FED iFM

Moving Data through Early Planning into Design and Operations

Stephen R Hagan FAIA
Kimon Onuma FAIA
Russell Manning

Federal Facilities Council

U.S. Department of Agriculture
- Agricultural Research

U.S. Department of the Air Force
- Air National Guard; Installations and Management Support
- Office of the Civil Engineer

U.S. Department of the Army
- Assistant Chief of Staff for Installations Management
- Army Corps of Engineers

U.S. Department of Commerce
- Office of Real Estate Policy
- National Oceanic and Atmospheric Administration

U.S. Department of Defense
- Washington Headquarters Services

U.S. Department of Energy
- Office of Management
- National Nuclear Security Administration
- Office of Science

U.S. Department of Homeland Security
- Science and Technology Directorate
- Customs and Border Protection
- U.S. Coast Guard

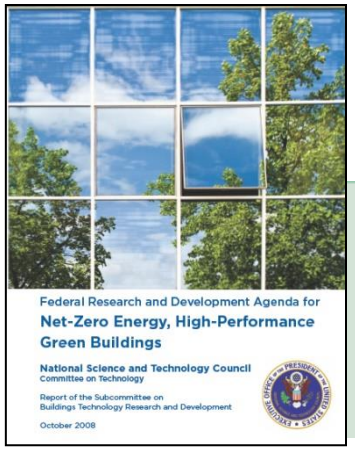
U.S. Department of Health and Human Services
- National Institutes of Health
- **Indian Health Service**

U.S. Department of Navy
U.S. Department of State
U.S. Department of Veterans Affairs
Architect of the Capitol
General Services Administration
National Aeronautics & Space Administration
Smithsonian Institution

FED iFM

What is the Scale of Federal Facilities?

	U.S. Commercial (Millions)	Federal Facilities
• Number of Bldgs	4.9	505,559
• Total Square Feet (billions SF)	71.7	3.87



Characteristics of U.S. Government Real Assets Worldwide (2006)

Total Federal Assets	Total Building Assets	Total Land Records	Total Area of Building Assets
1,253,821	505,559	239,899	3.87 billion square feet

Source: GSA Federal Real Property Council (FRPC) 2007, www.gsa.gov/gsa/cm_attachments/GSA_DOCUMENT/FRPP112007_R2-tI3-v_0Z5RDZ-i34K-pR.pdf

FED iFM

How Well are Federal Facilities Performing? And How Well are We Maintaining Them?

2012

2008

2004

FED iFM

Presentation Purpose and Outcomes

- Introducing FED iFM
  - Outline a Strategic Vision
  - Build Awareness
  - Enlist Support
  - Gather input and feedback

FED iFM

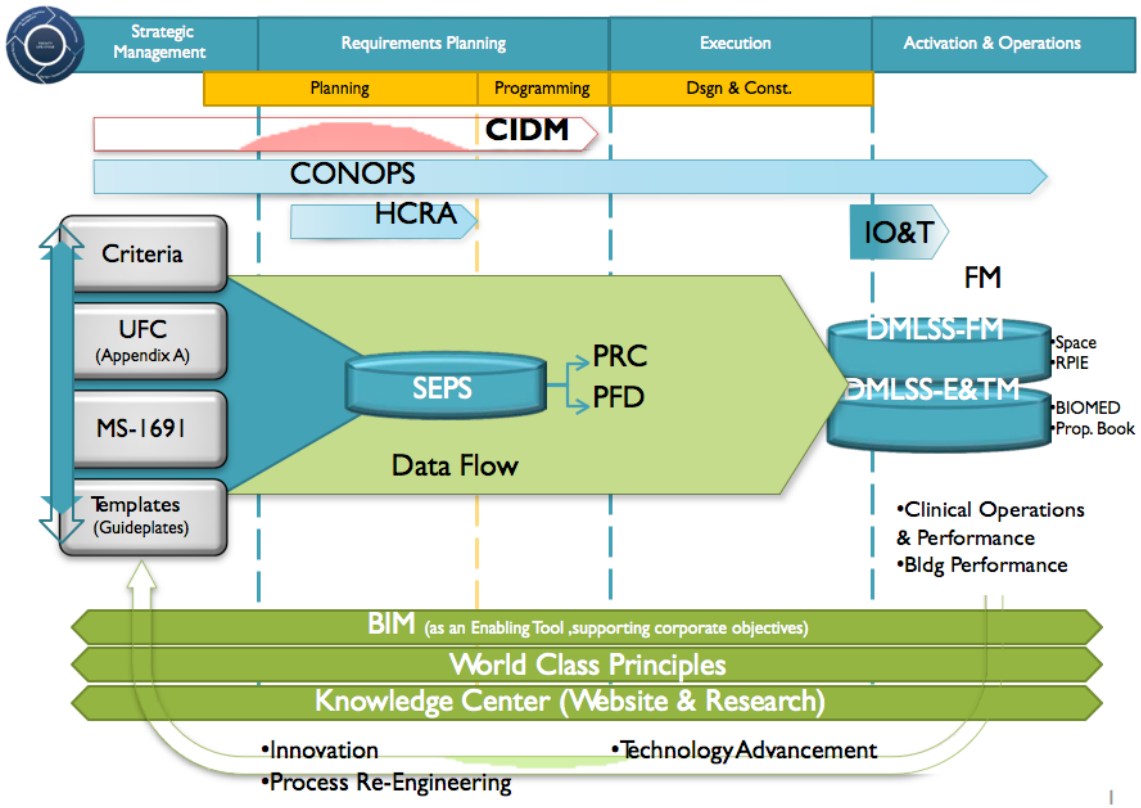
Data and Facility Lifecycle

- Building on Strategic Plans and Roadmaps for Department of Defense Military Health System and VA

FED iFM

Data and Facility Lifecycle

FED iFM



SEPS
Strategic
Plan
2013-2017
facilities.health.mil

Goals of FED iFM

- Introduce a strategic vision for FED iFM
- Share the results of current federal agency initiatives that are striving for the FED iFM vision
- Engage with private sector owners, architects and professional organizations to build a bridge of collaboration and shared interests in achieving the FED iFM vision; and
- Enlist technology service providers to build platforms, applications (apps) and app marketplaces to access agency data repositories and to foster and enable the realization and success of the FED iFM vision

What is FED iFM ?

- Integrated Facility Management for Federal Agencies and the Private Sector
- A Community of Practice
- A Focus on Moving Data from Early Planning through Design, Construction and into Operations and Facility Sustainment
- A Vision of a Technology "hub"—a Software and "App" Ecosystem--for *Rapid and Agile Deployment of Tools and Innovative Practices to Dramatically Improve Efficiency and Effectiveness*

What is FED iFM ? (cont)

- At the outset, focus on Health Care Facilities at the DoD Military Health System and VA and partner with GSA, Smithsonian Institution, NAVFAC, Indian Health Service.
- A broader horizon for all Federal Facilities and the common and shared issues and challenges that need to be addressed
- Founding Stakeholders are: Federal Facility Council (FFC), NIBS Committees, AIA and IFMA
- Open source as well as proprietary commercial technologies
- Cloud- and App-based Agile Environments

FED iFM 2014 Industry Outreach

- Federal Facilities Council
- Private health care owners
- Orgs: AIA AGC IFMA FIATECH NIBS WBDG OGC SAME
- A/Es, CM, constructors, facility managers
- Consultants
- Technology Providers

www.wbdg.org/fedifm (Sign up!)

Federal Integrated Facilities Management (FED iFM)

Russ Manning

Chief, Operations & Life Cycle Integration Branch

06 February 2014

Challenge

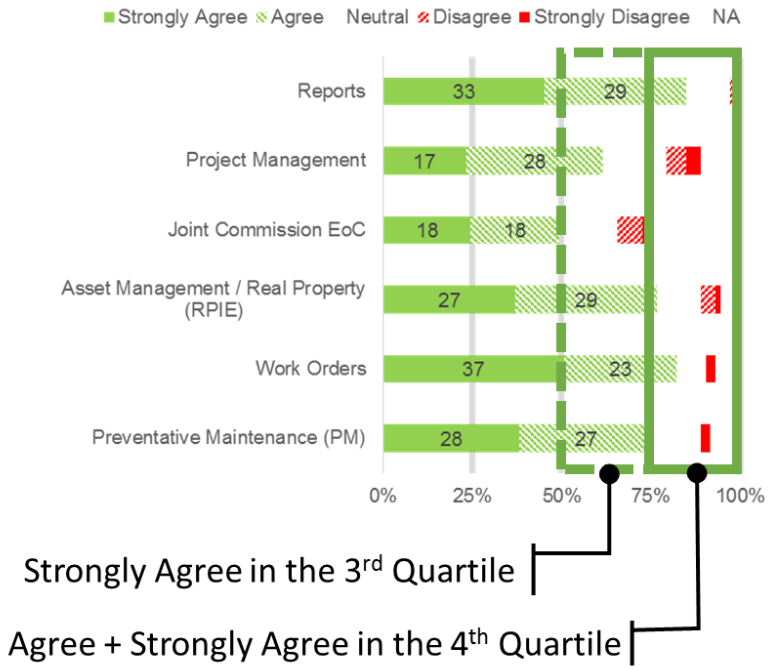
- Integrated Facility Management
  - Computerized Maintenance Management System (CMMS)
    - The CMMS component provides the means to manage the data relating to the real property installed equipment (RPIE) for the facility and its associated preventative maintenance work orders, project management, etc..
  - Computer-Aided Facility Management (CAFM) system
    - The CAFM component provides a means to manage the space utilization for the facility in a graphical manner and link to relevant CMMS data. The CAFM also provides a means for the DoD-MHS to comply with the DoD OSD/IE Real Property Inventory Requirements (RPIR).

Major Element Tasks to Support

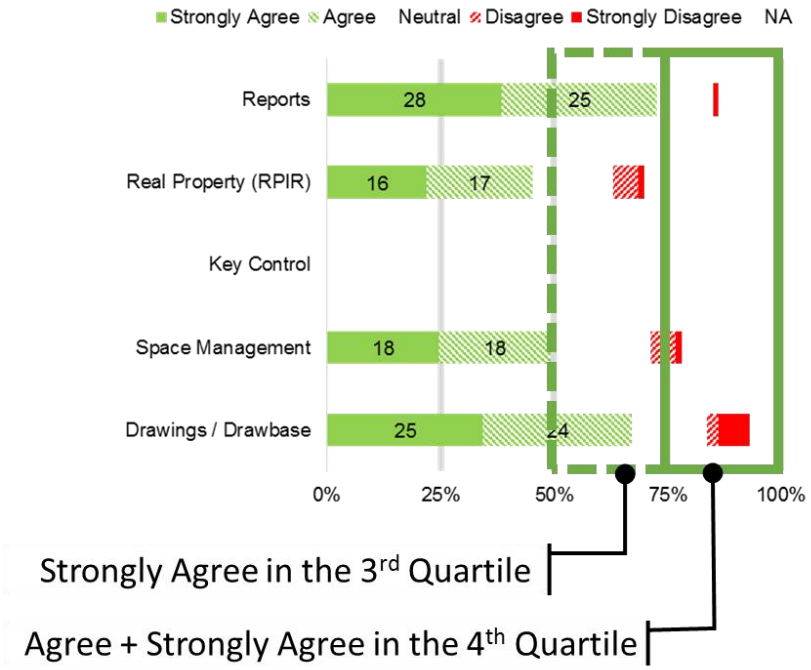
- CMMS
  - Preventative Maintenance (PM)
  - Work Orders
  - Asset Management / Real Property (RPIE)
  - The Joint Commission (TJC) Environment of Care (EoC)
  - Project Management
  - Reports
  - Etc.
- CAFM
  - Drawings / Drawbase
  - Space Management
  - Key Control ♣
  - Real Property Inventory Requirements (RPIR) Fields
  - Reports
  - Etc.

