Requirements Management Overview & RMS Database Demo

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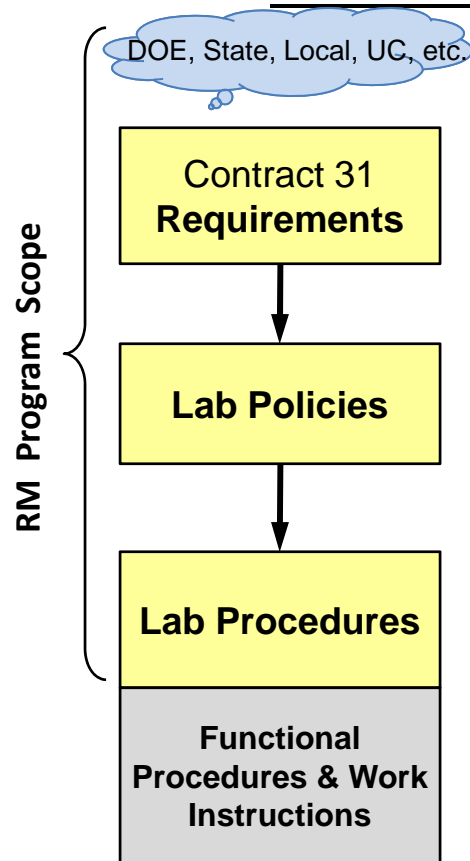
13 August 2014

Agenda

- Overview of LBNL Reqs Mgmt Program   10 min
- LBNL Policy Manual (RPM)   10 min
  - Platform, structure
  - Demo
- LBNL RMS Database   25 min
  - General info
  - Structure, capabilities
  - Associations (relationships)
  - Deliverables
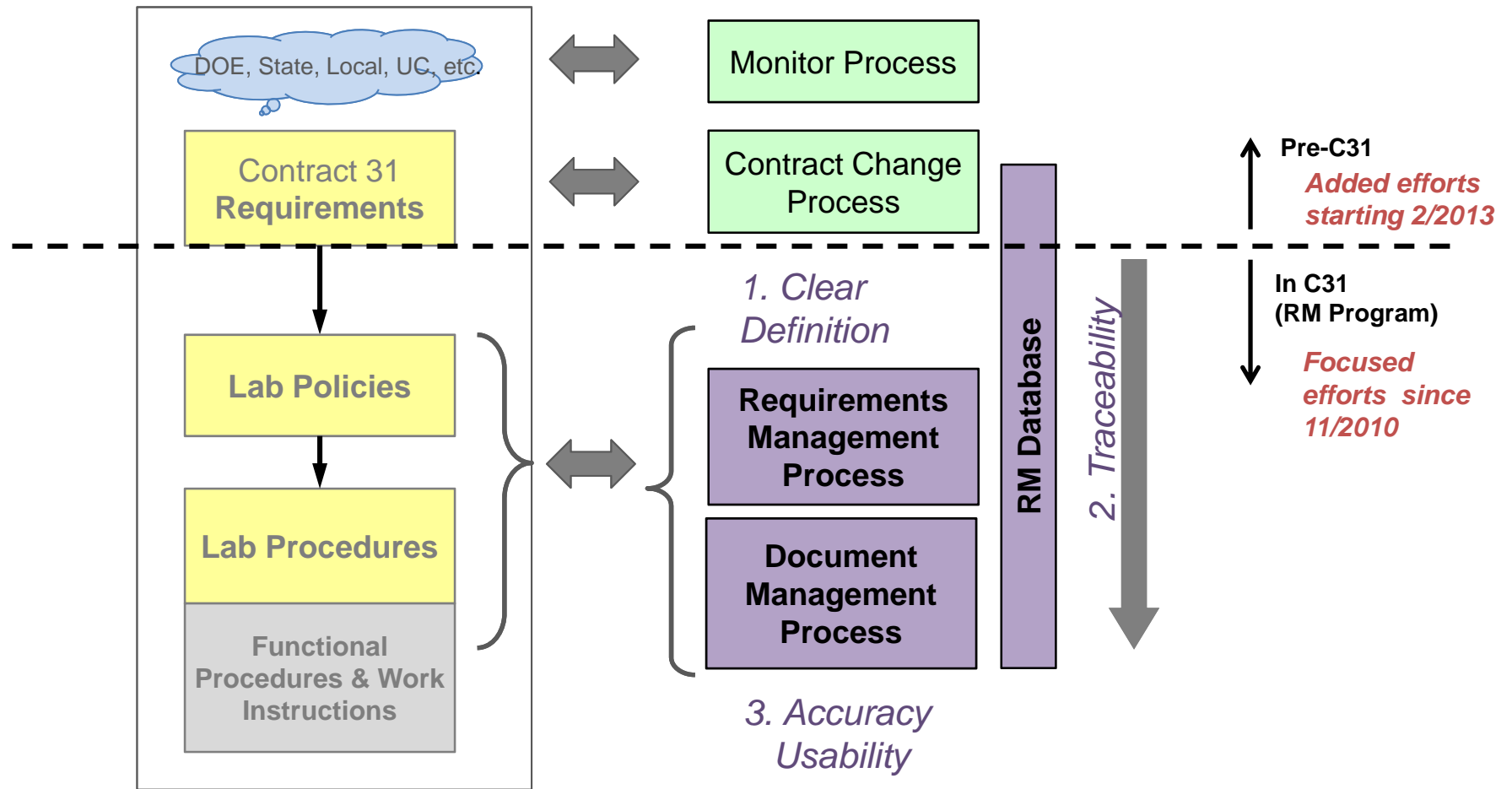 - Demo
  - Summary comments

LBNL Requirements Management (RM) Program

Translated from Contract 31 and related standards and regulations, the Lab's policies and procedures define the operating framework for Laboratory community members to successfully produce outputs that are on time, within budget, and of high quality.

RM Program Scope

DOE, State, Local, UC, etc.

Contract 31 Requirements

↓

Lab Policies

↓

Lab Procedures

Functional Procedures & Work Instructions

- *RM Program*: Implementation of a Lab-wide system that simplifies the task of finding, understanding, and implementing requirements, comprising:

  - A process to manage new/changed requirements through implementation (**DEFINITION**).

  - A hierarchal structure describing the relationships among institutional requirements, documents, and information. (**TRACEABILITY**).

  - A process for tailoring institutional policies and procedures to allow end users to effectively & efficiently meet requirements. (**ACCURACY** and **USABILITY**).

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Mapping: Flow-down and Processes

DOE, State, Local, UC, etc.

