



# Welcome to the



## FEBRUARY 6<sup>TH</sup>, 2019 | San Antonio

### REMOTE ATTENDEES

WEB ACCESS: <https://goo.gl/RR4irr>

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AUDIO CONNECTION: (510) 338-9438

Send discussion question to [info@digonsystems.com](mailto:info@digonsystems.com)





# Welcome

Presented by Matthew Walters & Kurt Sorensen



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# Introductions

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- DIGON Team
  - Kurt Sorensen, President
  - Paul Schowalter, VP Operations
  - Melissa Nagel, Product Manager
- CERL Team
  - Matthew Walters
  - USACE ERDC-CERL Research Engineer
  - Sustainment Management Systems (SMS) Project Manager
  - OSD SMS CSP BUILDER Working Committee Chair



# Other CERL Team Members

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- Clint Wilson – SMS Program Manager
- Buddy Bartels – Research Engineer
- Melinda Buckrop – Research Engineer
- Joe Karbarz – Computer Scientist
- Juan Davila-Perez – Research Engineer
- Brenda Mehnert – Research Engineer
- Matt Werth – Research Engineer



# Agenda

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- **AM Schedule**

8:00 – 8:30: Welcome

8:30 – 9:00: CERL Team Update

9:00 – 10:00: Next Release Cycle

- *Break*

10:15 – 10:45: Enterprise SMS

10:45 – 11:45: Reporting Update

- **PM Schedule**

1:15 – 1:45: Catalog Update

1:45 – 2:45: System Integrations

- *Break*

3:00 – 3:30: Functionality

3:30 – 4:00: BIM Migration

4:00 – 4:45: Mission Effectiveness



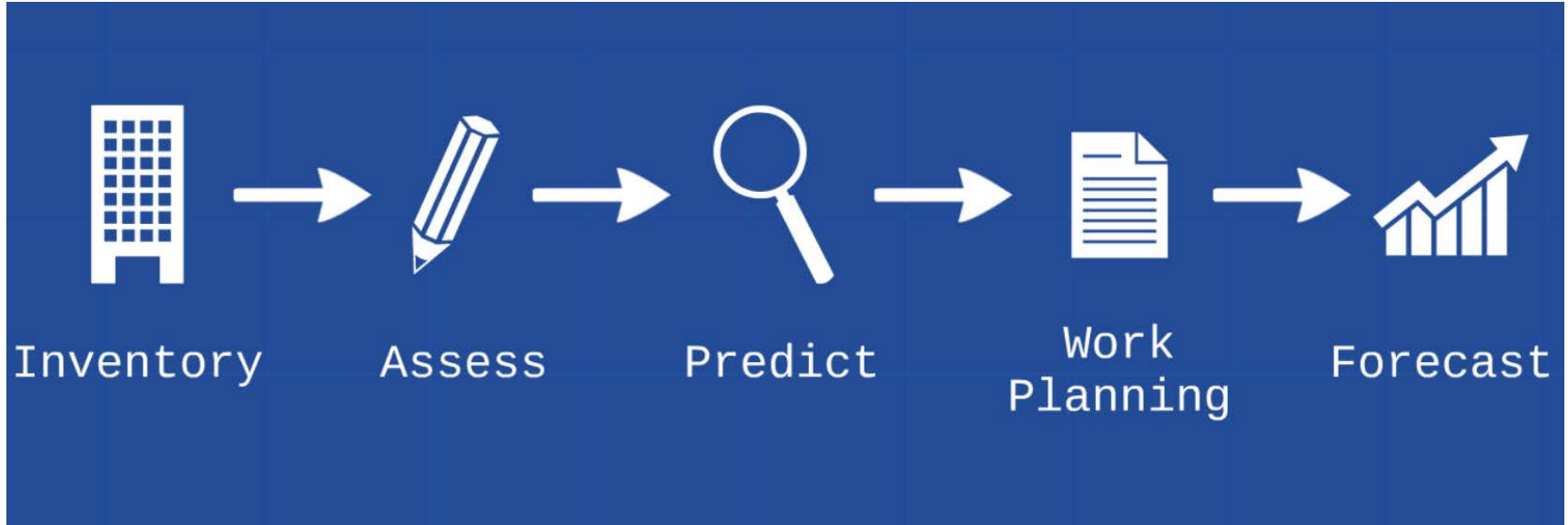
# Bi-Annual Format

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- Late Summer (August) Summit in Washington, DC
  - 2-day format with breakout sessions and group discussions
  - Collaboration teams established to work through shared challenges/issues
- Winter Summit (February) Summit in San Antonio, TX
  - 1-day format – mid point check up on items discussed at Summer Summit
  - Collaboration teams provide progress update working through their project



# BUILDER in Five Minutes





# CERL Team Update

Presented by Matthew Walters



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# CERL Update Outline

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- BUILDER Development
  - Federal Team & Recruiting
  - Release Management and Planning
  - Internal Development Tasks
  - Contract Management
  - Testing
  - Demonstrations
- Enterprise SMS Development
  - Background
  - Software Development
  - Engineering Data
  - Demonstration



# Federal Software Team Resources

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*October 2018:*

2 Full-Time  
1 Part-Time (planning)  
2 Undergraduate Interns

## **Challenges as Currently Staffed**

- Still under-staffed to meet current needs despite growth
- Difficulties in responsiveness to defects
- Tasking resources between BUILDER and ESMS development

*Today:*

4 Full-Time  
2 Part-Time  
3 Undergraduate Interns

## **Addressing Current Challenges**

- Approval granted to increase staff significantly
- Active recruiting to increasing Federal CS Staff
- Establishing intern recruiting program (2 new interns started Jan. '19!)
- Intern pipeline to full-time employment (recent success in CS area!)



# Other SMS Status

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- Pavements (PAVER) chaired by: James Allen
- Rail (RAILER) chaired by: James Allen
- Fuels (FUELER) chaired by: Joe Karbarz
- Utilities (Utilities SMS) chaired by: Clint Wilson



# Next Release Cycle

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## 3.4 Wrap-up

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- 3.4.1 Current version for CERL hosted BUILDER
  - Addresses the BRED export / import fix
- 3.4.3 Bug fix update
  - Users with permissions less than Master Planner were not able to view inspections outside of the inspection window.
  - BRED Image Packages not exporting correctly



## 3.4 Building Options

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### New Building Data Fields

- The following additions have been made at the General Info. tab on the Building inventory screen:
  - Building "Current Status" now has a sub-status
    - Building Not Inspectable
    - Excluded Systems
    - Building Renovation Year
  - All informational only fields... for now.

