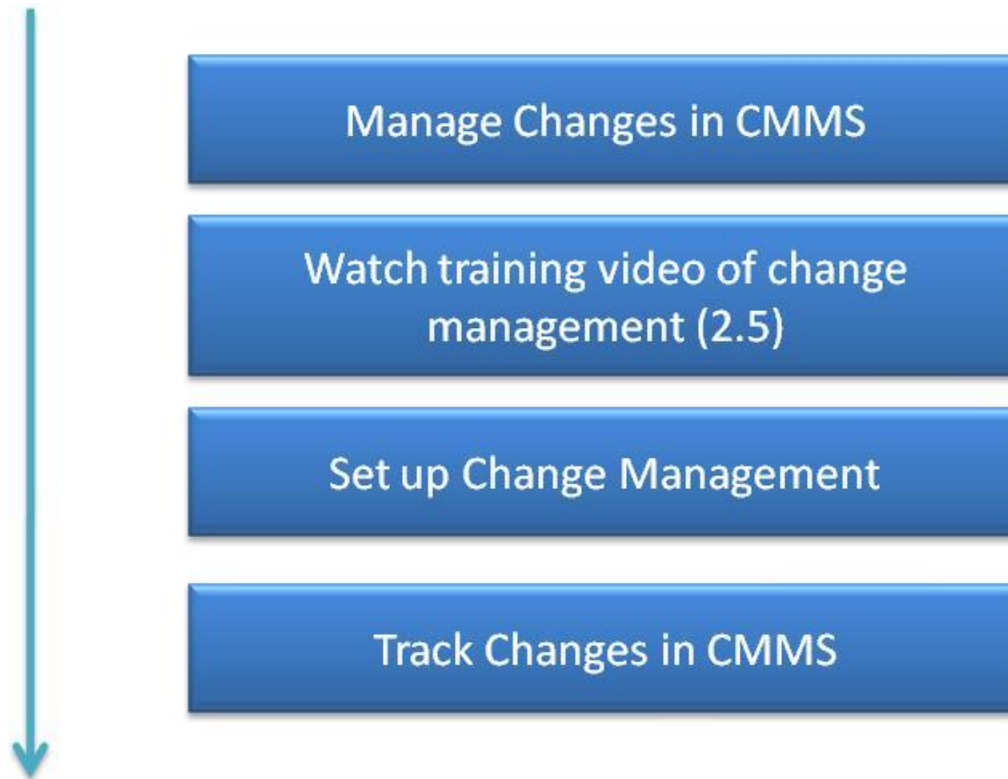
Item (in_id__in_no)	Site (site_id__site)	Order type (order_ty	Order creation (o	Min (min_level)	Max (max_level)	Avg. price () (avg
10.01.22.33	MySite	in_order_minmax	inog_auto	10	20	55.68

Iteration 6: Roll out to the Field

CalemEAM

- Issue spare parts to work orders
- Receive spare parts from shipping

- **Learn and improve based on practice from Iteration 6**
- **Repeat Iteration 6 to add more spares to inventory**



Iteration 7: Learn and Set up Change Management

CalemEAM

Role	Calem Object	Function
Line Manager	Line Manager	Pre-Approve MOC
Change Coordinator	Change Planner	Assign Reviewers Plan MOC
Change Review Board	Reviewers	Review MOC
Change Manager	Change Manager	Approve MOC
Change Monitor	Change Monitor	Get MOC notifications
Change Owner	Users	Execute MOC
Change Requestor	Users	Create MOC

- Roll out to selective changes

✓ 1 Submission

✓ 2 Planning

✓ 3 Approval

▶ 4 Execution

● 5 Review

● 6 Close

● History

● **DataView**

● Customize

MOC Request (2 of 24)

Status Log

Create WO

Customize

More ▼

MOC #: ● 28

Subject: ● My moc

Status: In Process

Service site: ● [MySite](#)

Actual start:

Actual finish:

Step (0)

Customize

Seq	Action step	Assigned to	Need by	Time completed
-----	-------------	-------------	---------	----------------

- **Learn and improve based on practice from Iteration 7**
- **Repeat Iteration 7 to manage more changes in CMMS**



Iteration 8: Learn and Use Weekly Schedule

CalemEAM

- Learn the Scheduling Processes
- Use Weekly Schedule Screen for Work Order Assignment

March 7 - March 13, 2016 **Weekly Schedule - 10/60 (To-Sched/Avail), 10/60 (Planned/Capacity)**

← Previous → Next Set Week WO Planned Work Assign. Customize

Full name	7 Monday	8 Tuesday	9 Wednesday	10 Thursday	11 Friday	12 Saturday	13 Sunday	Team
Administrator	0	0	0 104438- Test for 2	0	0	0	0	MyCA_Team1
Calem Test (no Log...	0	0	0	0	0	0	0	Network.Team
Dan	0	0	0	0	0	0	0	
Jack Greener	0	6	0	0	6	0	0	Network.Team
John Freeman	0	0	0	0	0	0	0	Network.Team
	0 102011- Monthly i	6	6	6	6	0	0	