Contract 31 **Requirements**

Lab Policies

Lab Procedures

Functional Procedures & Work Instructions

Monitor Process

Contract Change Process

1. Clear Definition

Requirements Management Process

Document Management Process

RM Database

3. Accuracy Usability

2. Traceability

Pre-C31

Added efforts starting 2/2013

In C31 (RM Program)

Focused efforts since 11/2010

FIND + UNDERSTAND + ACT → TIMELY RESULTS

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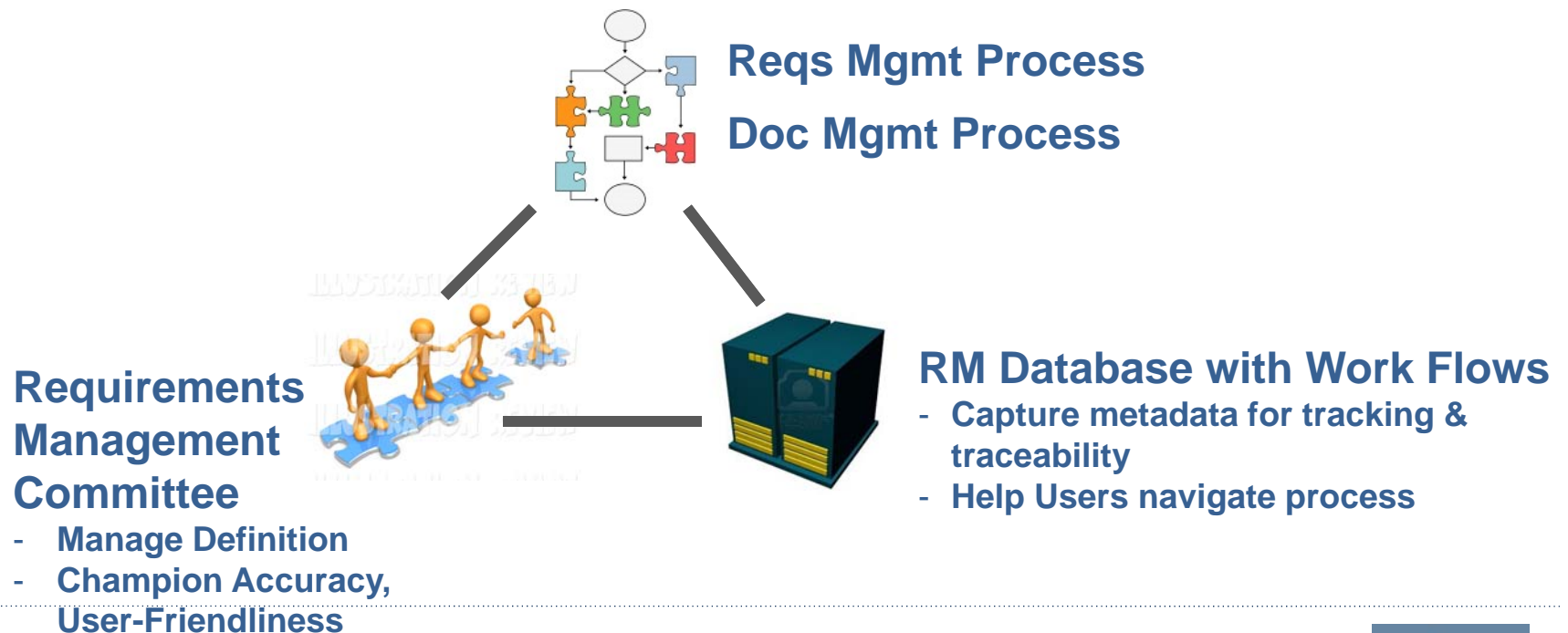# Tailoring a Program for Customers: Challenges

- Transitory population (nearly 50%!!)
  - Need ***FIND*** + ***UNDERSTAND*** <u>quickly</u> to convey the essential requirements for work
  - But: Documents not always readily available nor easy to read.
- Centralization & Standardization:
  - Necessary for efficiencies and cost; sets up quick find for transitory folk
  - But requires all of Ops+ to play by the same rules:
    - Counter to culture of independence & creativity
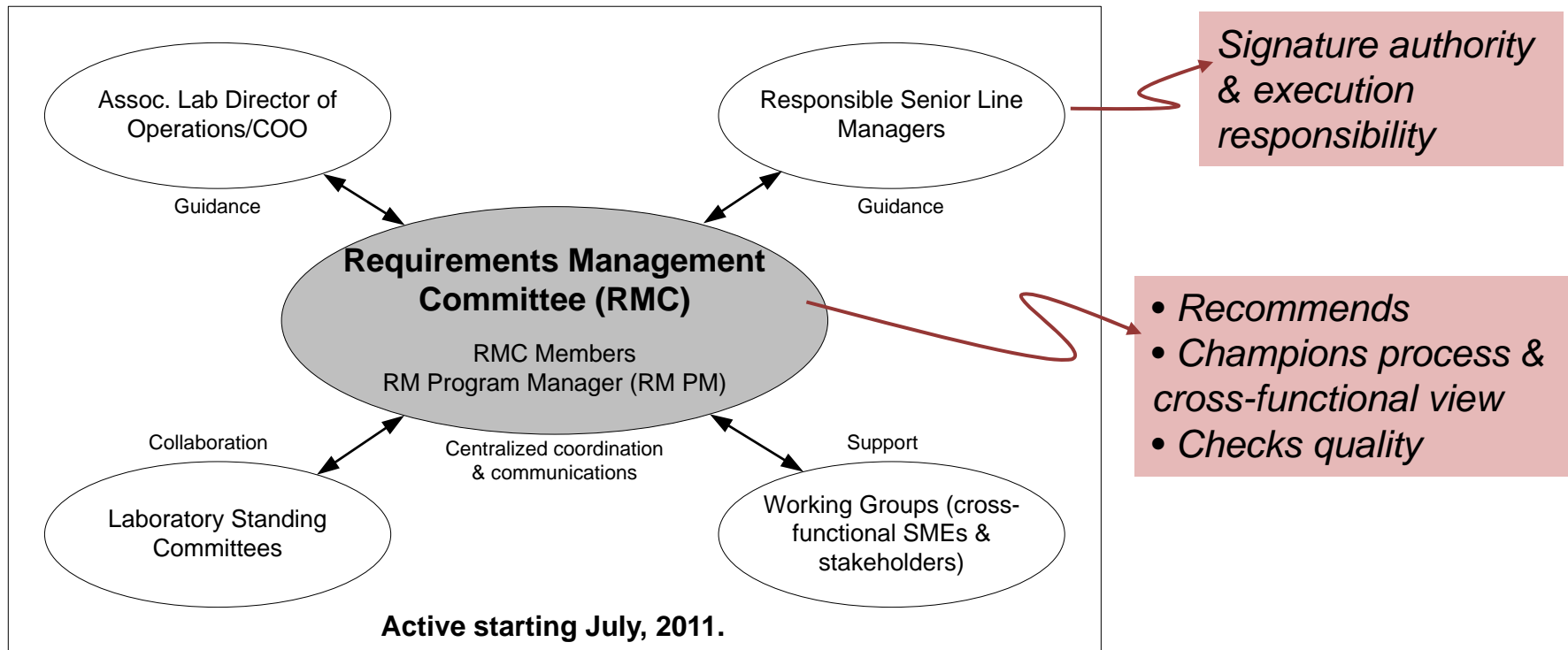   - No Lab precedent for an all-encompassing system