### Building Alt Facility ID

- The RPUID is now editable in BUILDER Web!



## 3.4 PM Inspections

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### New Section Inspection Type

Similar to Distress Survey, in that ratings are done against the subcomponents to determine a subcomponent condition index (SCCI), which is then aggregated to the section level using subcomponent weight factors to determine the section (CSCI).

However, SCCI is determined based on the direct rating given to each subcomponent.

Subcomponent weights are not exposed through the user interface or a library for modification.

Text is also available to provide guidance on the expectations of subcomponent ratings.



## 3.4 Distress Survey Update

### Direct Rating of Subcomponents

Inspection

Attachments (0)

Inspection Date: 7/27/2018

Inspector: Sorensen, Kurt

Type

- ☐ Direct Rating
- ☒ Distress Survey
- ☐ PM Inspection

Method

- ☒ Not Sampling
- ☐ Sampling

Results

CSCI:

☐ Defect Free

N/A	Subcomponent	Direct Rating	Distresses
<input checked="" type="checkbox"/>	Drain	<div></div>	<a href="#">Distresses (0)</a>
<input checked="" type="checkbox"/>	Surface	<div></div>	<a href="#">Distresses (0)</a>
<input checked="" type="checkbox"/>	Vents	<div></div>	<a href="#">Distresses (0)</a>

If you do a distress survey, but choose to provide both a direct rating and record distresses, the direct rating is what's used to calculate the CI.





## 3.4 Section Status

### Sections Can Now Have Status

Not tied to any functionality

CI roll-up weight, total replacement cost, work items

Have requested to add this status to the policy attributes so that “replaced” sections do not generate work items.

A screenshot of a software interface showing a dropdown menu for "Current Status". The dropdown is open, displaying a list of status options: "Active", "Archived", "De-Activated", "De-Commissioned", "Missing", and "Replaced". The "Active" option is currently selected and highlighted in orange. The label "Painted:" is visible to the left of the dropdown list.

Current Status:	Active
Painted:	Active
	Archived
	De-Activated
	De-Commissioned
	Missing
	Replaced



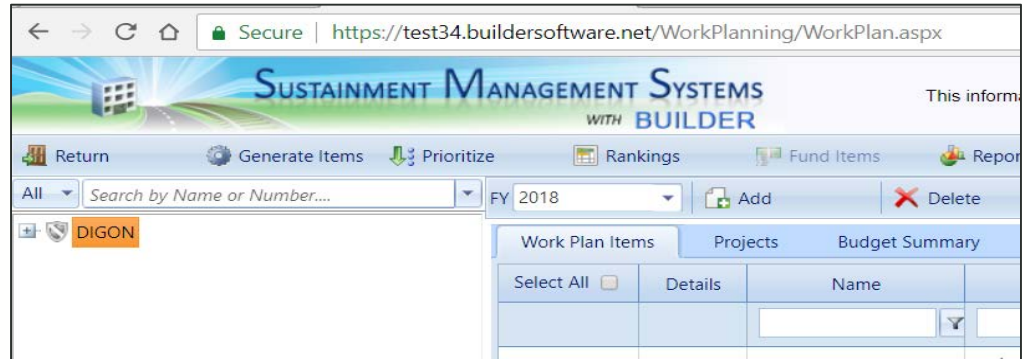
## 3.4 Work Item Generation

### All Work Items Have Priority

Previous versions of BUILDER would generate items with only a Policy Sequence.

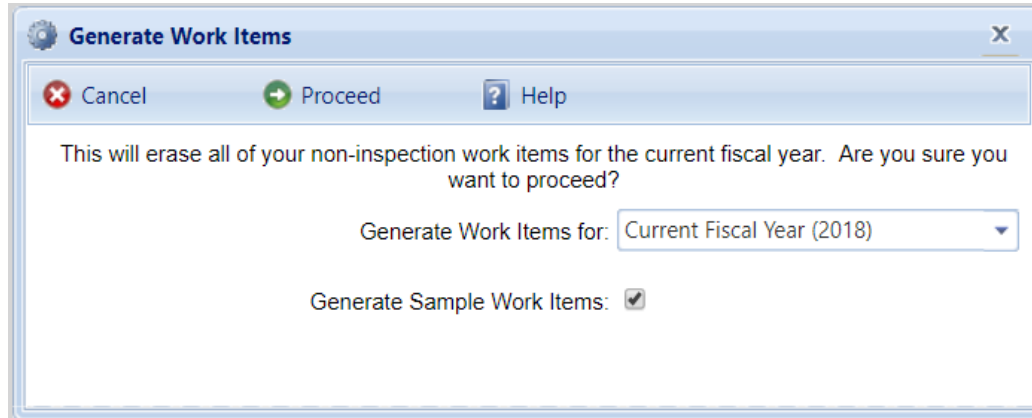
We discovered that one cannot generate work items without a prioritization scheme now.

### Can Generate Work Items at the Organization level



## 3.4 Sample Work Items

Generate work items based on sample



Great for not localized issues rather than sectioning by condition



## 3.4 Other Notes

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### BRED 3.4

BRED 3.4 still “in testing”

Old BRED still works fine but does not have any of the new fields.

### CII Library

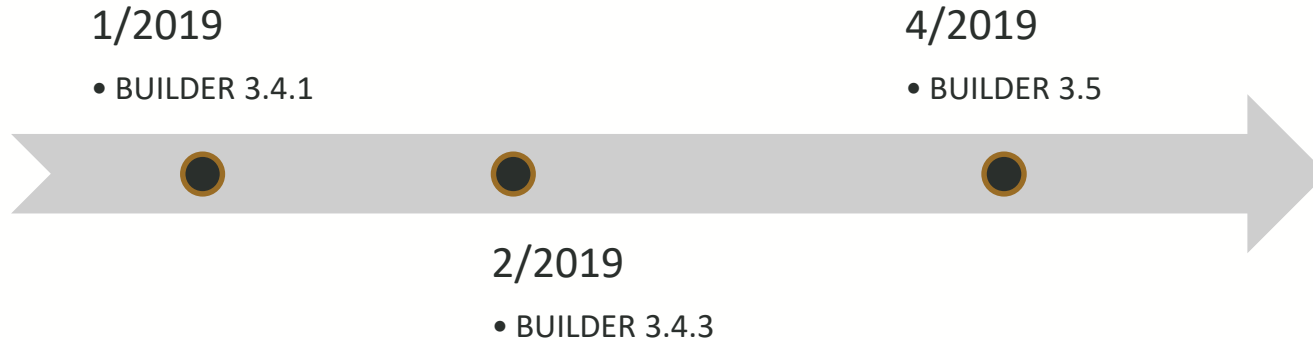
The Component Importance Index is used to establish a section importance.