Current User Feedback "Supports Doing the Job"

CMMS



CAFM



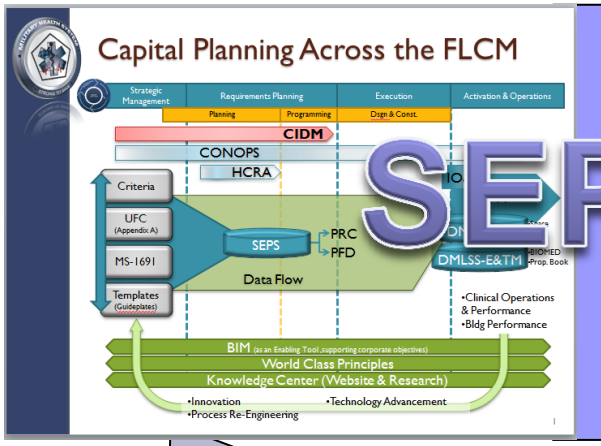
Vision / Concepts / Goals

- Integrating FM solutions
- Shared data set across tools
  - NOT each tool capturing the same data
- Best tools for the given tasks
  - Sharing data from central data repository
- Web-centric solutions
- Secure to DoD Standards
- Working collaboratively with other Federal FM community partners

Broader Integration Vision

Objective: Effective **Data** Exchange across the Life Cycle

Strategic Management	Requirements Planning	Execution	Activation & Operations



SEPS

BIM
GIS
COBIE
ETC.

FED *i*FM

Russell Manning DHA
Kimon Onuma FAIA

FED iFM

Department of Defense Military Health
Current Work Order Process

Imagine if this can be reduced by 30% per year

114,322 days per year to manage DMLSS FM Work Orders

114,322 Days x $992 Per Day Full Burdened Rate = $113,407,424

Calculated as 8 hour days

16,332 Days + 32,663 Days + 48,995 Days + 16,332 Days

DoD Wide 783,917 Work Request in 2012

Go back to Workstation Enter into DMLSS FM

Send Field Tech to Respond

Close out Work Order

Hosted DMZ Test Environment from V3.5-v3.9

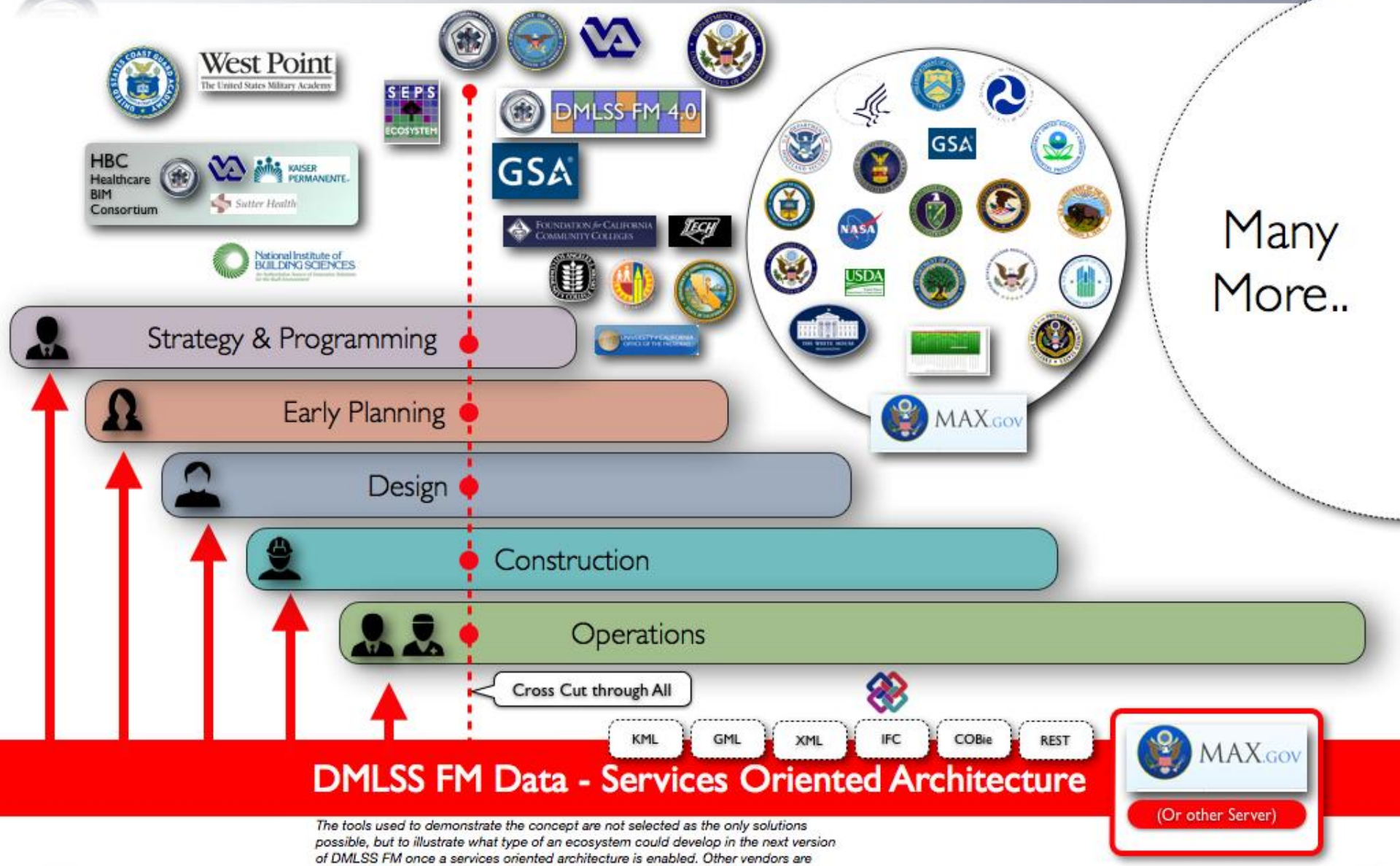
DMLSS FM Data - Services Oriented Architecture

MAX.GOV

(Or other Server)

The tools used to demonstrate the concept are not selected as the only solutions possible, but to illustrate what type of an ecosystem could develop in the next version of DMLSS FM once a services oriented architecture is enabled. Other vendors are encouraged to demonstrate how their solutions fit into the DMLSS FM Ecosystem.

Other Agencies and Potential Connections



The tools used to demonstrate the concept are not selected as the only solutions possible, but to illustrate what type of an ecosystem could develop in the next version of DMLSS FM once a services oriented architecture is enabled. Other vendors are encouraged to demonstrate how their solutions fit into the DMLSS FM Ecosystem.

Portfolio and Life Cycle

Example of how existing Redacted DMLSS FM Data was used to link from world level down to equipment

6

DMLSS FM 4.0

Hosted DMZ Test Environment from V3.5-v3.9

DMLSS FM Data - Services Oriented Architecture

MAX.GOV

(Or other Server)

The tools used to demonstrate the concept are not selected as the only solutions possible, but to illustrate what type of an ecosystem could develop in the next version of DMLSS FM once a services oriented architecture is enabled. Other vendors are encouraged to demonstrate how their solutions fit into the DMLSS FM Ecosystem.

The Technology is Available Today to Webservice Enable Complex Data

Enabled by GPS

Is this a Dashboard, GIS, BIM, or Facility Application?
It is all and more & DMLSS FM 4.0 should function like this.

Dashboard
Live Data, Review, Address, Links
Ratings, Cost, Photos

Location
Maps, Google, Bing, ESRI + More
Filter and Create Map on Fly

Facility Data
Contact, Menu, Live Reservations
Live Reviews, Website Link

Much More
Map, Directions, Transit,
Write Review, Add your Photos

The servers are accessible 99.9% of the time. IT just works.

Zero training Needed.

Automating Machine to Machine Communication lets humans focus on the task at hand.

Users have come to expect this level of interactivity with data.

Asking for direction can launch another mapping app to show you live traffic.

Searches through **massive amount** of facility data from multiple sources in real time, on your phone....

Knows where you are.

Guides you on what to do.

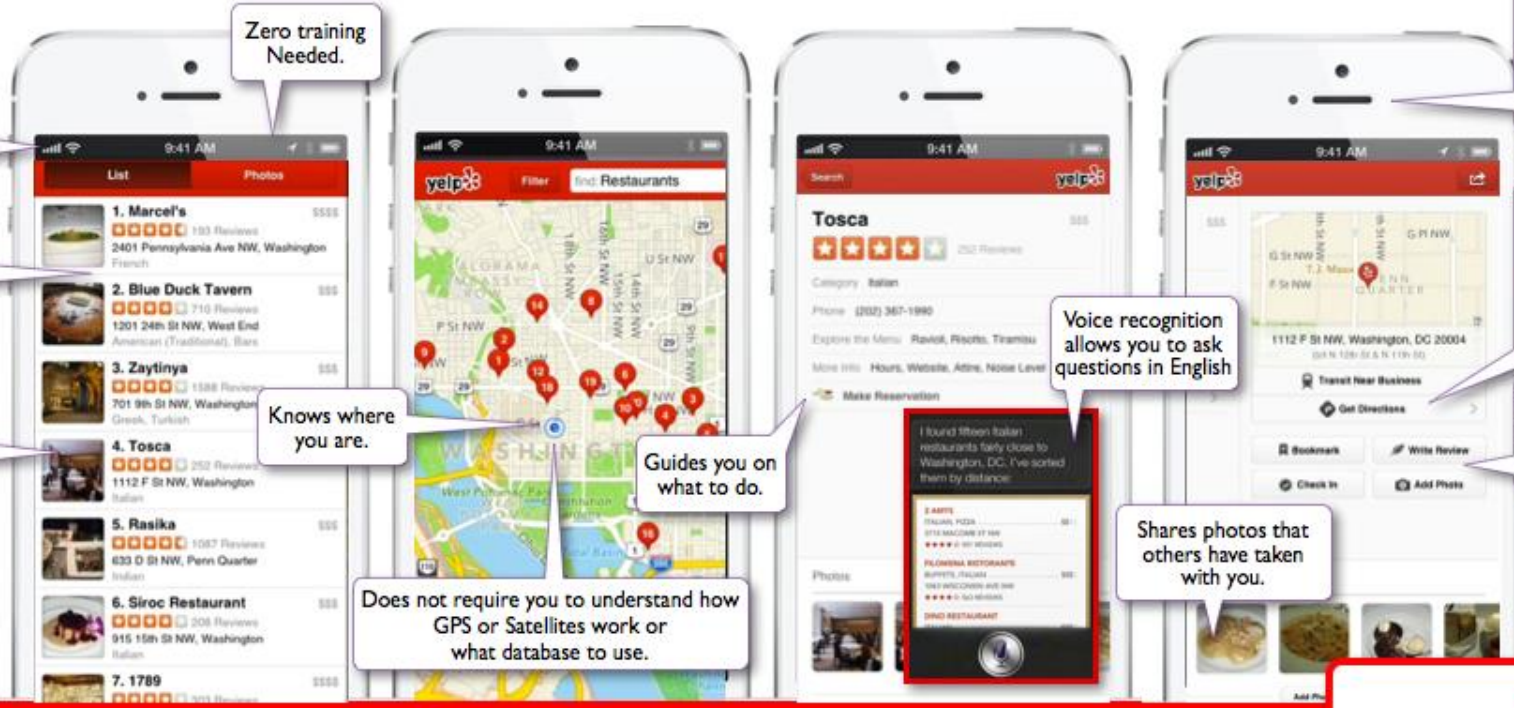
Voice recognition allows you to ask questions in English

Lets you add your own data to share with others.

