Role of Business Analysis in the Automation Project

Work Products, Activities, Techniques

November 5, 2021

Version 1.3

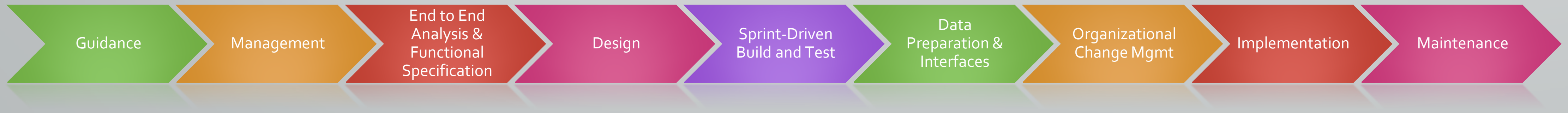
Business Analysis Overview for Success

Every major responsibility in an automation initiative depends on good business analysis. Here you will see the activities, work products, and techniques that make up good business analysis.

For too long we have allowed the Project Management Office to consume resources better invested in stronger business analysis. Ironically, without understanding the an issue with the rigor of business analysis, no amount of project management practice or personnel will focus on the right topics, at the right time, and arrive at options and solutions efficiently that endure.

Similarly, technical architecture that is gold plated or short-sighted results when decisions made without the analysts perspective on volumetrics and usage patterns.

Other essential skill sets and workflows are addressed but from the point of view on how the business analysis contributes to understanding the context, alternatives, and future consequences.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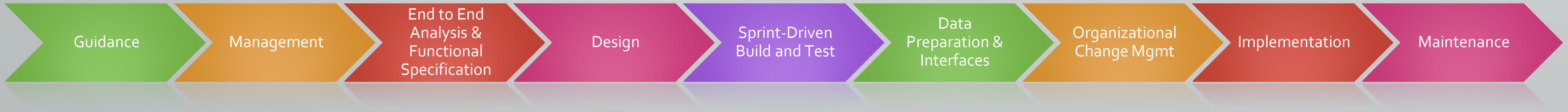
Management
End to End Analysis & Functional Specification
Design
Sprint-Driven Build and Test
Data Preparation & Interfaces
Organizational Change Mgmt
Implementation
Maintenance

Business Analysis Occurs Throughout the Project

Every significant automation effort has a series of overlapping workflows. Business Analysis and ideally Business Analysts participate in every workflow. There may be minor variations but activities always include these topics:

- Initiation, Authorization and Guidance
- Ongoing Management Support
- Analysis
- Functional Specification
- Architecture and Technical Design
- Build, Data Readiness, and Integrations
- System Test and User Acceptance Test
- Organizational Change Management (Business Operations alignment, Training, EE Recognition)
- System Administration (Platforms and Help Desk)
- Implementation, Road Map and Maintenance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Change control

Date	Needed Change	Status
	Tips Tricks and Traps need content – current is from one workflow	
	Make Business Analyst specific rather than methodology explanation	
	Is Workflow section introduction page sufficiently unique?	
	Need Breadcrumbs with a workflow?	
	Distinguish a work product, a technique, and activities	
	Link ppt seminars to each section as appropriate	
	System Test – okay to stay in build????? Think not	Pull out System Test for end to end
	Update definitions for use case user story, etc.	

Change Control p2

Date	Needed Change	Status
	Use the CPUC diagrams as high level to tie together process models; functions are use cases	Entered, now need explanation; add a second slide with a smaller version
11/4/21	Clean up distinction and break between Functional Specification Transition to Design and the Section on Technical Architecture	
	Break apart a few slides to add more to pure Design	
	Add pages to Maintenance and Operations – borrow from the training class on the subject	
	Do we add omething on DevOps in the future – maybe a placeholder for now	
	Add something on Daily Standups	
	Add something on Agile Scrums and Sprints	
	Show how analysis and specification can be browkn into Sprints	
	Replace arrows at bottoms to separate Analysis from Specification;	
	Add Test Questions for each Section	

Guidance Proj Mgr

Guida

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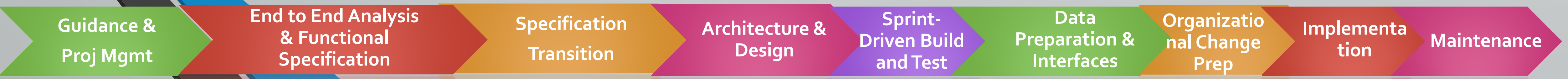


Guidance & Proj Mgmt

End to End Analysis & Functional Specification

Specification Transition

Architecture & Design

Sprint-Driven Build and Test

Data Preparation & Interfaces

Organizational Change Prep

Implementation

Maintenance

Project Initiation and Guidance

A brief introduction to the

- Project Charter
- Project Sponsor, Owner, and Steering Committee
- Stage Gates, Budget Approvals, and Project Oversight

Project Charter

The Business Analyst is in position to educate the vendor team on the Client's vision of the Solution's purpose.

- Scope – Provides the compelling business criticality to undertake a major investment that will disrupt the status quo.
- Key Participants – A deputy director or above from a program area must be viewed as the Sponsor and driver for the project. The CIO ensures that current automation capabilities contribute and that any new investments can be utilized throughout the enterprise. Other executives contribute to ensure a seamless workflow of functions and data across internal divisions and external public and private business partners.
- Analyst Expertise Needed – The Analyst looks across the enterprise to see how other program areas could benefit from the new processes and capital investments. Work with Technology division for their perspective on existing and new technical platform capabilities.
- Usage Throughout the Project – Charter Guides and requires alignment of proposed functionality with the Charter
- Frequency of Update – The Analyst looks need to update the Charter as well as keep people aware – changes are good, not bad but unfortunately rarely occur.

Stage Gates, Budgets, and Oversight

The Approval and funding Processes are certain to make the solution two years behind current capabilities, three years behind widely used features, and four years behind industrywide technology adoption.

The Analyst needs to introduce graphical depictions including Process Models, Conceptual Data models, interface models at the very start. Any proposed change over time can then be shown for its impact on the models—this enhances the understanding and value but also reduces the perception of risk or questioning of the Client's vision.

Need to break the Solution into the smallest possible Minimum Viable Product and Define "Pivot Points" where the next set of functional, technology, and features can be finalized.

The Analyst helps keep the project driving forward and not become a pinball distracted by the latest possible idea. Good ideas are documented and the right opportunity used to insert improvements.

Project Sponsor & Product Owner and Project Manager

The Project Sponsor is an enterprise Senior Executive with control over significant resources and the credibility to use the power of persuasion to enable effective communication and coordination across organizational boundaries.

The Analyst may not have direct contact with the Sponsor so it is important to keep the Product Owner and Project Manager apprised. The Analyst may gain data and insights that are important, but communication channels are critical to project success along with appreciation that the Sponsor has a lot of constituencies and competing factors to address.

Agile methods introduce the Product Owner as a linchpin who can make command decisions on the fly that select features and functions and arbitrate choices that arise on Agile projects. Product Owners are not Project Managers. A separate Project Manager may keep track of project progress and ensure that systematic activities such as status reporting and staff scheduling are performed efficiently.

Contracts

The Business Analyst should read and understand all contracts for all participants.

Start by knowing your own contracted responsibilities; if assignments or activities are not aligned, talk to the Project Manager—stay in the chain of command. Your objective is to fulfill expectations, not look for excuses.

Do NOT assume you know what to do based on past projects or the project task plan. Learn the due dates, the work products and deliverables, the review process, project stakeholders, how to document. Do not take on responsibilities outside your duties without notification and preferably without approval. Otherwise you might embarrass someone who thinks you are stepping on their toes or make it appear your manager is not aware of what is going on.

Your agreement to do something based on a hallway conversation should be limited to what time to have coffee—never commit the project, your colleagues, or resources without approval.

Don’t hesitate to volunteer or offer suggestions, just understand that you must respect the roles of others, especially the client’s team members. A pure Agile project may authorize a greater level of discretion to promote self-forming teams, but those situations do not have enforceable deadlines or accountability to the scope, depth, and format for a Deliverable or work product.

Tips, Tricks, and Traps ….

Project Initiation and Guidance

The Backlog is well defined in a hybrid approach. The end to end analysis and functional specification are done, the Minimum Viable Product formulated. User Stories may be identified but still need "grooming".

Decisions and Business Rules are maintained in their own repository. So when new ones are found or better defined through grooming or in a Sprint, the repository must be updated. This reduces accidental duplication.

Analysts can conduct a "Design specification" sprint to ready a use case for development in a Build Sprint that follows. Getting Decisions, rules, data, and features flushed out before the Development sprint aids in estimating and avoids delays.

The attitude that functionality not completed in the assigned Sprint can be carried over to another Sprint is very dangerous. Deadlines exist for a reason. Inability to complete work as scheduled must be elevated to determine if the entire schedule needs to be adjusted. There is no such thing as "catching up".

Leaving Rule specification to a Development Sprint is high-risk: may take time to get agreement among needed SMEs, may delay the developers, or a placeholder may get lost. The Decision/Rule repository must be kept current.

Project Management

The Manager must seek the Analyst's insight into the complexity of functionality, the dependencies, perception of what is important to the SMEs for order of build, value to the enterprise. Analysts also have insight to where a special effort needed to align business processes with automation capabilities.

A brief introduction to the

- Project Management Plan Elements
- Managing the Managers: Product Owner, Vendor, Information Technology, Cross Division Contributors
- Risk Management is not Risk Elimination
- Update Plan Elements, don't enshrine them!
- Management Practices
- Tips, Tricks, and Traps

Project Plan Elements

Elements are not commodities,the effort is not an expense it is an Investment in building confidence and educating all participants.

The Project Management Plan has multiple elements, typically each with their own Plan. Projects have enough activity to obtain lessons learn requiring plans to have their processes as well as their content updated every quarter.

- Communications
- Status Reporting
- Risk Management
- Scope Management
- Staffing Management
- Added elements can include:
- Quality Plan

Project Plan and Schedule:

The Analyst’s Role

- To be completed

Project Plan Elements Updates

The individual Plan elements are not meant to be static documents that are prepared and then collect dust on the shelf. The approach to communications will evolve and should be incorporated as updates to the Communications Plan. For example, use of JIRA, Microsoft Teams, Sharepoint or other automation enablement typically take on greater importance as first-time users gain insight into the tool capabilities and gain confidence and comfort in using the tools. Communication Plan changes should be made when documents originally expected to be printed are now acceptable in electronic form, archiving capabilities utilized for version control, client technical platform staff become more engaged to support dev ops or as preparation of testing and production server configuration begins.

Project Management Practices

- The Project Management Practices can be the same across a wide range of approaches to how the Solution is specified, built, and implemented. PM practices typically include a Work Plan (Schedule), management plans for Risk, Communication, Scope and Changes, Quality Assurance, and Staffing. Responsibilities for PM are allocated to both the client and the vendor. Status reporting and lines of communication may evolve but must be emphasized throughout. Engagement by the Project Sponsor…. role of Product owner….

Tips, Tricks, and Traps ….

Project Management

“The last 10 percent of a Task can take another 90 percent .

What does 90 percent completed mean? Just because 90 percent of the time or the hours have been reported, doesn’t mean the expected work result is 90 percent completed.

Too often a team lead says they are 90 percent done but it turns out 90 percent of the needed work remains to get done.

The last 10 percent can be a killer.

Do the Team Managers and their key staff know what the Tasks in the Plan are? Does anyone know what the needed skills are to perform a defined task, know what the techniques to apply are, know how to measure the progress of a task, much less a workflow or deliverable?

System Development Life Cycle

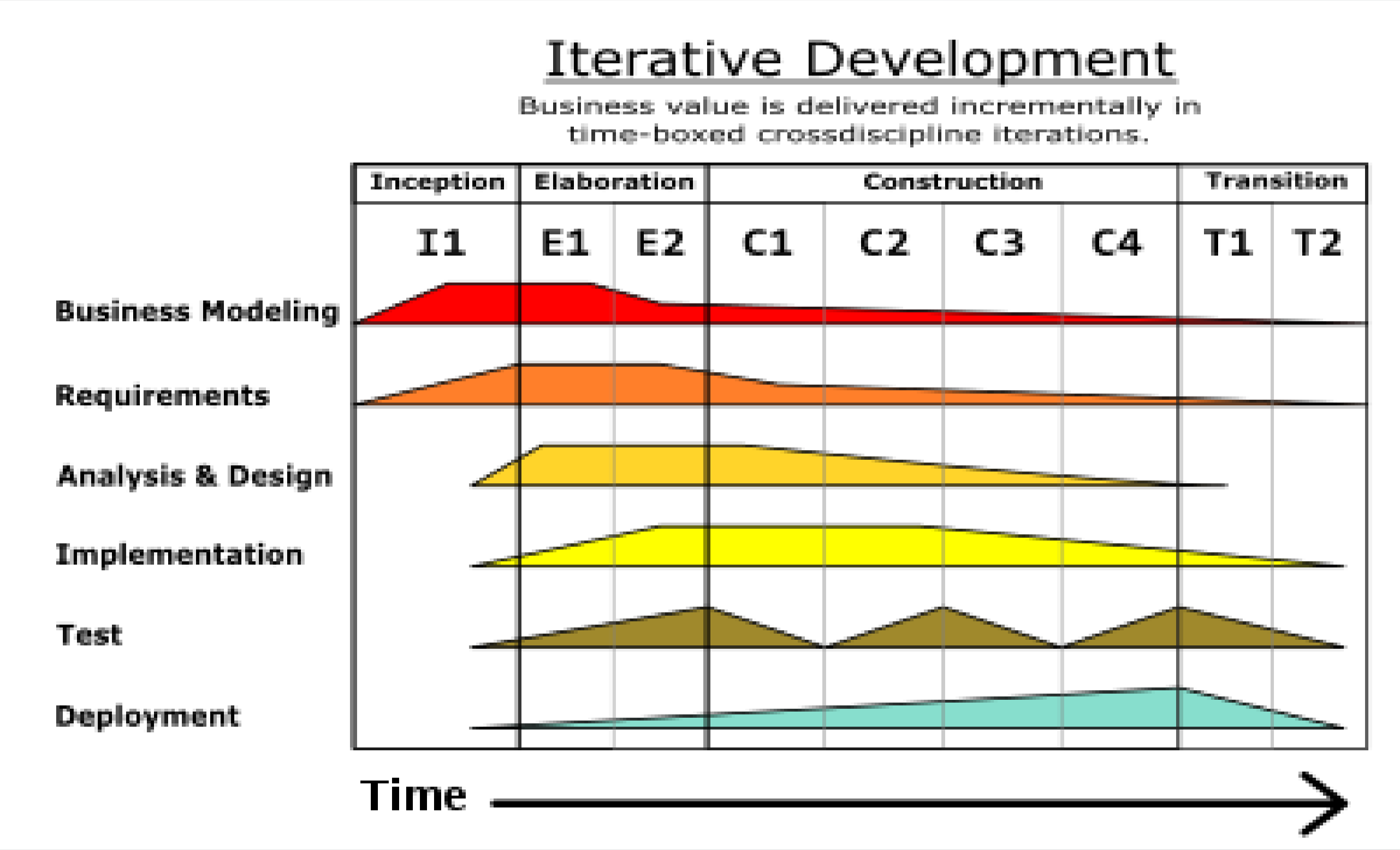
A brief introduction to the

- System Development Life cycles such as Agile, hybrid, and waterfall
- The Work Flows that exist one way or another that are critical to the success of any Life Cycle
- Stage Gates, Budget Approvals, and Project Oversight
- Deliverables as checkpoints in a workflow: necessary to verify understanding, accountability, AND as guidance for future work.
- Tips, Tricks, and Traps

What is a System Development Life Cycle ?

- Automation efforts need a defined approach. The activities are pretty much same regardless of the approach. The major activities are best understood as WORKFLOWS. The key differentiator is the organization and SEQUENCE for executing the steps in each Workflow.
- The Rational Unified Process provides an excellent guide to understanding Workflows. Workflows are the major activities undertaken—every project has these essential workflows in one form or another. KEY is to understand that each workflow continues to have activity AFTER any formal deliverable and signoff. Failure to recognize the NEED to incorporate changes in approved documents as more is learned and circumstances change will invariably compromise quality, cost, timeframe, and even delivery.

Workflows to Manage show the original RUP workflows and phases



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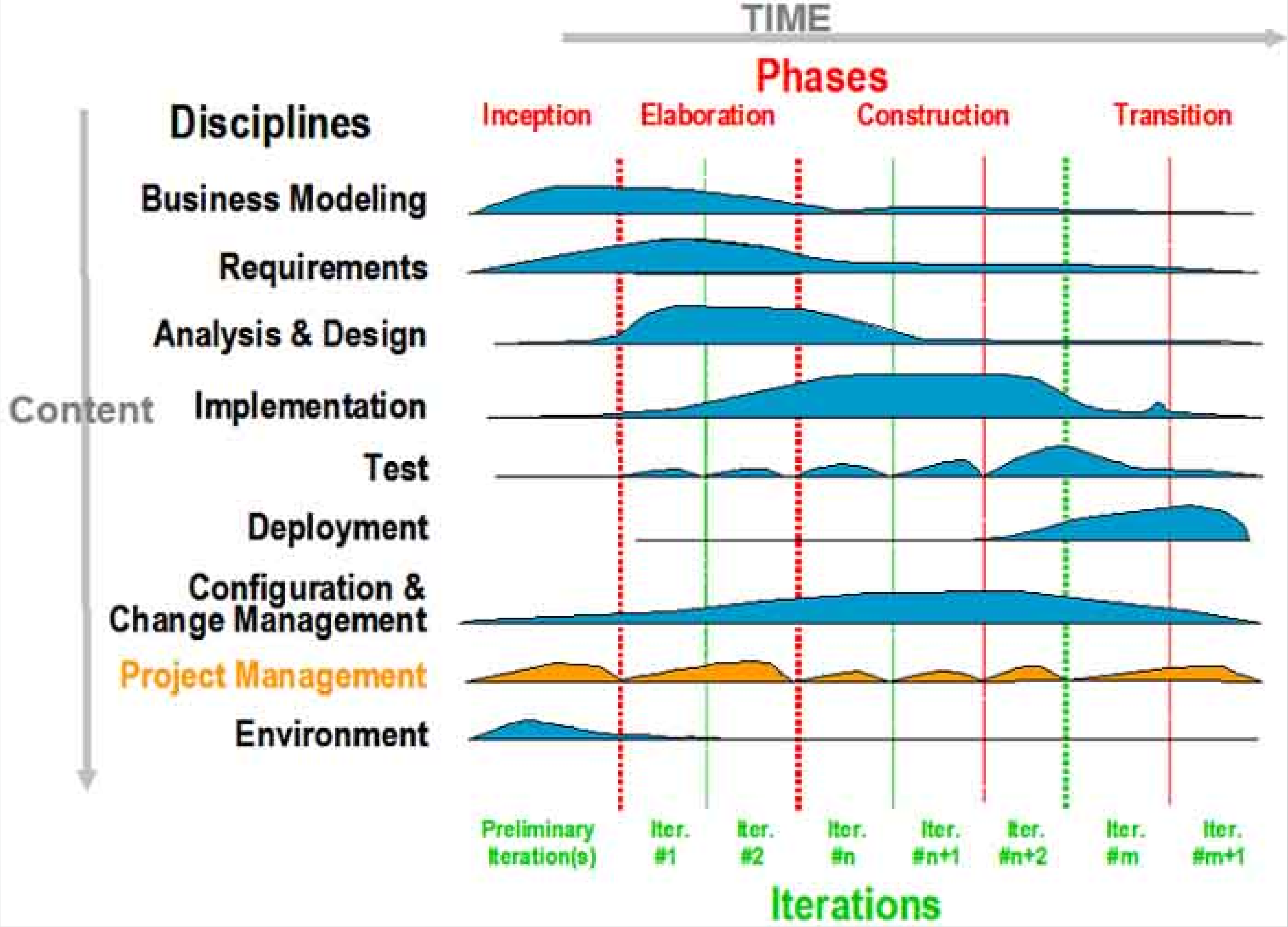

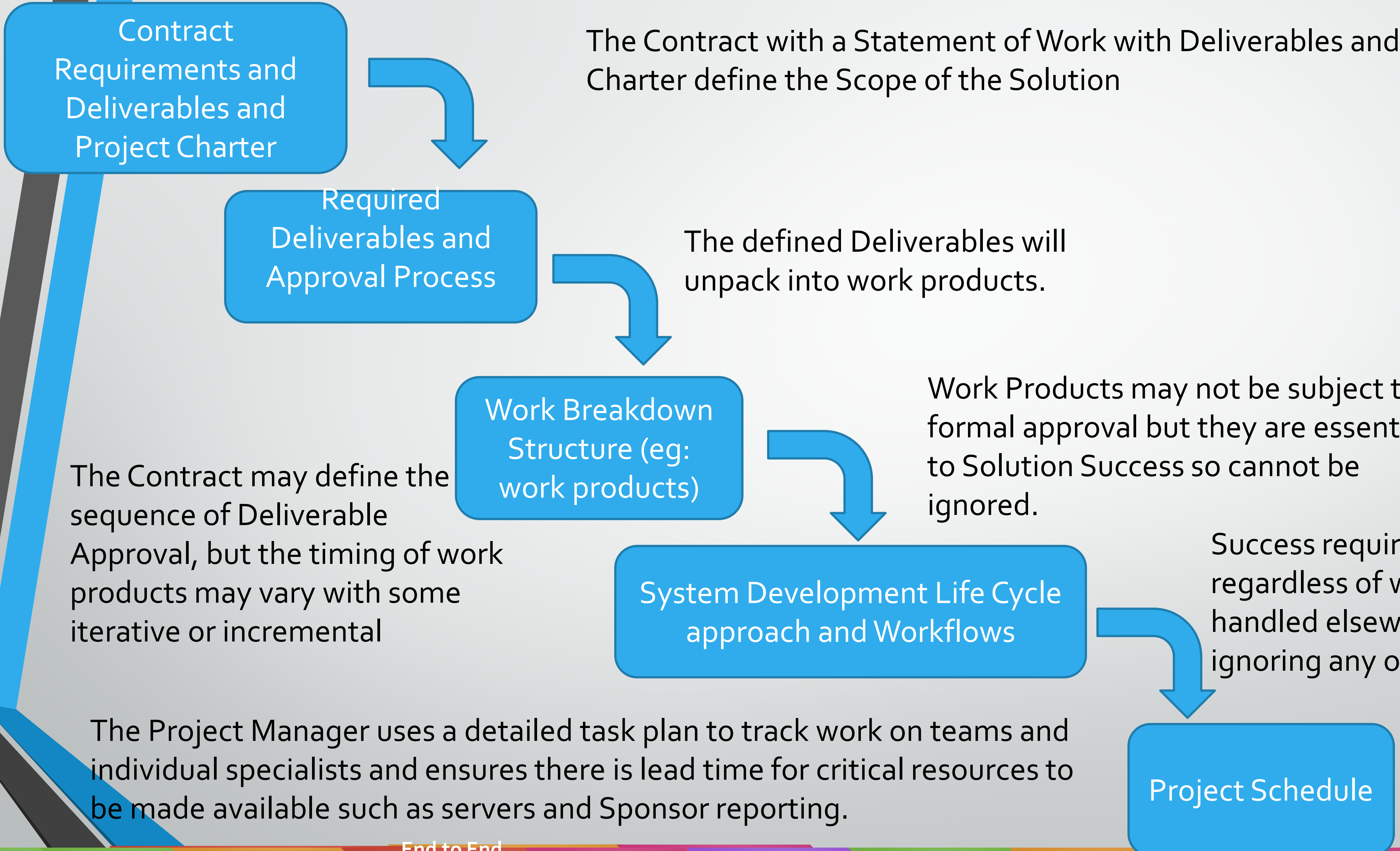

Contract Requirements and Deliverables and Project Charter

The Contract with a Statement of Work with Deliverables and a Project Charter define the Scope of the Solution

Required Deliverables and Approval Process

The defined Deliverables will unpack into work products.

Work Breakdown Structure (eg: work products)

Work Products may not be subject to formal approval but they are essential to Solution Success so cannot be ignored.

The Contract may define the sequence of Deliverable Approval, but the timing of work products may vary with some iterative or incremental

System Development Life Cycle approach and Workflows

Success requires an essential set regardless of whether they are ir handled elsewhere. No project s ignoring any of them.

Project Schedule

The Project Manager uses a detailed task plan to track work on teams and individual specialists and ensures there is lead time for critical resources to be made available such as servers and Sponsor reporting.

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Work Products and Deliverables

- Generally there is a formal deliverable for each Workflow. But even once approved, the deliverable must be continuously updated when events arise.
- Each Deliverable typically has multiple work products.
- Ideally, continuous review and collaboration enables formal approval to be little more than verification that the work products already understood align with the prescribed scope, depth, and format
- Unfortunately, there is too much emphasis upon formalizing the format of deliverable that detracts from the substance and makes it difficult to make updates needed over time.
- Approved deliverables must allow for easy-to-make changes to continue alignment with future project work.

System Development Life Cycle

Agile is the most discussed and least understood Life Cycle considered. We address Agile in the next section. The Life Cycle refers to the major stages, workflows, phases, tasks, and work products that are defined at the beginning of the project and managed throughout the solution preparation and rollout. The major life cycle options today are:

Agile, Waterfall, and Hybrid. Each of these is discussed separately below.