Helpful for work prioritization



# BUILDER Release Contents & Schedule

- BUILDER 3.4.1 – January, 2019 (supporting network enforced security change)
- BUILDER 3.4.2 – (NNSA Cost Modifier Work)
- BUILDER 3.4.3 – February, 2019 (12 bug fixes)
- BUILDER 3.5 – April, 2019 (5 new feature sets, 44 bug fixes, Scenario Silverlight removal)
  - Cost Modifier, Inventory Improvement, POM Scenario, Work Item Previous Year Status, Auditing Improvements





## 3.4.3 Bug Fixes

- BUG 2139: Scroll bar moves both date and window position simultaneously
- BUG 2213: Crash when opening Efficiency Wizard at Functional Area Level
- BUG 2373: Functionality - Checklist data type does not show up
- USER STORY 2827: Save without closing functionality assessment in BRED
- USER STORY 2831: Finger scroll on functionality assessment and inventory tree in BRED
- USER STORY 2833: "Take Picture" option for Question Image in BRED
- BUG 3000: Save after changes to comments in BRED
- BUG 3021: assessment window does not expand with the application screen (drag corners)
- BUG 3022: no comment buttons on functionality assessments
- BUG 3024: put the percent complete for each assessment in the assessment summary window (it's there once you open it)
- BUG 3025: Add new building error on the inventory side (cannot edit year built due to string to integer issue)
- BUG 3026: widen the scrollbars on inventory tree if possible
- BUG 3027: assessment saving is pretty slow
- Functionality assessments are now properly displaying the percent completion field for assessments where applicable.
- The "Historic" checkbox on the building inventory screen is now functioning as expected.
- Changes to a Component Section that would affect the Component Section Condition Index was not being reflected in a Facility's rollout.
- In Cost Books, the general multiplier text box for the Building level costs now saves correctly.
- An update to Internet Explorer caused BRED Exports and Rollups to appear as if they froze mid-process. A fix has been applied to BUILDER to accommodate IE's new behavior.
- Component Section's with long descriptions were previously wrapping incorrectly in the Inventory tree, causing the description to start on a new line. This has been corrected to display more naturally.
- Inspection work items were incorrectly creating new inspections when their status was set to "Completed".
- An update to BUILDER required by a recent security protocol scan added requirements for checking for user inactivity that would enact user locks if outside the acceptable time window. BUILDER 3.4 required an upgraded version of SQL Server and a database configuration was not properly migrated. This combination put users outside of the acceptable time window in a limbo state of not being able to log in, but not actually being locked out.
- An upgrade to the inventory tree caused the new page element to think there was a cross site scripting issue with data with which BUILDER was populating the inventory tree. A correction was made to allow BUILDER to display the required data while still protecting against cross site scripting vulnerabilities.
- BUILDER Component Subtype descriptions corrected.
- Users can now save changes to the Site pages.
- Users utilizing the BUILDER API Webservice can now save Section Alternate ID information.



## 3.5 Bug Fixes

- Distress survey density should be computed, not selected
- BRED imports should not start automatically
- Navigation Search not respecting user permissions
- Building Status Year is Not Enforced
- Dialog box missing when you create Site or Complex already in Organization
- Policy Not Saving Correctly
- Work Generation failing for Facilities with Projects
- Standards not populating
- Warranty in Effect Indicator
- BUILDER Distress Survey Help Link not Linked
- Construction type shows as "Leased" when DB value is NULL
- Completing Inspection Work Item Creates Bogus Inspection With No Rating
- Cannot delete facility if efficiency assessment exists
- Unable to delete building with subissues
- BUILDER not creating performance record table for new component sections
- KBI functions in BUILDER API Broken
- Seismic Zone is spelled wrongly
- Green Item - Site Level Master Planners should not be allowed to create organizations
- DLA/DeCA Whole Building "Replace"
- Remove defunct seismic tables from BRED files
- Work Plan Prioritization
- "Copy WorkItems" context item does not immediately enable when a new scenario completes
- Site PRV Calculations Wrong
- PRV does not match the sum totals of items in a complex/site/org
- Click Jack security vulnerability
- Install leaves all foreign keys untrusted
- Paint Work Items
- Organization Work Items
- Work item changes not recognized by API
- Missing point of contact fields in the API data contract
- Changes made to Funding Restrictions to Work Configuration not saving
- DHA Scenarios Analysis graph is not correct
- Component Section Cost Book Edits.
- Export Scenario Analysis Grid to Excel:
- Scenario Error Reporting
- BRED - unable to export images
- BRED Images with Blank Titles
- Functionality Work Items not being generated
- Fiscal year needs to be adjusted in CostRecordDisplay\_\* views
- PDF Attachments for Functionality Questions - This was named already, however it sounds like there is reasonable additional work required to make this work correctly with BRED. This would be to ensure that Functionality Questions/Answers can have PDF attachments for both BRED and BUILDER.
- Calculate RPL for Paint
- API Rollup Permissions
- Nightly Rollup not updating FCI
- Functionality Attachments File Types



## 3.5 Features

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### **BUILDER Feature Contract** – Extended from Dec. '18 to end of Feb. '19

- Inventory Improvement Package
- Catalog Interaction Improvements (API)
- Update Scenarios to Support POM
- Scenarios Trust Previous Fiscal Years
- Custom Report User Interface (PowerBI) Design – not a completed solution, but a design spec. and prototype provided
- Additional BUILDER Auditing Groups (track changes to Work Items, Work Configuration Settings, Cost/Service Life Books)





## 3.5 Performance Improvement Target

**BUILDER Database SQL Server Optimization** – Contract concluded at end of CY18

- Contract to remediate BUILDER Database performance issues exposed by increased data volume
- Heavy documentation required to provide lessons learned guide for application within ESMS
- Result: further optimized database for better application responsiveness; faster BUILDER!
- ***Contract results and recommendations targeted for BUILDER 3.5***