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RM Program Key Elements

OBJECTIVE:

Organized searchable, findable info for Users

Reqs Mgmt Process

Doc Mgmt Process

Requirements Management Committee
- **Manage Definition**
- **Champion Accuracy, User-Friendliness**

RM Database with Work Flows
- **Capture metadata for tracking & traceability**
- **Help Users navigate process**

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RM Committee: Manage Definition
Champion Accuracy, User-friendliness

Assoc. Lab Director of Operations/COO

Responsible Senior Line Managers

Guidance

Guidance

Requirements Management Committee (RMC)

RMC Members
RM Program Manager (RM PM)

Collaboration

Centralized coordination & communications

Support

Laboratory Standing Committees

Working Groups (cross-functional SMEs & stakeholders)

Active starting July, 2011.

Signature authority & execution responsibility

- *Recommends*
- *Champions process & cross-functional view*
- *Checks quality*

Committee Charter:

Provide centralized coordination and communications on Contract 31 requirements and related Lab policy matters.

Committee representation:

HR, EH&S, Finance, Facilities, IT, Protective Services, Legal/TechTransfer, Public Affairs, Engineering, Integrity Office, Institutional/Contractor Assurance.

References: *RM Governance*, 04.04.001.002
RMC Charter

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RMC Representatives: Roles & Responsibilities

Point of Contact

- Within Division or Department (or functional assigned responsibility area), coordinates Division's or Department's responsibilities on requirements, policy, and related institutional matters. Serves as the Division or Department expert on the institutional RM and document management processes. Applies and promotes the institutional RM and document management processes within the functional assigned responsibility area.

- Serves as the Division's or Department's point of contact to the Laboratory's RM Program as a member of the RMC.

- As delegated by his/her appointing Sr. Line Manager, has authority to accept RMC actions or assignments on behalf of his/her respective functional area.

Facilitator, Leader, Communicator, QA for Process

- With support of the Sr. Line Manager, can assign policy/requirement-related tasks to divisional SMEs, and drive for completion. Typical tasks include application of expertise to analyze or interpret a DOE directive, Contract requirement, regulation, in terms of impact on institutional programs, processes, practices.

- Serves as "first pair of eyes" to provide quality assurance review of Lab policies or requirement-related analyses. Reviews information with a cross-functional view and for consistency and completeness per RM program guidelines. Follows up with SME or author as necessary to ensure written message is accurately communicated. May recommend and then assist facilitating additional inputs (RMC, respective Sr. Line Manager, other Laboratory standing committees, etc.)

- As a member of the RMC, actively participates in identifying, developing, supporting and improving the institutional RM processes. "Support" can include, for example, coaching/teaching others, demonstrating through practice, being an advocate, and so forth.

- Applies leadership and collaborative skills in working with SMEs, Working Group members, the RMC, other Laboratory standing committees. Champions, facilitates, and practices cross-functional collaboration.

- Consistently attends and participates at RMC meetings. If absence is necessary, is responsible for finding alternate.

- Communicates actions and/or assignments to respective Sr. Line Manager on regular basis.
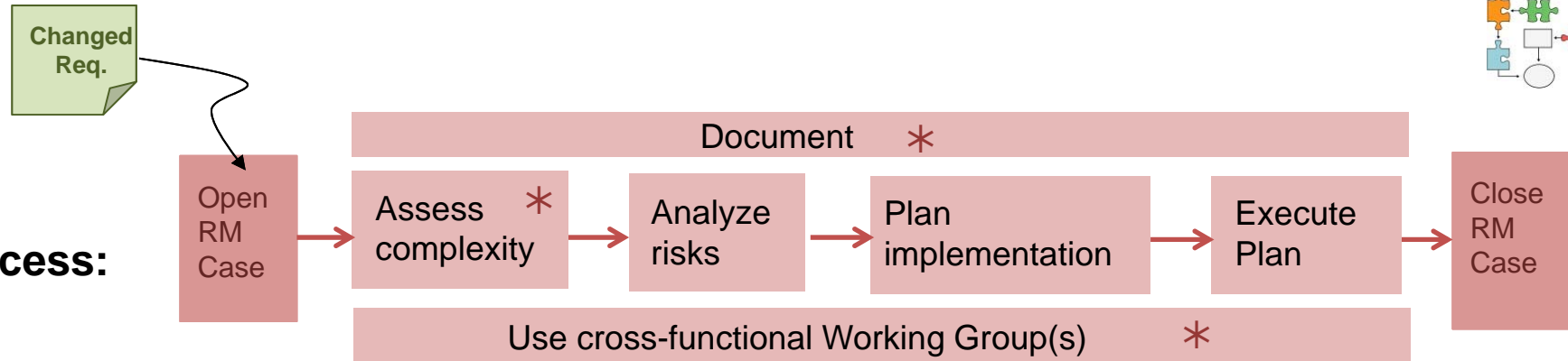
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Sr. Line Manager RM Responsibilities

- Has responsibility and accountability for managing Laboratory requirements that pertain to his/her area of responsibility, including identification of what the requirements are and implementing them through policies, programs, procedures, etc.

- Has responsibility and authority to define and implement changes in policies, programs, procedures, etc. resulting from changes to Contract 31, UC requirements, and to applicable federal, state, local laws and regulations, as well as any direction provided by supplementary letters or memos from DOE or UCOP.

- Has ownership and accountability for the technical content, accuracy and completeness of respective Function's documents.   Approves institutional documents upon completion of required reviews.

- Ensures compliance with LBNL requirements and document management policies and procedures.

- Communicates to the RM PM and RMC objectives and general guidance on implementation for the policy under question.

- Reviews and approves policy and detailed implementation plans recommended by a Working Group and the RMC. Approval implies commitment of resources and funding for coverage of his/her function. For those cases where multiple functions are participating, approvals must be obtained from each participating function.