Other approaches with niche followings over the years include Iterative, Incremental, Spiral, rapid, Prototype-driven, and the most ubiquitous: ad hoc or “just winging it”.

Hybrid Approach

Hybrid approach performs “end to end” business analysis up front to provide guidance to the best of the Agile approach to software development.

Upfront end to end business analysis enables:

1. Determining the “Minimum Viable Product” delivers a usable solution and a road map of functionality to add based on experience gained with the initial rollout.
2. Knowing enough up front to determine the platforms and tools for building the solution.
3. Identifying business functions that can be designed to be built once and re-used; without this planning Agile risks building multiple version of closely related capabilities..
4. How to best re-use existing data and functionality..

Agile Best Practices

The strengths of the Agile approach include:

- Define a Minimum Viable Product (MVP)
- Assigning development (coding) work to Sprints that typically are time-boxed to a two-week period
- Sprint practice can be extended to increments of other workflows such as business analysis and architecture; however, it is dangerous to start coding functionality until end-to-end business analysis performed to some level of fidelity
- Product Owner – Project Executive assigns an alter-ego engaged potentially full-time to make decisions quickly and in a timely manner. But better end to end preliminary work will reduce number and urgency of Product Owner actions.
- Team building across analyst, developer, tester

Challenges in Agile

Product Owner

Lack of deadlines –

Getting small teams to deliver what they promise

Lack of accountability for results

High risk of hitting dead-ends in the design approach

Without a plan any path will take you somewhere

Dive into coding before stabilizing technical architecture, identification of shared components, or end to end business analysis

risk of falling off cliff or stuck in a box canyon that requires starting over.

High expense of refactoring as design evolves and product stack stabilizes

Lack of standards to ensure user design is consistent and coding follows shared practices.

Contractual Challenges with Agile

Paying just for time and materials makes it challenging to know whether results will be stable

Potential for teams to pursue what is interesting, not what needs to get done

Deadlines don't exist—just push functionality to backlog for the next sprint

The expected level of functionality is not defined so accountability absent for results

How We Apply Discipline to Agile

We take a "Top – Down" approach to identifying what Agile calls the Themes, Epics, and User Stories. Agile allows work to go forward once a lower-level epic or User Story is defined, without first systematically figuring out what are the Themes and how do all the pieces of functionality fit together.

The Project Charter and Workshops generate the end to end business process model. There are typically five to nine major business processes. Agile calls these the Themes.

Each Theme has multiple Epics (aka Use Cases).

Each Use Case has multiple User Stories.

Tips, Tricks, and Traps ….

System Development Life Cycle

Workflows must overlap, even with a waterfall project. Staff need to keep busy during the time that a formal deliverable is under review. Remember that deliverables represent understanding at a point in time. The workflow continues t after the deliverable which will require changes in the deliverable over time.

Format deliverables so that they can be readily updated while archiving the original approved version.

Determine who will bear the cost to update a deliverable when a change is required in the future.

Management Throughout the Project

A brief introduction to the

- Project Charter
- Project Sponsor, Owner, and Steering Committee
- Stage Gates, Budget Approvals, and Project Oversight
- Approach to preparation, review, and approval of Deliverables
- Traceability to verify What has been approved in the past will get implemented
- Tips, Tricks, and Traps

Ongoing Management Activity

Ongoing Management Activities include the Work Plan and Status Reporting but go far beyond to include:

Decision Log

Issue Log and Resolution

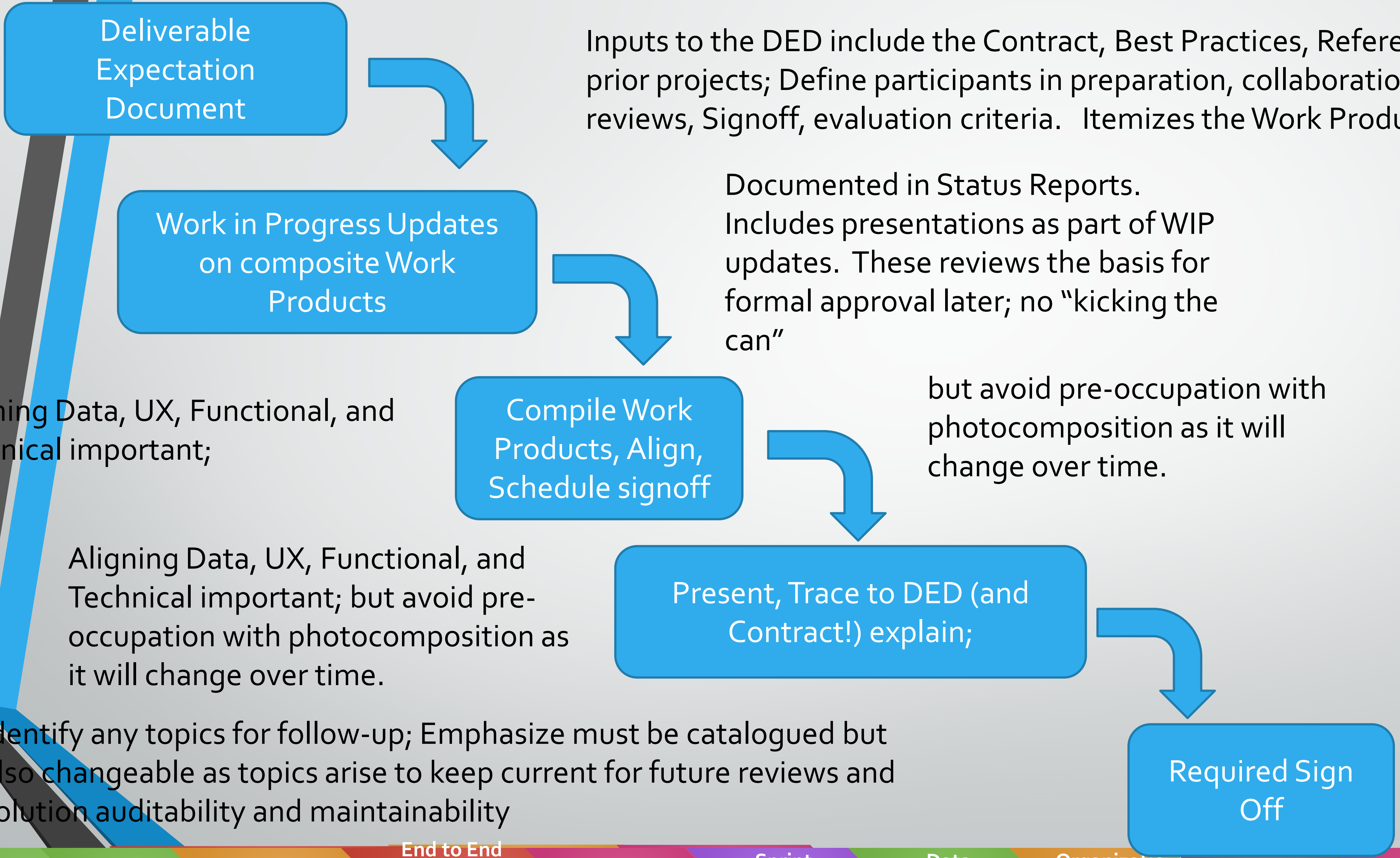
Change Control Process

Updates to and Verifying Adherence to Communication Processes

Updates to Project Organization and Key Role Assignments

Deliverable Management

- Deliverables require Signoff by Key Client Management and Experts
- Identified through the Work Breakdown Structure
- Timing for start, steps, and completion in the Work Plan
- Scope, Depth, and Format in the Deliverable Expectation Document (DED)
- Explain the steps and approach in a Kickoff for the Workflow that will generate the Deliverable
- The Workflow for a Deliverable may include one or more work products
- Deliverable review and approval should be little more than verification that what was done in collaboration of work products is compiled, factored, and able to be updated over time.
- The Manager must notify signatories two weeks in advance so they know when to be ready, have criteria to verify such as the DED, Charter, and audit trail of collaboration by staff.
- The Manager has resources assigned to make updates to keep deliverables aligned with current efforts.
- All Deliverables must be current to inform those who will do testing and in the future do maintenance and enhancements.



Deliverable Expectation Document

Inputs to the DED include the Contract, Best Practices, References from prior projects; Define participants in preparation, collaboration wip reviews, Signoff, evaluation criteria.   Itemizes the Work Products.

Work in Progress Updates on composite Work Products

Documented in Status Reports. Includes presentations as part of WIP updates. These reviews the basis for formal approval later; no "kicking the can"

Compile Work Products, Align, Schedule signoff

Aligning Data, UX, Functional, and Technical important;

but avoid pre-occupation with photocomposition as it will change over time.

Aligning Data, UX, Functional, and Technical important; but avoid pre-occupation with photocomposition as it will change over time.

Present, Trace to DED (and Contract!) explain;

Required Sign Off

Identify any topics for follow-up; Emphasize must be catalogued but also changeable as topics arise to keep current for future reviews and solution auditability and maintainability

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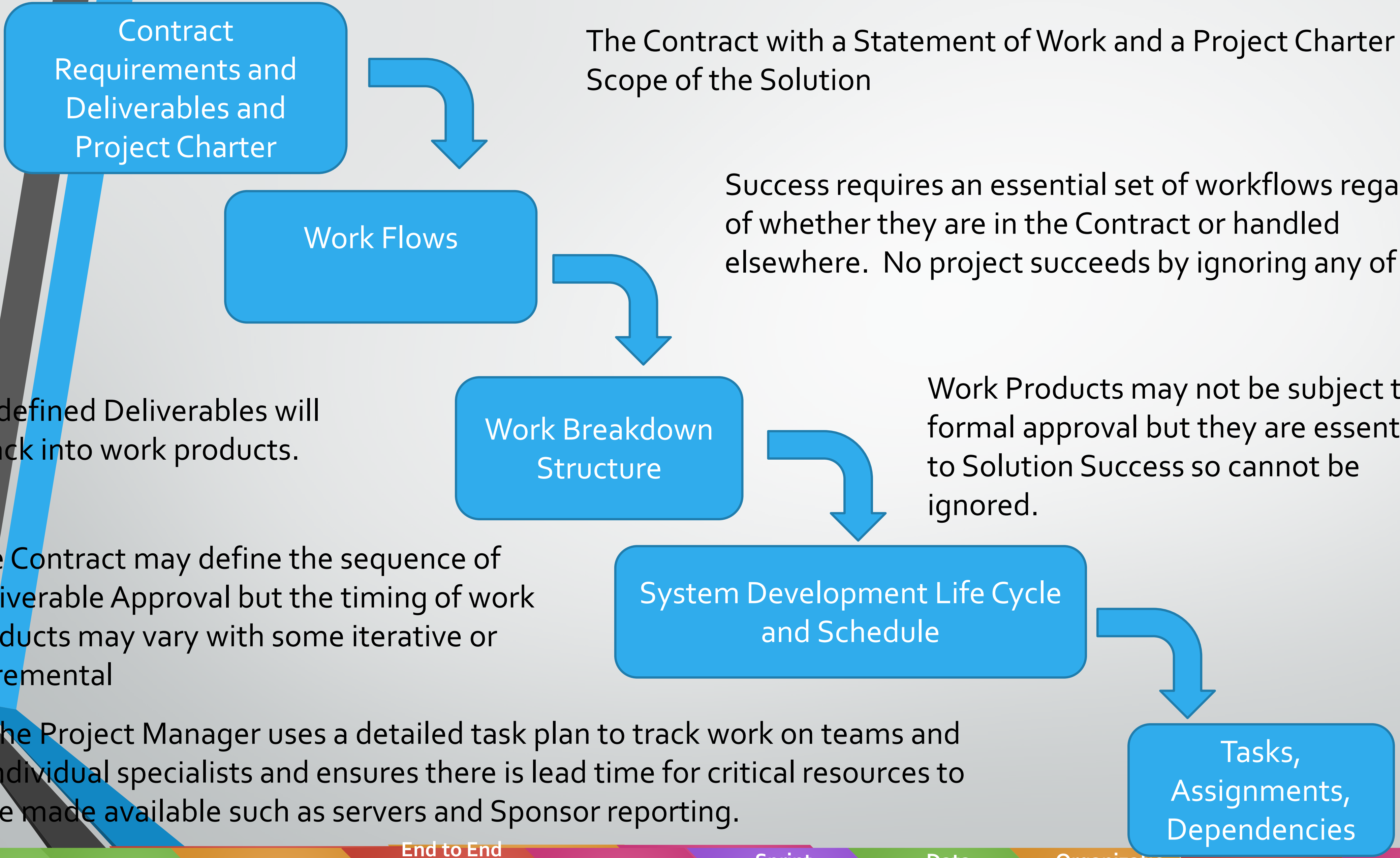

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Work Breakdown Structure

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System Development Life Cycle and Schedule

The Project Manager uses a detailed task plan to track work on teams and individual specialists and ensures there is lead time for critical resources to be made available such as servers and Sponsor reporting.

Tasks, Assignments, Dependencies

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Requirements Management & Traceability

Go to detailed explanation

Distinguish between “High Level Requirements” and Detailed Requirements for Functions and Features

Traceability done to Detailed Requirements

High Level Requirement important for a Project Charter and shared vision, but can be interpreted one way by vendor and another by the client.

Better to unpack into Process Models and Use Cases than detailed Requirements for Traceability and measurement of progress

IVV is twenty years behind the times by continuing to focus on requirements.

Managing Status Reporting

- Document accomplishments, work in progress, planned activities, dependencies where people, documents, or other resources needed;
- Critical to compare what said in last report on a task to what is said about the same task this time period.
- Any task performed outside a defined task requires documentation, and change control. Change control process may delegate to the Manager with a "post audit" monthly.
- Status must cover responsibilities of all participants: vendor, outside suppliers, business partners, client assigned team members, and others who assist.
- Documenting participation that goes into work products and deliverables essential to ensure needed collaboration, buy-in, early identification of issues, and efficient approval of deliverables.
- Team Leads should document work that is synthesized by the Manager in preparing report.
- All reports need document management registration.

Managing Project Quality

Quality requires much more than Contract Compliance or User Acceptance test approval.

How the Deliverables are prepared as described above in Deliverable Management;

Keeping an assertive pace so that participants see clear progress to sustain enthusiasm;

A collaborative process so participants see that as they learn their contribution gets incorporated;

Trust: Trust is earned through listening, verifying understanding, following through on commitments, competence, hard work.

Honest brokering across competing interests.

Managing Scope & Change Orders

The Business Analyts are in the best position to assess where proposed features and functions fit into the Solution: whether in scope or out. Of course, items related to licensed products and computing performance are led by the information technology specialists. But even on technology decisions, the business analysts working with the subject matter experts are best positioned to validate assumptions about volumetrics in terms of quantity and frewquency that impact platform decisions. Tradeoffs in what goes into the Minimum Viable Product also benefit from the analysts' understanding and analysis approach; as most solutions have 80 percent of the usage centered on 20 percent of the capability, there may be ways to trade proposed new functionality with capability once thought important but upon further examination is not as important as understanding and streamlining thought processes are applied. The business process models guide the location and dependencies of any change and the user stories and use cases provide lower level details as applicable.

Business Analyst Contributions to Project Plan:

Risk
Schedule
Communications
Scope Mgmt

The Project Manager may serve as the gatekeeper for the content and work with the client on the process, but the Business Analysts working with the Subject Matter Experts are the closest to day to day activities to know when action is needed.

Recognizing and documenting changes early can avoid or significantly reduce time delays, costs, or unaligned assumptions.

Situations where Analysts may identify contributions to plan elements include:

Interfaces or volumes or special functions not identified in the Scope of Work emerge during workshops or preliminary research;

Channels of communication during the course of the project that need documentation in the Communication Plan to avoid leaving someone out of the loop, confusion or later fingerpointing;

SMEs working on legislative bill analysis may provide early heads-up of new functionality needs or enable better alternative analysis for executives.

Tips, Tricks, and Traps ….

Ongoing Management

The Backlog is well defined in a hybrid approach. The end to end analysis and functional specification are done, the Minimum Viable Product formulated. User Stories may be identified but still need "grooming".

Decisions and Business Rules are maintained in their own repository. So when new ones are found or better defined through grooming or in a Sprint, the repository must be updated. This reduces accidental duplication.

Analysts can conduct a "Design specification" sprint to ready a use case for development in a Build Sprint that follows. Getting Decisions, rules, data, and features flushed out before the Development sprint aids in estimating and avoids delays.

The attitude that functionality not completed in the assigned Sprint can be carried over to another Sprint is very dangerous. Deadlines exist for a reason. Inability to complete work as scheduled must be elevated to determine if the entire schedule needs to be adjusted. There is no such thing as "catching up".

Leaving Rule specification to a Development Sprint is high-risk: may take time to get agreement among needed SMEs, may delay the developers, or a placeholder may get lost. The Decision/Rule repository must be kept current.

End to End Business Analysis

We divide End-to-End between the Analysis presented here and Functional Specification which comes next. We recommend a detailed briefing and eliciting specific guidance from the Sponsor and Owner at the end of analysis and before doing the Functional Specification. This End to End Analysis goes through the elicitation process with subject matter experts, challenging assumptions, collecting volumetrics, exploring options based on best practices, consultation with technology leadership to make optimal use of existing investment, lessons learned, and exploring how new technology investments will be supported and shared across the enterprise. There is considerable investment in research and straw models BEFORE starting workshops. We believe effective use of Subject Matter Experts requires doing our homework first. Straw models are thrown out and new models prepared that address

- Multiple levels of process models to offer a top-down understanding from business goals to operations to specific workflows
- Data Modelling with a glossary of business terms so that everyone is speaking the same language
- Wireframes for every major function to verify a shared understanding and alignment across graphical depictions of functions (process models), data, and user interactions.

Overview for End to End Business Analysis

We organize thinking about Analysis across:

- Work Products
- Activities
- Techniques

We believe business analysis must be done at the beginning of the project and performed end to end. In parallel with end to end analysis a technical team can establish development environments, perform a detailed assessment of existing technology standards and investments for re-use with the new solution, and assemble technical components that are "common" such as notification, tickler; and define the integration approach to other systems and external data sharing partners.

The PURPOSE of End to End Analysis is to understand the Pattern, major functions, and then assess how to organize the workflow.   Understanding of technologies that can enable best practice approaches informs our work.

Does End to End Analysis delay progress?

Agile advocates confuse activity with progress. S

The original Agile evangelists has plenty of evidence to condemn traditional waterfall development. Forcing the business to sign-off on requirements before understanding how the system would look, the high cost of making changes, and the inability to apply lessons learned from early in the project to later are all indictments to waterfall.

But Agile advocates failed to:

- recognize a new generation of tools and techniques that enable simulating the user experience without a major investment in programming.
- Appreciate that developers do not effectively communicate and validate requests from subject matter experts;
- Recognize that the business analyst brings techniques to elicit, pose options, challenge assumptions, apply patterns for best practices, and reconcile different points of view essential to verify the solution supports the enterprise, not a single user.

Tips, Tricks, and Traps ….

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ACTIVITIES in End to End Business Analysis

Any case management pattern-based program can and should efficiently undertake end-to-end business analysis to guide the technical architecture and design, build, and organizational change management efforts.

The major steps in End to End Business analysis are:

- Research
- Elicitation Models
- Workshops (aka JADS)
- Analysis Work Products
- Functional and Data Specification Work Products
- Value Engineering and Minimum Viable Product boundary

Diagram Type	Sub types	Brief description and scenarios when to use	Comments
Control Flow Diagram		Basic diagram depicting flow of control in a Business process.	High Level
Causal Loop Diagram		It aids in visualizing how different variables in a system are interrelated. The diagram consists of a set of nodes and edges. A simple example would be a food supply chain.	High Level
Ishikawa diagram		All factors contributing to a particular state of the system.	High Level
Process-Data diagram		A process-data diagram is a diagram that describes processes and data that act as output of these processes. On the left side the meta-process model can be viewed and on the right side the meta concept model can be viewed.	Both
Functional Flow Block Diagram		A Functional Flow Block Diagram (FFBD) is a multi-tier, time-sequenced, step-by-step flow diagram of a system's functional flow.	
Flowchart		Self Explanatory. CAPMAN uses Cross Functional Flowchart.	Low Level
Context Diagram		A System Context Diagram (SCD) is a diagram that defines the boundary between the system, or part of a system, and its environment, showing the entities that interact with it. This diagram is a high level view of a system. It is similar to a block diagram.	High Level
Event Chain Diagram		Event chain diagrams are visualizations that show the relationships between events and tasks and how the events affect each other. Event chain methodology is an uncertainty modeling and schedule network analysis technique that is focused on identifying and managing events and event chains that affect project schedules. Event chain methodology is the next advance beyond critical path method and critical chain project management. More advanced form of GANTT chart.	Low Level
Influence Diagram		It is a compact graphical and mathematical representation of a decision situation and the factors involed in a decision situation.	High Level
PERT Diagram		Diagram showing different milestones and the durations to get there.	High Level
GANTT chart		Project schedule diagram that shows the different milestones and dates when we can get there. This is the diagram deployed in MS Project	Both
Class Diagram		Basic structures and the relationships between them in a software application. Use this to come up with associations between different classes. For example, Invoices, Rate Increments, Contracts, etc can be considered classes.	High Level
Object Diagram		More specific implementations of a particular class. For example, a 'Primary Capitation Medi-Cal Only' Invoice is an object that inherits the Invoice class.	High Level
Component Diagram		Use this diagram to show how certain functions depend upon different components. For example, for users to enter Contracts, CAPMAN has to up, etc. This diagram is to mainly show dependencies.	High Level
Profile Diagram		This diagram is used to show the meta details of a class. This is to show the low level details of a class and what it inherits. Class could inherit a class, for example a server class could inherit a Device class, so this is to promote extendability.	Low Level
Composite Structure Diagram		To show how classes can collaborate over communication links to perform functions. For example 'Rate adjustment' function involves comparing contract versions.	Low Level
Deployment Diagram		A more technical diagram which shows what functions are performed where. Use this to depict on which servers certain software functions are performed, etc.	High Level
Package Diagram		A package is a collection of items that cover a purpose (use case). For example, 'Benefits and Enrollment' could be a package that covers all Membership and Enrollment functions. 'Claims processing' is another package that depends upon 'Benefits and Enrollment' package. Use this to specify dependencies between packages to simplify showing dependencies between classes.	Low Level
Activity Diagram		Graphical representation of workflows and stepwise actions (similar to flowchart).	Low Level
Use Case Diagram		A use case diagram can portray the different types of users of a system and the various ways that they interact with the system	Both
Interaction Diagram		Interaction diagrams, a subset of behavior diagrams, emphasize the flow of control and data among the things in the system being modeled	Both
Interaction Diagram	Sequence Diagram	A sequence diagram is an interaction diagram that shows how processes operate with one another and in what order.	Both
	Communication Diagram	Communication diagram (called collaboration diagram in UML 1.x) is a kind of UML interaction diagram which shows interactions between objects and/or parts (represented as lifelines) using sequenced messages in a free-form arrangement. Communication diagram corresponds (i.e. could be converted to/from or replaced by) to a simple sequence diagram without structuring mechanisms such as interaction uses and combined fragments.	Both
	Interaction Overview Diagram	The interaction overview diagram is similar to the activity diagram, in that both visualize a sequence of activities. The difference is that, for an interaction overview, each individual activity is pictured as a frame which can contain a nested interaction diagrams. This makes the interaction overview diagram useful to "deconstruct a complex scenario that would otherwise require multiple if-then-else paths to be illustrated as a single sequence diagram".	Low Level
	Timing Diagram	Timing diagrams are used to explore the behaviors of objects throughout a given period of time. A timing diagram is a special form of a sequence diagram. The differences between timing diagram and sequence diagram are the axes are reversed so that the time is increased from left to right and the lifelines are shown in separate compartments arranged vertically.	Both
State Machine Diagram		These diagrams show different states of the system with connecting transition actions.	Low Level

Startup Research

Scope – Current Automated Systems, comparable solutions from other agencies, COTS as references,

Resources and References – Guidebook on Case Management, Current Systems documentation

Key Participants – Business Analyst, Client Technical experts and Product Owner

Expertise Needed – Analytical Techniques for Modeling

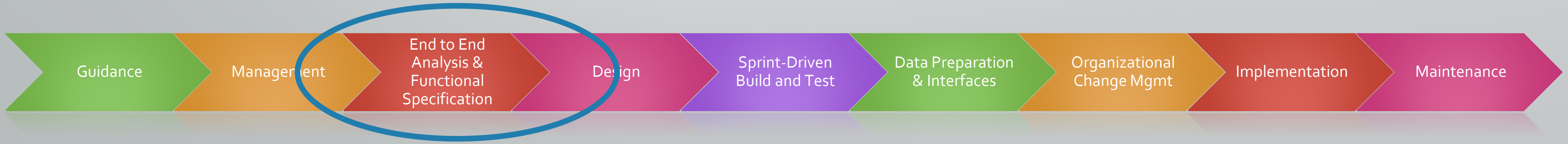
Usage Throughout the Project – Research ideally begins to inform the Charter, expands for the first and second Stage Gates, so that by the time the analysts prepare for Workshops a repository is in place.

Frequency of Update – Research will supplement the Workshops to define business rules, verify legal requirements, utilize emerging industry standards for data exchange.