# BUILDER Testing

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## Montana State University TechLink T-SEAL

- Automated user interface test buildout for regression stability
- Manual brute force testing
- Current Process:
  - Send updated software to T-SEAL team for review; wait for results
  - Address any issues identified
- Future Process:
  - Integrate automated testing into build process to provide instant feedback
  - Address any issues identified
  - Build and deploy a fully tested application in a single step
- CERL DevOps lead working to integrate tests into automated builds now
- Test suite still developing with T-SEAL team

## CRADA Partner Early Release



# BUILDER 3.5 Preview Demos

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- BUILDER 3.5 Demo



# Cost Modifier Enhancement

- BUILDER 3.5

<https://costmod.buildersoftware.net>



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**New Modifier Item**

Close Add Help

Modifier Scope:

Modifier Type:

Modifier Name:

Modifier Value:

Modifier Description:

Apply to PRV: ☐

Save

Comment

Reports

123 - Fort Collins

111 - Complex One

222 - Hospital

Building No: 222

Building Name: Hospital

General Info

Additional Info

Assess. History

Work Item History

Systems at a Glance

Cost Modifiers

Attachments (0)

Assigned Cost Modifiers

Assign Cost Modifier

Modifier Scope	Modifier Type	Modifier Name	Modifier Value	Est. Modifier Impact	Apply to PRV	Modifier Description	Assignment Comment	
Complex	Multiplier	Health & Safety	1.50	\$16,008.45	<input type="checkbox"/>			
Building	Multiplier	Security	2.00	\$32,016.90	<input checked="" type="checkbox"/>	Additional security required		Unassign



# Next Round of BUILDER Development

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## **Review of 2018 Requested Changes (Top 5)**

- Catalog Editor Request
- Custom Report User Interface
- ~~Additional BUILDER Auditing Groups~~ – Added to current development contract!
- Access Control Overhaul Feature
- Functionality Accessible Through BUILDER API

## **Additional BUILDER Work in 2018-2019**

- Microsoft Silverlight replacement (Functionality and recent Scenarios additions)
- Prioritizing BUILDER Bug Backlog to address in highest priority order



# 15 Minute Break

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# Enterprise SMS Progress



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# ESMS Development

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## Background

- Initiated by Fuels and Utility domains
- Single, flexible, modern platform for all SMS Domains
- Current applications showing age both aesthetically and technologically
- Provides a new framework for advanced data analytics, prediction, and optimization

## Design Philosophy

- Common software architecture to accommodate all current SMS domains (buildings, rail, pavements, utilities, fuels)
- Abstract design to allow for rapid expansion to account for new domains
- All work completed on shared platform usable by every ESMS Domain





# Software Development

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## **Completed Milestones**

- Optimized ESMS Desktop App
- Initial Long-Range Work Planning
- PowerBI Integration with ESMS Web

## **Short-Term Milestones**

- BUILDER API Integration
- API Services for integration with other systems
- Workflow – work item lifecycle
- Long-Range Work Planning Funding
- User Interface Design Review

## **Long-Term Milestones**

- BUILDER Feature Parity
- Advanced Analytics
- Work Planning Optimization



# Engineering Data

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## **Completed Milestones**

- Fuels Engineering Criteria via Functional Assessments
- Pilot Assessments at Offutt Air Force Base

## **Nearing Milestones**

- Engineering IDIQ MATOC award

## **Short-Term Milestones**

- SMS engineering data peer-review/validation
- SMS engineering data gap analysis

## **Long-Term Milestones**

- Lifecycle characteristics and modeling for remaining FACs



# Enterprise SMS Demonstration

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Link was removed as this is a dynamic testing environment.

- Work Analysis in Enterprise SMS – Staging Site
- BUILDER Data Import – Test Site
- PowerBI Demonstration – Staging Site



# Reporting

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# CERL Custom Report Library

- A custom reports guide was constructed on behalf of the USAF BUILDER team to detail the custom reports loaded for the USAF BUILDER site
- This version of Custom Reports was recently reviewed and updated by USAF/CERL and may differ from reports of the same name on other BUILDER Sites
- These reports can be moved to any other BUILDER site if desired by a customer



BUILDER Custom  
Reports Guide - USAF



# DIGON Custom Report Library

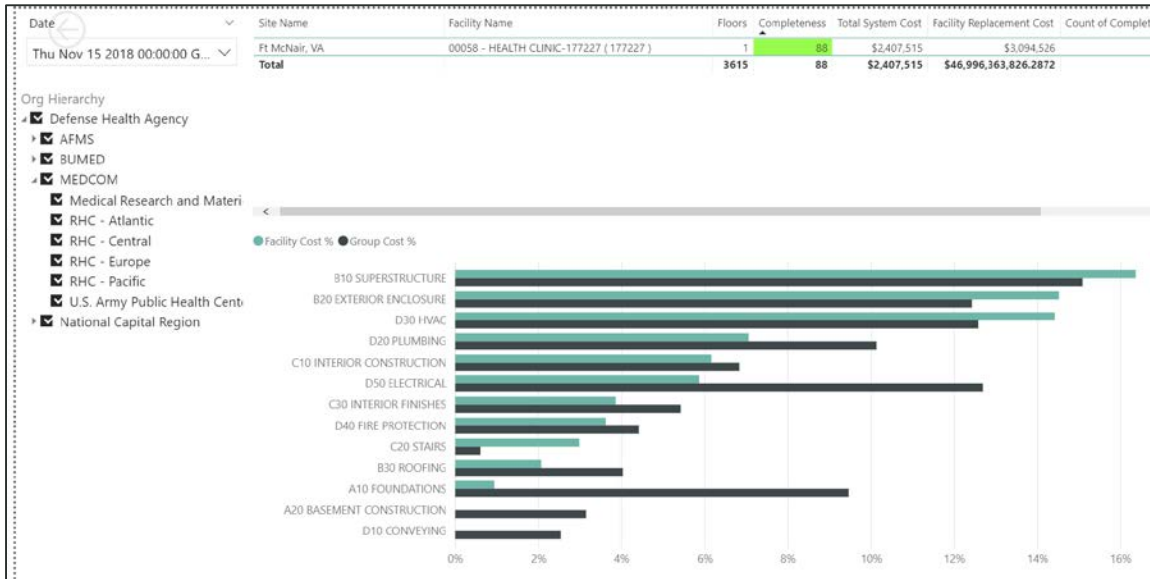
- Catalog
  - Number of uses for each item
  - Printable and full details
- Audit
  - Insights into records by person within a date range
- QA Review
  - Also QA Review Details
- Scenario Summary
  - Visual trends
- Site
  - Multiple versions
  - Work configuration
  - Inspection photos