- Has responsibility for execution of approved plans for implementing mechanisms supporting a Laboratory requirement or policy, including assigning resources and funding.

- Works with the RM PM and RMC to resolve issues that may arise in the process of review and translation of requirements, policy into implementation.
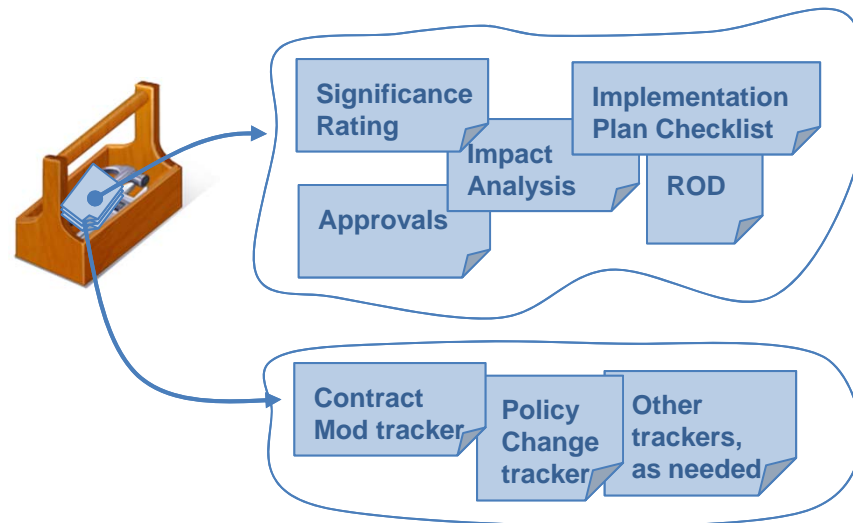
RM Process and Tools

Changed Req.

RM Process:

| Open RM Case | Assess complexity ✳ | Analyze risks | Plan implementation | Execute Plan | Close RM Case |

Document ✳

Use cross-functional Working Group(s) ✳

RM Process Tools:

- Significance Rating
- Impact Analysis
- Implementation Plan Checklist
- Approvals
- ROD

http://www.lbl.gov/DIR/OIA/OCA/reqs-mgmt-prog.html

RMC Mgmt Tool:

- Contract Mod tracker
- Policy Change tracker
- Other trackers, as needed
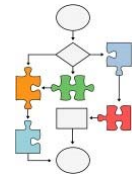
Smartsheet collaborative spreadsheet
www.smartsheet.com

Applied to:

- Institutional requirements, policies, documents
  - Recommended for Division/Function documents
- Pre-C31, In-C31

References: *RM Process*, 04.04.001.003
Doc Mgmt Process, 10.06.001.001

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Vision: Documents & Flowdown - Search, Find, Traceability

Contract 31, Standards, Regulations, Contracting Manager Policies(UC)

Authority: DOE, UCOP

Note:
Policies & procedures may draw from more than one authority.

Lab Driving Requirements
See list of examples.

Authority: DOE, UCOP, Lab

Authority: Lab, UCOP

- Contractor Assurance System (5520)
- Worker Safety & Health (3851)
- Site Security Plan
- Operations & Quality Management Plan (3111)
- ISM (3140)
- Radiation Protection Program
- Others

Policy Manual

Institutional Taxonomy (Tree/Map)
Institutional Glossary
A to Z
Key word search

Lab-wide Policies

Lab-wide processes, procedures, other implementing docs

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Vision → Tangible: Wiki-RPM
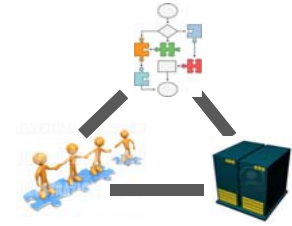
- Project start: April, 2011

- Open to public: April, 2012

- Use Lab Commons platform

- 300 unique policies
  - Encompassing <u>ALL</u> Operations
  - Organized in 12 sections, 79 policy areas
  - Comprised of Brief, detailed Policy, Document Information
  - About 85% converted end FY13

- Institutional Glossary

- Multiple ways to search

- Model for new EHS Manual, Engineering Process Guide

- Demo! - https://commons.lbl.gov/display/rpm2/Home
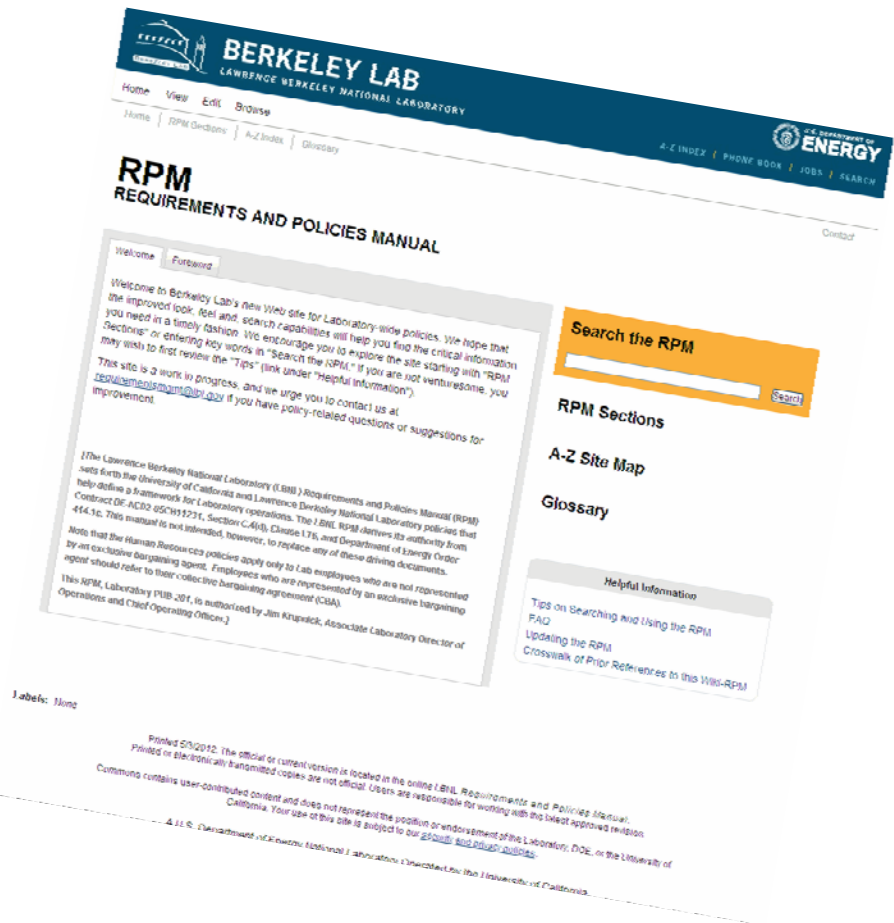
RMS Database Detailed Overview