Work Products – Project Charter, Stage Gate support, Straw Models for Elicitation Effort in Workshops

Straw Models for Elicitation

- Objective – Straw Models emphasize they are “throw away”. Their purpose is two-fold: a) demonstrate to the Workshop participants that the Analyst has made an effort to understand the current environment and future opportunities; b) provide prompts to elicit new ideas, verify problems and needs, keep focus, get more depth and thoughtfulness in less time with greater sense of accomplishment.
- Scope – Story Board, Business Process Models, Subject Data Model, Glossary
- Resources and References – Guidebook on Case Management, Comparable solutions, Best Practices
- Key Participants – Business Analyst, Client Technical experts and Product Owner
- Expertise Needed – Analytical Techniques for Modeling
- Usage Throughout the Project – The Straw Models are thrown away and REPLACED by the models developed with the Workshop Particpants. This makes clear the Analyst is NOT trying to “sell” a solution, only provide a means for effective elicitation.
- Frequency of Update – None.



Guidance

Management

End to End Analysis & Functional Specification

Design

Sprint-Driven Build and Test

Data Preparation & Interfaces

Organizational Change Mgmt

Implementation

Maintenance

Workshop Preparation

Scope – Current Automated Systems, comparable solutions from other agencies, COTS as references,

Resources and References – Guidebook on Case Management, Current Systems documentation

Key Participants – Business Analyst, Client Technical experts and Product Owner

Expertise Needed – Analytical Techniques for Modeling

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Work Products – Project Charter, Stage Gate support, Straw Models for Elicitation Effort in Workshops

Workshop Execution

Scope – Current Automated Systems, comparable solutions from other agencies, COTS as references,

Resources and References – Guidebook on Case Management, Current Systems documentation

Key Participants – Business Analyst, Client Technical experts and Product Owner

Expertise Needed – Analytical Techniques for Modeling

Usage Throughout the Project – Research ideally begins to inform the Charter, expands for the first and second Stage Gates, so that by the time the analysts prepare for Workshops a repository is in place.

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Work Products – Project Charter, Stage Gate support, Straw Models for Elicitation Effort in Workshops

Managing Workshops

Scope – Current Automated Systems, comparable solutions from other agencies, COTS as references,

Resources and References – Guidebook on Case Management, Current Systems documentation

Key Participants – Business Analyst, Client Technical experts and Product Owner

Expertise Needed – Analytical Techniques for Modeling

Usage Throughout the Project – Research ideally begins to inform the Charter, expands for the first and second Stage Gates, so that by the time the analysts prepare for Workshops a repository is in place.

Frequency of Update – Research will supplement the Workshops to define business rules, verify legal requirements, utilize emerging industry standards for data exchange.

Work Products – Project Charter, Stage Gate support, Straw Models for Elicitation Effort in Workshops

Techniques in Business Analysis

80/20 Lens – Track volumes and statistics for top 80 and bottom 20, not for the whole

Understand Volumetrics

Duration and Elapsed Time

Identify and Challenge Assumptions – past practice need not constrain future choices

Case Management Pattern for Top – Down Function Identification

Assign Bottom-Up Findings to Function and Theme – organize and align

Best Practices – encourage self service, automated edits and cross references

Awareness of Technologies that Enable Best Practices

Levels of Fidelity

Refactoring – regularly modify the models based on new information and insight

Triangulation – Align functional process models with data model with UX wirefreames

Policy > Decision > Business Rule

Carefully Prepare for Workshops

Research Before Asking Questions

Establish Creditability with SME Team through by Eliciting through straw models rather than blank white board

Show willingness to throw away the straw model and replace with Team contribution

- Let’s be clear up front: each work product will go through multiple iterations. We define those iterations up front. This may mean a more work up front but with the goal of giving the team time to digest in smaller chunks, offer changes, make informed suggestions in response to a draft rather than being expected to start with a “blank whiteboard”.
- Levels of Fidelity apply to:
  - Process Models
  - Data Models
  - User Experience
  - Architecture

The increase in level of Fidelity or evolution includes:

Zero - Reference Model

One - Elicitation Model

Two - Subject Matter Expert Version One

Three - Workshop Work Product

Four - Refactored Model (as needed) to align across models submitted for formal approval

Five - Controlled Model that is updated throughout the life of the implementation and then the ongoing maintenance.

Levels of Fidelity - Conditions for Success

- the concept of Levels of Fidelity requires participants to understand that they have the opportunity and must embrace that it takes time and active participation to figure out the Solution. No one is going to hand it over on a silver platter to ask for an engraved signature with a guarantee that nothing will ever change.
- We believe in Elicitaiton Models to sitmulate questions and suggestions. Responding to a sketch is better than starting with a blank sheet of paper; this of course requires that we do a lot of homework to prepare that sketch. The purpoe of workshops is not to educate the Vendor's Facilitator but to get the participants to ask "shy" and "what if".

The approach is structured so that time is not wasted and there is no confusion about where we are, and there is time to learn and apply rather than getting a firehose of expectations followed by regrets there wasn't time or a process to understand before committing to the solution's direction.

Story Board

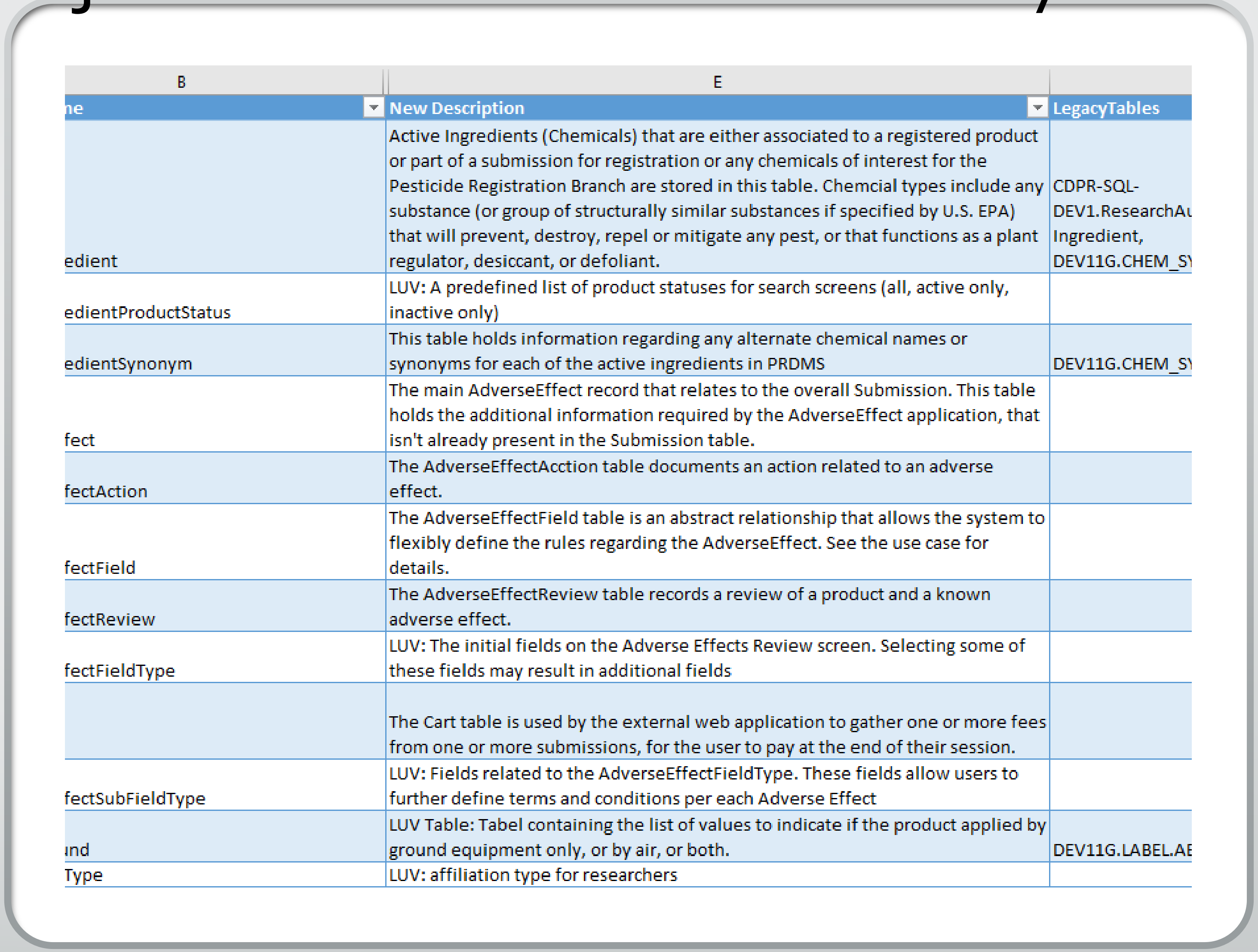
The Story Board is a very simple description of major features and functions that outline the scope of the Solution.

The Story Board emphasizes capabilities envisioned and does NOT attempt to describe the User Experience in terms of web page design for content and user interactions.

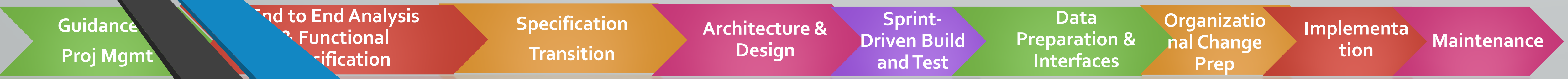
The Story Board is the first model that will be shared with the Subject Matter Experts in the Workshops. The Story Board introduces a best practice-driven approach including applicants creating an account, online submittal and tracking, Dashboards of work assignments, managing the workflow, notifications and alerts, decision making, customer interactions for updates and approvals, followup satisfaction, ongoing reporting requirements.

Example: Subject Data Model and Glossary

The Subject Data Model will evolve into the Entity Relationship Diagram and ultimately the Physical Schema. The Glossary will evolve into the Data Elements Dictionary and Database Directory. The Glossary includes Business Terms that may not translate into specific data elements as well.



B	E	
ne	New Description	LegacyTables
edient	Active Ingredients (Chemicals) that are either associated to a registered product or part of a submission for registration or any chemicals of interest for the Pesticide Registration Branch are stored in this table. Chemcial types include any substance (or group of structurally similar substances if specified by U.S. EPA) that will prevent, destroy, repel or mitigate any pest, or that functions as a plant regulator, desiccant, or defoliant.	CDPR-SQL-DEV1.ResearchAu Ingredient, DEV11G.CHEM_SY
edientProductStatus	LUV: A predefined list of product statuses for search screens (all, active only, inactive only)	
edientSynonym	This table holds information regarding any alternate chemical names or synonyms for each of the active ingredients in PRDMS	DEV11G.CHEM_SY
fect	The main AdverseEffect record that relates to the overall Submission. This table holds the additional information required by the AdverseEffect application, that isn't already present in the Submission table.	
fectAction	The AdverseEffectAcction table documents an action related to an adverse effect.	
fectField	The AdverseEffectField table is an abstract relationship that allows the system to flexibly define the rules regarding the AdverseEffect. See the use case for details.	
fectReview	The AdverseEffectReview table records a review of a product and a known adverse effect.	
fectFieldType	LUV: The initial fields on the Adverse Effects Review screen. Selecting some of these fields may result in additional fields	
	The Cart table is used by the external web application to gather one or more fees from one or more submissions, for the user to pay at the end of their session.	
fectSubFieldType	LUV: Fields related to the AdverseEffectFieldType. These fields allow users to further define terms and conditions per each Adverse Effect	
ınd	LUV Table: Tabel containing the list of values to indicate if the product applied by ground equipment only, or by air, or both.	DEV11G.LABEL.AE
Type	LUV: affiliation type for researchers	



Pattern, Case Management Reference Model, and Process Models

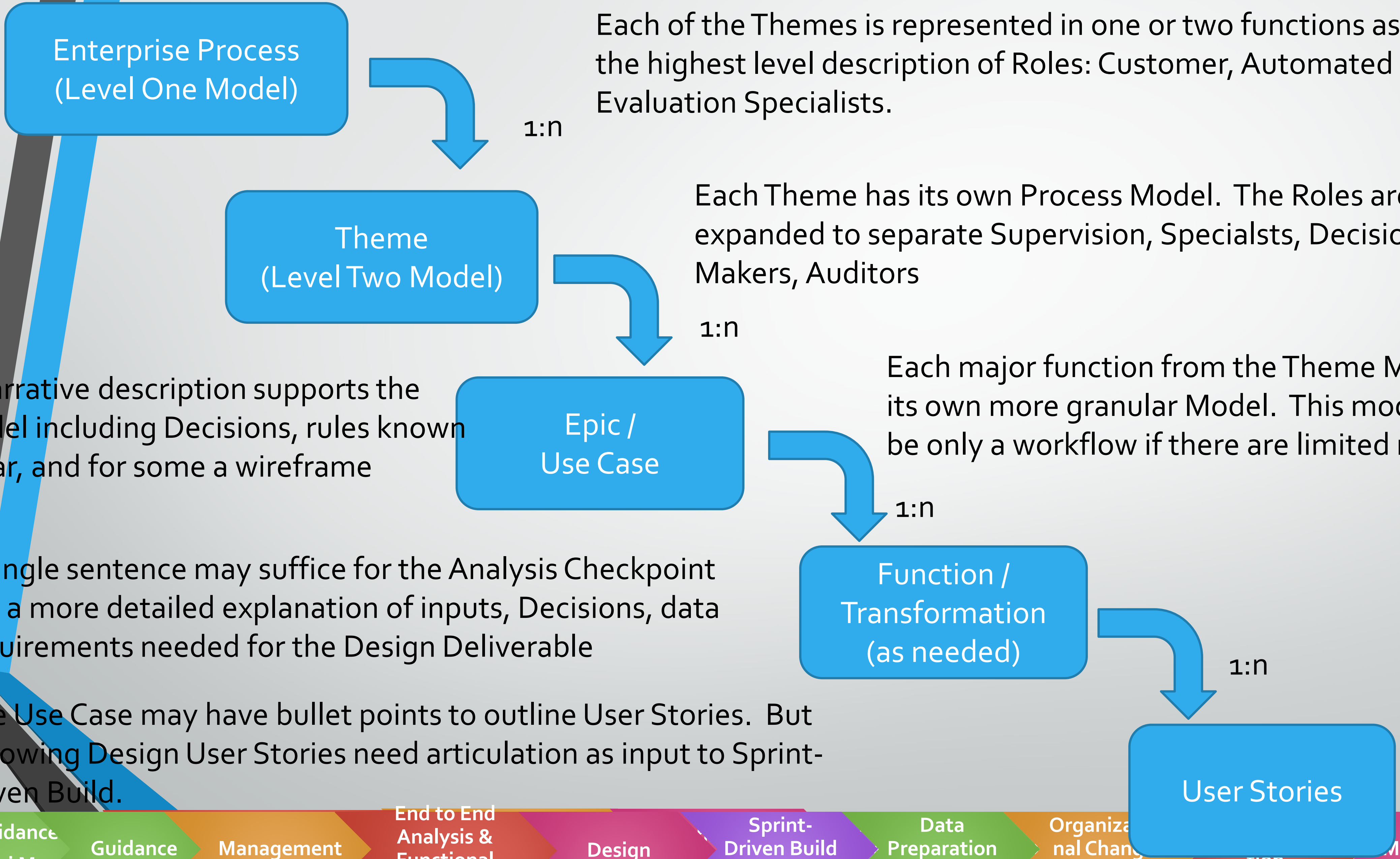
You must start with the assumption that your needed solution follows a PATTERN. Your program may have many unique requirements and functionality, but when you raise up to 1000 feet (not 10000) a pattern will emerge that is found across many solutions.

Patterns provide guidance, prompts, on which to start organizing the Processes (Themes), use cases, decisions, business rules, and even essential data needs.

Case Management is the most widely applicable Pattern in public sector applications. We provide a 100-plus page Guidebook for Case Management to introduce the framework for what to consider in your automated solution—even when the Decisions and Business Rules are unique to you.

Process Models provide a graphical representation for the activities and how they will fit together. These models will got through multiple iterations as their fidelity level increases from a reference model to straw model used for the first round of elicitation to representing robust functionality and streamlined processing from the collaboration of subject matter experts in the Workshops.

The approved Models serve as the map to ensure a shared understanding and traceabiiity for architecture, design, communication for the build, test, and introducing new team members during implementation and later for maintainability.



Enterprise Process
(Level One Model)

1:n

Each of the Themes is represented in one or two functions assigned to the highest level description of Roles: Customer, Automated Solution, Evaluation Specialists.

Theme
(Level Two Model)

1:n

Each Theme has its own Process Model. The Roles are expanded to separate Supervision, Specialsts, Decision Makers, Auditors

Epic /
Use Case

A narrative description supports the Model including Decisions, rules known so far, and for some a wireframe

1:n

Each major function from the Theme Model has its own more granular Model. This model may be only a workflow if there are limited roles.

Function /
Transformation
(as needed)

A single sentence may suffice for the Analysis Checkpoint but a more detailed explanation of inputs, Decisions, data requirements needed for the Design Deliverable

1:n

User Stories

The Use Case may have bullet points to outline User Stories. But following Design User Stories need articulation as input to Sprint-driven Build.

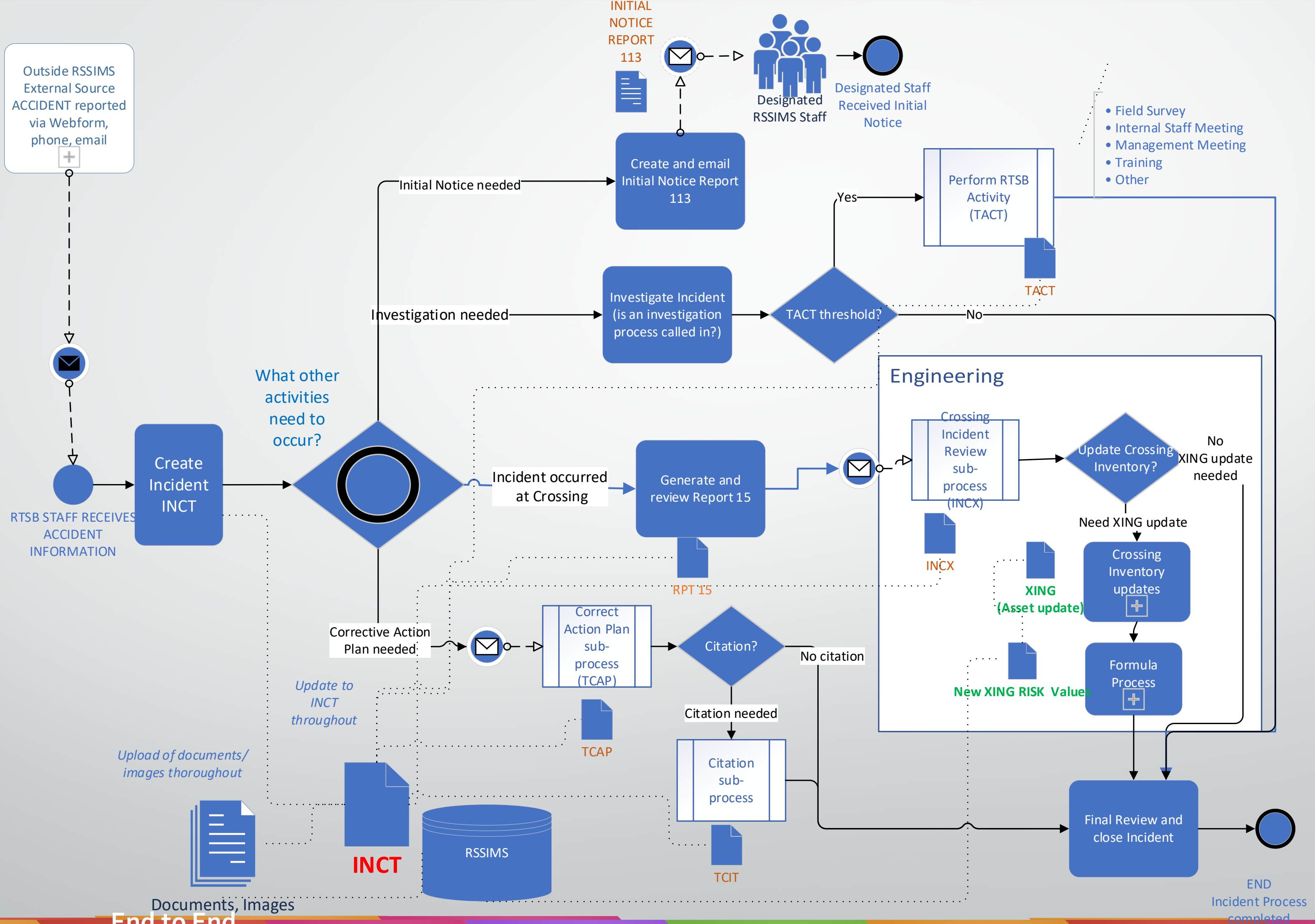
INCIDENT MAIN PROCESS:

1. Incident (INCT)
2. Several possible activities may be invoked

Output:

Crossing Inventory Asset(s) attributes updated; new association to an incident

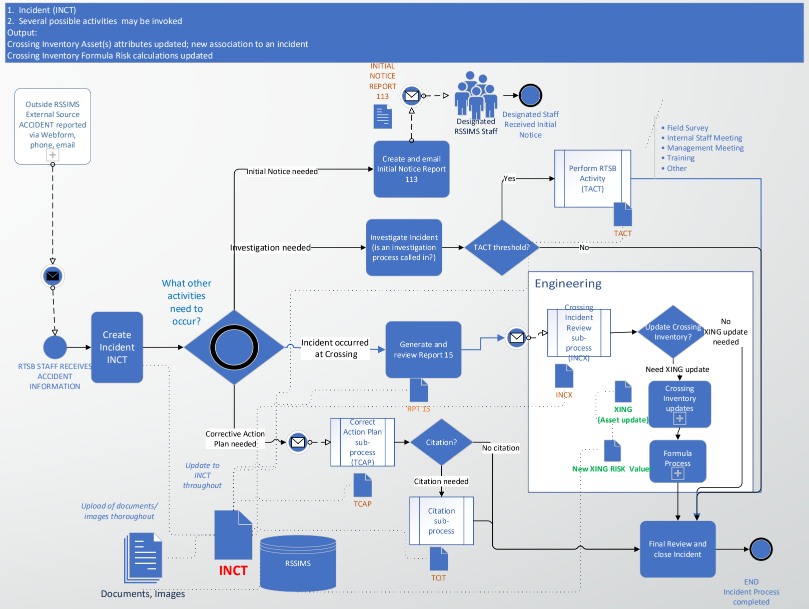
Crossing Inventory Formula Risk calculations updated



INITIAL NOTICE REPORT 113
Designated RSSIMS Staff
Designated Staff Received Initial Notice
Outside RSSIMS External Source ACCIDENT reported via Webform, phone, email
Initial Notice needed
Create and email Initial Notice Report 113
• Field Survey
• Internal Staff Meeting
• Management Meeting
• Training
• Other
Yes
Perform RTSB Activity (TACT)
TACT
Investigation needed
Investigate Incident (is an investigation process called in?)
TACT threshold?
No
What other activities need to occur?
Create Incident INCT
RTSB STAFF RECEIVES ACCIDENT INFORMATION
Engineering
Incident occurred at Crossing
Generate and review Report 15
Crossing Incident Review sub-process (INCX)
Update Crossing Inventory?
No XING update needed
Need XING update
INCX
RPT 15
XING (Asset update)
Crossing Inventory updates
Corrective Action Plan needed
Correct Action Plan sub-process (TCAP)
Citation?
No citation
New XING RISK Value
Formula Process
Update to INCT throughout
TCAP
Citation needed
Citation sub-process
Upload of documents/ images thoroughout
INCT
RSSIMS
TCIT
Documents, Images
Final Review and close Incident
END Incident Process completed

The Higher Level Process Model with Meaning

- A more precise model introducing BPMN 2.0 practices
- More than we need, but impressive
- Very helpful to show icons such as the envelope to denote documents and images getting saved in the document management system
- This model was developed “bottom up” after the client had prepared more detailed models but had nothing that help them together.
- So you can have detailed models with swim lanes and a higher level model to introduce them using this graphic metaphor.