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# Data Quality Console - DHA

- Creating tools to help identify data anomalies





Lunch – 1:15 PM



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# Catalog Follow-ups



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# Cost Catalog Update Strategies

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- **Federal (DoD) Cost Source**
- **Commercial Cost Source**
- **Integration Methods**



# Federal (DoD) Cost Source Status

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- Leverages Tri-Service Automated Cost Estimating System (TRACES)
- Uses TRACES DoD Costbook currently under development
- Replacement Assemblies for select BUILDER component catalog items have been built based on TRACES DoD costbook task items. These task item unit costs are being completed as part of larger USACE Huntsville contract - will feed into the assembly level unit costs.

**Status: In development – initial rollout targeted for June 2019 (USACE Huntsville to USACE CERL)**

Examples of assemblies that have been built on next slide.



# Fed Cost Source Assembly Examples

## B203001 Exterior 3' x 7' Exterior Personnel Solid Steel Personnel Door Replacement, EA, CMC 21401

08131333XXXX	Door exterior steel residential full panel, 3'0" x 7'0" (900mm x 2100mm) prehung, insulated	1	EA	Yes	Replacement of existing solid steel door & frame, include repairs to all surrounding finishes
08121313XXXX	Knock Down Hollow Metal Single Door Frame, 16 gauge, 3'0" x 7'0" (900mm x 2100mm), 5-3/4" throat (144mm)	1	EA	Yes	Replacement of existing solid steel door & frame, include repairs to all surrounding finishes
08714113XXXX	Door Hardware, School door package for exterior, hinges, cylinder, closer, lever pull, door stop & panic device	1	EA	Yes	Replacement of existing solid steel door & frame, include repairs to all surrounding finishes
08714151XXXX	Threshold, Flat saddle, 3'0" long, aluminum	1	EA	Yes	Replacement of existing solid steel door & frame, include repairs to all surrounding finishes
08050511XXXX	Demolition, metal door frame	1	EA	Yes	Removal of existing solid solid steel door
08050511XXXX	Exterior single door demolition, 3'0 x 7'0 x 1-3/4" [914m x 2134mm x 44mm]	1	EA	Yes	Removal of existing solid solid steel door
ACARCARP1	1 laborer (Semi-skilled)	0.5	HR	Yes	Removal of existing solid solid steel door

## D504050 Replace Emergency Light Fixture, EA, CMC 21610

26050513XXXX	Remove interior fluorescent lights, 2 lamps, 2' x 4'(600mm x 1200mm), recessed drop-in, 15'(4.6m) high, incl supports & whips	1	EA	Yes	Removal of existing fluorescent light fixture
26511613XXXX	Interior fluorescent lights, acrylic lens, grid recessed ceiling mount, 2-40 W, 2' W x 4' L, incl lamps, mounting hardware and connections	1	EA	Yes	Replacement fluorescent light fixture
26515323XXXX	Fixture whips, 3/8" greenfield, 2 connectors, TFFN, (3) #16, 6' L	1	EA	Yes	Replacement Fixture Whip
26511613XXXX	Emergency back up battery & lamp, for fluorescent lighting fixture, 32 W, (Type XF1)	1	EA	Yes	Replaces battery backup for fluorescent light fixture
B-ELECTRN	Electricians	2	HR	Yes	Additional labor for unknown conditions
B-CARPNTER	Carpenters	2	HR	Yes	Additional labor for unknown conditions



# RSMMeans Cost Source Status

- Leverages RSMMeans Assemblies and Line Item data
- NNSA has implemented RSMMeans costs into BUILDER
- Update to all BUILDER cost entries 1500+ additional catalog items added

**Status: Available for now through Gordian RSMMeans**



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# System Integration Examples



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# Defense Health Agency

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- API based integration with the in-house CMMS, DMILL-S-FM.
- Batch communications with full support of all sections within the CMMS.
- Transferring Inventory, Condition Assessments, and Work Items

Roy Hirschak

- DHA Facilities Enterprise
- 210-536-6390
- [roy.d.hirschak.civ@mail.mil](mailto:roy.d.hirschak.civ@mail.mil)

Christopher J. Blum

- Air Force Health Facilities Division
- 210-925-1499
- [christopher.j.blum.ctr@mail.mil](mailto:christopher.j.blum.ctr@mail.mil)



# Navy

Interface Application facilitates data exchange

- Connects to BUILDER and pushes/pulls info via BUILDER API
- Exchanges info with MAXIMO via data tables

Data Elements from MAXIMO

- Facilities (MAXIMO Locations) – Updates BUILDER when facilities records are added/updated
- Component-Sections (MAXIMO Assets) – Updates BUILDER when asset records are added/updated/deactivated

Data Elements to MAXIMO

- Condition Index – Sends the current projected CI for an asset to MAXIMO after a new inspection or change to the asset record
- Work Items – Sends the work requirements generated by BUILDER scenario to MAXIMO for tracking and execution

Jonathan E. Crittenden

- CBM Program Manager
- NAVFAC HQ - PWBL
- [jonathan.e.crittende@navy.mil](mailto:jonathan.e.crittende@navy.mil)





# Air Guard

- API based integration with the in-house CMMS, iEMS.
- Implementation in two phases with batch files SPIRE. After information assurance approval, a direct and automated API will sync data between the two systems.

GEORGE M. (MIKE) TURK, NGA-13

- iEMS Program Manager
- (208) 422-5635
- [george.m.turk.nfg@mail.mil](mailto:george.m.turk.nfg@mail.mil)

Kurt Sorensen

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# National Nuclear Security Administration



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- API based integration with multiple CMMS applications
- SPIRE is leveraging the BUILDER Application Programming Interface (API) to facilitate data communications. The SPIRE platform has a web portal that allows users to process batch Excel files. If a more real-time capability exists within the CMMS, SPIRE also provides a RESTful API that simplifies communications.