- Development
- Database scope
- Relationships
- Workflow
- Deliverables
- Examples/Demo

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RMS Database – Development History

- Developed by Ovitas (www.Ovitas.com)
- Project Milestones & Costs

		Development	Maintenance/ License (annual)
Project initiated	10/2011		
1st Release	11/2012	$170K	$30K
2nd Release (deliverables)	11/2013	$ 45K	$30K
Minor ease-of-use fixes	09/2014	$ 9K	$30K

- Support outsourced to Ovitas – $225/hr
- 3 Environments: Production, QA, Development
- Application Layer → Database Layer (Oracle)
- LDAP access

Database Top Level Requirements

- ## Overall Objectives:
  - Track changes to DOE Contract 31 and associated requirements that the Lab is obliged to follow

  - Show traceability of requirements through the Lab's implementing documents (policies, programs, processes, procedures, etc.)

- ## Manage entry, maintenance, search, reporting of:
  - Requirements metadata

  - Document metadata

  - Records of Decision (RODs) on Reqs and Docs

  - Interrelationships of the above

- ## Manage tracking of Contract Deliverables including notifications and completion.

Reference: RM Database System Requirements Specification, 04.04.001.004

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RM Database Application: Tracking, Traceability
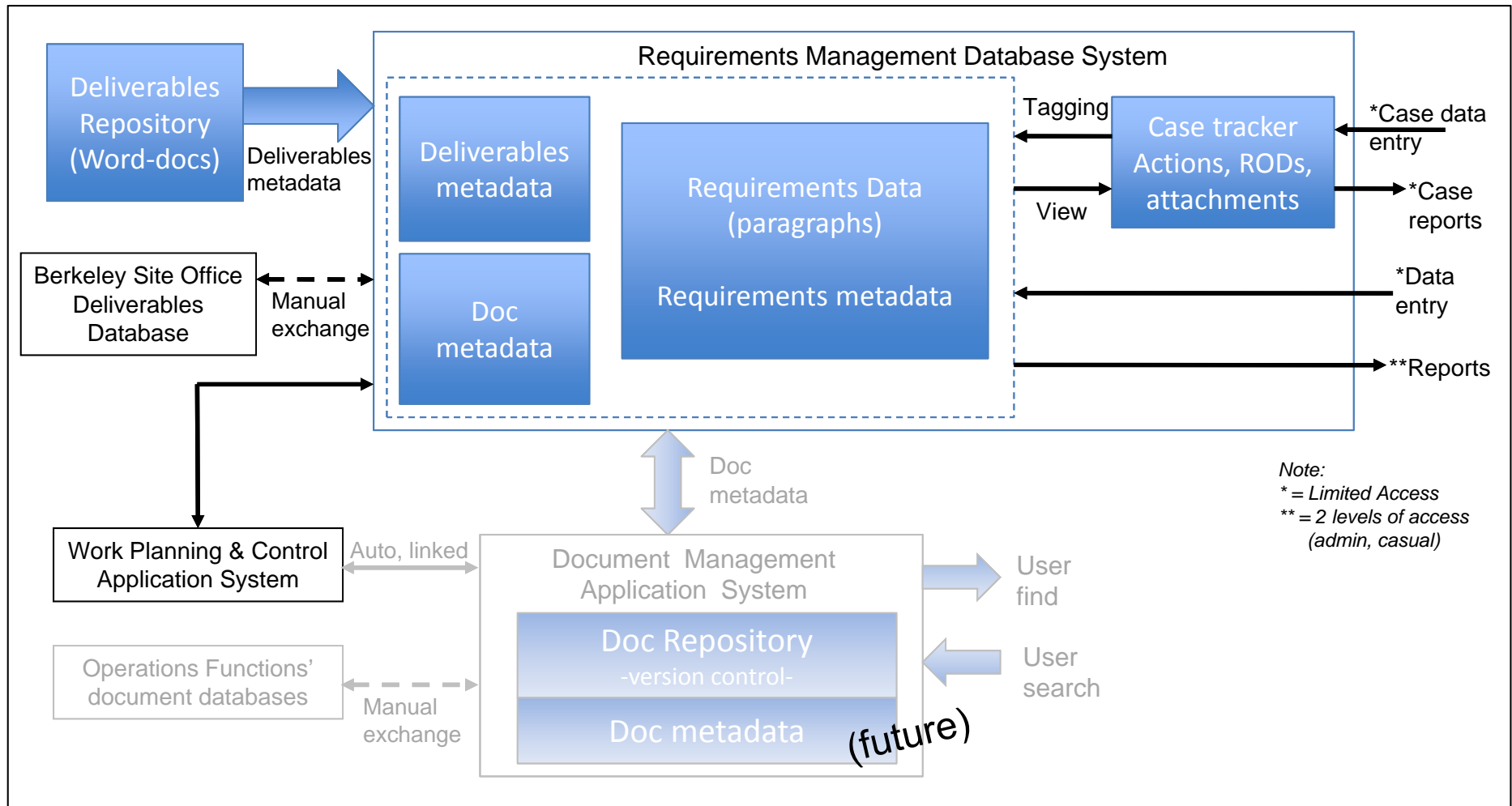
RMS Data Definitions:
Requirement and Document Concept Types