Work Orders | **Scheduling**

WO Scheduling (5787)

Goto WO Status log Customize More ▾

<input type="checkbox"/>	#	Wo #	Flag	Scheduling	Asset #	Location	Status	Priority	Subject	Sched start	Need by	Assigned to	Site
<input type="checkbox"/>	1	69572		None	0911-2345	B02.HQ	In-process	P1	Meter-based PM job for 09...	3/1/14 2:17 PM Ce...		MPB	MySite
<input type="checkbox"/>	2	105752		Fully	Test-PROD-00...	B02.HQ	New	P1	My testing	3/23/16 8:21 AM C...		Calem Eam	MySite
<input type="checkbox"/>	3	4471		Fully	JJ.CA.AC-001	OH-CA-001	In-process	P1	PM_Weekly -002	9/2/10 10:00 AM E...	11/2/08 1:0...	John Freeman..	JJ.CA
<input type="checkbox"/>	4	4279		Partially	SP02-M-PORT	CA.Building2	Released	P1	PM_Weekly	7/25/10 10:00 AM ...	3/1/09 1:00 ...	MPB	My TX sit..

Schedules – Set up Schedules

- Define Schedule Cycles: weekly or multi-week cycles
- Set up schedules for selective teams

Main Customize

Sched Cycle (1 of 3)

Customize

Cycle:

Note:

Last modified: Modified by: [Administrator](#)

Time created: Created by: [Administrator](#)

Sched Week (1)

Customize

	Mon	Mon Shift	Tue	Tue Shift	Wed	Wed Shift	Thu	Thu Shift	Fri	Fri Shift	Sat	Sat Shift	Sun	Sun Shift
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Day	<input checked="" type="checkbox"/>	Day	<input checked="" type="checkbox"/>	Day	<input checked="" type="checkbox"/>	Day	<input checked="" type="checkbox"/>	Day	<input checked="" type="checkbox"/>	(None)	<input checked="" type="checkbox"/>	(None)

Main Customize

Sched Cycle (1 of 1)

Customize

Cycle:

Note:

Last modified: Modified by: [Calem Eam](#)

Time created: Created by: [Calem Eam](#)

Sched Week (2)

Customize

	Mon	Mon Shift	Tue	Tue Shift	Wed	Wed Shift	Thu	Thu Shift	Fri	Fri Shift	Sat	Sat Shift	Sun	Sun Shift
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Day	<input checked="" type="checkbox"/>	Day	<input checked="" type="checkbox"/>	(None)	<input checked="" type="checkbox"/>	(None)	<input checked="" type="checkbox"/>	Night	<input checked="" type="checkbox"/>	Night	<input checked="" type="checkbox"/>	Night
<input type="checkbox"/>	<input checked="" type="checkbox"/>	(None)	<input checked="" type="checkbox"/>	(None)	<input checked="" type="checkbox"/>	Day	<input checked="" type="checkbox"/>	Day	<input checked="" type="checkbox"/>	(None)	<input checked="" type="checkbox"/>	(None)	<input checked="" type="checkbox"/>	(None)

- **Learn and improve based on practice from Iteration 8**
- **Repeat Iteration 8 to add more teams to schedules**



CalemEAM

- WO SLA by category
- SR SLA by priority

Main	SLA	Asset	WO	Contact	Document	Business Lines	Customize
------	-----	-------	----	---------	----------	----------------	-----------

Contract (1 of 15)

Contract: CONTRACT-001

Note: Testing service site as vendor site

WO SLA (2)

<input type="checkbox"/>	Category	Enforce finish	Value	SLA UOM	SLA Time	Note	Last modified
<input type="checkbox"/>	Corrective	<input type="checkbox"/>		Hours			12/10/13 9:30 AM..
<input type="checkbox"/>	Emergency	<input type="checkbox"/>	0	Days			12/10/13 9:30 AM..

SR SLA (2)