Incheol Pang

- NNSA, NA 521
- (202) 586-9257
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# 15 Minute Break

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# Functionality

Presented by Buddy Bartels

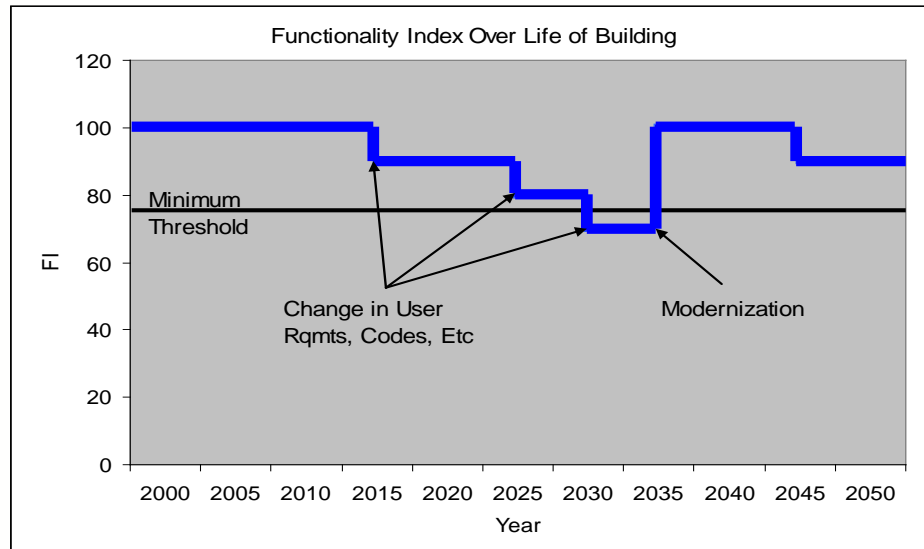


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# BUILDER Functionality Module

- Relates the suitability to perform the functions for which it is required (built-in capability of the asset)
- May experience loss due to changes in:
  - Occupant requirements
  - Materials or technology
  - Codes/Regulations



**The Functionality State is improved through Facility Modernization Investments**



# FY19 Functionality Improvements

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- Silverlight Conversion → Angular
  - Microsoft Silverlight deprecated in 2012
  - Conversion for Scenarios, Functionality, Backend Tools
- Database View Optimization for Functionality Custom Reports
  - Enhance ability to create new custom reports
- Update “Out of the Box” Functionality Assessments
  - Current Functionality assessments are out of date
  - New Functionality set will be based on WBDG design objectives

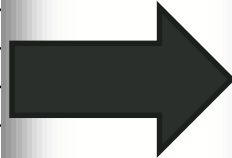
# FY19 Functionality Improvements

- Whole Building Design Guide (WBDG) – Design Objectives

PARTICIPATING AGENCIES



+ Access
+ ADA
+ Aesthetics
+ ATFP
+ Building Services
+ Building Size and Configuration
+ Comfort
+ Efficiency and Obsolescence
+ Environmental/Health
+ Location
+ Maintainability
+ Missing or Improper Components
+ Structural Adequacy



## DESIGN OBJECTIVES

- > Accessible
- > Aesthetics
- > Cost-Effective
- > Functional / Operational
- > Historic Preservation
- > Productive
- > Secure / Safe
- > Sustainable



# Custom Functionality Users

---

- USDA – Agricultural Research Service (ARS)
  - Sandra Sadler - [Sandra.Sadler@ARS.USDA.GOV](mailto:Sandra.Sadler@ARS.USDA.GOV)
- Defense Commissary Agency (DeCA)
  - John Dulin - [John.Dulin@deca.mil](mailto:John.Dulin@deca.mil)
- National Nuclear Security Administration (NNSA)
  - Incheol Pang - [Incheol.Pang@NNSA.DOE.Gov](mailto:Incheol.Pang@NNSA.DOE.Gov)
- Defense Health Agency (DHA)
  - Roy Hirschak - [roy.d.hirschak.civ@mail.mil](mailto:roy.d.hirschak.civ@mail.mil)





# BIM Data Migration

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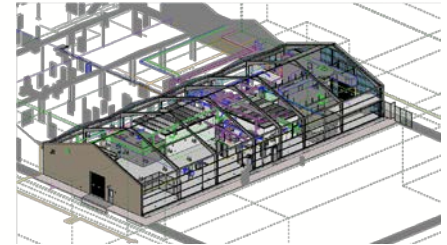
# Air Force Construction Data Exchange

## Objectives

- Investigate USAF requirements for construction information data exchange to BUILDER
- Demonstrate BIM to BUILDER prototype data exchange process

## Major Tasks

- Investigate current Air Force BIM requirements
- Map BIM data requirements to BUILDER SMS data elements via COBie
- Review alignment with current SMS BUILDER data collection practices and identify gaps
- Develop product classification mapping to BUILDER SMS component inventory schema
- Test BIM to BUILDER process with USAF provided BIM model
- Document results and recommendations





# Tasks Progress

Task	Status	Details
Investigate current Air Force BIM requirements	Completed	Air Force requires use of USACE ECB 2018-7 ADVANCED MODELING REQUIREMENTS in their projects ( <a href="http://www.wbdg.org/ffc/af-afcec/bim">http://www.wbdg.org/ffc/af-afcec/bim</a> )
Map BIM data requirements to BUILDER SMS data elements via COBie	Completed	Facility->Building Info; Floor-> Comp-Section Name; Space->Section Detail Location; Zone->Functional Area; Component->Component-Section Detail
Review alignment with current SMS BUILDER data collection practices and identify gaps	In Progress	Rules for section aggregation, section naming conventions, section details, and catalog coverage
Develop product classification mapping to BUILDER SMS component inventory schema	In Progress	Map OmniClass Table 23 products to BUILDER Catalog Items (CMCs)
Test BIM to BUILDER process with USAF provided BIM model	In Progress	Developing a sample COBie file containing data exported from example BIM.
Document results and recommendations	Started	Continuously recording results