REQUIREMENT Concept Types
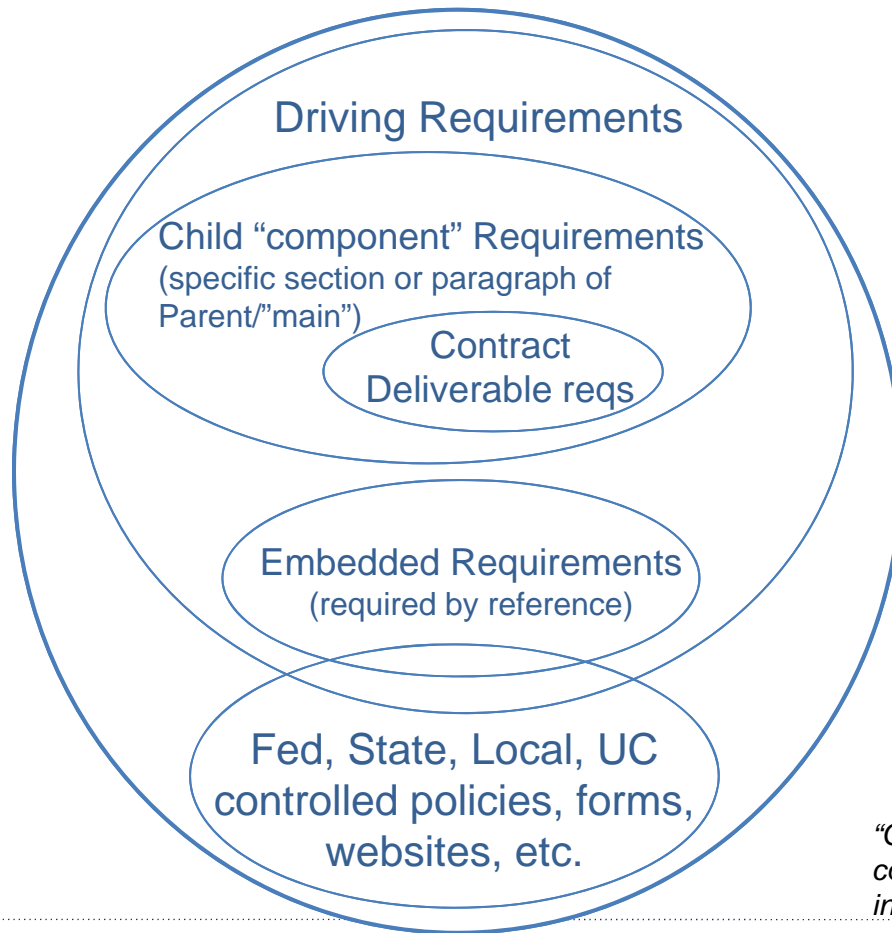
DOCUMENT Concept Types (Lab-controlled)

Driving Requirements

Child "component" Requirements
(specific section or paragraph of
Parent/"main")

Contract Deliverable reqs

Embedded Requirements
(required by reference)

Fed, State, Local, UC controlled policies, forms, websites, etc.

Policies

Processes

Programs

Lab Driving Req Docs

Plans

Forms

Procedures

Websites

Manuals
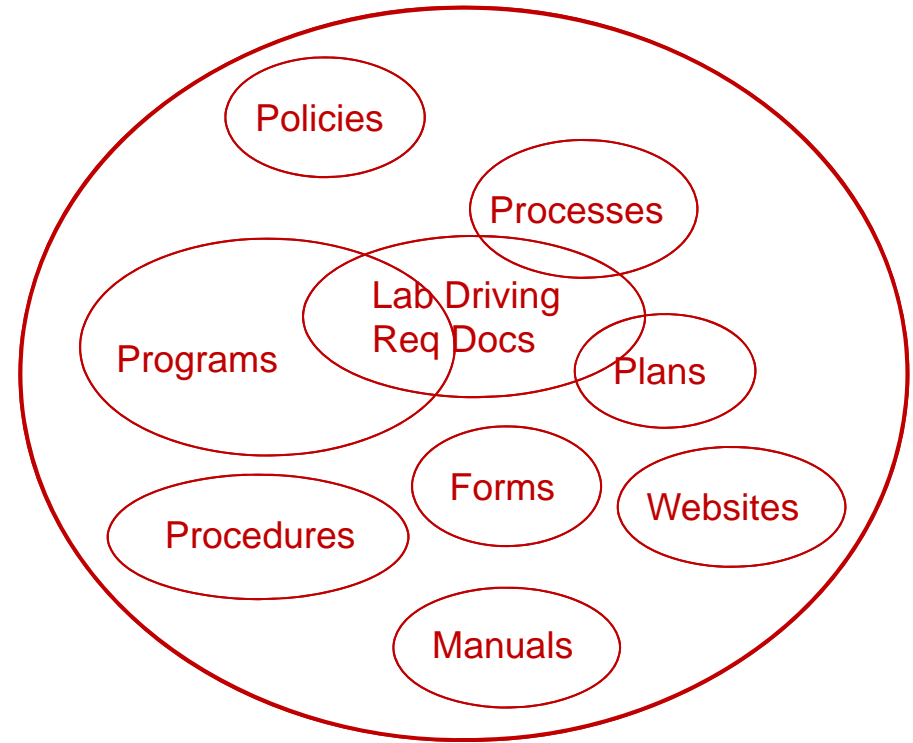
"Concept": An object that is stored in RMS. It is comprised of properties (title, date, owner, etc.) which include designated relationships (associations)

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RMS Data Relationships: Some possibilities

Driving Req

Embedded Req

Component/ Child Req = Deliverable req → Deliverable Tracking Process

Lab Driving Req Doc

Lab Policy

Program doc

External Website

Lab Website

Procedure

Lab Form

External form

Doc concept
Req concept

Relationship

parent
↓
child

Note: This illustrates only some of the req → doc, req → req, doc → doc, doc → req relationships that can be set up within RMS. A chain of these establishes a hierarchy.

A relationship ("association") is a property of each of the affected concepts. No other data is shared or can pass from one to the other. This means that if a parent Req is modified, and it has a Child, the Child must be separately modified.

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Case Associations Capture Change Histories

Case wf

Referenced Cases

Doc wfs (change)
→ **Docs** (changed)

Req wfs (change)

Reqs (changed)

Docs (not change)

Reqs (not change)