Shares photos that others have taken with you.

And it is free.

Does not require you to understand how GPS or Satellites work or what database to use.

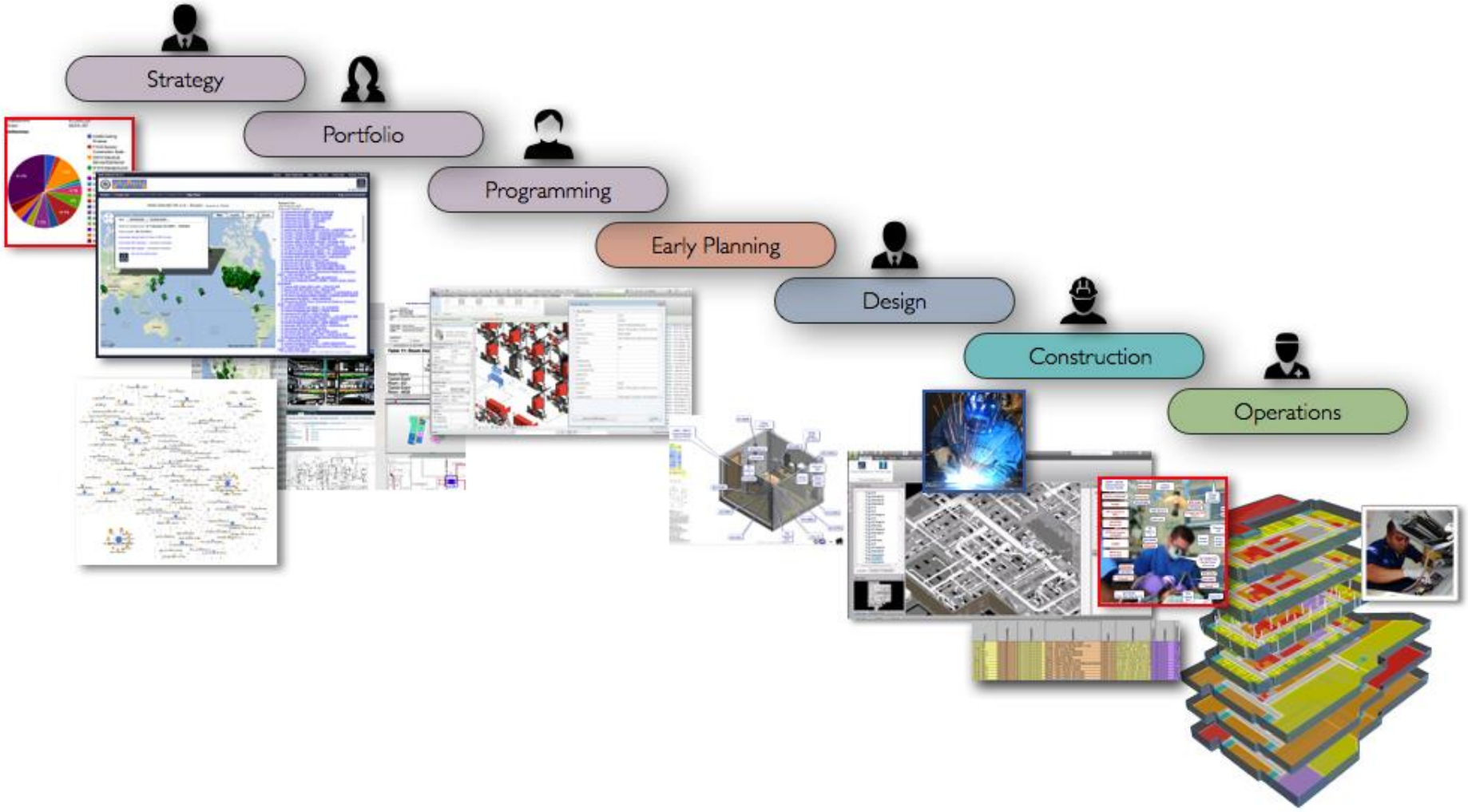


DMLSS FM Data - Services Oriented Architecture

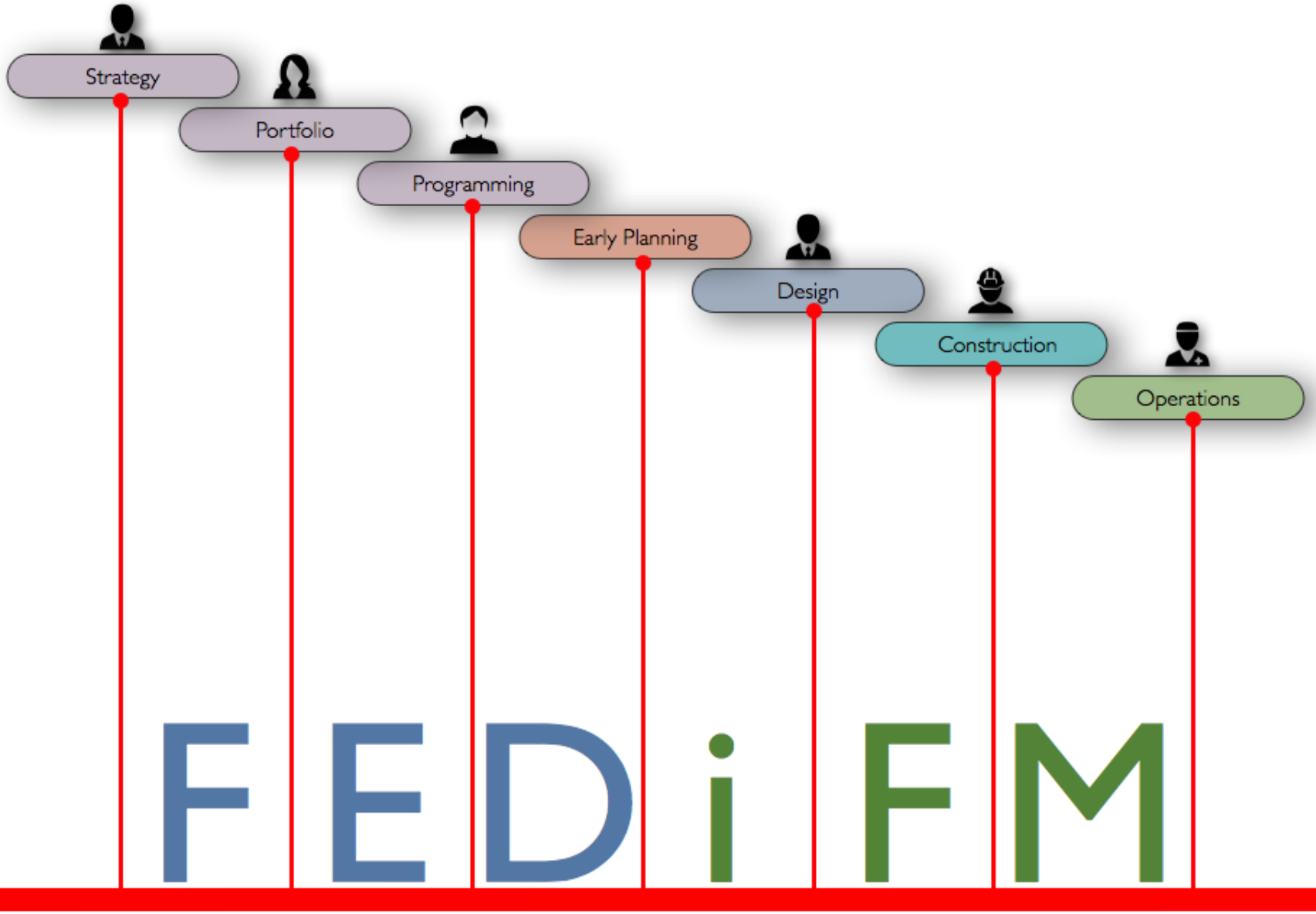
Screenshots of Yelp iOS App

The tools used to demonstrate the concept are not selected as the only solutions possible, but to illustrate what type of an ecosystem could develop in the next version of DMLSS FM once a services oriented architecture is enabled. Other vendors are encouraged to demonstrate how their solutions fit into the DMLSS FM Ecosystem.