# Sample File

Data obtained from AFCEC provided BIM

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Email	CreatedBy	CreatedOn	Category	Company	Phone	ExtSystem	ExtObject	ExtIdentifier	Department	OrganizationCode	GivenName	FamilyName	Street	PostalBox	Town	StateRegion	PostalCode	Country
2	mariangelica.carrasquillo@usace.army.mil	mariangel	2018-05-03 14:55	14	U S Army	(217-373-3	Autodesk	IfcPerson	00a09e50	CF-N	ERDCEER	Mariangel	Carrasqui	Newmark Rd	n/a	Champaign	IL	61822	USA
3	tjhecht@heapy.com	mariangel	2018-05-03 20:11	11	HEAPY EN	(937) 224	Autodesk	IfcPerson	4173544a	n/a	n/a	n/a	n/a	1400 W DOROTHY LN	n/a	DAYTON	OH	45409	USA
4																			
5																			
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	Name	CreatedBy	CreatedOn	Category	ProjectName	ZipName	LinearUnits	AreaUnits	VolumeUnits	CurrencyUnit	AreaMeasurement	ExternalSystem	ExternalProjectObject	ExternalProjectIdentifier	ExternalSiteObject	ExternalSiteIdentifier	ExternalFacilityObject	ExternalFacilityIdentifier	Description	ProjectDescription	FileDescription	Phase		
2	REPAIR CE MAINTENANCE SHOP FOR WPAFB	n/a	6/7/27/16	11-13 21	REPAIR CE Enter add	Feet	Fract	Square Fe	Cubic Fe	None	Revt Def	Autodesk	IfcProject	13prT&G	IfcSite	13prT&G	IfcBuilding	13prT&G	2016-0604	REPAIR CE Enter add	READY TO ADVERTISE			
3																								
4																								
5																								
6																								
7																								
8																								

	A	B	C	D	E
1	Name	CreatedBy	CreatedOn	Category	ExtSystem
2	FIRST FLOOR	tjhecht@heapy.com	6/8/2016 2:42:54 PM	n/a	Autodesk Revit 2018, Build: 20170223_151502
3	T/O BLAST WALL	tjhecht@heapy.com	6/8/2016 2:42:54 PM	n/a	Autodesk Revit 2018, Build: 20170223_151502
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					

	Name	CreatedBy	CreatedOn	Category	FloorName	Description	ExtSystem	ExtObject	ExtIdentifi	RoomTag	UsableFeet	GrossArea	NetArea
2	185F	tjhecht@heapy.com	6/8/2016 2	13-23 19 1	FIRST FLQ	FURNACE ROOM	Autodesk fRooms	5a5b2128-	ROOM - 185F	n/a	n/a	377.5882	
3	185H	tjhecht@heapy.com	6/8/2016 2	13-23 23 1	FIRST FLQ	SHOP AREA	Autodesk fRooms	5a5b2128-	ROOM - 185H	n/a	n/a	430.5215	
4	185I	tjhecht@heapy.com	6/8/2016 2	13-23 23 1	FIRST FLQ	SHOP AREA	Autodesk fRooms	5a5b2128-	ROOM - 185I	n/a	n/a	483.9663	
5	185D	tjhecht@heapy.com	6/8/2016 2	13-63 13 1	FIRST FLQ	STORAGE ROOM	Autodesk fRooms	5a5b2128-	ROOM - 185D	n/a	n/a	289.6344	
6	185A	tjhecht@heapy.com	6/8/2016 2	13-63 13 1	FIRST FLQ	FILING SPACE	Autodesk fRooms	5a5b2128-	ROOM - 185A	n/a	n/a	60.1528	
7	185C	tjhecht@heapy.com	6/8/2016 2	13-55 11 0	FIRST FLQ	OFFICE SPACES	Autodesk fRooms	5a5b2128-	ROOM - 185C	n/a	n/a	119.1458	
8	185B	tjhecht@heapy.com	6/8/2016 2	13-55 11 0	FIRST FLQ	OFFICE SPACES	Autodesk fRooms	5a5b2128-	ROOM - 185B	n/a	n/a	119.1458	
9	185	tjhecht@heapy.com	6/8/2016 2	13-31 11 0	FIRST FLQ	BREAKOUT SPACE	Autodesk fRooms	5a5b2128-	ROOM - 185	n/a	n/a	557.8943	
10	C100	tjhecht@heapy.com	6/8/2016 2	13-25 11 1	FIRST FLQ	CORRIDOR	Autodesk fRooms	5a5b2128-	ROOM - C100	n/a	n/a	375.4533	
11	190D	tjhecht@heapy.com	6/8/2016 2	13-63 13 1	FIRST FLQ	FILING SPACE	Autodesk fRooms	5a5b2128-	ROOM - 190D	n/a	n/a	119.0669	
12	190E	tjhecht@heapy.com	6/8/2016 2	13-55 11 0	FIRST FLQ	OFFICE SPACES	Autodesk fRooms	5a5b2128-	ROOM - 190E	n/a	n/a	119.0669	
13	190F	tjhecht@heapy.com	6/8/2016 2	13-55 11 0	FIRST FLQ	OFFICE SPACES	Autodesk fRooms	5a5b2128-	ROOM - 190F	n/a	n/a	118.9845	
14	190A	tjhecht@heapy.com	6/8/2016 2	13-31 11 0	FIRST FLQ	BREAKOUT SPACE	Autodesk fRooms	5a5b2128-	ROOM - 190A	n/a	n/a	664.8889	
15	190B	tjhecht@heapy.com	6/8/2016 2	13-63 13 1	FIRST FLQ	LOCKER ROOM	Autodesk fRooms	5a5b2128-	ROOM - 190B	n/a	n/a	313.6019	
16	190	tjhecht@heapy.com	6/8/2016 2	13-23 23 1	FIRST FLQ	SHOP AREA	Autodesk fRooms	5a5b2128-	ROOM - 190	n/a	n/a	3369.2286	



# Follow-up

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# Installation Mission Effectiveness