ROD(s)
→ **Docs**
→ **Reqs**
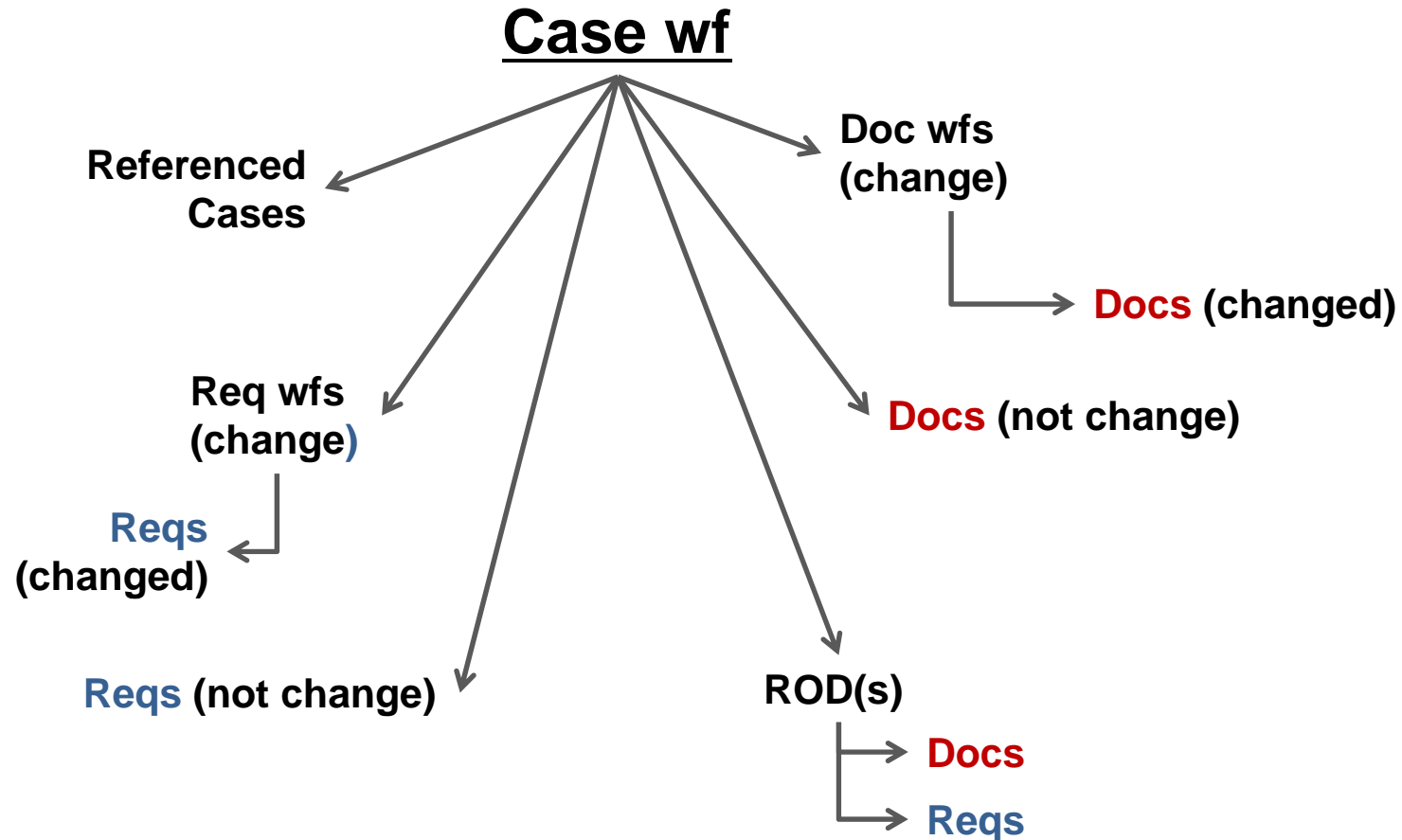
Case: A focus or topic – usually associated with a change to a requirement and/or policy and/or program. An "instance" where RM process is applied.
"wf" = workflow = sequence of steps to enter or modify a record's data

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RMS design accommodates mid-level users (SMEs)

Users	RM PM, RMC, **SMEs**
Alerts	- Owners of Late Actions - **If POLICY**, RMC is alerted at Case/Initial - **If POLICY**, RM PM, CSO Editor, RMC at Doc/Develop, Approve, Finalize - **For non-Policy**, RM PM, RMC Function Rep are alerted at each Case step

- Long term objective is for SMEs (policy owners, Inst. Doc owners) to enter & track own data with monitoring via alerts

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RMS Database - Deliverables

CREATION:

User enters:

(Child) Req info + DelivDef info
Req A due annually

Req concept

RMS generates →

Req A 2/1/2011
Req A 2/1/2012
Req A 2/1/2013
Req A 2/1/2014

Open DelivDoc WF concepts

RMS alerts! →

Req A 2/1/2011 Due!

Deliv owner closes wf →

Req A 2/1/2011 Closed!

Closed DelivDoc concept
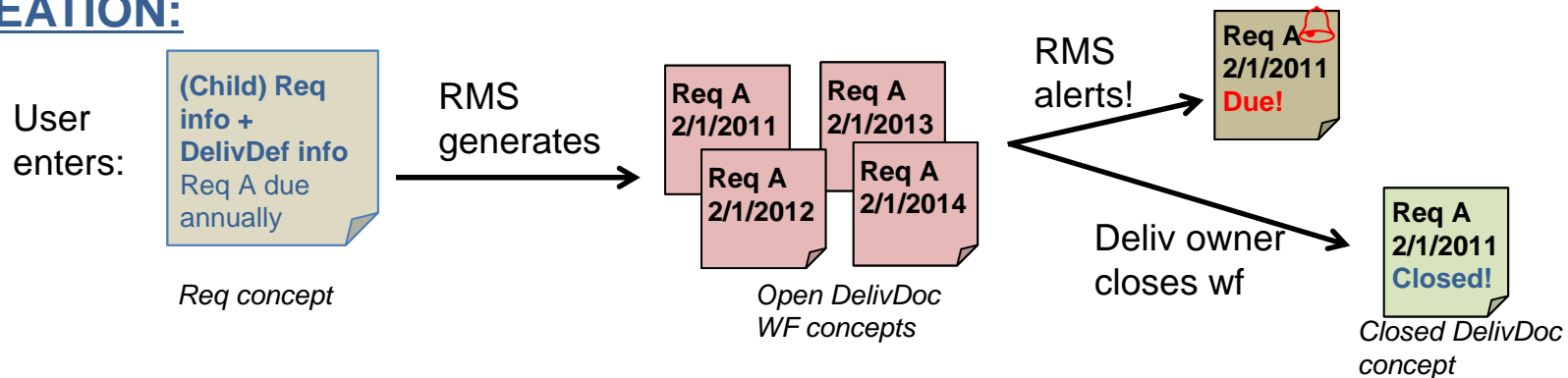
Note: Modifying Child Req/DelivDef info results in update of any OPEN Deliv wf. Closed Deliv are not changed (good!)

DATA & RELATIONSHIPS:

Notes:
- *The different concept types are searchable.*
- *Relationships between Child Req & generated DelivDoc wfs & Closed wfs remain established, when Child Req is modified.*
- *Must update Parent & Child Reqs separately.*

RMS Database

Driving Req (Parent)

Req concept

manual →

(Child) Req info + DelivDef info
Req A due annually

Req concept

auto →

Req A 2/1/2011 Closed!
Req A 2/1/2012 Closed!