Data for the Lifecycle



FED iFM - Data Mapping



FM

Section 02:
Equipment Definitions

GSA National Equipment Standard

www.gsa.gov/bim

Design Build Operate

FED iFM - Data Mapping

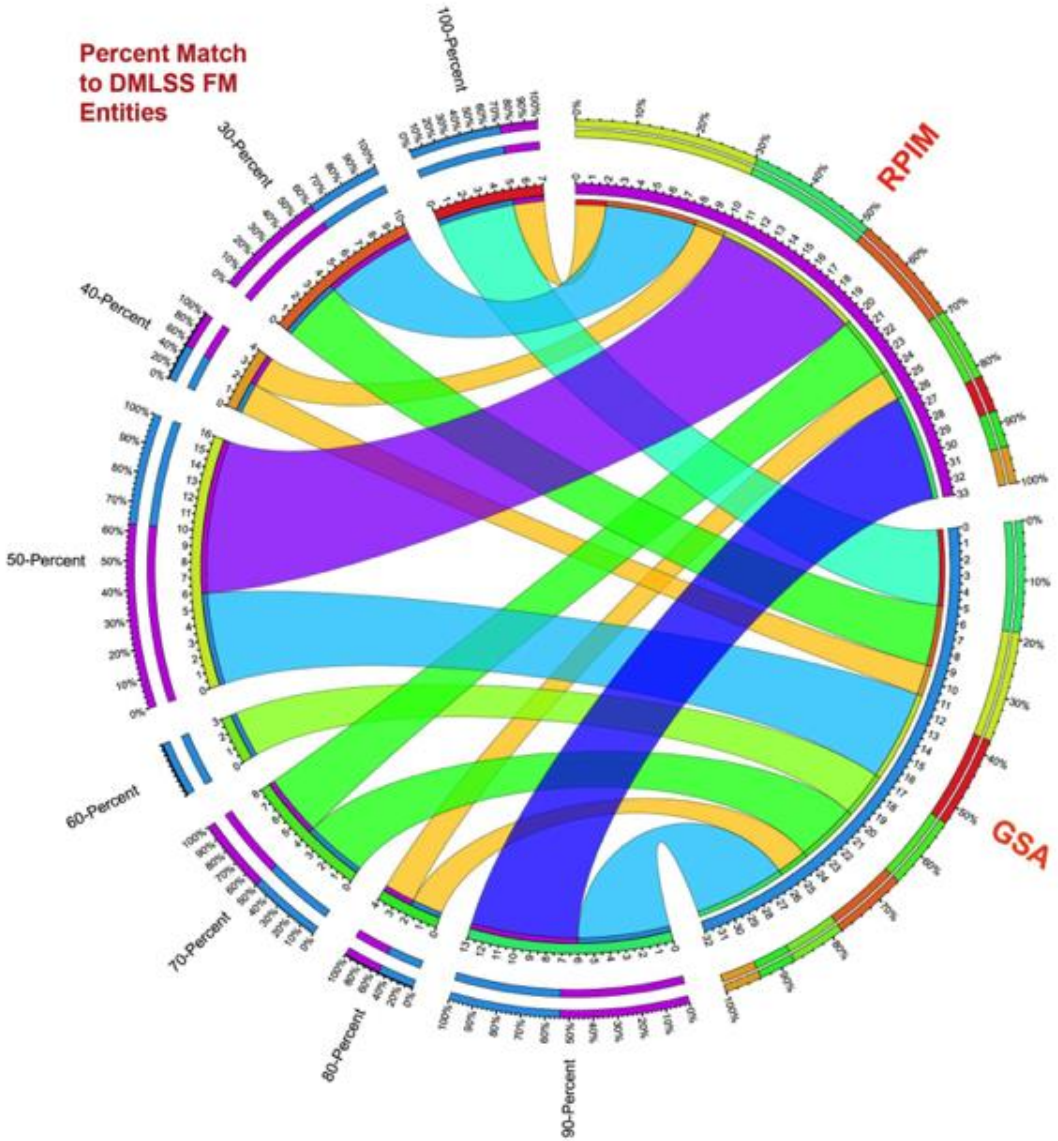
RPIM

DMLSS - FM

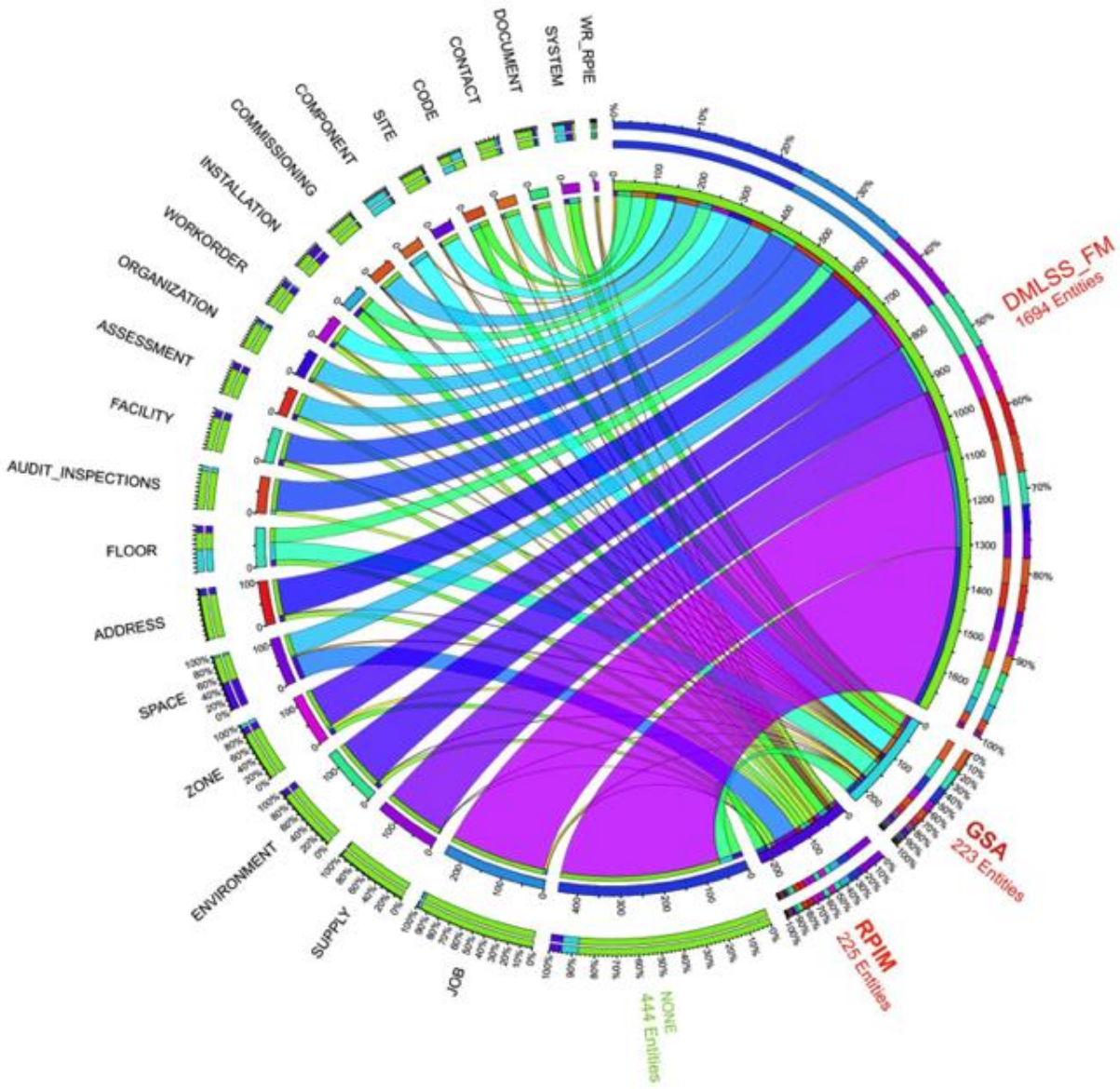
GSA NEST

No Single System
Covers Everything

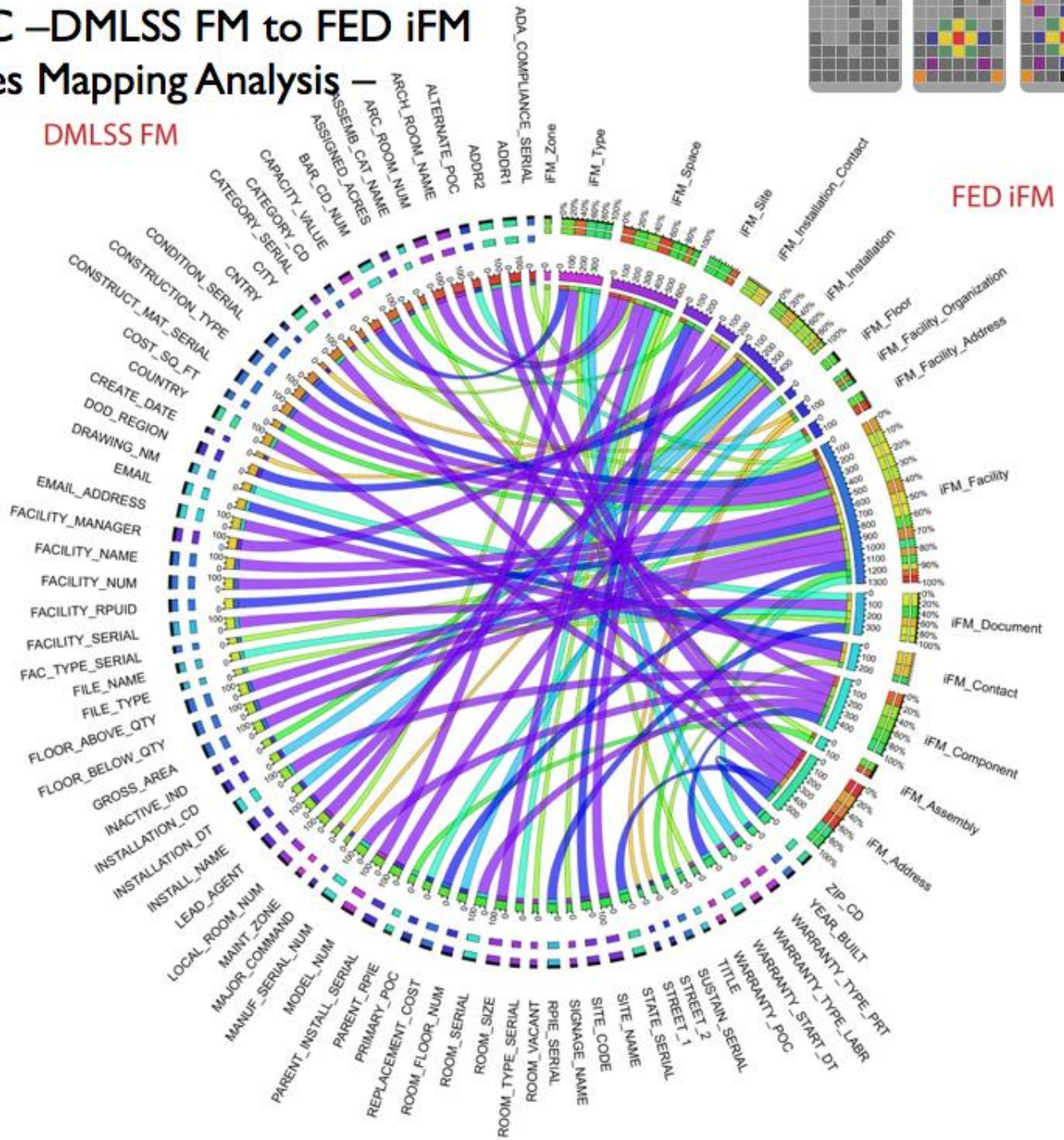
Step A - Map DMLSS to RPIM and GSA Entities
Percentage of Match Confidence Level