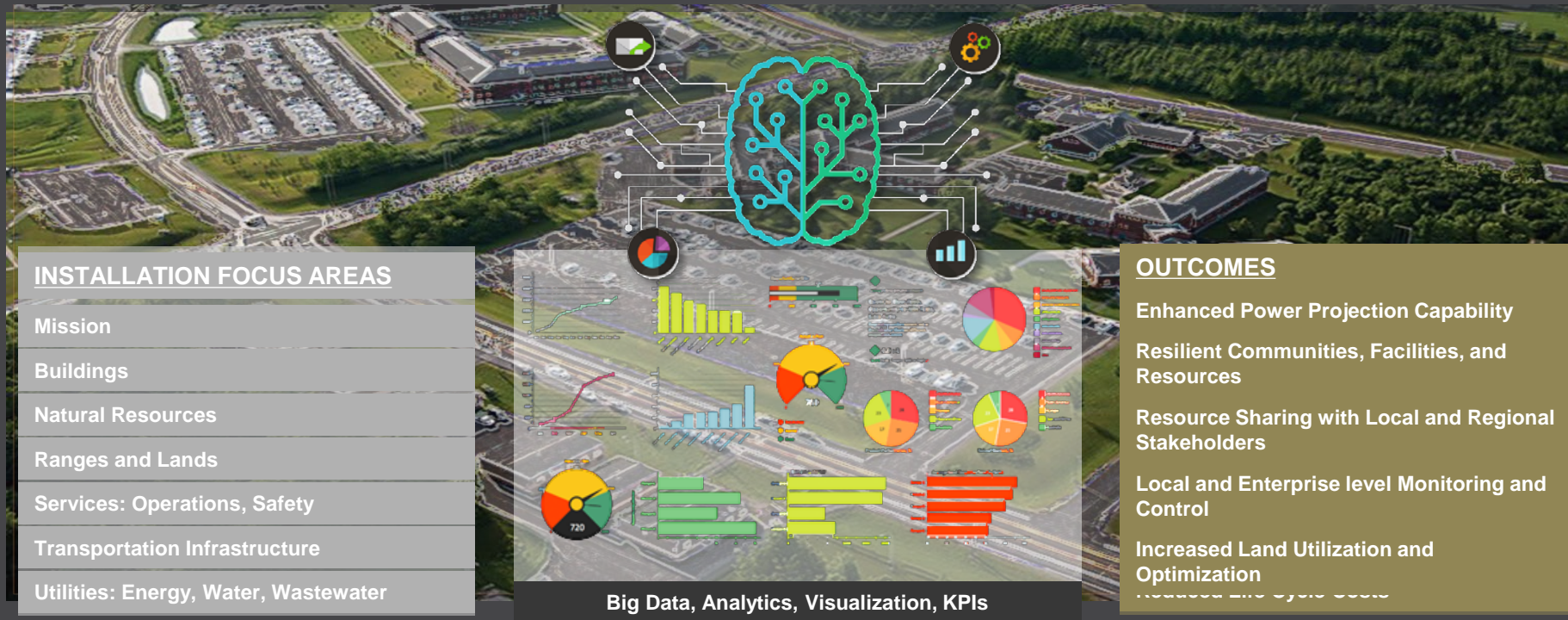
## Virtual Testbed for Installation Mission Effectiveness

Presented by Buddy Bartels



# Virtual Testbed for Mission Effectiveness

Establish an **Installation Common Operating Picture** to automatically identify **integrated optimization choices** using Big Data, Predictive Analytics, and Artificial Intelligence.



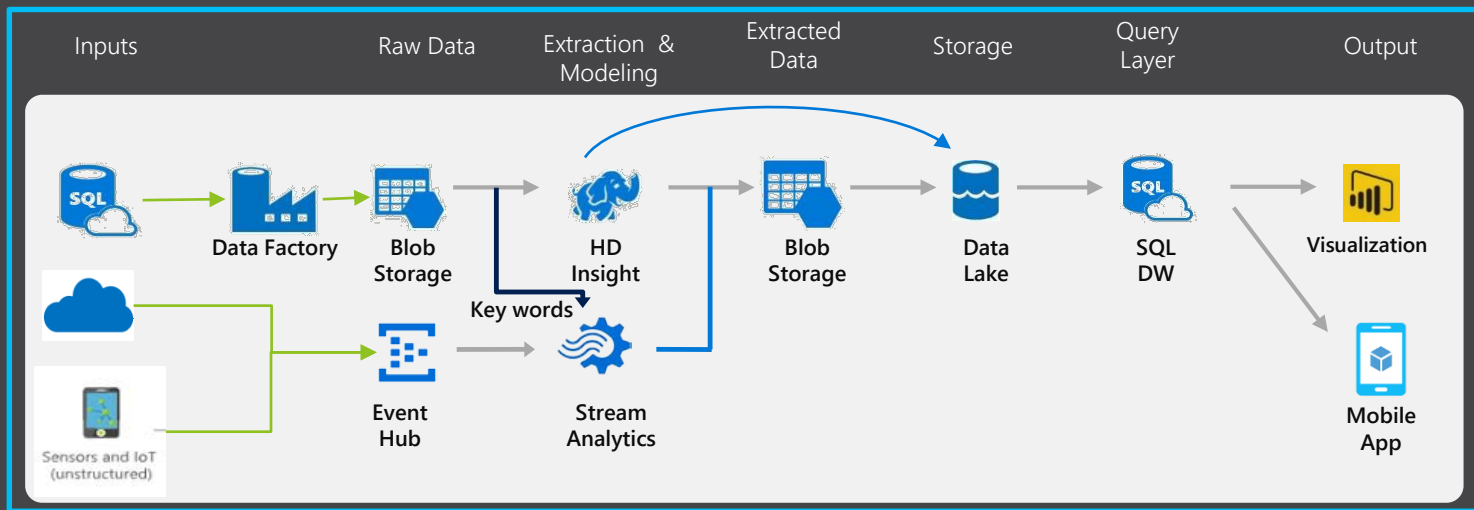
# Decision Architecture

**The current situation:** Individual stovepipes isolate information, require manual efforts to synthesize, and generally make holistic decision making impossible. Decision-makers need to understand the greatest threats to resiliency, best return on investment, potential future issues with infrastructure, and current and future resource demands that effect levels of service.

## Example Sources

- Facility Condition
- Existing Work Orders
- Security Threats
- Energy and Water Consumptions
- Emergency Services
- Training Operations
- Transportation
- Base Services
- Equipment Sensor Data
- Key Words
- News & Weather
- Web Feeds

**The objective:** Develop an integrated model of installation resources, assets, and services, along with processes to transfer and ingest data from existing sources. Leverage machine learning to develop insights of behaviour and impacts across business lines to provide installation personnel with knowledge and insights about how to optimize operations.



The cloud provides the tools and elasticity to meet Army-scale problems





# BUILDER Data Integration Proof of Concept

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Live Demonstration



# Ft. Hood Scenario Analysis

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Live Demonstration



## Quick Question

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What is the interest level in a 1 day training course next year?



# Thank You

## Next Summit Summer @ Keck Center in DC August 20-21, 2019

Please send feedback and future discussions to:  
[info@digonsystems.com](mailto:info@digonsystems.com)