Converted to Closed Deliv concepts

Req A 2/1/2013
Req A 2/1/2014

Remaining Open Deliv wf concepts

parent
↓
child

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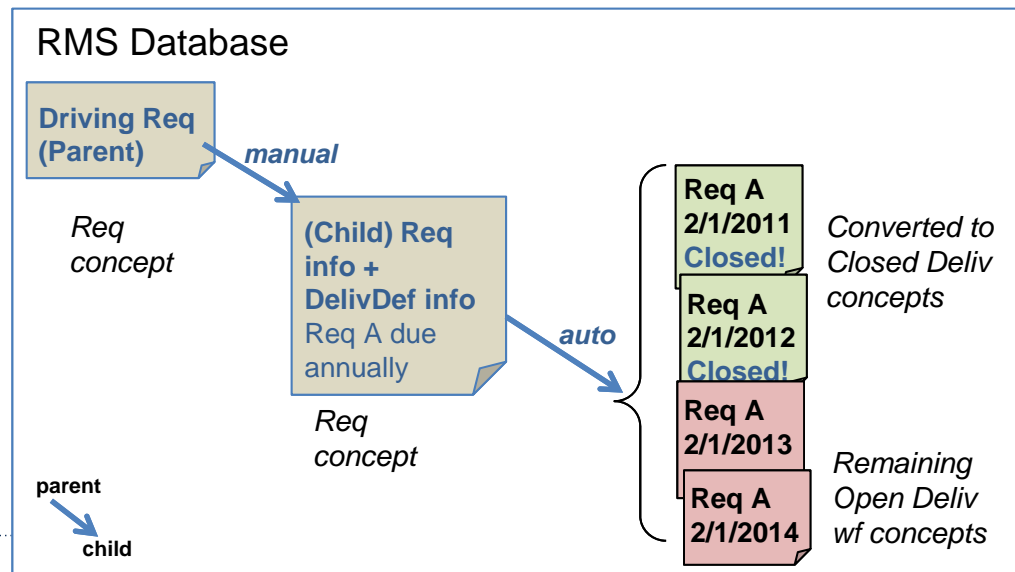
RMS Database Output Example

This generated report lists:
for a given DOE Order,

3 associated Policies

and their implementing documents

FLOW-DOWN

- The RMS database is intended to answer such questions as:
  - If DOE Order xxx changes, what Lab documents might be impacted?
  - What documents support Policy Z?
- The data derives from Policies (SRD, Implementing Docs)

Last Comments: LBNL RMS Database

- Usage is low
  - RM PM, RMC members enter data
  - RM PM, RMC, Internal Audit, DOE/Berkeley Site Office, others search

- Highest value observed so far:
  - Tracking/reminding Contract deliverables!
  - Requirements change histories via Contract Mods
  - Policy management
  - Traceability reqs → policies → programs

- Shortcomings:
  - Managing names
  - Not quite sufficiently intuitive for non-technical folk

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Extra info on LBNL RM

Important RM Links

Item	Access	Link
RPM	Lab A-Z ; Home page , or Requirements and Policies Manual (RPM)	https://commons.lbl.gov/display/rpm2/Home
RM Process docs, forms	Lab A-Z: Requirements Management PROGRAM. Bottom of web page	http://www2.lbl.gov/DIR/OIA/OCA/reqs-mgmt-prog.html
RMC Charter	Lab A-Z: Requirements Management PROGRAM web page. Select from left panel menu	http://www2.lbl.gov/DIR/OIA/OCA/reqs-mgmt-prog-charter.html
RMS database	Lab A-Z: Requirements Management PROGRAM web page. Select from left panel menu	https://rms.lbl.gov/atongui/ [NOT Web accessible]
Policy Change Tracker	Smartsheets – RMC Workspace	
Policy Change Tracker form	Smartsheets – RMC Workspace Or, RPM Home page/Updating RPM	https://app.smartsheet.com/b/form?EQBCT=db758e3760544314a1ff9b16b70e390d
Contract Mods Tracker	Smartsheets – RMC Workspace	

Significance Rating (04.04.001.206)

1. Check the Boxes:

a		Brief description of what is being analyzed:			
		Value	1	2	3
b	**Impact**	# Policy Area(s)	☐ 1		☐ > 1
		# Divisions affected	☐ 1	☐ 2	☐ > 2
		# of people	☐ < 100	☐ 100 to 1000	☐ > 1000
	(see Table	Risk area (safety)	☐ Low	☐ Medium	☐ High
	for definitions)	Risk area (business)	☐ Low	☐ Medium	☐ High
		Risk area (compliance)	☐ Low	☐ Medium	☐ High
		Sums (# checks times Value):			
		Impact Total (sum total divided by 6)			
c	**Implementing Mechanisms**	Documents (number)	☐ Small (1-2)	☐ Medium (2-4)	☐ Large (>4)
	(consider all	Documents (complexity)	☐ Easy (< 10 hr)	☐ Modest (<30 hr)	☐ Complex (>30 hr)
	areas & people	Training	☐ Easy (dept)	☐ Modest	☐ Complex
	impacted)	Resources, roles	☐ Small change	☐ Modest addition to existing	☐ Substantially different, new hires
		Property/equipment	☐ Small cost (< $10K)	☐ Modest cost (<$100K)	☐ High cost (>$100K)
		Communication	☐ Easy	☐ Modest	☐ Complex (pamphlets, multiple announcements over several months, etc.)
		Testing	☐ None	☐ Beta	☐ Alpha, Beta, Pilot
		Program	☐ No change	☐ Modest change	☐ Form new
		Sums (# checks times Value):			
		Implementing Total (sum total divided by 8)			
		Enter SIGNIFICANCE RATING (use Figure 1 and Impact and Implementing Totals. Round up for fractions greater or equal to 0.5. Round down for fractions less than 0.5)			
		Using the resulting Significance Rating, determine Approval Levels from Table 1 and Minimum Required Program Elements from Table 2.			

2. Sum, divide, get Impact # and Imp

FIGURE 1: Significance Rating

Impact (vertical axis: 1, 2, 3)
Implementing Mechanisms (horizontal axis: 1, 2, 3)

	1	2	3
3	B	B	A
2	D	C	B
1	E	D	C

3. Determine intersection of the 2 numbers

4. Minimum Level of Approvals

TABLE 1: Approvals:

Significance Rating	Approval
A	Lab Director (or designee)
B	COO (or designee)
C, D	Sr. Line Manager(s)
E	Sr. Line Manager (or designee)

5. Minimum Expectations for Project/Program Execution

TABLE 2: Minimum Required Program Elements

Significance Rating	Minimum Required Program Elements of CM Management Syste...
D, E	• Document gap analysis and comparison to current implementation m... • Select approach with input from users • Develop specific communications strategies, including methods, targe... and venues. Document details (who, how, where, when) in Implemen... • Draft program/policy change for review • User review/input as needed
C	• Establish a cross-functional Working Group whose main charter is to ... any analyses and planning, including review of all affected documents... evaluation and selection final implementation • Document gap analysis and comparison to current implementation m... • Benchmark (telephone calls and e-mails may suffice)