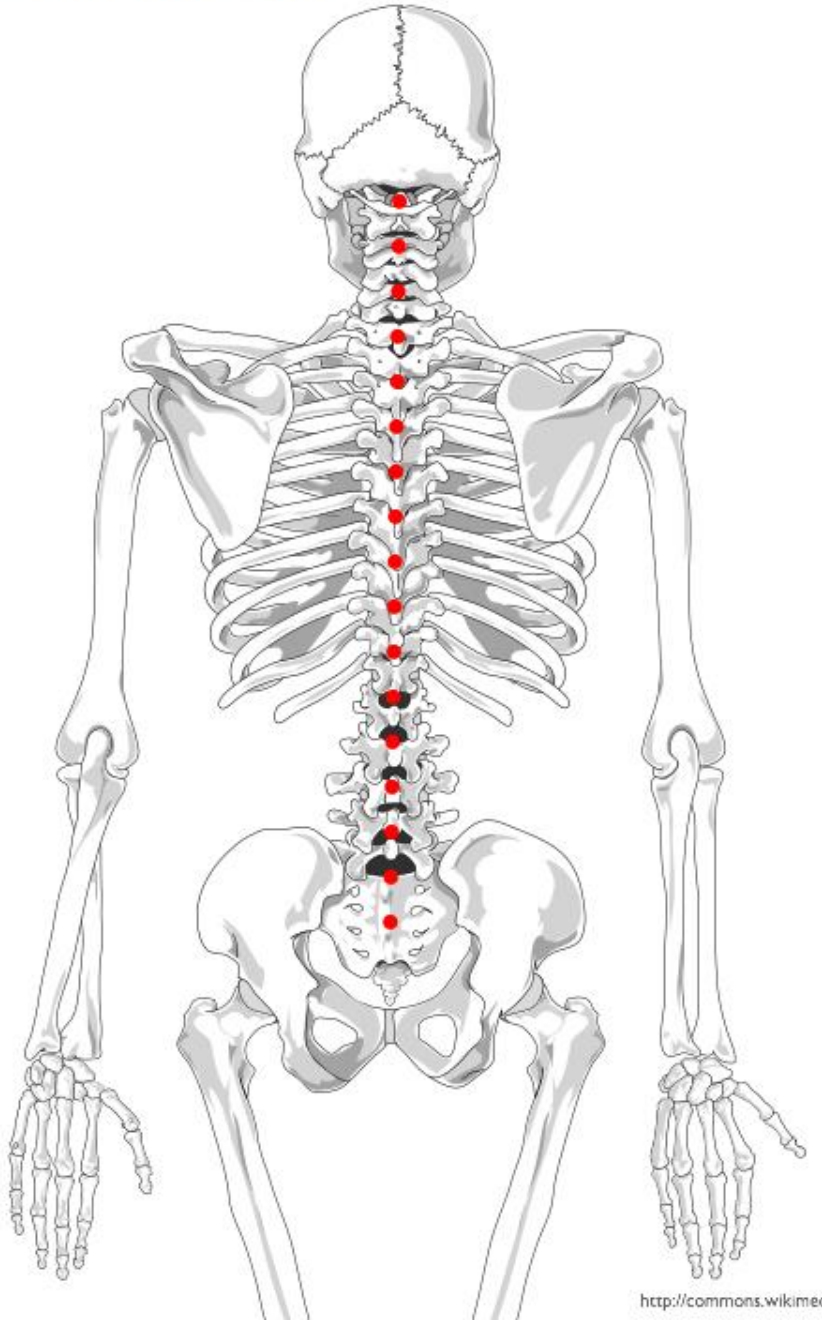
Step B - Map to Common FED iFM Entities



Step C –DMLSS FM to FED iFM Entities Mapping Analysis –

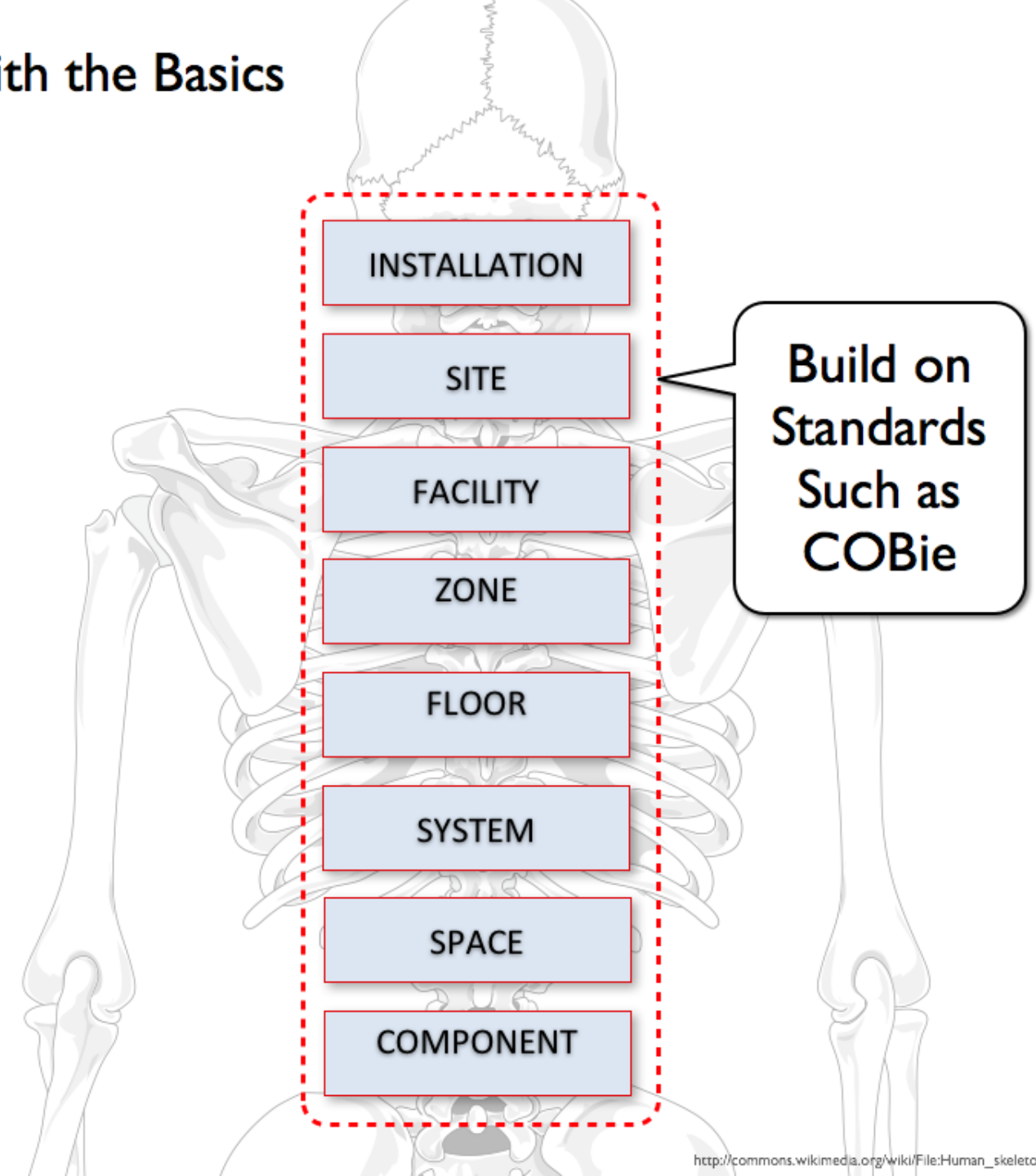


FED iFM is Like a Backbone



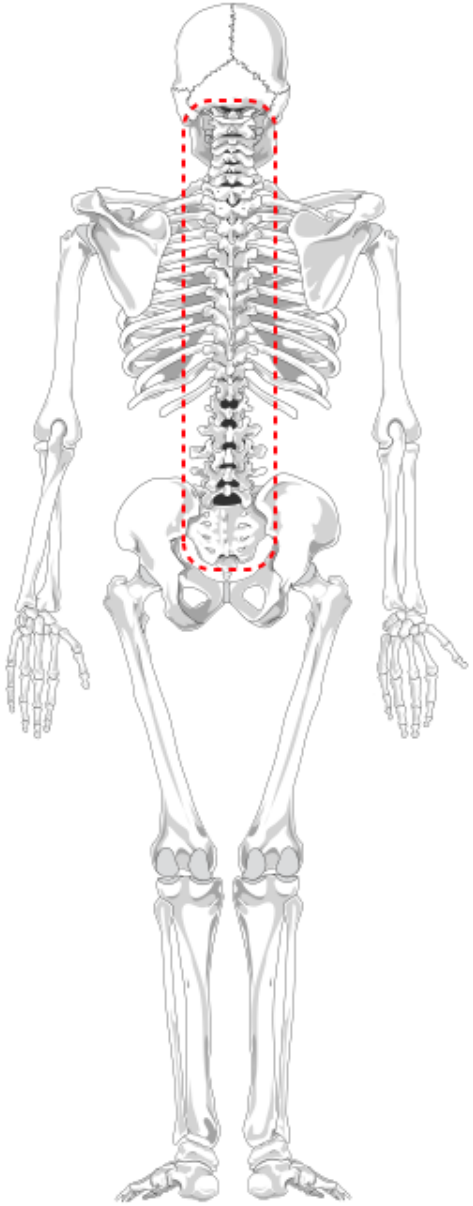
http://commons.wikimedia.org/wiki/File:Human_skeleton_back_no-text_no-color.svg

Start with the Basics



http://commons.wikimedia.org/wiki/File:Human_skeleton_back_no-text_no-color.svg

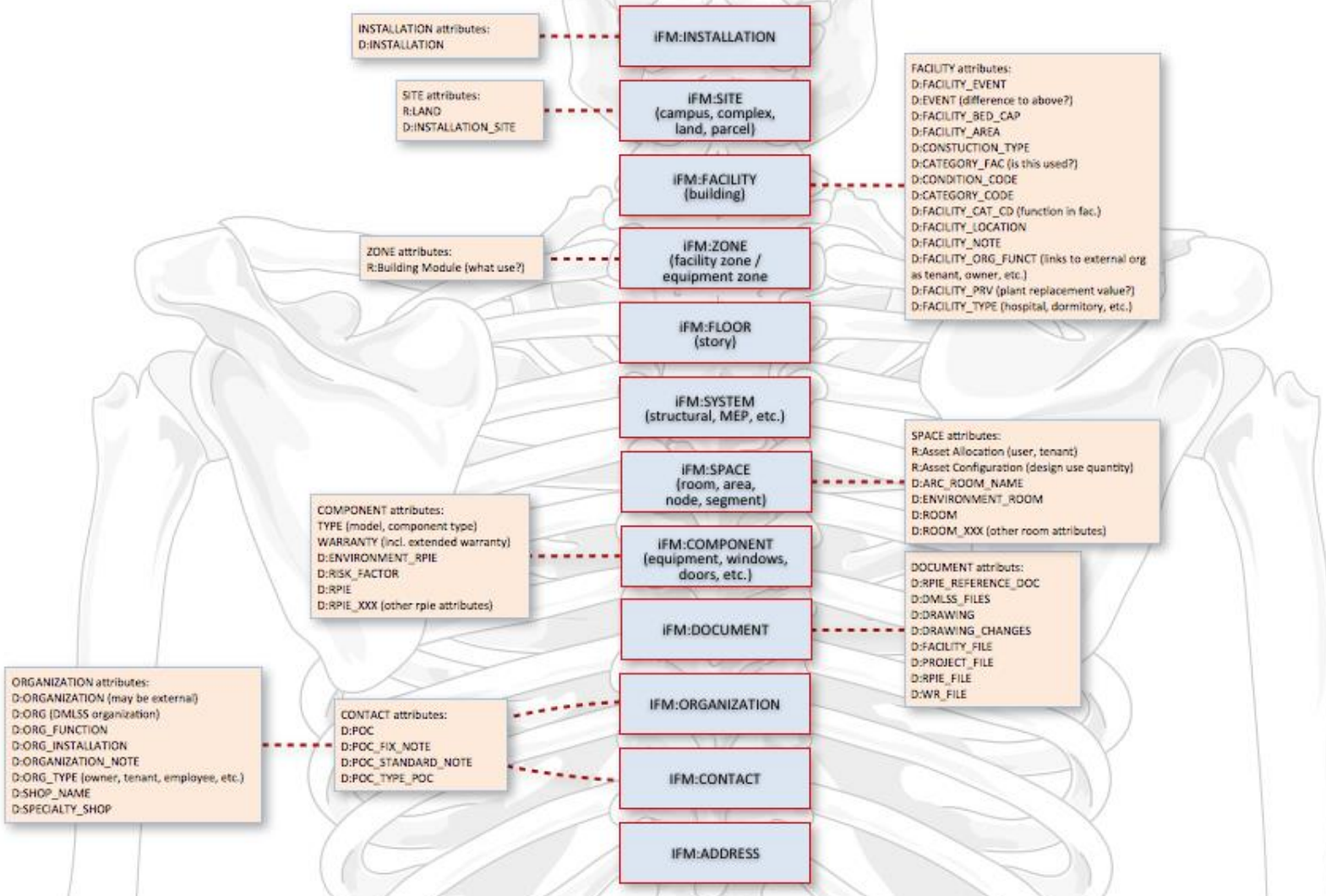
Build a Backbone First



- iFM:INSTALLATION
- iFM:SITE (campus, complex, land, parcel)
- iFM:FACILITY (building)
- iFM:ZONE (facility zone / equipment zone
- iFM:FLOOR (story)
- iFM:SYSTEM (structural, MEP, etc.)
- iFM:SPACE (room, area, node, segment)
- iFM:COMPONENT (equipment, windows, doors, etc.)
- iFM:DOCUMENT
- IFM:ORGANIZATION
- IFM:CONTACT
- IFM:ADDRESS