1. Incident (INCT)
2. Several possible activities may be invoked
Output:
Crossing Inventory Asset(s) attributes updated; new association to an incident
Crossing Inventory Formula Risk calculations updated
Outside RSSIMS External Source ACCIDENT reported via Webform, phone, email
INITIAL NOTICE REPORT 113
Designated RSSIMS Staff
Designated Staff Received Initial Notice
Field Survey
Internal Staff Meeting
Management Meeting
Training
Other
Initial Notice needed
Create and email Initial Notice Report 113
Yes
Perform RTSB Activity (TACT)
TACT
Investigation needed
Investigate Incident (is an investigation process called in?)
TACT threshold?
No
What other activities need to occur?
RTSB STAFF RECEIVES ACCIDENT INFORMATION
Create Incident INCT
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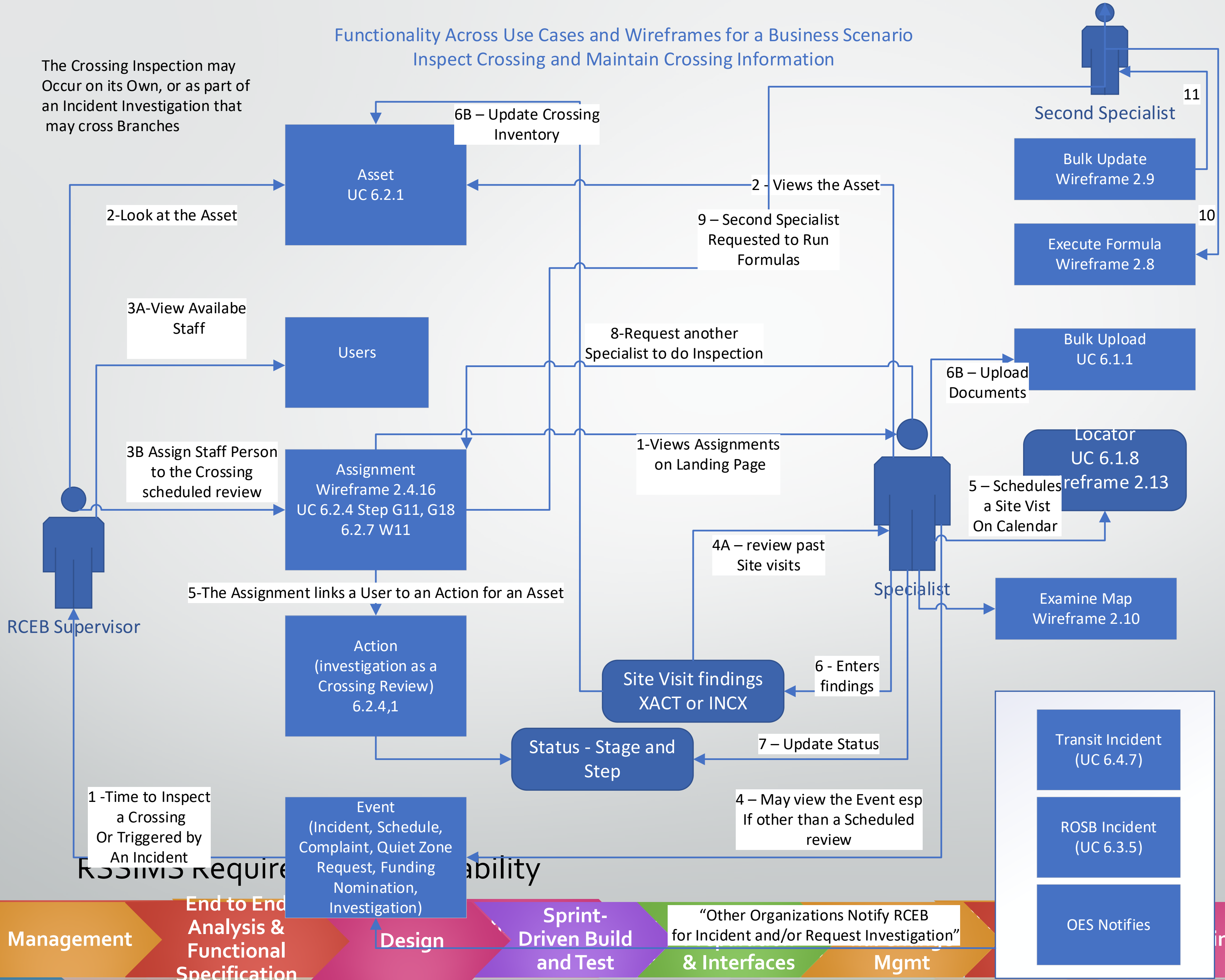
INCX
Update Crossing Inventory?
No XING update needed
Need XING update
Crossing Inventory updates
XING (Asset update)
New XING RISK Value
Formula Process
Corrective Action Plan needed
Correct Action Plan sub-process (TCAP)
TCAP
Citation?
No citation
Citation needed
Citation sub-process
TCIT
Update to INCT throughout
Upload of documents/ images thoroughout
Documents, Images
INCT
RSSIMS
Final Review and close Incident
END Incident Process completed

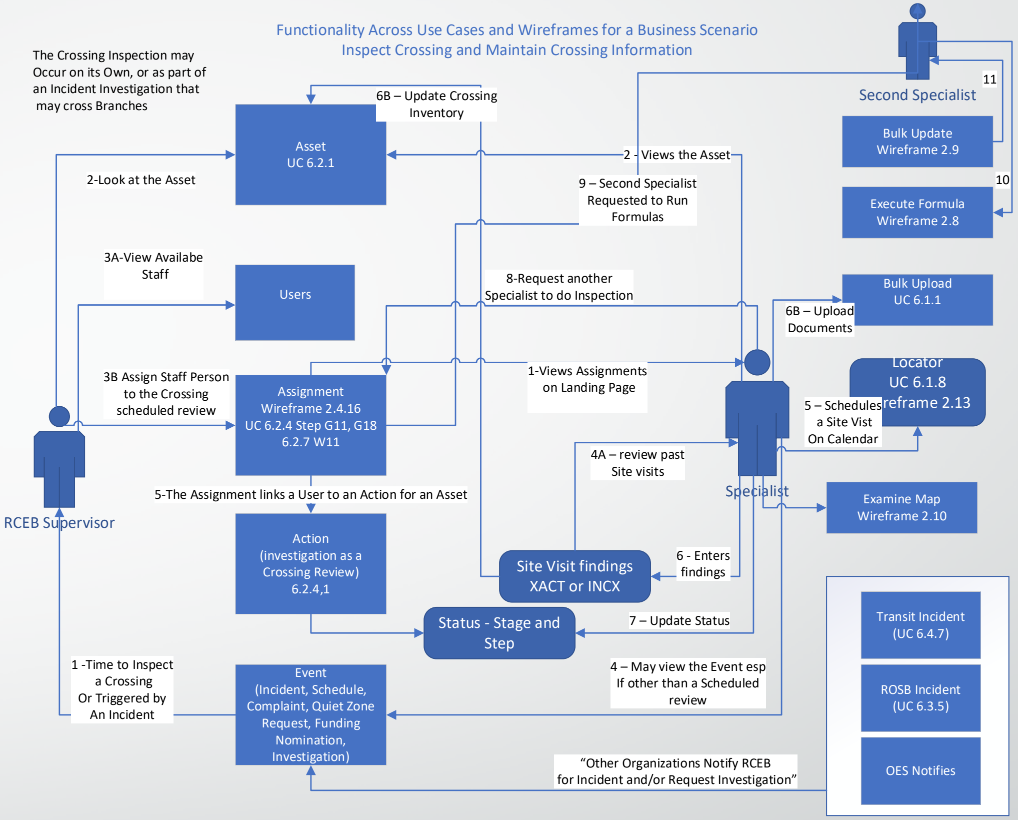
Functionality Across Use Cases and Wireframes for a Business Scenario
Inspect Crossing and Maintain Crossing Information

The Crossing Inspection may Occur on its Own, or as part of an Incident Investigation that may cross Branches



Second Specialist
11
10
Bulk Update Wireframe 2.9
Execute Formula Wireframe 2.8
Bulk Upload UC 6.1.1
6B – Upload Documents
Locator UC 6.1.8 Wireframe 2.13
5 – Schedules a Site Vist On Calendar
Examine Map Wireframe 2.10
Specialist
6B – Update Crossing Inventory
Asset UC 6.2.1
2 - Views the Asset
2-Look at the Asset
9 – Second Specialist Requested to Run Formulas
3A-View Availabe Staff
Users
8-Request another Specialist to do Inspection
3B Assign Staff Person to the Crossing scheduled review
Assignment Wireframe 2.4.16 UC 6.2.4 Step G11, G18 6.2.7 W11
1-Views Assignments on Landing Page
4A – review past Site visits
RCEB Supervisor
5-The Assignment links a User to an Action for an Asset
Action (investigation as a Crossing Review) 6.2.4,1
Site Visit findings XACT or INCX
6 - Enters findings
Status - Stage and Step
7 – Update Status
1 -Time to Inspect a Crossing Or Triggered by An Incident
Event (Incident, Schedule, Complaint, Quiet Zone Request, Funding Nomination, Investigation)
4 – May view the Event esp If other than a Scheduled review
"Other Organizations Notify RCEB for Incident and/or Request Investigation"
Transit Incident (UC 6.4.7)
ROSB Incident (UC 6.3.5)
OES Notifies
RSIMS Require ability
Guidance Proj Mgr
Guidance
Management
End to End Analysis & Functional Specification
Design
Sprint-Driven Build and Test
& Interfaces
Mgmt
intenance
ce

- A better approach for showing a high-level process model.
- There is something about showing people, the equivalent of use cases as boxes/functions.
- This model was developed from the "bottom up" where
  - Client had already developed individual use cases
  - But had now shown how the use cases fit together
  - We grouped use cases to show a scenario that covered many major functions both common and domain specific.
  - Showing things like notifications as part of a scenario helps paint the full picture.
  - Each person shown can be a separate role so you still get the swim lane effect.



Functionality Across Use Cases and Wireframes for a Business Scenario
Inspect Crossing and Maintain Crossing Information

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RCEB Supervisor
Second Specialist
Specialist
Asset
UC 6.2.1
6B – Update Crossing Inventory
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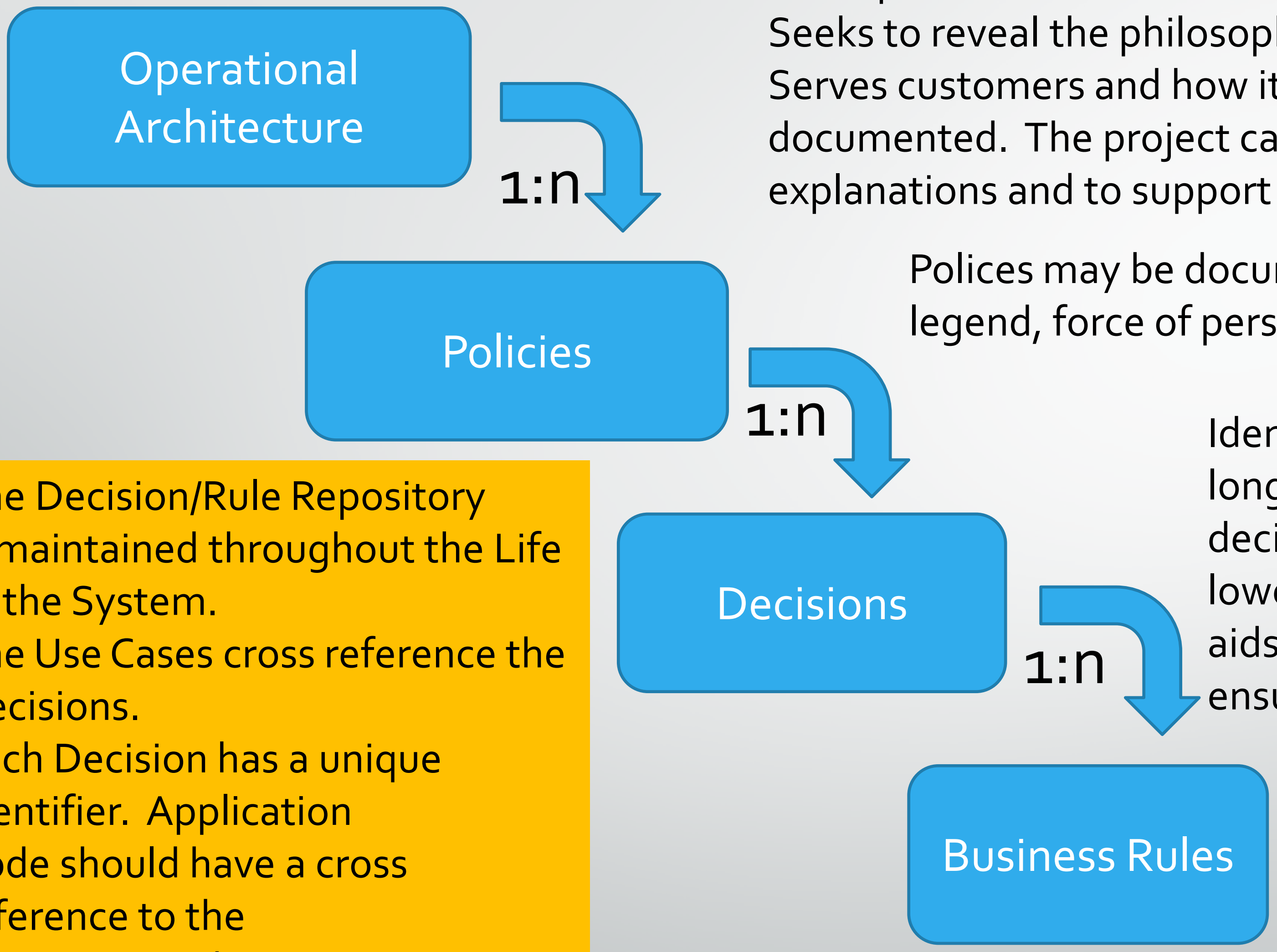
Transit Incident
(UC 6.4.7)
ROSB Incident
(UC 6.3.5)
OES Notifies

Repository for Policies, Decisions, and Business Rules



The Operational Architecture is a high-level concept that
Seeks to reveal the philosophy of the organization toward how it
Serves customers and how it treats its staff. The OA is rarely if ever
documented. The project can draft an OA or internal usage to look for
explanations and to support recommendations.

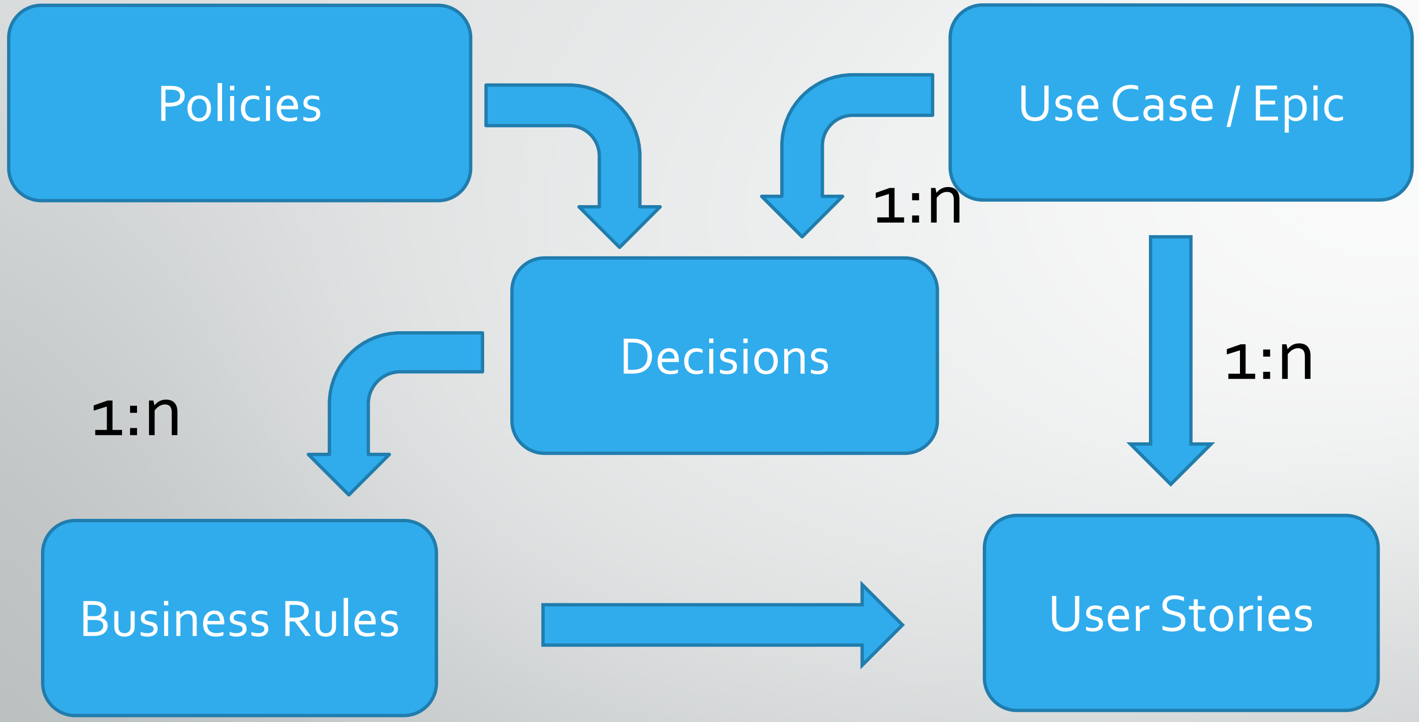
Polices may be documented or implemented through urban legend, force of personality, or tradition.

Identifying decisions is a newer approach and long overdue in business analysis. Most decisions are "compound": the collection of lower-level decisions. Visibility to decisions aids in finding streamlining opportunities and ensuring alignment with Policies.

Rules must be managed to enable ease of change over time. Rules are NOT edits. Rules support Decisions that Support Polices.

The Decision/Rule Repository
Is maintained throughout the Life
of the System.
The Use Cases cross reference the
Decisions.
Each Decision has a unique
Identifier. Application
Code should have a cross
reference to the
Decision to aid in consistency,
currency, and
testing

Epics and Use Cases



Management Establishes Policy
Decisions Align with Policy
Use Cases Explain a Function from a Process Model
A Decision has one or more Business Rules
User Stories are the lowest level of expression of a capability (feature or (micro) function) of a Use Case

Guidance Proj Mgr

Guidance

Management

End to End Analysis & Functional Specification

Design

Sprint-Driven Build and Test

Data Preparation & Interfaces

Organizational Change Mgmt

Implementation

Maintenance

ce

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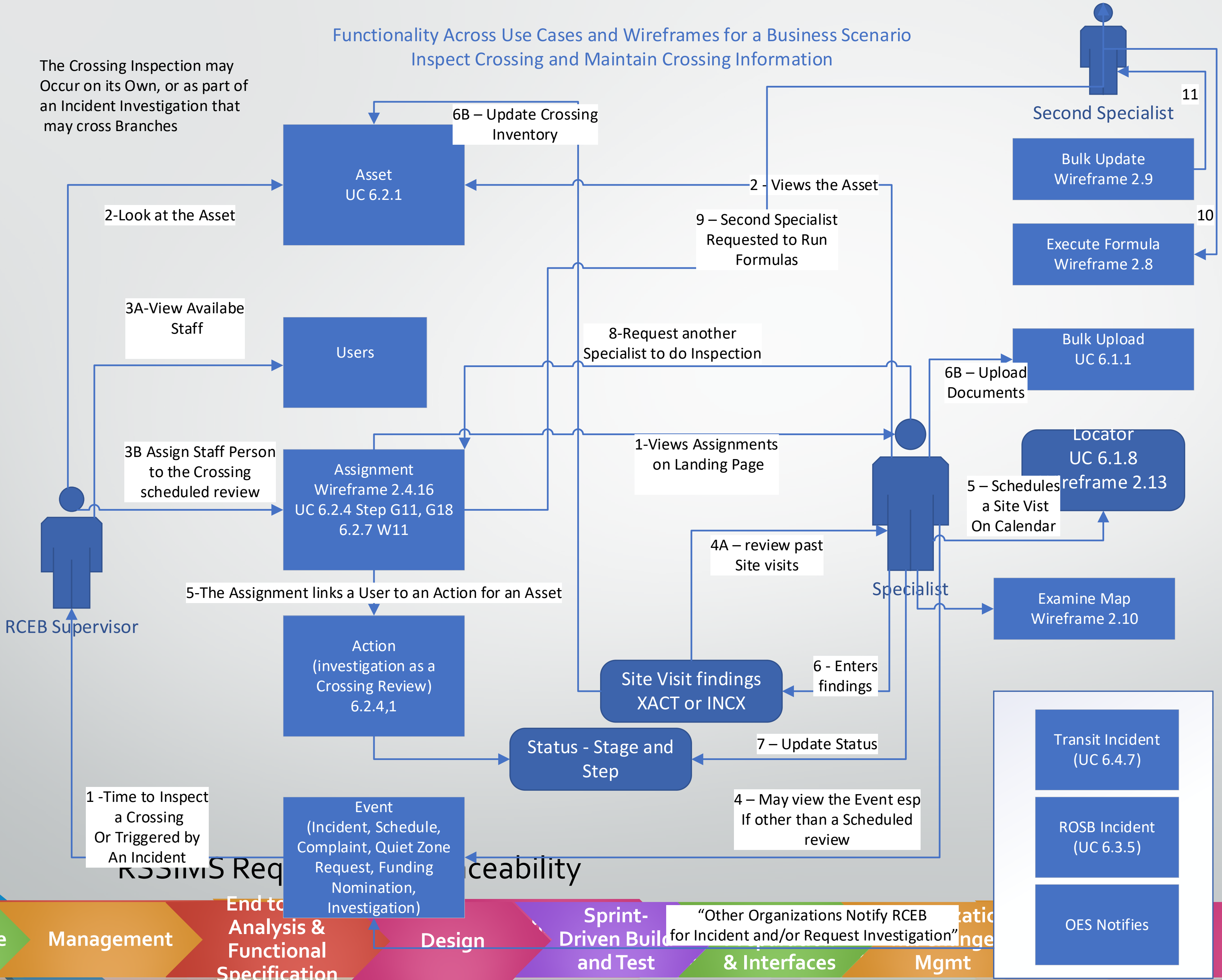

Second Specialist

11

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Bulk Update Wireframe 2.9

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Asset UC 6.2.1

6B – Update Crossing Inventory

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OES Notifies

“Other Organizations Notify RCEB for Incident and/or Request Investigation”

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Maintenance

Use Case/Epic	Decision	Rule
Establish Applicant Account	Applicant Organization is Unique	Each organization has a unique name
		Verify organization name for similar names
		Process specialist will confirm name is unique in 48 hours
		Notify Applicant name is unique
		Notify existing contact from other program of contact for a separate program
		Set first contact as default Organization Enterprise Contact
	Applicant Organization name not Unique	
		Notify Applicant within 48 hours
		Ask if okay to contact known contact to verify this applicant
	Permission to Research Duplicate	
		Specialist uses judgement to identify similar names
		Specialst notifies known contact
		Request known contact for authority to add new contact for new program area
	Associate new contact for existing organization	
		Provide new Contact official name of Organization
		Provide direction to make name change and update submittal

Business Process Patterns

A PATTERN IS A TEMPLATE OR BEST PRACTICE SET OF CAPABILITIES TO PERFORM AN OBJECTIVE SOFTWARE DESIGN HAS USED PATTERNS FOR DECADES THAT SKILLED DEVELOPERS EMBRACE. SADLY WE TREAT EACH BUSINESS NEED AS THOUGH NO ONE HAS EVER THOUGHT ABOUT THIS BEFORE AND WE MUST START FROM SCRATCH TO UNDERSTAND THE BASIC FRAMEWORK FOR A SOLUTION.

PATTERNS PROVIDE A PLACE TO START, PROVIDE PROMPTS TO SO WE DON'T MISS NEEDED CAPABILITIES AND ORGANIZE THE WOR.

CASE MANAGEMENT IS AN END-TO-END PATTERN.

ACCOUNT MANAGEMENT IS A PATTERN THAT GUIDES ENABLING CUSTOMERS TO ESTABLISH THEIR OWN LOGIN AND PASSWORD AND TO AUTHENTICATE USERS.

DASHBOARD IS A PATTERN TO ENABLE A SPECIALIST TO KEEP TRACK OF ASSIGNED WORKLOAD.

Business Interaction Model (BIM)

The Business Interaction Model (BIM) is the first generation of the Pattern for Business Analysis. Nearly all customer facing and transaction processing activities have an underlying Business Interaction Model.

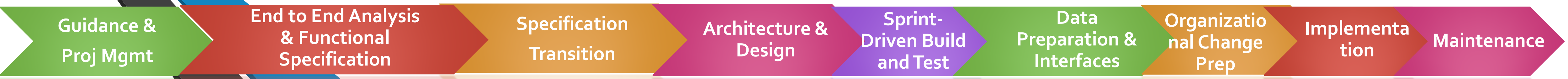
The Case Management Pattern is a more fully articulated version of the BIM.

The BIM was a breakthrough concept in recognizing three major groups of participants: the consumer, the producer, and the business partners (internal and external.) Their interactions form a system where all activities must be recognized but not all are necessarily automated.

Use Case and Epic Description Levels of Fidelity
Note boundary from analysis to Specification

- Refinements to UX define standards occur during during Design and may occur in Development. Strive for consistency across the system when a change made to a standard.

Fidelity	Description
Reference Model	such as from Guidebook for Case Management
Story Board	Narrative description of the types of information and actions performed on a page; No effort to represent an actual page.
Wireframe	Show the sections of a Page such as location but not details of a Menu, Bread crumbs, grids.
Static Pages	Web page style guide established (verified) such as Pattern Fly applied to Representative pages prepared to aid in specification for Use Cases/Epic descriptions.
Dynamic Pages	Representative Pages formalized with UX design standards; These are demonstrated using simulation tools to aid in Design approval.
Production	All pages built following the standards from the Design's representative pages



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User Experience Fidelity

The level of detail has planned stages to show features. For example, the approach to on-line help may be shown in the Static Pages with "fly over" capability demonstrated ith Dynamic Pages. The Solution might also include links to an on-line Training Manual or Procedures Manual

- Refinements to UX define standards occur during Design and may occur in Development. Strive for consistency across the system when a change made to a standard.

Fidelity	Description
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Wire Frame

The Wireframe is built on the shoulders of the Story Board. The Workshops may flush out more panels to include in the Story Board as they begin to see how best practices and modern technologies and transform the distribute of work across applicants,automated processes and business rules, access to cross verification capabilities, integration of document management and databases, integration with business partners, and other capabilities.