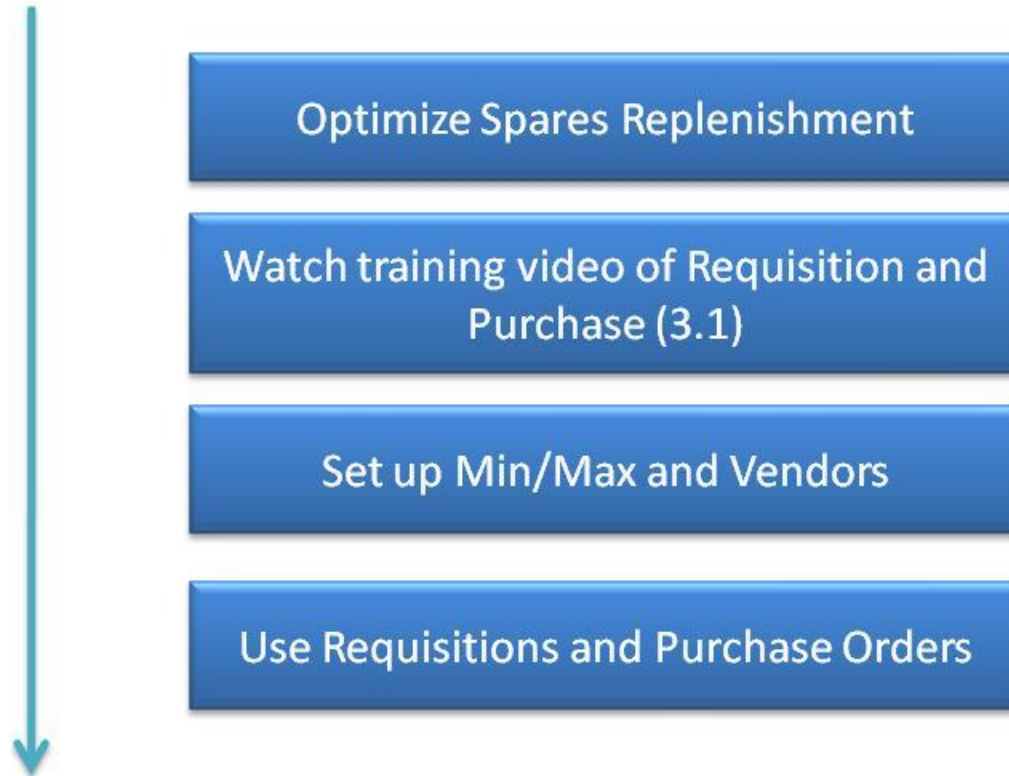
<input type="checkbox"/>	SR priority	SLA response	Resp UOM	SLA Onsite	Onsite UOM	SLA Resolution	Res UOM	SLA Notes	Default?
<input type="checkbox"/>	P3		2 Days						<input type="checkbox"/>
<input type="checkbox"/>	P1		4 Hours						<input type="checkbox"/>

- **Use SLA contracts in Work Orders**
- **Use SLA contracts in Service Request**

- **Learn and improve based on practice from Iteration 9**
- **Repeat Iteration 9 to add more SLA contracts**

Iteration 10: Optimize Spares Replenishment

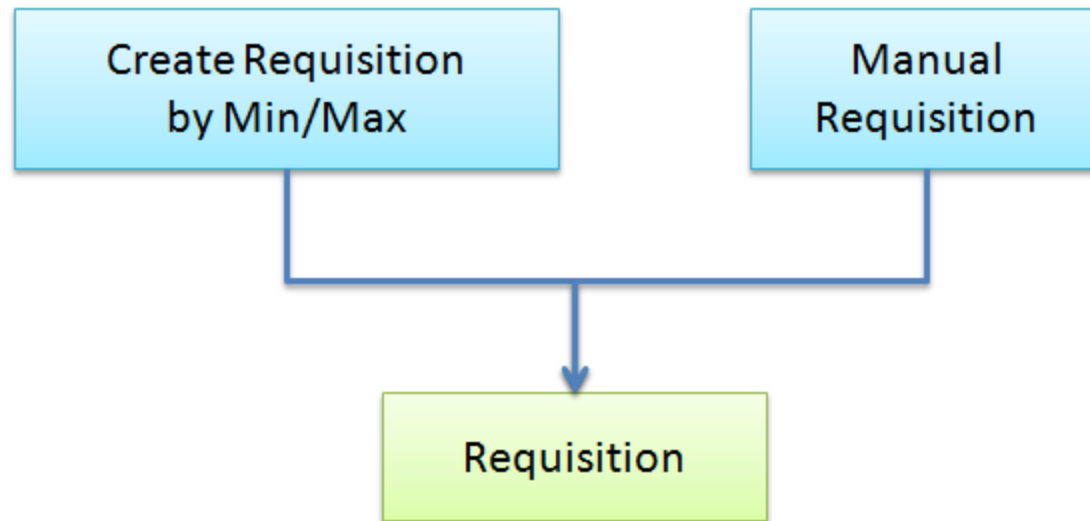
CalemEAM



Iteration 10: Set up Min/Max and Vendors

CalemEAM

- Set up Min/Max for selective spares
- Set up selective vendors and prices



- Set up roles for requisition
- Set up roles for purchase order

Role	Calem Object	Function
Supervisors	REQ Approver	Pre-Approve REQ
Managers	REQ Approver	Approve REQ
Requesters	User	Create REQ

Role	Calem Object	Function
Supervisors	Pre-Approve	Pre-Approve PO
Managers	PO Approver	Approve PO
Buyers	User	Create PO

- **Generate requisitions based on min/max**
- **Use requisition to request spare parts**
- **Use purchase orders to order spares from vendors**

- **Learn and improve based on practice from Iteration 10**
- **Repeat Iteration 10 to set up additional inventory mix/max, vendors, roles for requisition/purchase**

- **Review operational KPIs**
- **Identify new KPIs (add to your CMMS if not there already)**
- **Identify areas for improvement**
- **Repeat this process regularly**

Visit Us at www.calemeam.com

Clay Li

clay.li@calemeam.com