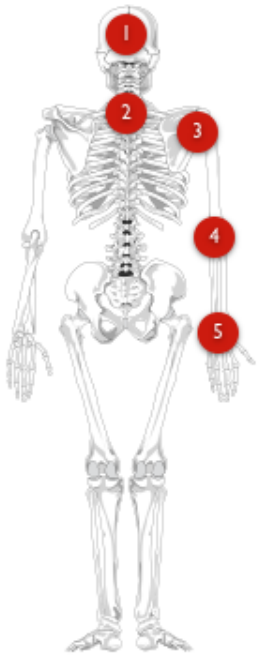
http://commons.wikimedia.org/wiki/File:Human_skeleton_back_no-text_no-color.svg

Expand with Attributes



http://commons.wikimedia.org/wiki/File:Human_skeleton_back_no-text_no-color.svg

Define Relationships



iFM:INSTALLATION

INSTALLATION attributes:
D:INSTALLATION

iFM:SITE
(campus, complex, land, parcel)

SITE attributes:
R:LAND
D:INSTALLATION_SITE

iFM:FACILITY
(building)

FACILITY attributes:
D:FACILITY_EVENT
D:EVENT (difference to above?)
D:FACILITY_BED_CAP
D:FACILITY_AREA
D:CONSTUCTION_TYPE
D:CATEGORY_FAC (is this used?)
D:CONDITION_CODE
D:CATEGORY_CODE
D:FACILITY_CAT_CD (function in fac.)
D:FACILITY_LOCATION
D:FACILITY_NOTE
D:FACILITY_ORG_FUNCT (links to external org as tenant, owner, etc.)
D:FACILITY_PRV (plant replacement value?)
D:FACILITY_TYPE (hospital, dormitory, etc.)

FACILITY types:
building
structure
linear structure

iFM:ZONE
(facility zone / equipment zone

ZONE attributes:
R:Building Module (what use?)

iFM:DOCUMENT

DOCUMENT attributes:
D:RPIE_REFERENCE_DOC
D:DMLSS_FILES
D:DRAWING
D:DRAWING_CHANGES
D:FACILITY_FILE
D:PROJECT_FILE
D:RPIE_FILE
D:WR_FILE

IFM:ORGANIZATION

IFM:CONTACT

IFM:ADDRESS

CONTACT attributes:
D:POC
D:POC_FIX_NOTE
D:POC_STANDARD_NOTE
D:POC_TYPE_POC

ORGANIZATION attributes:
D:ORGANIZATION (may be external)
D:ORG (DMLSS organization)
D:ORG_FUNCTION
D:ORG_INSTALLATION
D:ORGANIZATION_NOTE
D:ORG_TYPE (owner, tenant, employee, etc.)
D:SHOP_NAME
D:SPECIALTY_SHOP

iFM:FLOOR
(story)

iFM:SYSTEM
(structural, MEP, etc.)

iFM:SPACE
(room, area, node, segment)

SPACE attributes:
R:Asset Allocation (user, tenant)
R:Asset Configuration (design use quantity)
D:ARC_ROOM_NAME
D:ENVIRONMENT_ROOM
D:ROOM
D:ROOM_XXX (other room attributes)

iFM:COMPONENT
(equipment, windows, doors, etc.)

COMPONENT attributes:
TYPE (model, component type)
WARRANTY (incl. extended warranty)
D:ENVIRONMENT_RPIE
D:RISK_FACTOR
D:RPIE
D:RPIE_XXX (other rpie attributes)

Add Modules

iFM:WORKORDER
D:WR_RPIE

work order attributes:
D:COORDINATION (manager to liason)
D:CONTRACT_FM (contract information)
D:CLASS_TYPE
D:WR_RPIE
D:ASSIGNMENT
D:ASSIGNEMENT_REASON
D:CLOSE_OUT_REASON (cancelled, invalid, etc.)
D:COST_INFORMATION
D:FM_ESTIMATE (how is this used?)
D:IMPACT
D:IMPACT_REASON
D:IMPACT_TYPE
D:LABOR_ESTIMATE
D:PRIORITY_GROUP
D:PROJ_JOURN_ACTION
D:PROJ_PRIORITY_TYPE
D:PROJ_PROJ_CODE
D:PROJECT
D:PROJECT_XXX (all project related attributes)
D:RELATED_CAUSE
D:WORK_REQ
D:WORK_XXX (all work request related attrib.)
D:WR_ACTION (work request action)
D:WR_XXX (all WR related attributes)
D:WR_WR (preventive vs repair)

iFM:SUPPLY

SUPPLY attributes:
D:CUST_CAT (catalog items)
D:COMM_CLASS (supply categories)
D:CUSTOMER (supply – is this correct?)
D:EOR (ordered items)
D:EOR_CONTRACT (ordered items)
D:EOR_FUND_DATA
D:ITEM_LOC
D:ITEM_PACKAGING
D:ITEM_RECIPIENT
D:MTF_CAT (purchasable item)

IFM:REFERENCES: value lists, drop down):

REFERENCES attributes:
D:CAPACITY_UNIT
D:CHECKLIST_DESK
D:CHECKLIST_STATUS
D:RECORD_TYPE
D:SPECIFICATION_UNIT

POSSIBLE IFM ENTITIES

iFM:JOB
(job task, sched. maintenance)

JOB attributes:
D:MAINT_PROCEDURE
D:MAINT_PROC_NOTE
D:RPIE_SCHEDULE

iFM:AUDIT_INSPECTIONS

SAFETY attributes:
D:SAF_REQ_ROOM (is this safety req?)
D:SAFETY_CLASS
D:SAFETY_XXX (all safety attributes)
D:SURVEY

IFM:ENVIRONMENT

ENVIRONMENT attributes:
D:ENVIRONMENT_HAZARD

IFM:ASSESSMENT
(condition assessments, etc.)

iFM:CODE
(regulations)

iFM:COMMISSIONING

REAL PROPERTY ASSET
financial
legal
physical

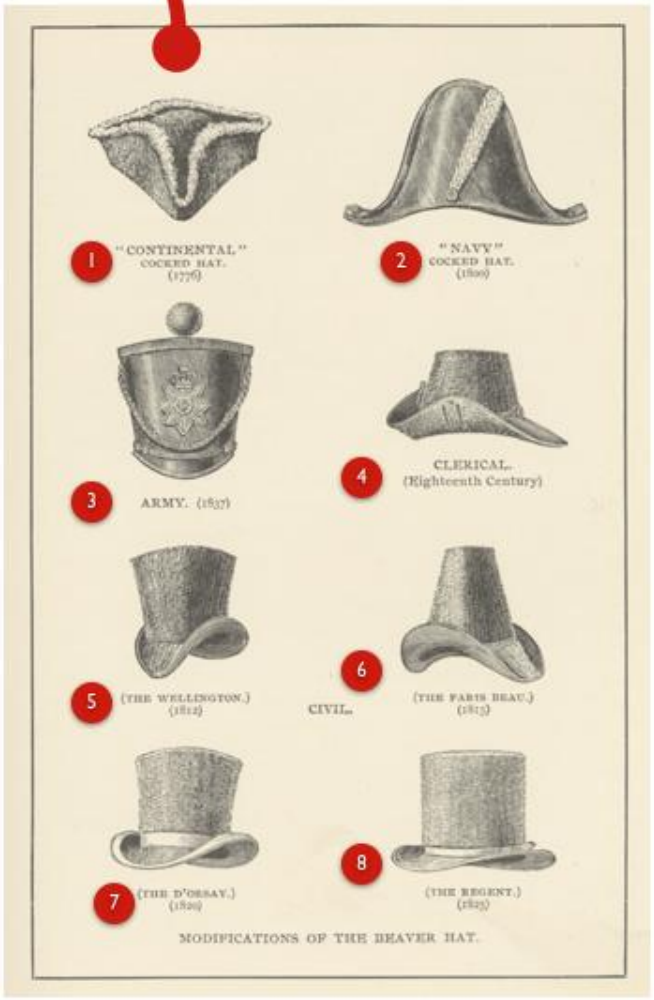
RPA-FINANCIAL attributes:
D:ELEMENT_OF_RESOURCE (expenditures)
R:Asset Review
R:Forcasting
R:Funding
R:Capitol Improvement
R:Disposal
R:Excess
D:FUND
D:PROJ_FUND_SOURCE
D:PROJ_FUND_ACT
D:PROJECT_FUND_REQ

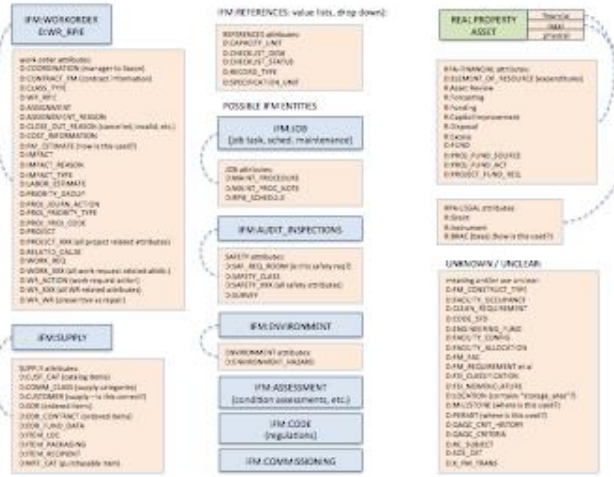
RPA-LEGAL attributes:
R:Grant
R:Instrument
R:BRAC (base) (how is this used?)

UNKNOWN / UNCLEAR:

meaning and/or use unclear:
D:FM_CONSTRUCT_TYPE
D:FACILITY_OCCUPANCY
D:CLEAN_REQUIREMENT
D:CODE_STD
D:ENGINEERING_FUND
D:FACILITY_CONFIG
D:FACILITY_ALLOCATION
D:FM_FAC
D:FM_REQUIREMENT et al
D:FSI_CLASSIFICATION
D:FSI_NOMENCLATURE
D:LOCATION (contains "storage_area"?)
D:MILESTONE (where is this used?)
D:PERMIT (where is this used?)
D:QAQC_CRIT_HISTORY
D:QAQC_CRITERIA
D:RC_SUBJECT
D:SOS_CAT
D:X_FM_TRANS

Modules Allow for Infinite Expansion on Top of Backbone





- Smithsonian Already has a Leading Initiative!
- VA and DoD are moving to Max.Gov!