The wireframe emphasizes which data goes on which panel and what functionality is performed. Only the most rudimentary attention is given to the concepts of menu location, breadcrumbs, navigation and graphics should be avoided so that the team stays focused on functionality and its logical groupings.

Prototype

Unfortunately there is no industry wide agreement on what is a prototype, wireframe, storyboard, simulation, or other terms related to the user experience.

We will use the term “Prototype” to demonstrate working functionality. This means there is code and probably a limited database that from which data can be retrieved, displayed, changed, and stored.

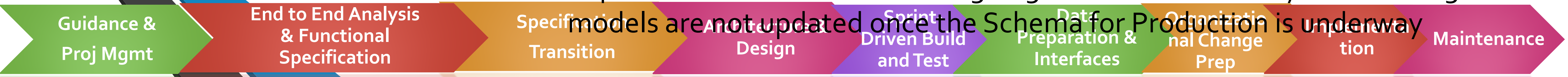
Architectural Prototypes can demonstrate the connections of the key automation capabilities from the customer to the web server to the document management system, the database, the integration hub, the application server, and possibly an external system connection. This type of prototype aids in refining the connections required rather than the functionality.

A functionality prototype can demonstrate assembling data from multiple sources, performing a user story (not a whole use case).

Data Model Fidelity

Fidelity	Description
Reference Model	such as from Guidebook for Case Management
Elicitation	Adds business specific entities and relationships;
Workshop wip	Subject Data Model; includes Subject descriptions and examples of attributes
Analysis Work Product	Entity Relationship Diagram
Design Deliverable	Logical Data Model.
Development	Schema for production database; Denormalized based on needed efficiency for projected usage; may have one for transaction processing and a separate model for BI/query
System Test	Testing will reveal ways to enhance performance through indexes, refactoring tables and new key structures.

The Production Schema is updated throughout the life of the implementation and then the ongoing maintenance. Analysis and Design models are not updated once the Schema for Production is underway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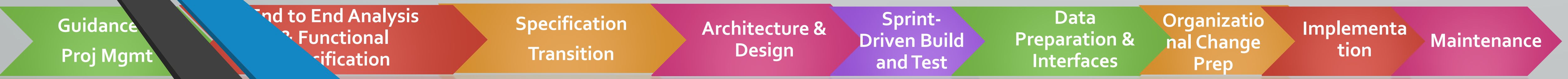
Terminology Fidelity

- The Data Elements Dictionary is updated with better explanations over time and as new tables are added to the schema. The Database Directory is updated to stay current with the Schema.

Fidelity	Description
Reference Model	such as from Guidebook for Case Management
Elicitation	A Glossary of Business Terms and Subject descriptions
Workshop wip	Expanded as new terms and Entities identified
Analysis Work Product	Glossary terms aligned with ERD
Design Deliverable	3rd normal form keys and representative attributes; Data Elements Dictionary
Production	Database directory and updated and expanded Data Elements Dictionary.



Themes and Processes

Organizing other Information

Scope –Workshop discussions lead to findings on Assumptions to Challenge and Assumptions critical to success. Volumetrics to collect include number of applications, distribution of error rates that require exception processing by application type.

Resources and References – Critical functions from the process models should have volumes, durations, and exception analysis described.

Key Participants – The Workshop SMEs can point to other specialists who can provide volumetrics.

Expertise Needed – The Workshop Facilitator can target functions requiring volumetrics.

Usage Throughout the Project – Volumetrics are important to prioritize where development effort should be targeted; sometimes it is faster and cheaper to handle rarely performed exceptions handled manually rather than trying to automate everything.

Frequency of Update – Assumptions and volumetrics can be updated throughout the Workshop effort. These will inform the decisions on the Minimum Viaple Product approved for construction.

Work Products – Sections of documentation that will be in an Analysis document and part of the Design Deliverable.

Verify Solution Direction

Scope –The process models, data model, and illustrations of the user experience are refactored and aligned. The alignment may not yet be perfect but it is sufficient to present to Executive Management. This checkpoint is essential to ensure there will be no surprises when the Design Deliverable issubmitted. Also The specifications guided by the models take significant effort. This checkpoint makes certain specifications are done for the supported project direction to avoid major rework later..

Resources and References – Critical functions from the process models should have volumes, durations, and exception analysis described.

Key Participants – The Workshop SMEs can point to other specialists who can provide volumetrics.

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Readiness Assessment

This is a very critical yet highly sensitive undertaking. A new system's complexity must recognize the training requirements for the customers and the technology division; the ability to recruit and retain needed skills; how to avoid mis-use of of newly available data, and the expense for ongoing enhancements and maintenance.

Scope – Present

Resources and References –

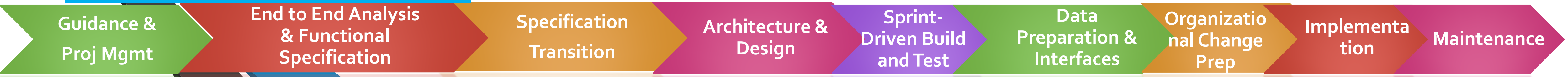
Key Participants – The Product Owner is best suited to lead the Readiness Assessment working with program managers with strong upport from the Project Sponsor. Readiness addresses both the Program side and the information technology side.

Expertise Needed – Organizatinoal change management experience helpful to develop evidence-based assessment of organizationa capability to modify business processes to make effective use of an automation system in way that provides job satisfaction and career opportunities for employees.

Usage Throughout the Project – In information technology, the assessment must determine the level of support needed to prepare the organizational structure supervisors, and specialists. The same applies to the program areas.

Frequency of Update – Updates quarterly will verify what progress has been made, what techniques work, and where added effort is needed.

Work Products –



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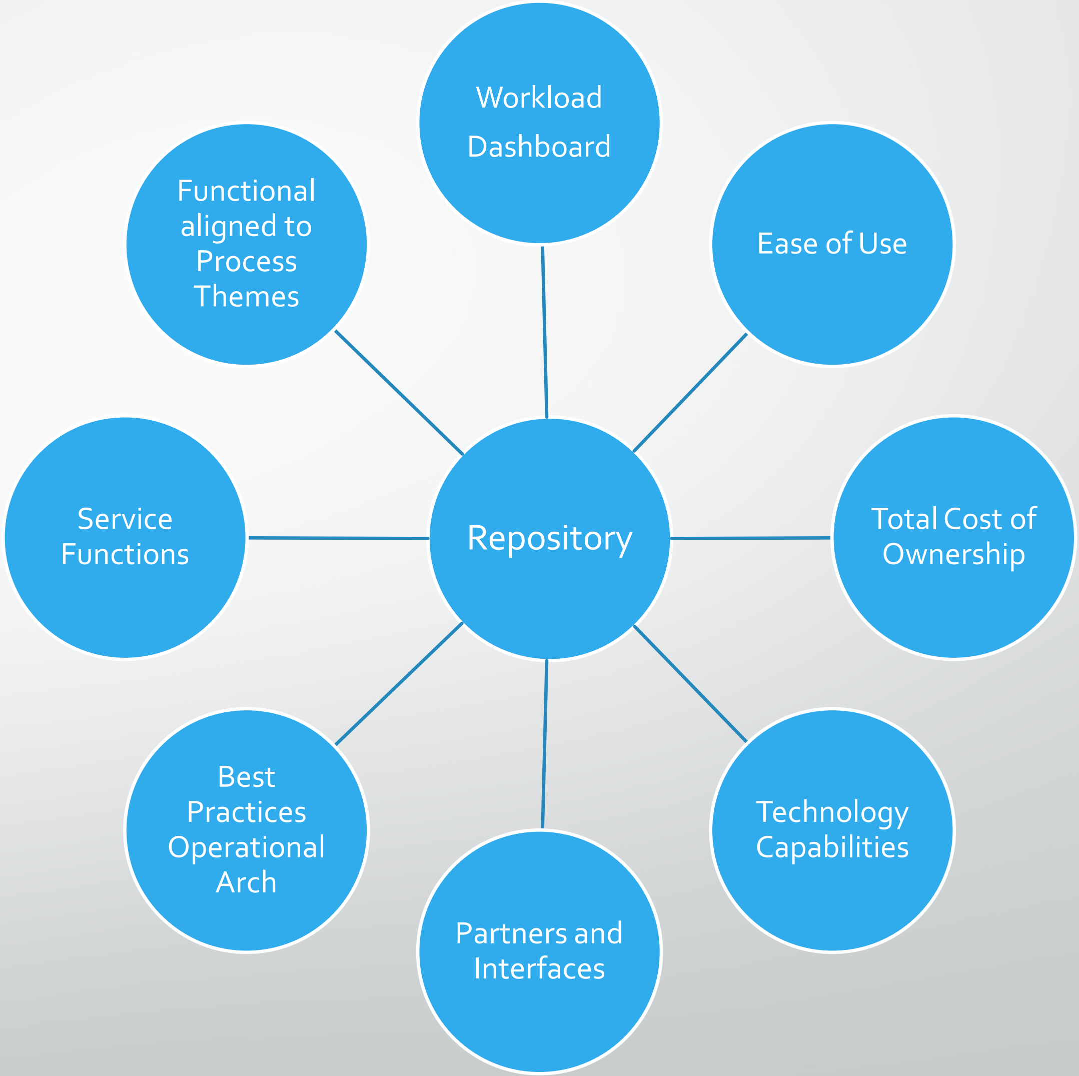
Requirements Management (first iteration)

- Refer to the Training Class on Requirements Management
- Clients use Requirements as a Contractual Commitment
- IVV consultants live and die by requirements; they may not understand anything about business analysis and what is important from an approach to analysis point of view, but they are pit bulls when it comes to tracing requirements to the work products and deliverables that follow
- Therefore, ALL ALL ALL requirements must be vetted.
- THERE IS A DIFFERENCE BETWEEN WHAT SOMEONE WANTS AND WHAT THE CONTRACT SAYS WE MUST PROVIDE
- THE DIFFERNCE REQUIRES MANAGEMENT APPROVAL AND POSSIBLY THE CHANGE CONTROL PROCESS.
- The Analyst has NO authority to unilaterally agree to a Requirement.

Building an Enterprise Requirements Repository

- Prompts for Original, domain specific Requirements
  - Best Practices
  - Enabling Technologies
  - Streamlining Opportunities
  - Similar applications
- Non-functional requirements repository
- Verify DWR technology standards, capabilities, and planned investments



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- Prompts for Original, domain specific Requirements
- Best Practices
- Enabling Technologies
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- Similar applications
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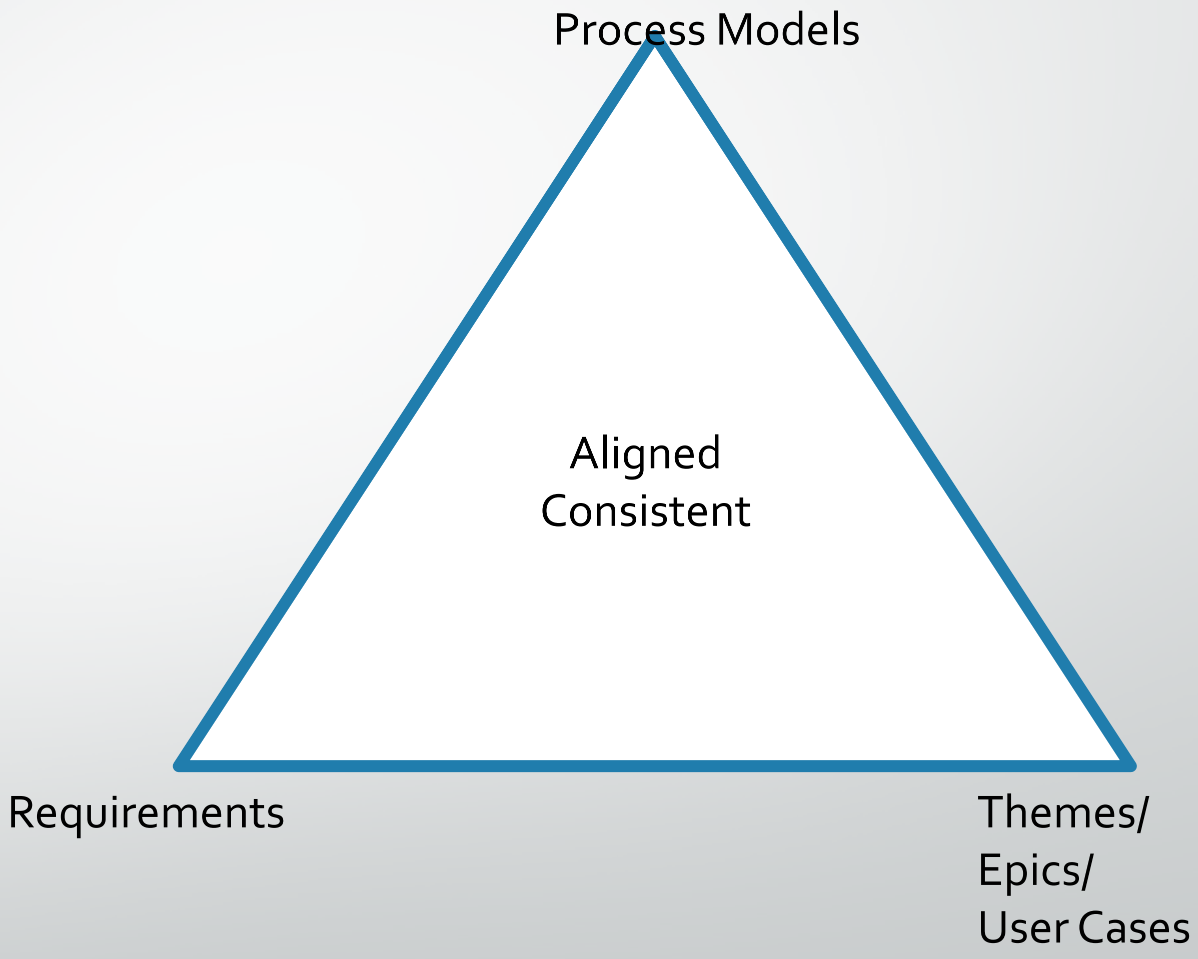
- Verify DWR technology standards, capabilities, and planned investments

Triangulation of Requirements to Processes and Use Cases/Stories

- Requirements cannot be adequately understood through a collection of narratives.
- To know they are properly organized requires the Process Modeling exercise; this also identifies gaps, duplicates, contradictions, ambiguities.
- Use Cases offer the "decomposition" of the Activities from the Process Models
- Cross checking each of the three with the other two is the best way to ensure completeness.



Service Requirements Separated from Business Domain

Service Requirements are Functional Capabilities typically needed in a wide range of solutions….

- Notification
- Schedule
- Tickler
- Notes
- Account Management (provisioning and authenticating external customers)
- Role-based security
- Integration of documents to database
- Enable multiple address types for a single entity
- Date range for a Status

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Analyze Requirements for Quality

Single purpose enables uniqueness and Ability to be unambiguous

Complete – triangulate with Process Model

Functions

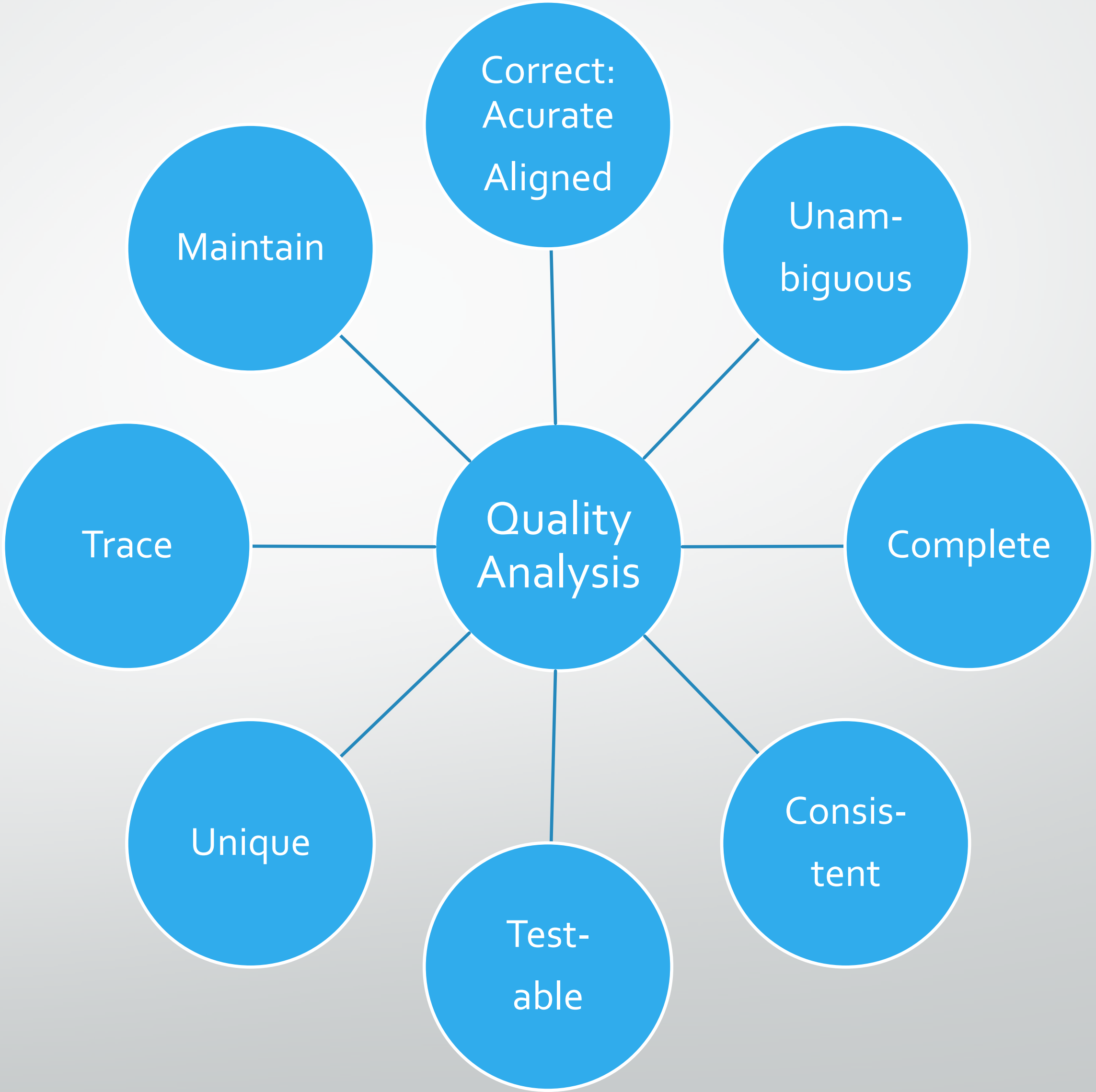
Maintain – unique identifier so change history

Is possible: splits, combinations, replacements,

Substitutions

IEEE Standard:

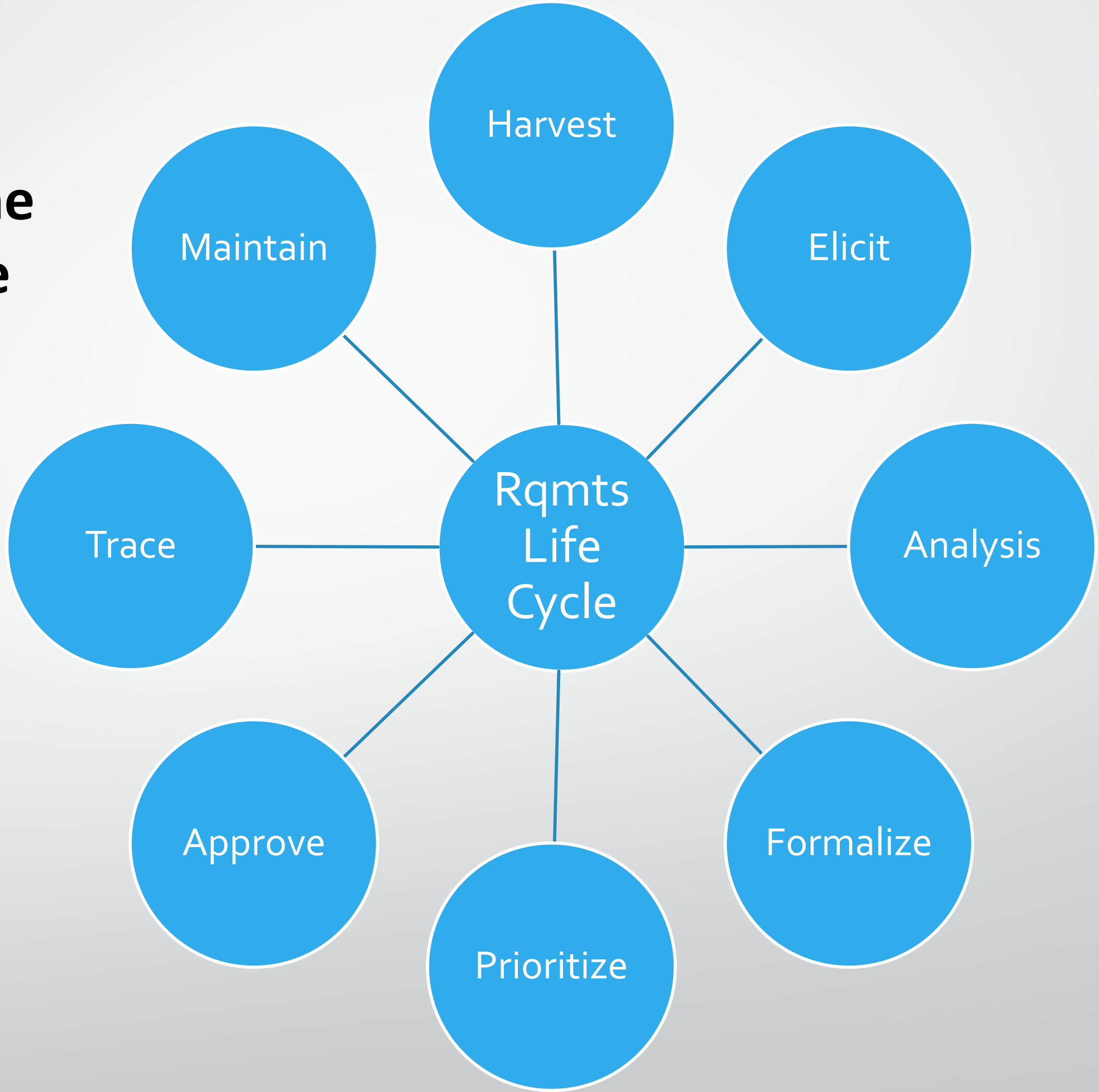
IEEE 830.01-7



Tracing Requirements Throughout the Life Cycle

There are nine major steps in the requirements management "life cycle":

- **Repository Setup**
- **Harvesting**
- **Elicitation**
- **Analysis**
- **Formalization**
- **Approval**
- **Traceability**
- **Maintenance**



Template

Scope –

Resources and References –

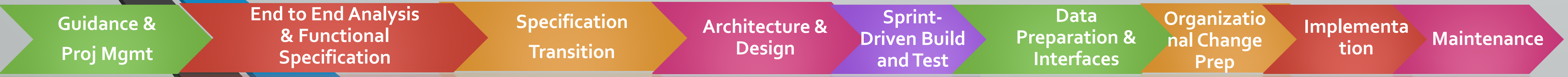
Key Participants –

Expertise Needed –

Usage Throughout the Project –

Frequency of Update –

Work Products –



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Tips, Tricks, and Traps

End to End Analysis

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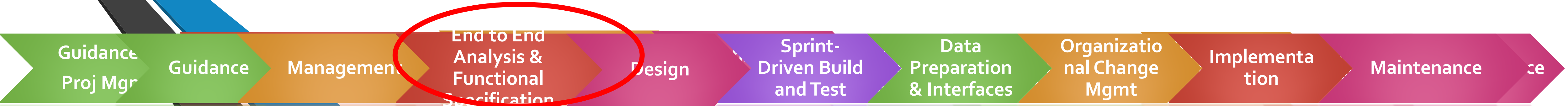
A functionality prototype can demonstrate assembling data from multiple sources, performing a user story (not a whole use case).

Functional Specification is the “second half” of end to end analysis that occurs before launching into a Sprint-driven development process. The Analysis described above provides a robust exploration, challenges to assumptions, exploration of improvement opportunities all to enable the Product Owner and Sponsor to enable INFORMED Decisions about specifics on the new Solution’s capabilities and preparation requirements. The development team may have started implementing “common functions” such as notification, workflow management that are required regardless of the Solution.

The functional specification takes the Owner/Sponsor’s selection of what to include and provides the greater level of detail including

- High-level use cases
- Logical Data Model
- User Stories
- Decisions and selected business rules
- Detailed screen designs for representative capabilities (typically about 20)



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Functional Specification

This is the Bridge from Analysis to Design.

The Specification is a major part of the Design Deliverable.

The level of effort to detail Use Cases, Decisions and Business Rules, and User Stories requires a Decision Point first to assess findings and verify the project direction.

None of this has to impact the expectations of the Charter. Instead this is the point to obtain executive sponsorship for streamlining processes, changing the way work is done, verify support for the skills staff will need, and assess readiness for possible changes to Job Descriptions, classifications to begin Organizational Change Management.