Structured Work Processes for Pre Project Planning

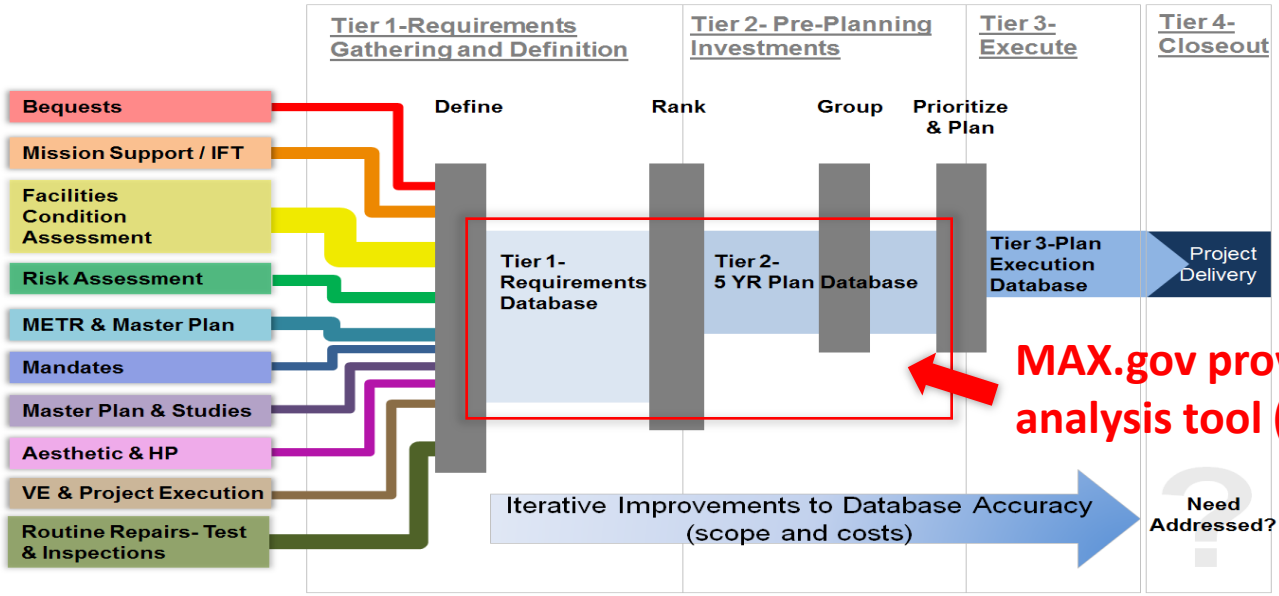
Facility Investments and Cost Engineering (FICE) is a branch that supports the three main divisions of OPDC. Through a structured process, it reviews all project requirements to establish project budgets and prioritizations for use by the IFTs in their pre project planning process: The pre project planning structured process includes:

Requirements (Tier 1)

1. Defining requirements to address needs based on risk,
2. Ranking these requirements,

Cost/Funding (Tier 2)

3. Forming projects based on highest ranking requirements and costs
4. Prioritizing and assigning funding source with FY for 5 year planning



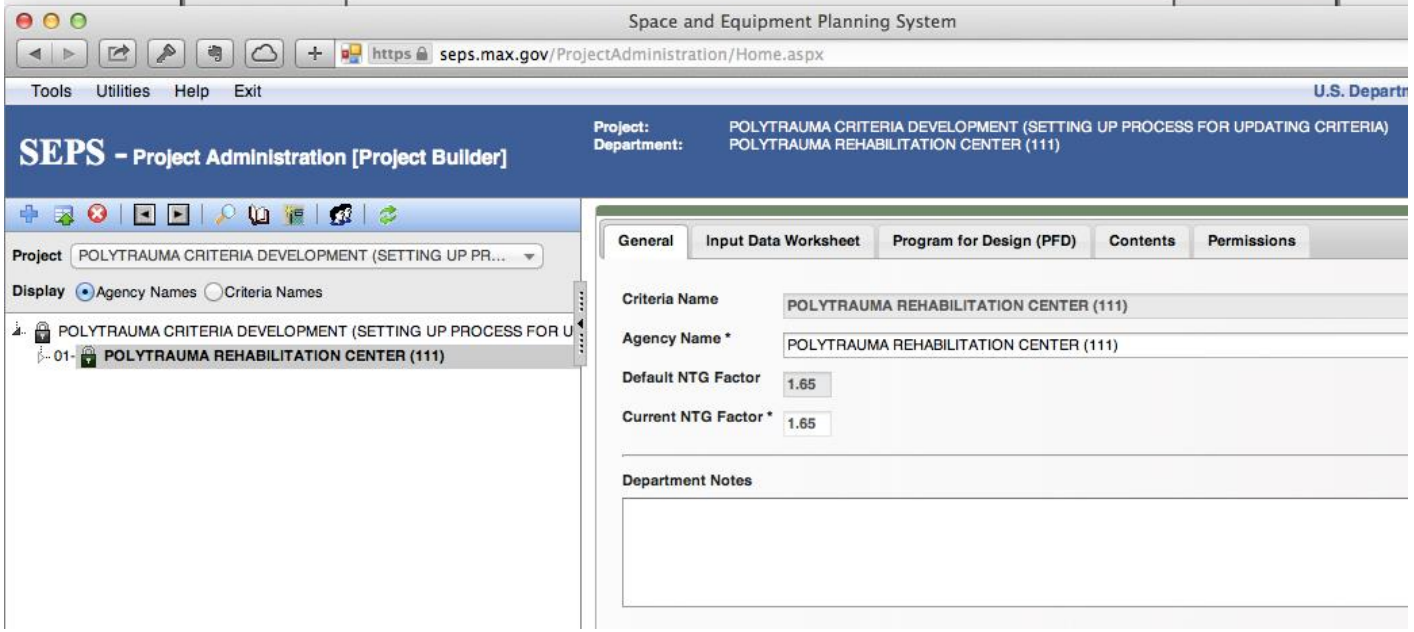
VA and DoD Also Leading the Way !!

FED iFM

VA | U.S. Department of Veterans Affairs

Department of Defense Military Health System

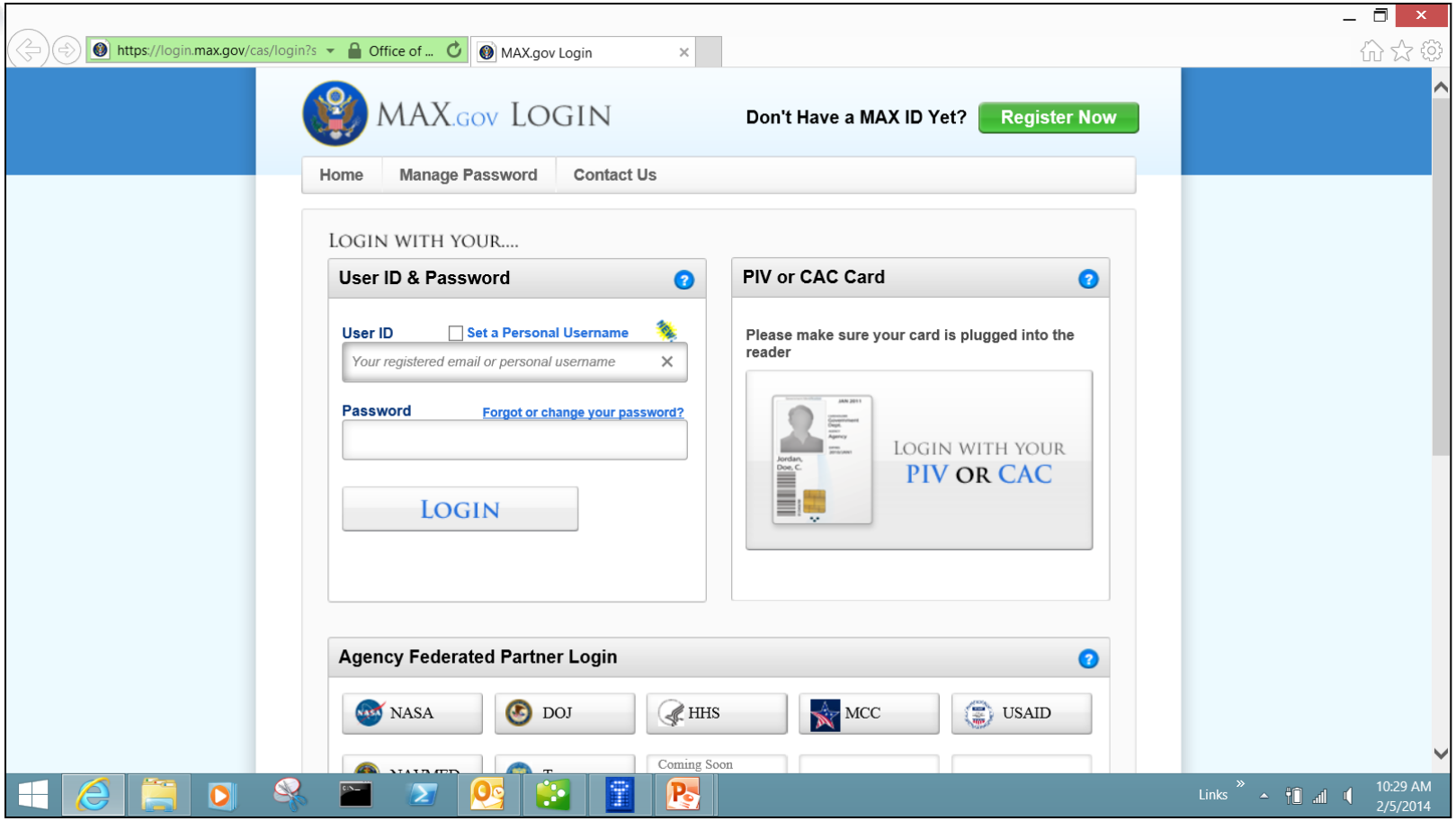
Welcome to the
Space and Equipment Planning System (SEPS)



FED iFM

- Security is Critical and a Top Priority!!!
  - Michael Chipley

Securing the Data – MAX.gov

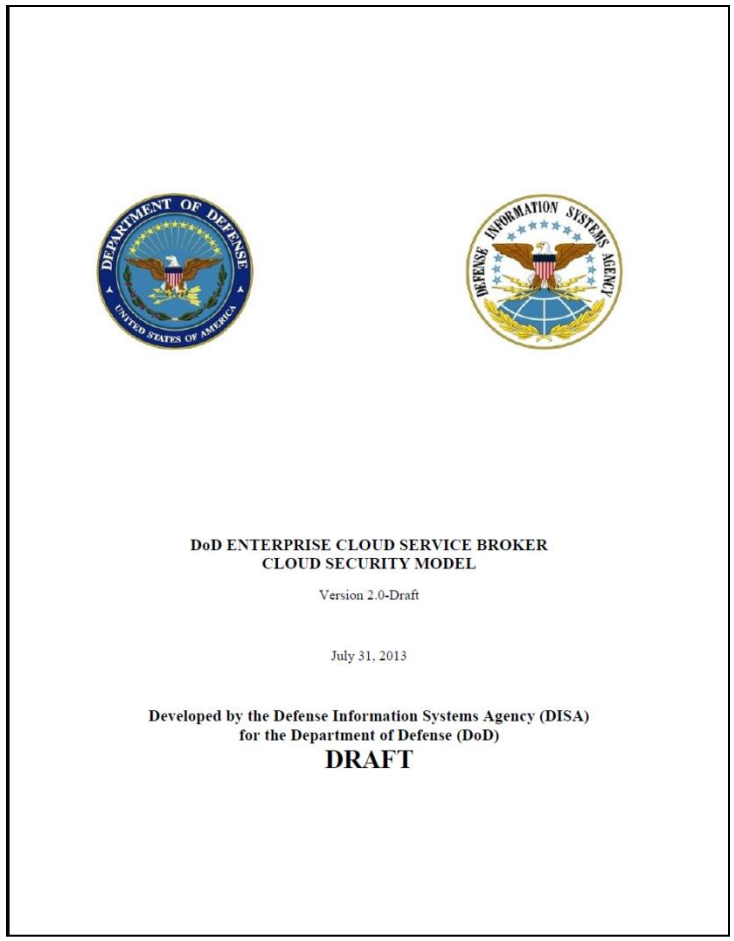


Security begins with Two Factor Authentication

Securing the Data - FedRAMP

MAX.gov is FedRAMP accredited to Mod-Mod-Mod

DoD Cloud Security Model



DoD ENTERPRISE CLOUD SERVICE BROKER
CLOUD SECURITY MODEL

Version 2.0-Draft

July 31, 2013

Developed by the Defense Information Systems Agency (DISA)
for the Department of Defense (DoD)
DRAFT

July 31, 2013

This document serves two purposes.