The justification for new technologies, integrations, and the impacts on the enterprise direction in technology investments will get addressed as a basis for detailing the Functional Specification.

The Product Owner is engaged several days a week to clarify and verify commitment to streamlining and organizational change management essential to delivering a solution based on the Functional Specification.

Resources and References – The Analysis Work Products.

Key Participants – Workshop Participants; Product Owner; Product Owner Delegate.

Expertise Needed – Expertise with Analysis techniques guided by Product Owner guidance and verification of work.

Usage Throughout the Project – Direct map to Development components

Frequency of Update –

Work Products –

- Refactored Process Models
- Logical Data Model
- Representative User Experience Templates
- Use Case Abstracts with Decisions, selected Business Rules, UX placeholders (Wireframes aligned with Representative UX Templates)
- Itemization of major User Stories

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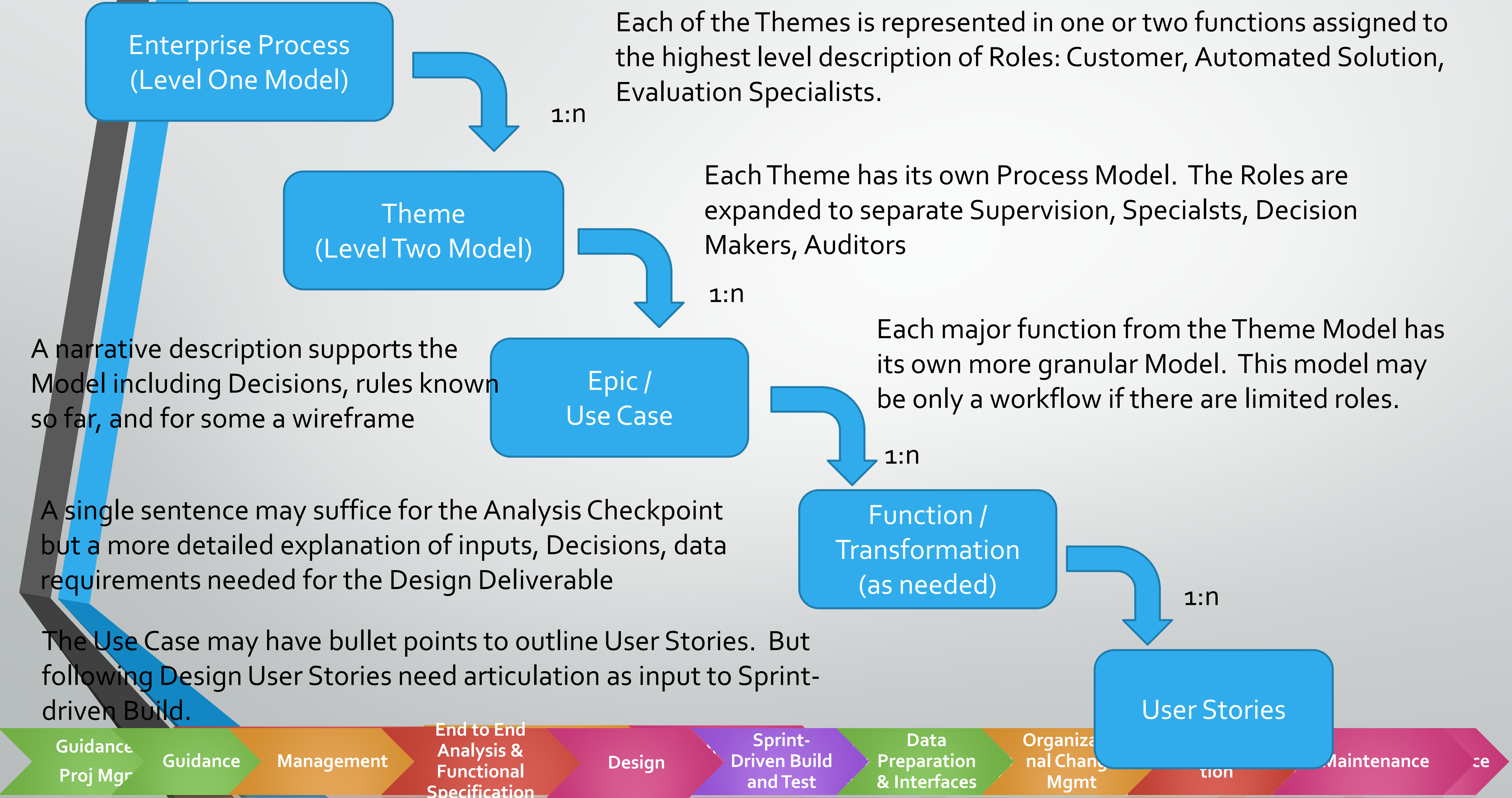
Avoid Re-Paving the Cowpath

	Description
	Customer Prepares Application
	Assign and Track Work Item
	Evaluate Work Item



Enterprise Process (Level One Model)

1:n

Each of the Themes is represented in one or two functions assigned to the highest level description of Roles: Customer, Automated Solution, Evaluation Specialists.

Theme (Level Two Model)

1:n

Each Theme has its own Process Model. The Roles are expanded to separate Supervision, Specialsts, Decision Makers, Auditors

Epic / Use Case

A narrative description supports the Model including Decisions, rules known so far, and for some a wireframe

1:n

Each major function from the Theme Model has its own more granular Model. This model may be only a workflow if there are limited roles.

Function / Transformation (as needed)

A single sentence may suffice for the Analysis Checkpoint but a more detailed explanation of inputs, Decisions, data requirements needed for the Design Deliverable

1:n

User Stories

The Use Case may have bullet points to outline User Stories. But following Design User Stories need articulation as input to Sprint-driven Build.

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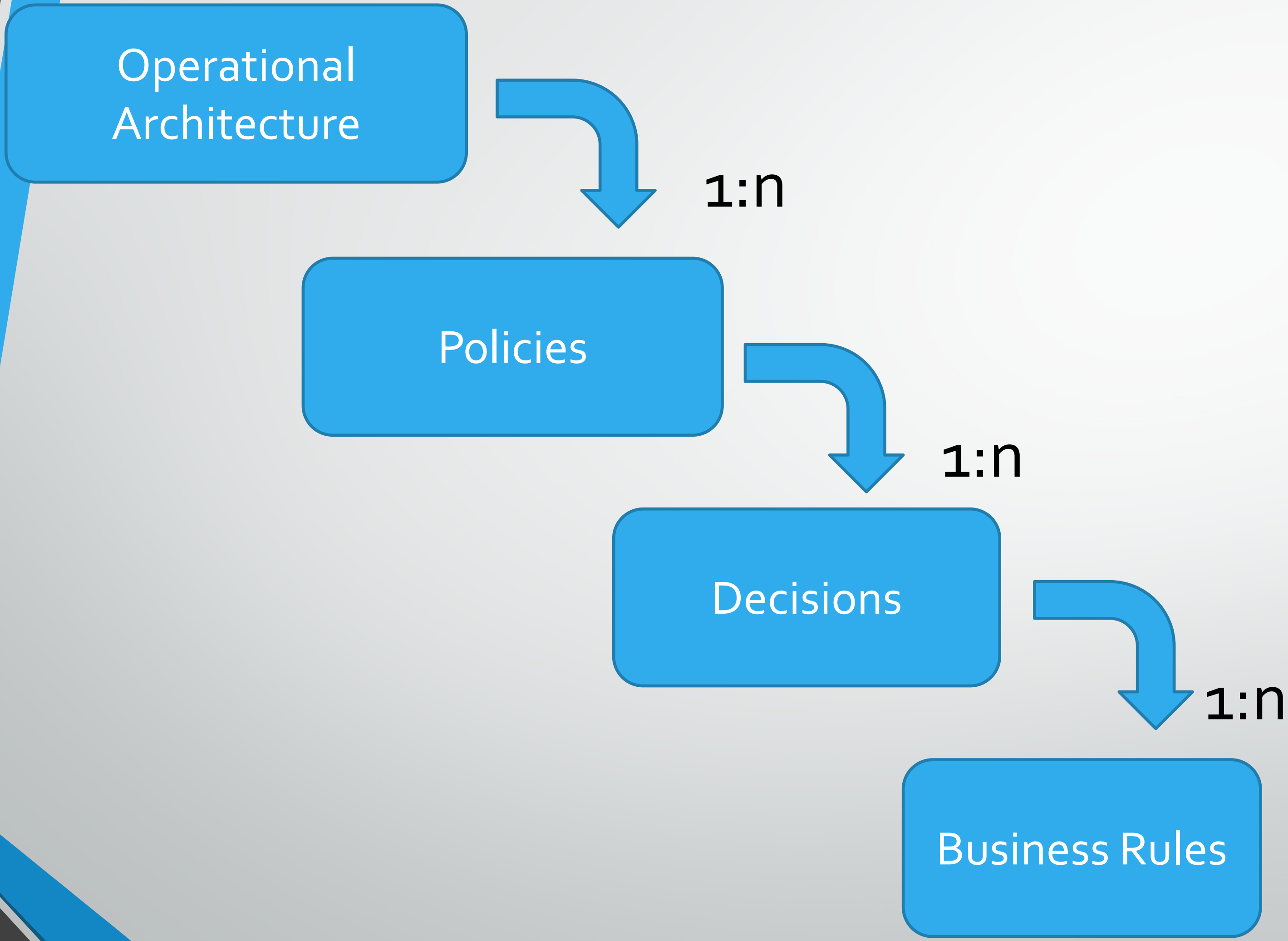


Operational Architecture

1:n

Policies

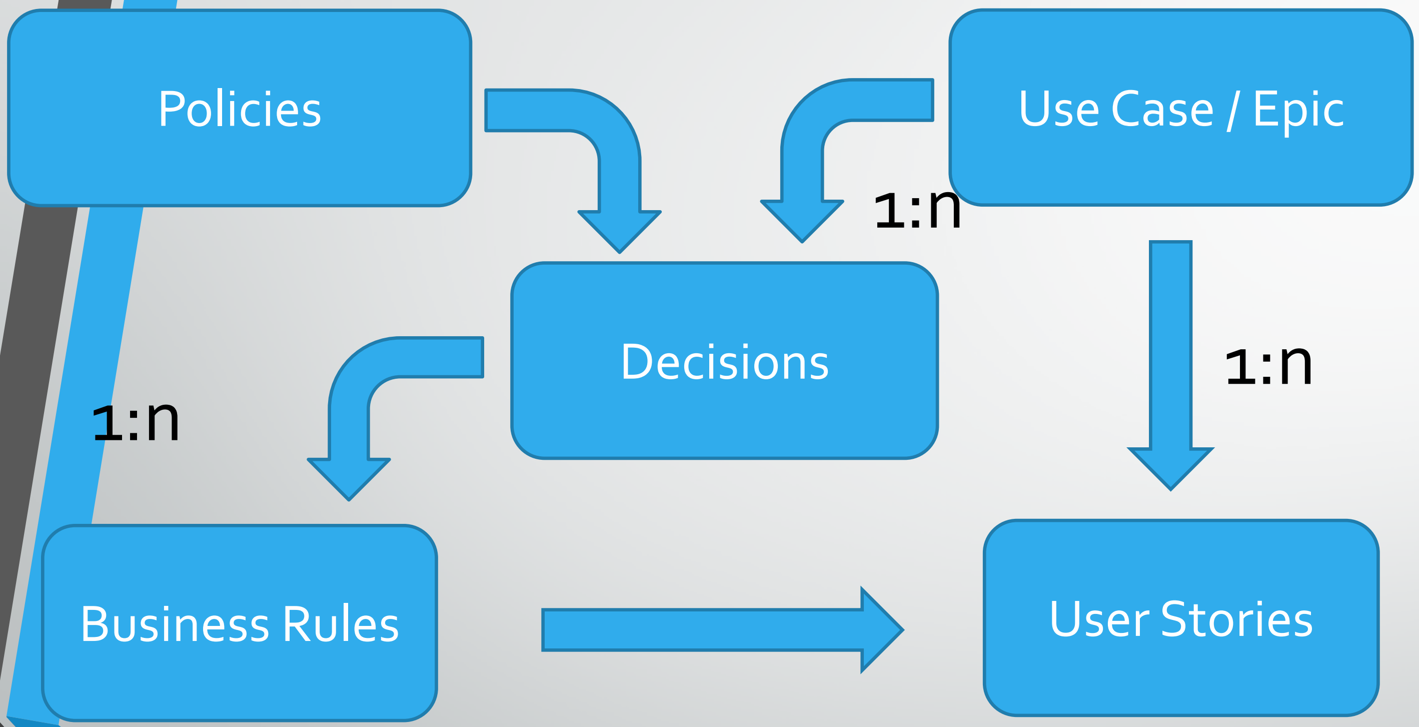
1:n

Decisions

1:n

Business Rules

Epics and Use Cases



Management Establishes Policy
Decisions Align with Policy
Use Cases Explain a Function from a Process Model
A Decision has one or more Business Rules
User Stories are the lowest level of expression of a capability (feature or (micro) function) of a Use Case

Tips, Tricks, and Traps ….

Functional Specification

The Backlog is well defined in a hybrid approach. The end to end analysis and functional specification are done, the Minimum Viable Product formulated. User Stories may be identified but still need "grooming".

Decisions and Business Rules are maintained in their own repository. So when new ones are found or better defined through grooming or in a Sprint, the repository must be updated. This reduces accidental duplication.

Analysts can conduct a "Design specification" sprint to ready a use case for development in a Build Sprint that follows. Getting Decisions, rules, data, and features flushed out before the Development sprint aids in estimating and avoids delays.

The attitude that functionality not completed in the assigned Sprint can be carried over to another Sprint is very dangerous. Deadlines exist for a reason. Inability to complete work as scheduled must be elevated to determine if the entire schedule needs to be adjusted. There is no such thing as "catching up".

Leaving Rule specification to a Development Sprint is high-risk: may take time to get agreement among needed SMEs, may delay the developers, or a placeholder may get lost. The Decision/Rule repository must be kept current.

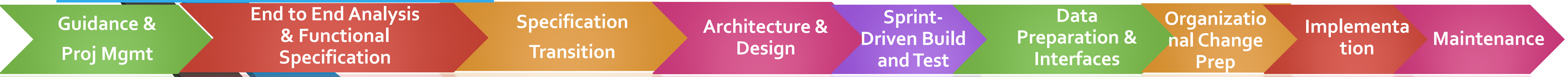
Use Cases and Epics

The Analysis Phase identified the significant Use Cases/Epics from the detailed (Level Two and any Level Three) process models. Only those selected by the Product Owner at the end of Analysis are further detailed during Specification for inclusion in the Design Deliverable.

The Use Case is bridge step that guides the specification of User Stories from a function in the Process Modelling effort from Analysis phase.

The Use Case is not as detailed as in the Unified Process or Waterfall approach. The new Use Case does have a wireframe to provide a reference to the User experience that the functionality will support. The Use Case still includes the pre-conditions as graphically depicted in the Process Model, volumetrics, User Roles, Decisions, major groupings of data, the primary path and major exception paths, and the outcome. Quantities, durations, and levels of effort are helpful.

Lower levels of detail will be included in User Stories. Representative User stories may be included but more detail will occur during sprint-driven development phase. Decisions are cross-referenced to the Decision repository as are any included Business Rules.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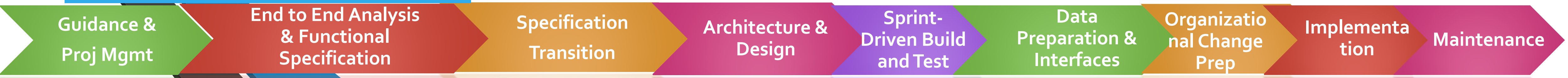
Use Case Template

User Stories

Sadly, our industry has allowed the concept of a User Story to drive the delivery of automation-enabled solutions beyond any original intention.

The User Story is a piece of work that is necessarily defined narrowly in order to get something done within a time constraint. The time constraint enables fast recognition when work might otherwise go off the rails – so the work must be narrow in scope yet meaningful to verify that something useful got done.

A collection of user stories will accumulate to an Epic or in older terms, a Use Case. The Project Sponsor may be interested in seeing the results at no lower level than a Use Case (Epic). User Stories are pieces of a Use Case assigned to a project team to deliver in a two-week Sprint.



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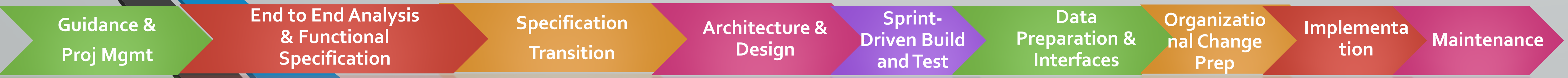
Case Management Pattern

The most common pattern where a customer submits an application seeking an approval/action by an agency. There are ten major phases for the application process; unfortunately too often we don't integrate the first and last phases which reduces opportunity to enhance the user experience, process more efficiently and then ensure higher quality performance, lessons learned, and compliance integrity.

	Description
	Customer Prepares Application
	Assign and Track Work Item
	Evaluate Work Item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Logical Data Model

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The Physical Schema …

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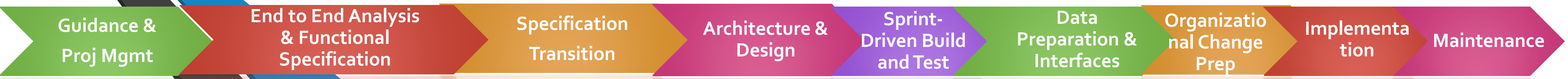
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Variations on the Case Pattern

- Within the Case Management Pattern the business may elect from a range of options that can impact the quality of service to the customer and enrichment of the work for the specialist.
- Strict Sequence – The Application must be complete and accurate before Acceptance to Begin work
- Incremental Sequence – The customer completes a part of the application for evaluation while still compiling and submitting information to complete other portions of the application.
- Parallel Processing – The application is assigned to separate specialists in parallel with a final decision made once the separate evaluations are brought together
- Interim Decision – An application may be approved and a claim paid as an estimate with the final amount calculated later once more information is processed; this can speed a partial payment with a later reconciliation of amount to pay or get reimbursed.
- Post Audit – The claim is paid as a matter of urgency with provision to audit later and modify the decision with the potential to claw back.

Duty Assignment Patterns

- Accounting has long embraced a "Separation of Duties" Pattern. This requires that the person who approves the payment of an invoice is separate from the person who then performs the accounts payable function to pay the invoice (write the check.) A further separation is to require that the person who does the purchasing is separate from either the person who approves the invoice or pays the invoice.
- In application processing, work may be assigned by location of the customer, size of customer, or type of customer, or without any regard to the customer characteristics. Each of these alternatives ties to the Operational Architecture. Work may be organized to promote expertise with a type of customer or organized to provide the greatest range of diversity for the specialist, or work may be broken down so that each specialist handles only one aspect with hand-offs to other specialists.

Tips, Tricks, and Traps ….

Functional Specification

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Non-Functional Requirements

- Framework for Non-Functional Requirements
- How to collect Non-functional requirements
- Importance of non-functional requirements
- Client typically has a limited view and we want to be comprehensive
- Entrée to explore client’s vision on technology investments

Framework for Non Functional Requirements

- Channel and Distribution Requirements
- Orchestration
- Technical Infrastructure Requirements
- Technical Architecture Requirements
- Re-Use Existing Functionality Requirements
- Performance Requirements
- Interoperability and Interface Requirements
- Extensibility, Scaleability, and Portability
- Reliability, Batch Window, Operations
- Technical Standards
- Disaster Recovery, Archive and Purge, Audit Trail

System Management-oriented Requirements

Financial Requirements

Total Cost of Ownership (TCO)

Operations: Batch Window, Slip Stream Releases

Maintainability Requirements

Portability Requirements

Operational Requirements

Security Requirements

Cultural and Political Requirements

Legal Requirements

Training

Documentation

Cutover

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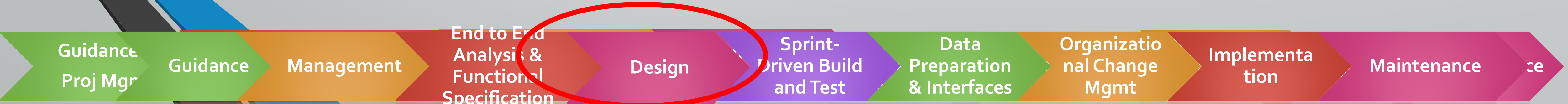
ways in which Business Analysts aid in …

Transition from Specification to Design

How do we get a smooth handoff from the Business and Systems analysts to the “Technical” team of architects and developers??

There are three key work products the Analysts must prepare in order to:

- Translate functional specifications in a way that developers can understand and trust
- Gain the respect of the developers to work with what the are provided, not try to start over on their own terms
- Have a seat at the table when the developers start interpreting the specifications into what is comfortable not what is specified.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Architecture

Architecture is rarely applied properly: It begins with Function to then determine the types of products that can perform those responsibilities, assess the integration opportunities and needs. Then examine where those same responsibilities exist or are part of the Enterprise roadmap. Ideally capital investments in products are shared and at the very least the same product is used across solutions. This promotes shared training, staff flexibility, and career choices for staff.

Scope – Most Contracts call for Preparation of a Design Deliverable that makes clear that requirements will be met and guide the detailed design and guide the development of the solution and what to test from a system and from a user perspective. Technical architecture is made an integral part of this explanation although mostly a system diagram is offered rather than true architecture planning.

Resources and References – The Solution Team must work closely with the Client's Chief Technology Officer (CTO). No project should regardless of priority or funding attempt to go its own way or entrust a vendor with selection of platforms and licensed products that will go into the solution. These are capital investments that will require years of configuration changes, upgrades, new integrations, and investments in staff training and cross training.

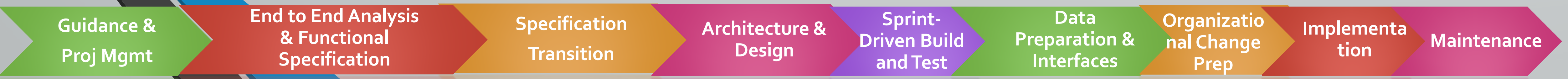
Key Participants –

Expertise Needed –

Usage Throughout the Project –

Frequency of Update –

Work Products –



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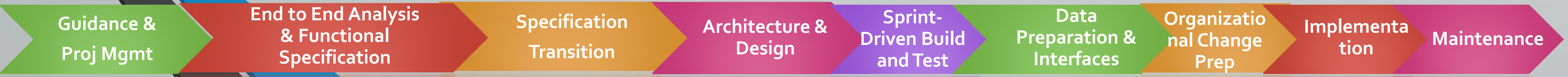
Business Analyst Support for Technical Architecture

- Research
  - Are there specialized data partner standards
    - Justice industry has xml-based standards for data exchanges
    - Health industry has X.12 EDI standards – archaic but required
    - QR Codes started in mid-90's in auto industry for parts suppliers
  - Early consultation on shared functions
  - Early consultation on platform standards: browser, database, reporting tools, mapping tools, available map layers
- Volumetrics: how many, how often, size of files and messages
- Channels: Process models that make communication visible, not embedded, to enable detecting options such as text, voice, email, chat, IVR



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ways in which Business Analysts aid in …

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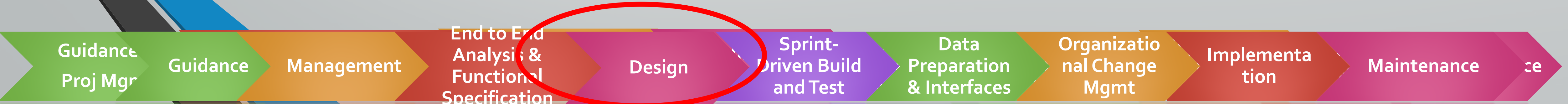

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Eight Key Work Products for Handoff

- The Business Analysts and Systems Analysts must prepare three work products to ensure the development team doesn't go off to do their own thing:
- One – Functional Architecture for Common and Business Specific Components
- Two – Navigate Functional Nodes for Key Use Cases
- Two - Entity Relationship Diagram
- Three - Sequence Diagrams for the Use Cases
- Four - Decisions and Business Rules
- Five - Standards-based Representative Screens; wireframes for the rest
- Six - UX Standards
- Seven – User Roles, CRUD privileges for each Role for each Screen/Report

Business Processes Drive Technical Architecture

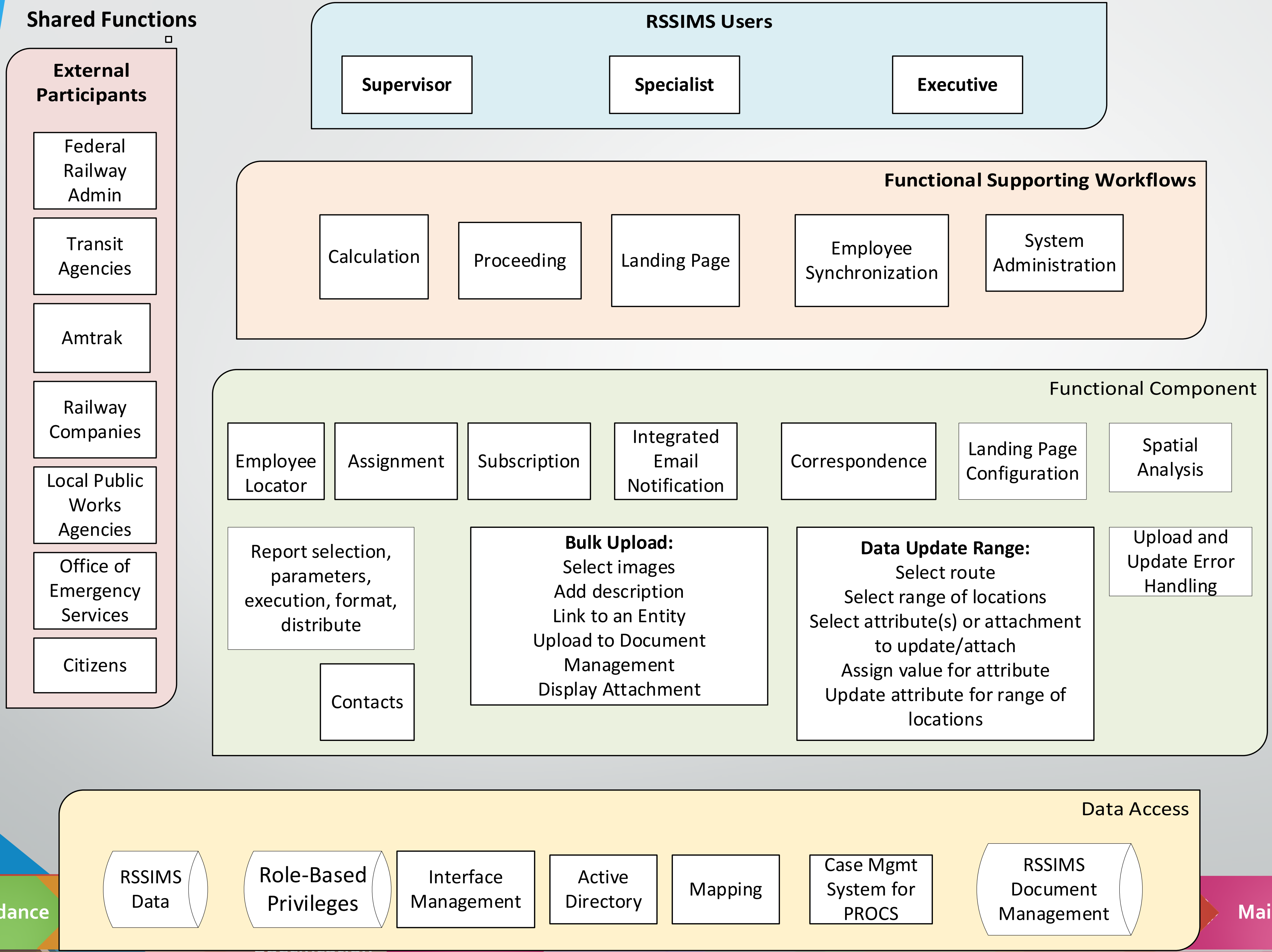
Frequently repeated but rarely followed.

Business Volumetrics are critical to making Selection of products and technologies. Volumes predicted for five years require stating the assumptions that underly estimates; this includes changes in consumer expectations and behavior, competitive landscape, staff retention requirements, and shifts in public policy.

The shape of the Solution scope's functionality, changes in business process and operations, processing capacity, accuracy and speed are made during the Analysis phase. These are further elaborated during Functionality Specification. These guide the selection and sizing of products and licenses.

Other influences are the enterprise strategic plan for capital investments that may call for the Solution to share products and licenses with other solutions or for This Solution to serve as the cornerstone for a new generation of enterprise available capabilities.

Other factors include the cost of ongoing support – both for the Solution's application and for the Solutions technology platforms. Speed of modification to a business decision that is mission critical may become a compelling factor in choice of technologies.



Shared Functions

External Participants

- Federal Railway Admin
- Transit Agencies
- Amtrak
- Railway Companies
- Local Public Works Agencies
- Office of Emergency Services
- Citizens

RSSIMS Users

- Supervisor
- Specialist
- Executive

Functional Supporting Workflows

- Calculation
- Proceeding
- Landing Page
- Employee Synchronization
- System Administration

Functional Component

- Employee Locator
- Assignment
- Subscription
- Integrated Email Notification
- Correspondence
- Landing Page Configuration
- Spatial Analysis
- Report selection, parameters, execution, format, distribute
- Contacts

Bulk Upload:
Select images
Add description
Link to an Entity
Upload to Document Management
Display Attachment

Data Update Range:
Select route
Select range of locations
Select attribute(s) or attachment to update/attach
Assign value for attribute
Update attribute for range of locations

- Upload and Update Error Handling

Data Access

- RSSIMS Data
- Role-Based Privileges
- Interface Management
- Active Directory
- Mapping
- Case Mgmt System for PROCS
- RSSIMS Document Management

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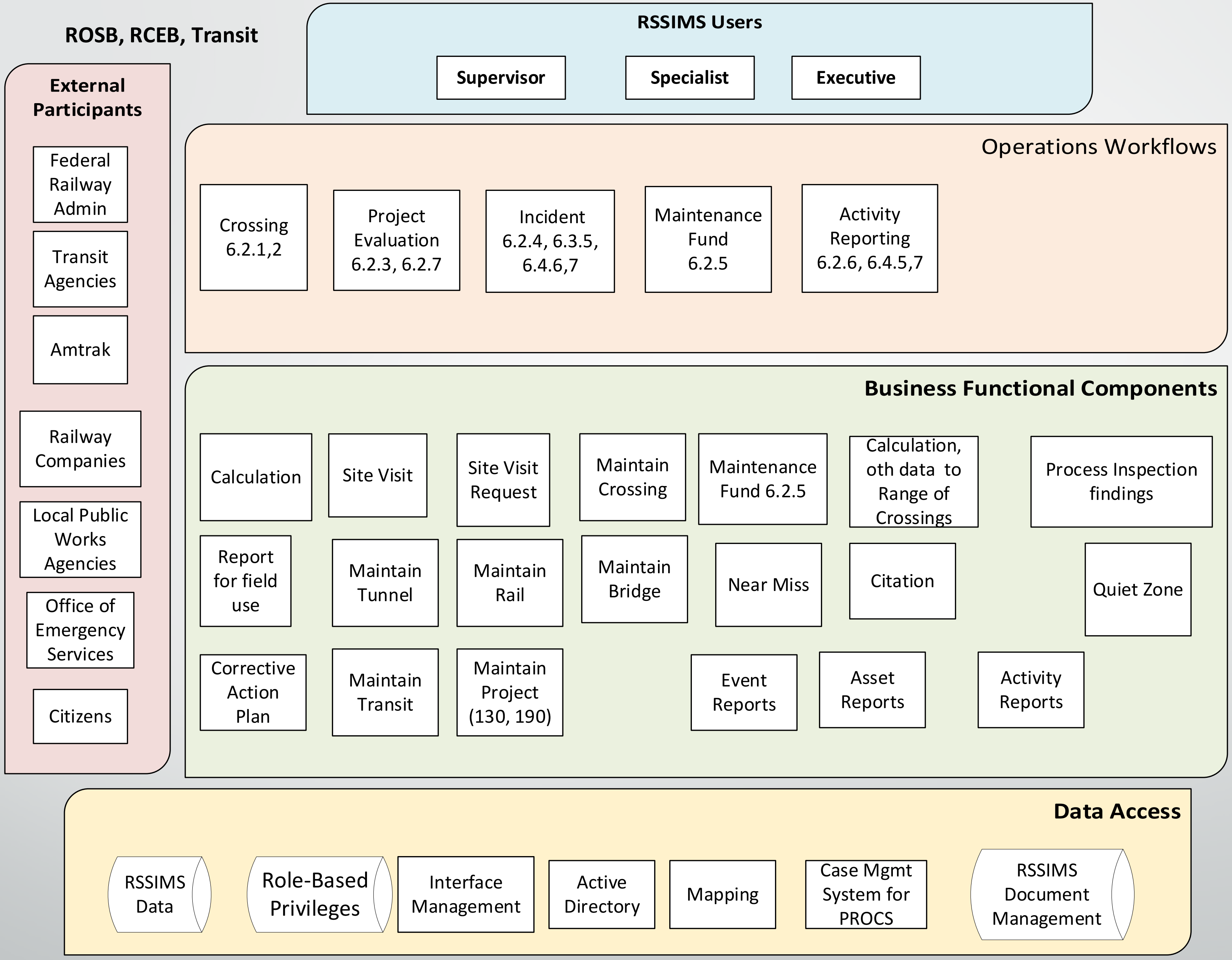

ROSB, RCEB, Transit

RSSIMS Users

Supervisor | Specialist | Executive

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- Federal Railway Admin
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Operations Workflows

- Crossing 6.2.1,2
- Project Evaluation 6.2.3, 6.2.7
- Incident 6.2.4, 6.3.5, 6.4.6,7
- Maintenance Fund 6.2.5
- Activity Reporting 6.2.6, 6.4.5,7

Business Functional Components

- Calculation
- Site Visit
- Site Visit Request
- Maintain Crossing
- Maintenance Fund 6.2.5
- Calculation, oth data to Range of Crossings
- Process Inspection findings
- Report for field use
- Maintain Tunnel
- Maintain Rail
- Maintain Bridge
- Near Miss
- Citation
- Quiet Zone
- Corrective Action Plan
- Maintain Transit
- Maintain Project (130, 190)
- Event Reports
- Asset Reports
- Activity Reports

Data Access

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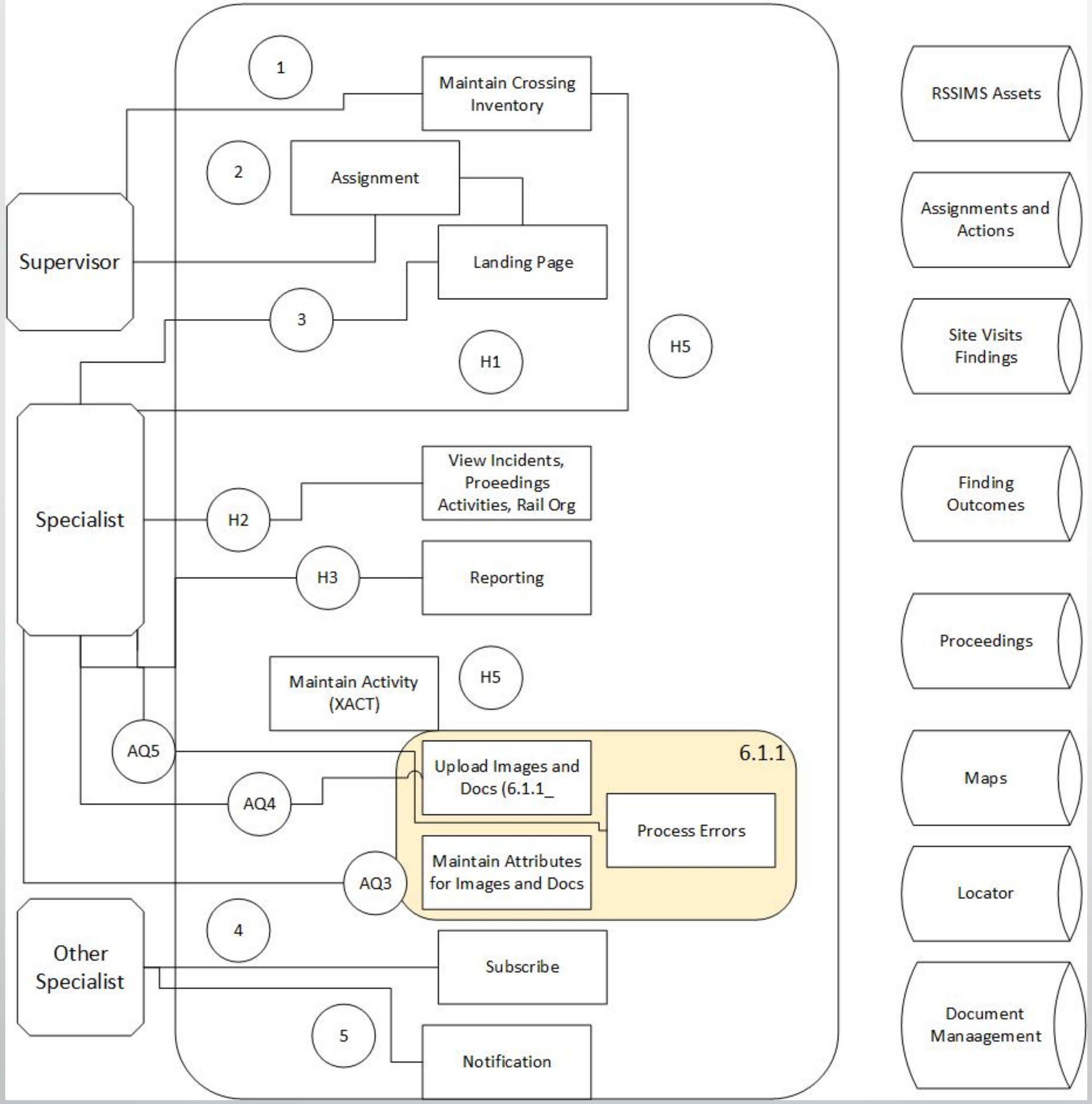
Navigation of Functional Nodes – 6.2.1 Crossing Inventory



Functional Architecture Before Technical Arch

- Work with the Business Analysts to propose a Functional Architecture during the Functional Specification phase
- Refine the Functional Components before launching into Technical Components
- Separate business functions from “helper” or “shared” or common functions.
- Whether Agile or Hybrid, the components get defined before launching into development
  - Some common function development can begin during Specification phase if well-understood

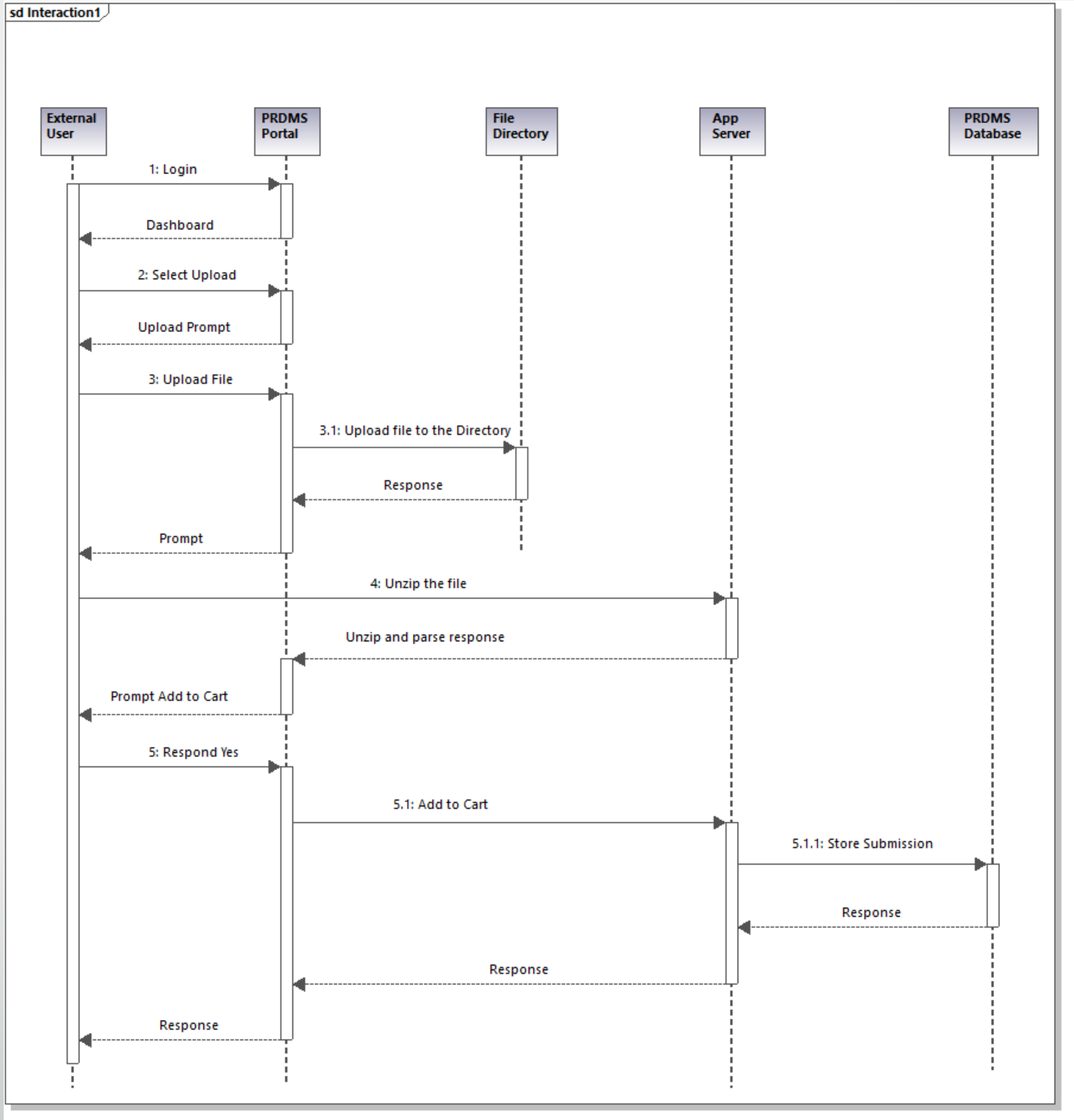
Sequence Diagrams After Components Defined

- Sequence Diagrams are not that hard
- Actually a good idea to have analysts prepare a Sequence Diagram to support the Use Case
- Have to wait until the Functional Architecture is stable before starting the Sequence Diagrams.
- The Sequence Diagram is an effective means of communication and “Hand Off” from the Analyst to the Technical Designer

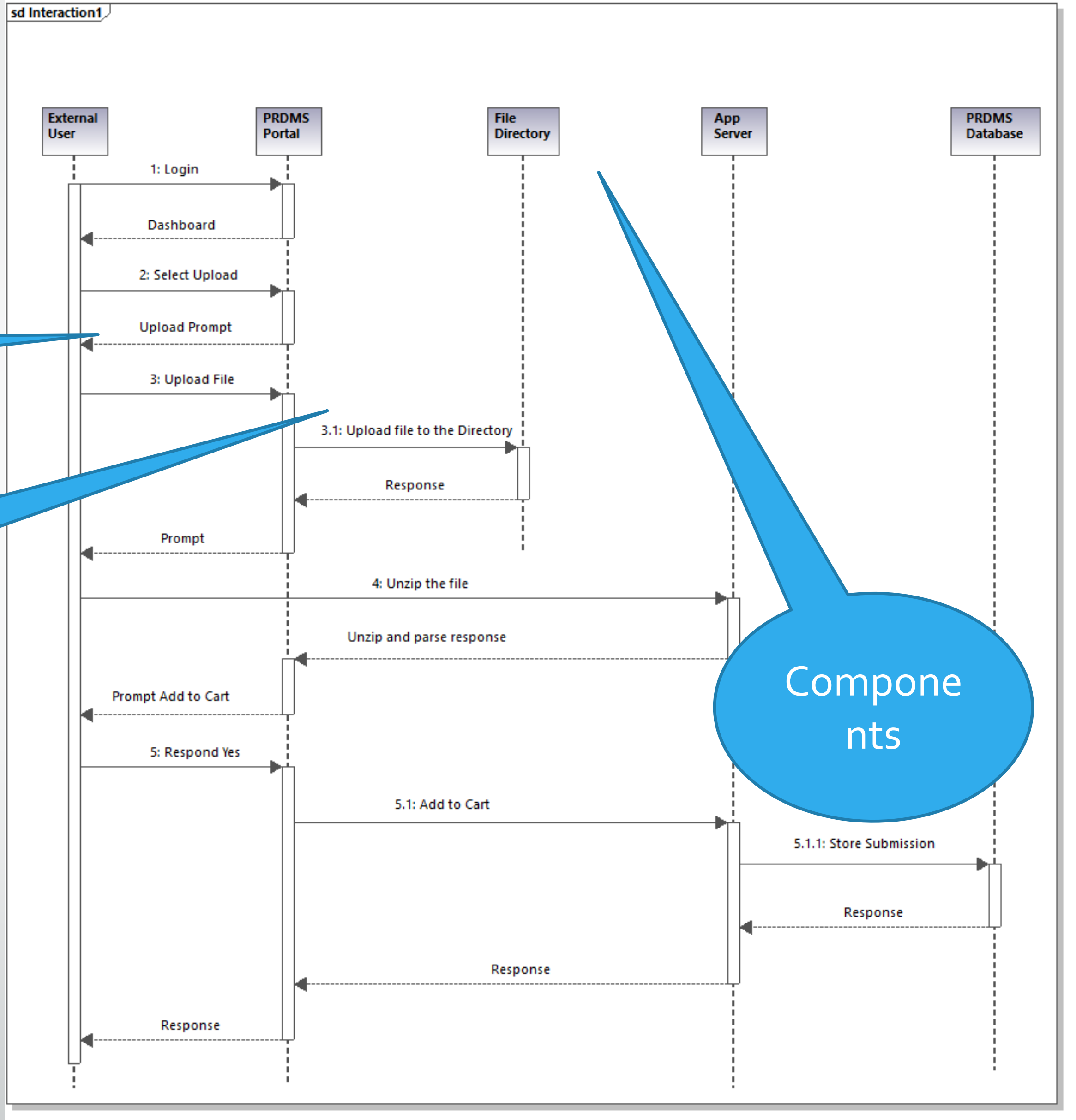
Sequence Diagram Example

Sequence Diagram shows the navigation
From one function to another in
Executing a use case.
Think of this as a graphical depiction
Of the Steps for the
User interacting with the System
And in turn the system
Firing the sequence of functions.

Very helpful in communicating to the
Developer what goes on after a User entry
Of data or a command.



Sequence Diagram Example



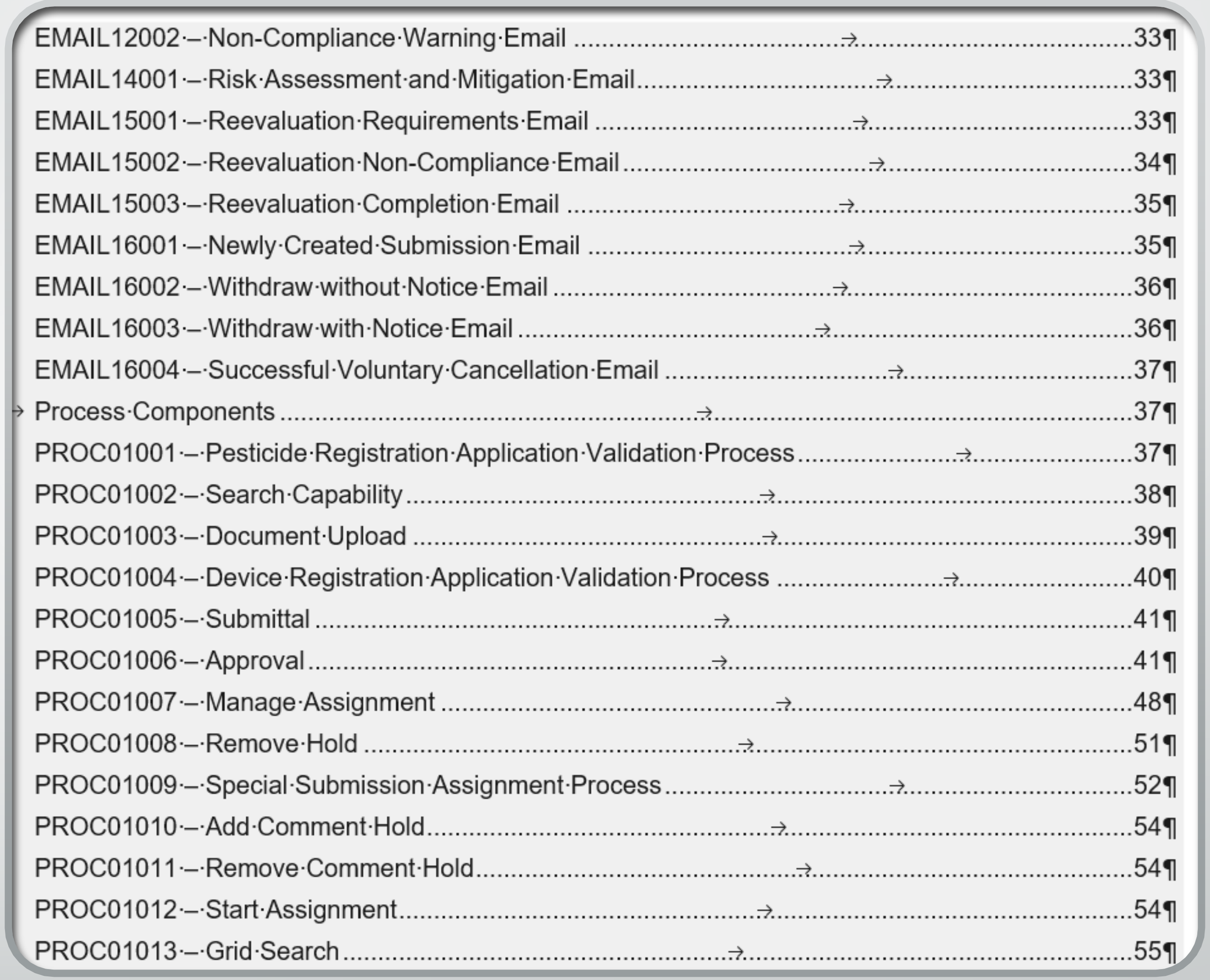
Sequence goes from top to bottom

Within a row we see passing control to another component

Components

Procedures as Elements of a Component….