1. It describes the process the cloud service providers (CSP) follow to be listed in the Enterprise Cloud Service Catalog.
2. It describes the process the DoD cloud customer follows to engage the ECSB for cloud services.

It is expected that the security model described in this document will evolve post ECSB Initial Operating Capability (IOC) as the ECSB learns more about cloud

DoD Cloud Security Model

5.1.1 Max Data Type

The first aspect of the security model and impact levels is the type of information to be stored or hosted in the cloud. These are as follows:

☐ **Public information:** This refers to information that is intended for unrestricted public dissemination. This information does not require control of read access, yet does require access control with regard to access for change or delete.

☐ **Unclassified Private:** This refers to information that is not controlled unclassified information (CUI, see below), but requires more limited access than full public release.

☐ **Controlled Unclassified Information:** Controlled Unclassified information (CUI) is the categorical designation that refers to unclassified information that under law or policy requires protection from unauthorized disclosure as established by Executive Order 13556 (November 2010). Designating information as CUI is the responsibility of the owning organization. CUI contains a number of categories, including, but not limited to the following: Other information requiring explicit CUI designation; for example, For Official Use Only, Official Use Only, Law Enforcement Sensitive, Critical Infrastructure Information, and Sensitive Security Information.

DoD Cloud Security Model

5 Cloud Service Provider Qualification Definitions

Impact Level	Maximum Data Type and C-I-A	FedRAMP Secure Repository +Federal ATO +JAB Provisional Authorization	CNSSI 1253	Ongoing Assessment	C2 & NetOps / CND Integration	Architectural Integration	Policy, Guidance, and Operational Constraints
1	U-Public NA-L-x	L	Tailored Set with equivalency	IAW FedRAMP: 3rd party report for DoD review	IAW FedRAMP: Incident Reports, Vulnerability Scans, POA&Ms, FedRAMP package updates, network architecture updates, configuration updates, outage notifications; Limited bi-directional comms between CSPs & CND Tier II to include warnings and notifications	Two factor authentication for System Administrators	Selective STIGs/SRGs/Other measures or equiv; Law Enforcement access; Official notifications; Data locations; Data spills; Data disposition; Storage Hardware disposition
2	U-Private L-M-x	M	Same as Level 1	+ Limited ECSB assessments	+ User Level Intrusion Incidents	+ DoDI 8500.2 Passwords	+ Additional selective STIGs/SRGs/Other
3	CUI L-M-x	M	Tailored Set by cloud service type with equivalency	+ At least Annual 3rd party/ DoD Red Teams + Red Team of significant changes	+ Non-Compliance Incidents + Rx Unclassified Threat Info + NIST CSV or XML formats for SCM (future ARF or ASR) + Rx Security Policy (signatures, filters)	+ DoD PKI + DIBNet-U + HBSS Equiv + NIPRnet Only	+ All STIG/CTO or equiv + Private Clouds only
4	CUI M-M-x	M	Same as Level 3	Same as Level 3	+ Credible Attempt Incidents + Rx Classified Directives + Rx Classified Threat Info	+ DIBNet-S	Same as Level 3
5	CUI H-H-x	M	All by cloud service type with equivalency	+ As often as Quarterly 3rd party/ DoD Red Teams	+ Reconnaissance Incidents	Same as Level 4	Same as Level 3
6	Classified H-H-x	M	Same as Level 5	Same as Level 5	Same as Level 5	+ SIPR HW Token	+ All STIG/CTO with exception

Legend: Green represents Public and Unclassified Information; Orange represents Controlled Unclassified Information; Red represents Classified Information
The + represents an inclusive incremental security requirement increase from the previous lower Impact Level (version 2013-07-31)

CUI

Figure 3 – Security Model

DoD Cloud Security Model

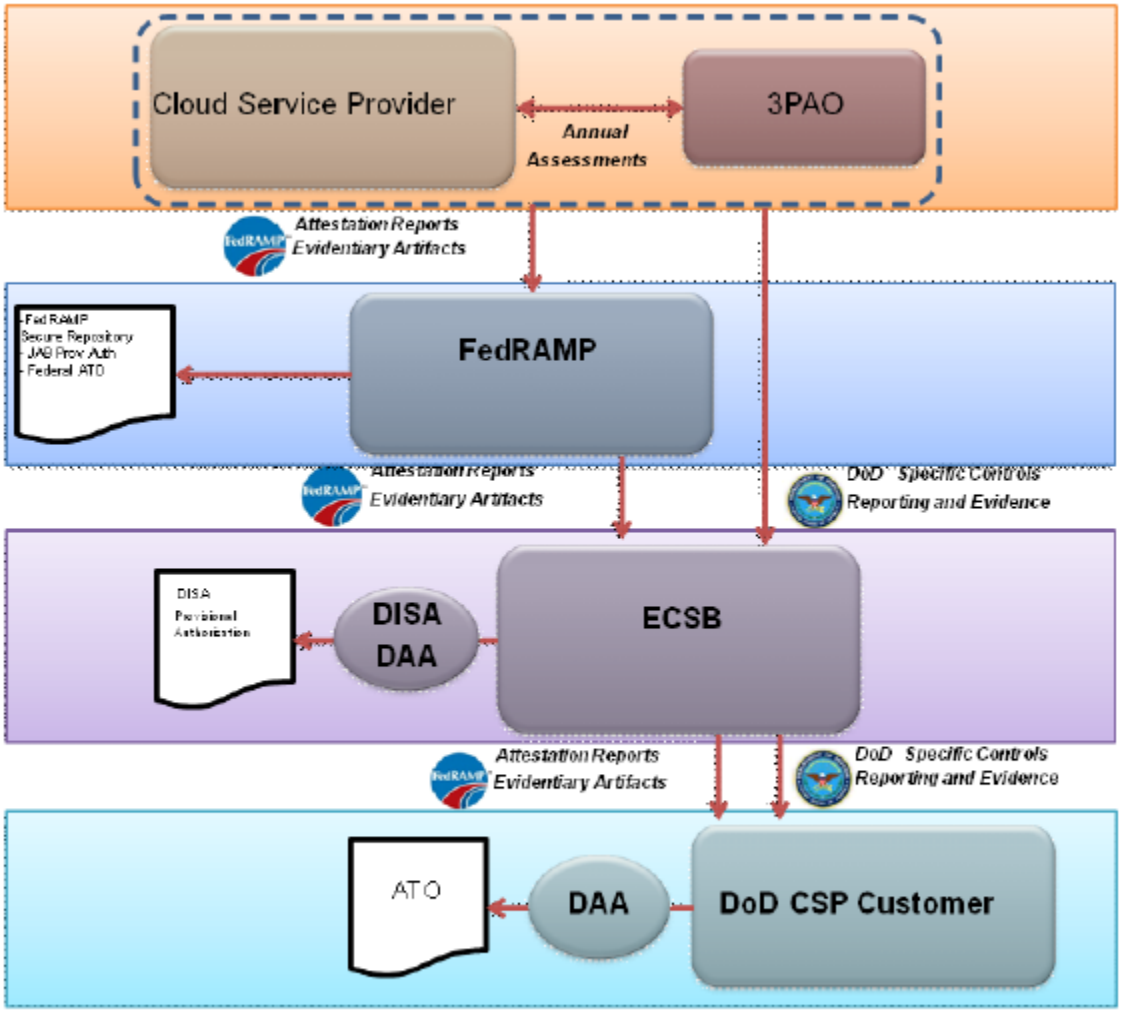


Figure 5 – DoD Ongoing Assessment and Authorization

We are at this step

Level 4 SaaS STIGS Example

D.4 Requirements for Software as a Service (SaaS)

D.4.1 FedRAMP (Level 4, SaaS)

A FedRAMP Moderate provisional authorization/ATO is the starting point for acceptance into the Enterprise Cloud Service Catalog. For those FedRAMP controls that require parameter values, the ECSB defines those parameter values in an annex to this document, ECSB Security Model Control Parameters Annex.

D.4.6.1 Security Technical Implementation Guides (Level 4, SaaS)

The Security Technical Implementation Guides (STIGs) are the configuration standards for DOD IA and IA-enabled devices/systems. The STIGs contain technical guidance to "lock down" information systems/software that might otherwise be vulnerable to a malicious computer attack. STIGs are applicable only if the CSP utilizes the product the STIG addresses or the technology a SRG addresses. However, it is our expectation that the intent of the STIGs or SRGs will be addressed and documented by candidate CSPs.

Currently in the process to identify the required STIGS, have Sys Admins apply/harden the hardware and software, obtain Certificates of Networthiness to apply for DISA ATO

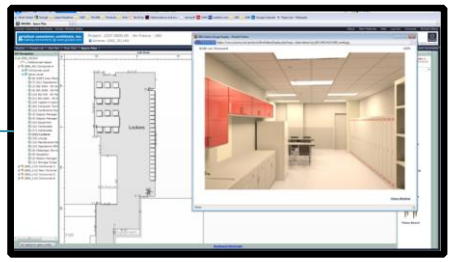
http://iase.disa.mil/stigs/

Max FED iFM Architecture

Internet

MAX Proxy

MAX Production



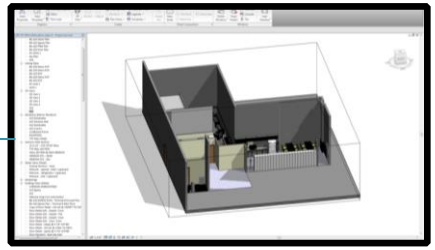
Level 4 SaaS GOV View
Project
Acquisition

Level 1 SaaS Public View
ALL

Level 4 SaaS ORG View
Project
Acquisition

ORG Proxy

ORG Production



FED iFM

- Questions and Discussion

FED iFM

- Contact us!

russell.manning@dha.mil

ko@onuma.com

Stephen.hagan@gmail.com