- Example of a list of PROCS that are built. Multiple PROCS may be in a Single Component. PROCS include each report, screen.



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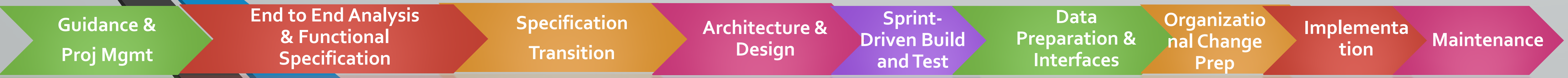
Key Participants – CIO, CTO, Leads for Servers, Network, Security, Database, Applications, Cloud Computing

Expertise Needed – Cloud Computing is especially important as the transition from "on prem" to public and private cloud computing platforms continues. Very few solutions require the most restrictive security of "government cloud" and very few specialists understand the restrictions on design imposed.

Usage Throughout the Project –From the outset, key participants must be mindful for how technology can enable best practices in solution formulation; but also recognize the importance of introducing new technologies so they can be applied across the enterprise and not isolated to a single solution. Isolated solutions decay quickly.

Frequency of Update – Each budget cycle must recognize the commitments explicit for training, licensing, compatibility upgrades, and functionality enhancements associated with introducing a new solution. Solutions that hide from visibility and attention decay quickly no matter how adanced the technology.

Work Products – Enterprise-wide functional architecture; application functional architecture; enterprise technical system architecture; application logical technical architecture; application system architecture.



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Tips, Tricks, and Traps ….

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Technology Governance

We are trained to assume that duplication is inefficient and that resources should be shared. We then react negatively when executive sponsors insist on having a separate platform for their solution and not to share equipment or databases with other programs and systems.

But sharing requires governance, coordination, priority setting, and compromise.

The Cost of governance in terms of delays and compromises may exceed the cost of just having duplicate platforms sometimes.

The Challenge is to be aware of the trade-offs, appreciate the cost of governance and work toward a broad understanding of the Total Cost of Ownership.

Scope –

Resources and References –

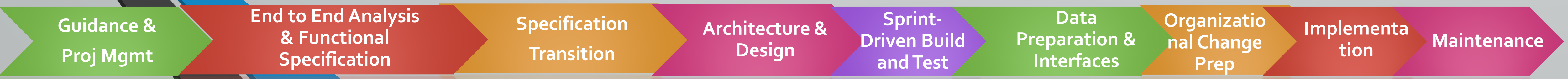
Key Participants –

Expertise Needed –

Usage Throughout the Project –

Frequency of Update –

Work Products –



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For application design we support:

Sequence Diagrams aligned with the Use Cases or Epics

Logical Data Model with a road map for completing the Schema

Web page standards

Query and report interface standards

Representative screen designs that serve as templates for a similar pages that a Use Cse will support

Resources and References – The vendor must demonstrate it has done this before with an example from a prior project. The CTO may also have an example from a prior project. They must then collaborate on deriving lessons learned and defining standards for the current project.

Key Participants – CTO verifies standards, monitoring approach, documentation
Product Owner – verifies that Design traces to Assigned Analysis Scope

Expertise Needed – Application Framework usage; Integration Hub approaches; Software Engineering Patterns; Database Performance and Maintainability

Usage Throughout the Project – Standards kept current throughout project; Sequene Diargram maintained; Data Model for Schema maintained. Data Elements Dictionary maintained.

Frequency of Update – Monthly verification during Development and Testing updates to work productsthat will support Maintenance are updated.

Work Products – Database ERD, Use Case Sequence Diagrams; User Interface design standards; coding standards; Decision and Business Rule Repository; Representative UX pages;

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Design Decisions

Even with the scope of functionality and the level of fidelity outlined from the functionality specifications, there are still decisions to make that get finalized in the Design Deliverable check point.

These will address:

Is there a separate database for reporting and query, document management approach, Online help capabilities, buy versus build, integration management, contribution to industry standards for data exchanges not already defined.

Buy Versus Build

Reporting

Expertise Needed – Application Framework usage; Integration Hub approaches; Software Engineering Patterns; Database Performance and Maintainability

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Total Cost of Ownership

Total Cost of Ownership (TCO) takes into consideration:
Expenses for the computing platforms whether cloud or on-premises
Software licenses and upgrades
Hiring and keeping staff trained and available to do needed work
Ongoing basic system administration, software maintenance, help desk
Onboarding staff to learn the new system to be proficient
Ongoing training as one-time training knowledge retention is short-lived

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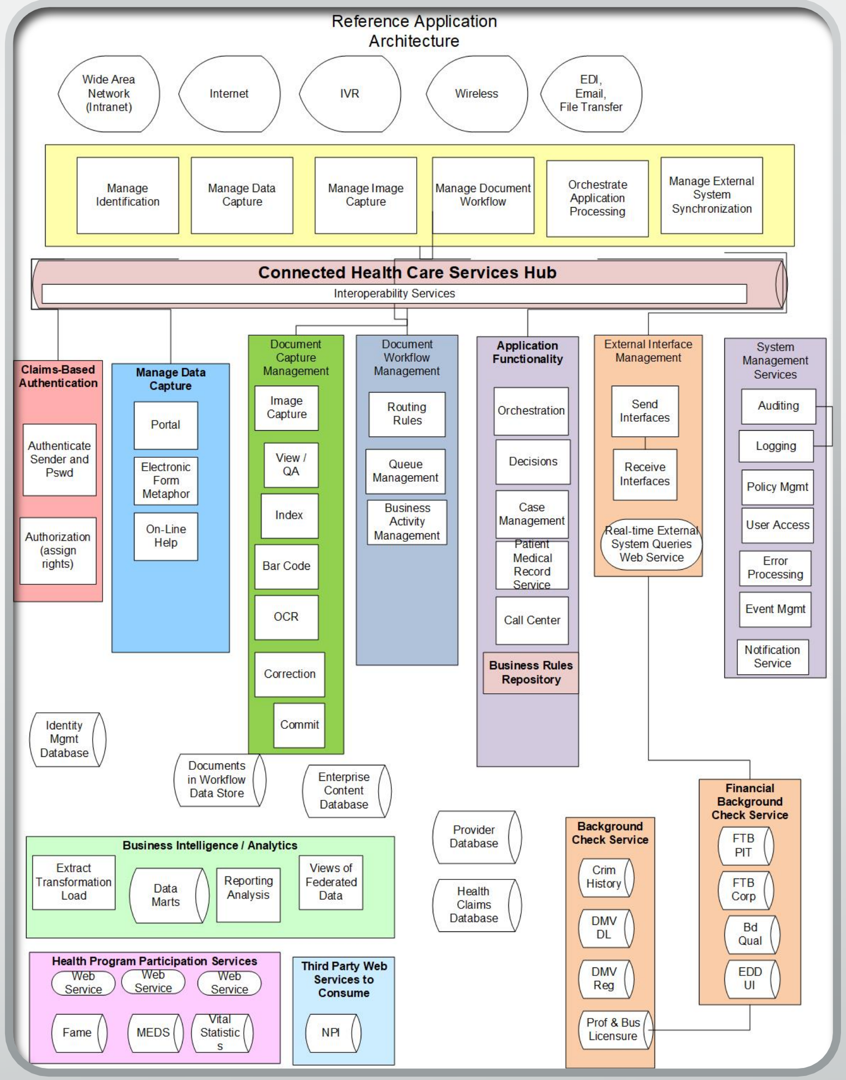
Functional Architecture

The breadth of capabilities that may be needed in a comprehensive solution serve as a graphical checklist. These are assessed to determine which are required in one form or another by the Solution's functionality. Selected functions are then assigned to products that may already be part of the Enterprise or will be acquired to support the Solution and future enterprise needs.



Reference Application Architecture

Wide Area Network (Intranet)
Internet
IVR
Wireless
EDI, Email, File Transfer

Manage Identification
Manage Data Capture
Manage Image Capture
Manage Document Workflow
Orchestrate Application Processing
Manage External System Synchronization

Connected Health Care Services Hub
Interoperability Services

Claims-Based Authentication
- Authenticate Sender and Pswd
- Authorization (assign rights)

Manage Data Capture
- Portal
- Electronic Form Metaphor
- On-Line Help

Document Capture Management
- Image Capture
- View / QA
- Index
- Bar Code
- OCR
- Correction
- Commit

Document Workflow Management
- Routing Rules
- Queue Management
- Business Activity Management

Application Functionality
- Orchestration
- Decisions
- Case Management
- Patient Medical Record Service
- Call Center
- Business Rules Repository

External Interface Management
- Send Interfaces
- Receive Interfaces
- Real-time External System Queries Web Service

System Management Services
- Auditing
- Logging
- Policy Mgmt
- User Access
- Error Processing
- Event Mgmt
- Notification Service

Identity Mgmt Database
Documents in Workflow Data Store
Enterprise Content Database
Provider Database
Health Claims Database

Business Intelligence / Analytics
- Extract Transformation Load
- Data Marts
- Reporting Analysis
- Views of Federated Data

Health Program Participation Services
- Web Service
- Web Service
- Web Service
- Fame
- MEDS
- Vital Statistic s

Third Party Web Services to Consume
- NPI

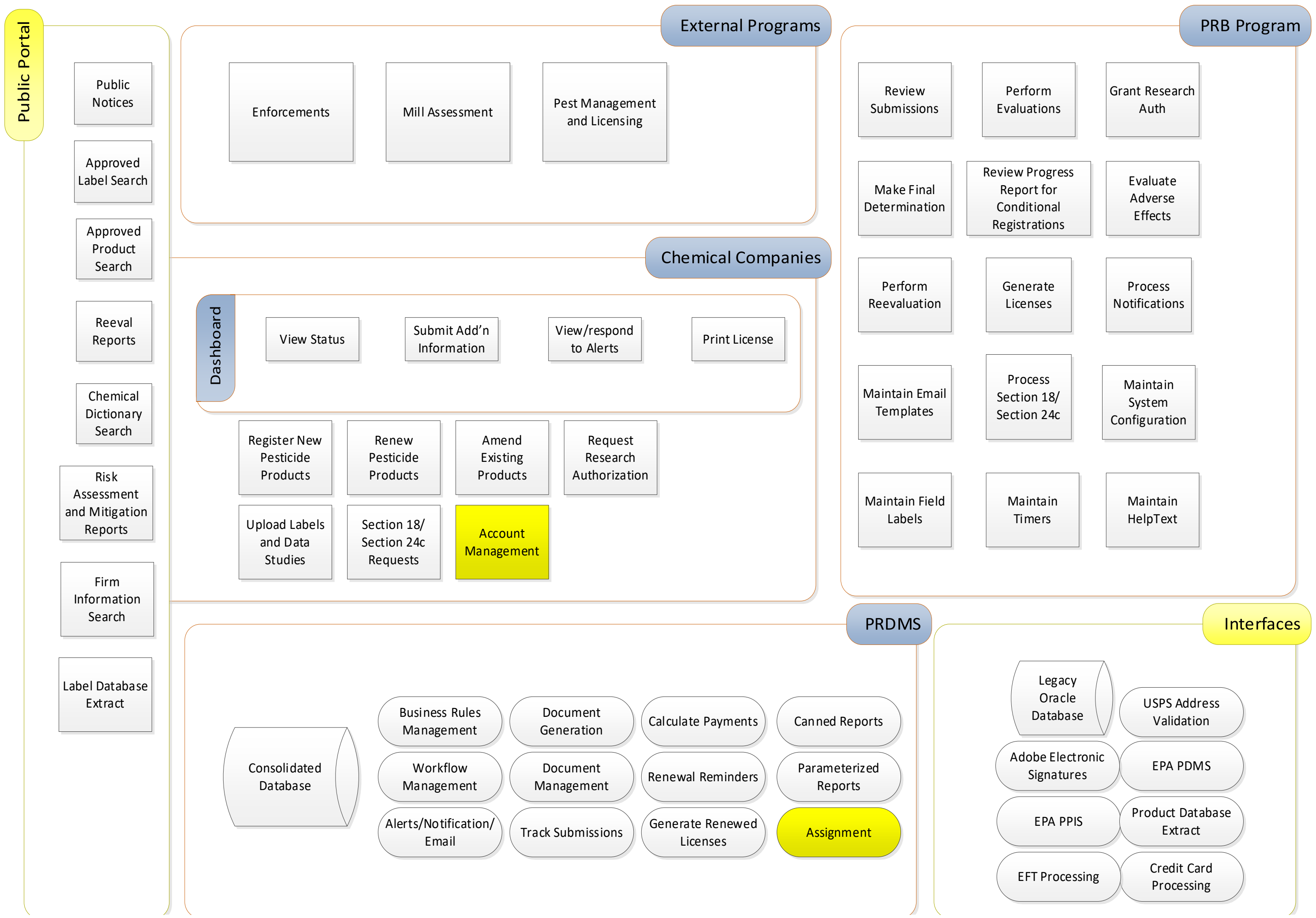
Background Check Service
- Crim History
- DMV DL
- DMV Reg
- Prof & Bus Licensure

Financial Background Check Service
- FTB PIT
- FTB Corp
- Bd Qual
- EDD UI

Application Architecture

The breadth of capabilities that may be needed in a comprehensive solution serve as a graphical checklist. These are assessed to determine which are required in one form or another by the Solution's functionality. Selected functions are then assigned to products that may already be part of the Enterprise or will be acquired to support the Solution and future enterprise needs.

PRDMS – Node Architecture – Functions only



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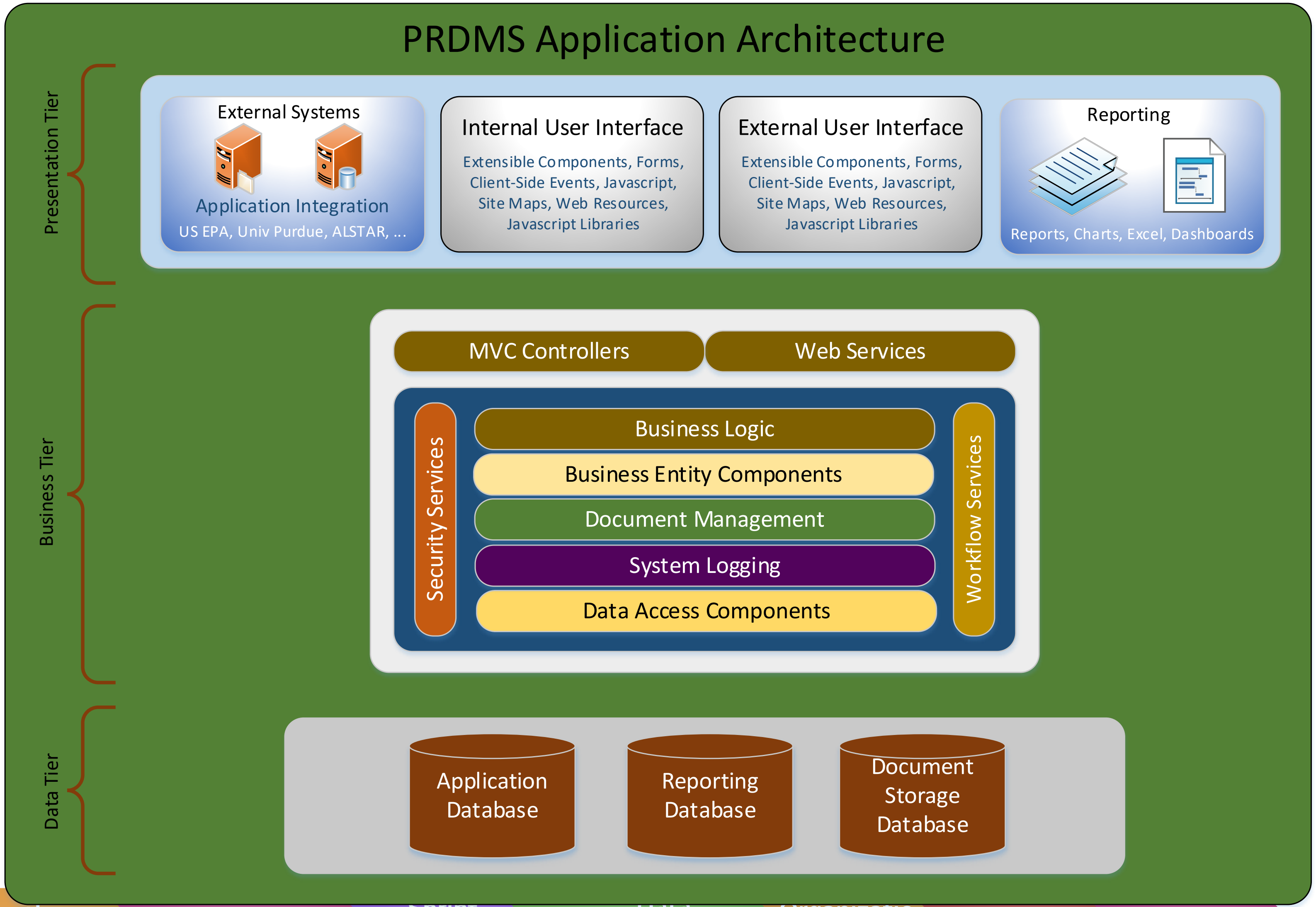
Application Architecture Level 1



PRDMS Application Architecture

Presentation Tier

External Systems

Application Integration

US EPA, Univ Purdue, ALSTAR, ...

Internal User Interface

Extensible Components, Forms, Client-Side Events, Javascript, Site Maps, Web Resources, Javascript Libraries

External User Interface

Extensible Components, Forms, Client-Side Events, Javascript, Site Maps, Web Resources, Javascript Libraries

Reporting

Reports, Charts, Excel, Dashboards

Business Tier

MVC Controllers

Web Services

Security Services

Business Logic

Business Entity Components

Document Management

System Logging

Data Access Components

Workflow Services

Data Tier

Application Database

Reporting Database

Document Storage Database

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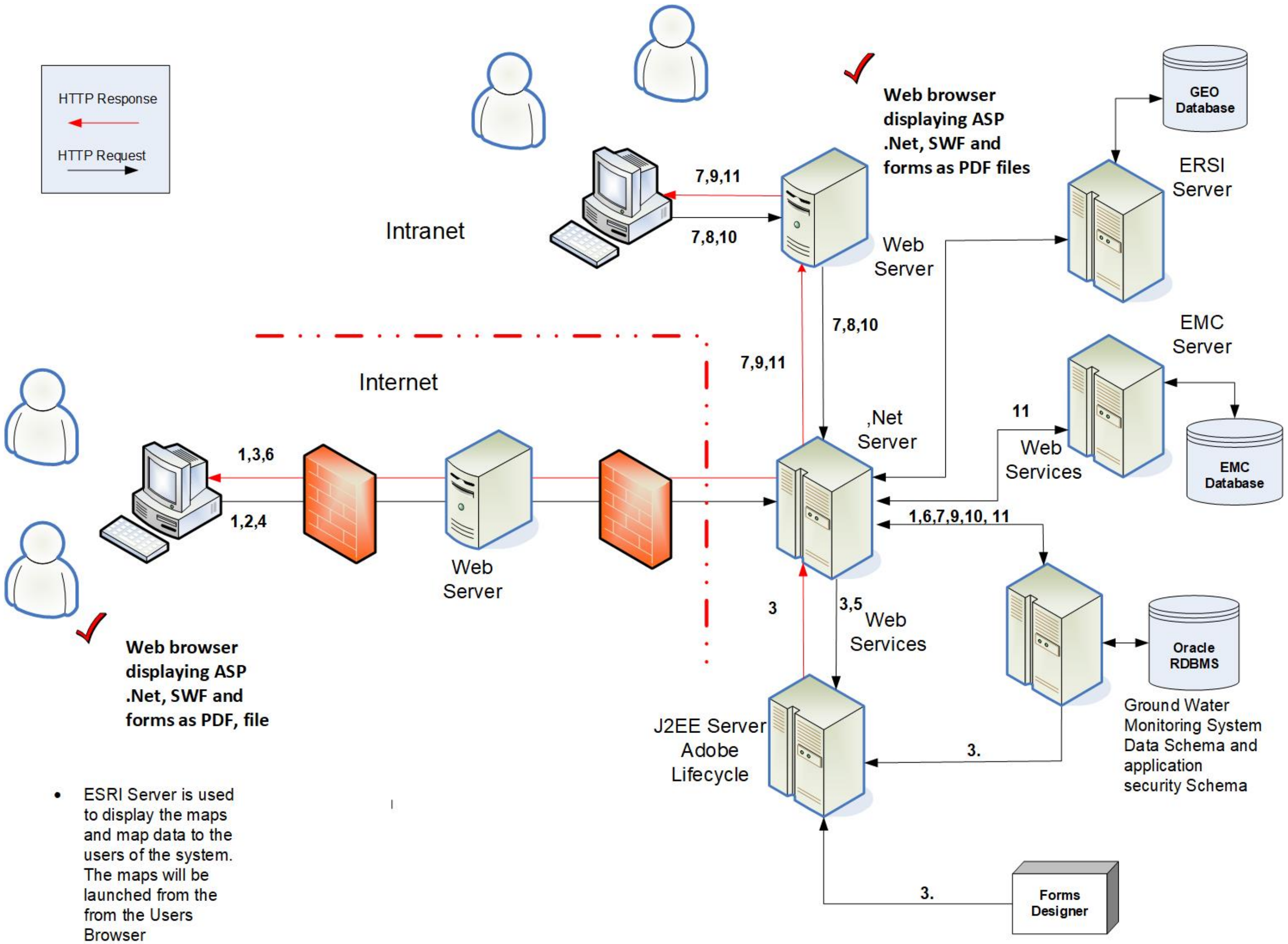
Use Case Node Navigation



Web browser displaying ASP .Net, SWF and forms as PDF files

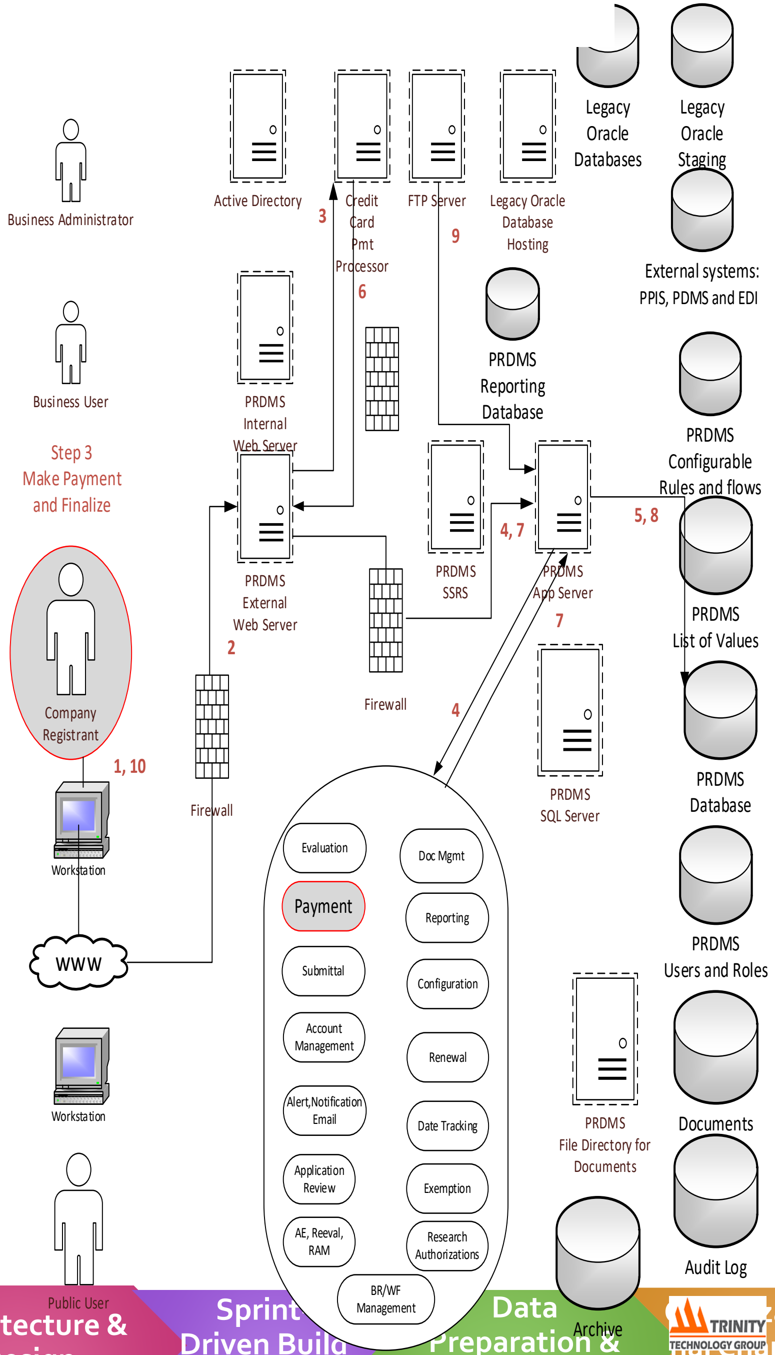
Web browser displaying ASP .Net, SWF and forms as PDF, file

Ground Water Monitoring System Data Schema and application security Schema

- ESRI Server is used to display the maps and map data to the users of the system. The maps will be launched from the from the Users Browser

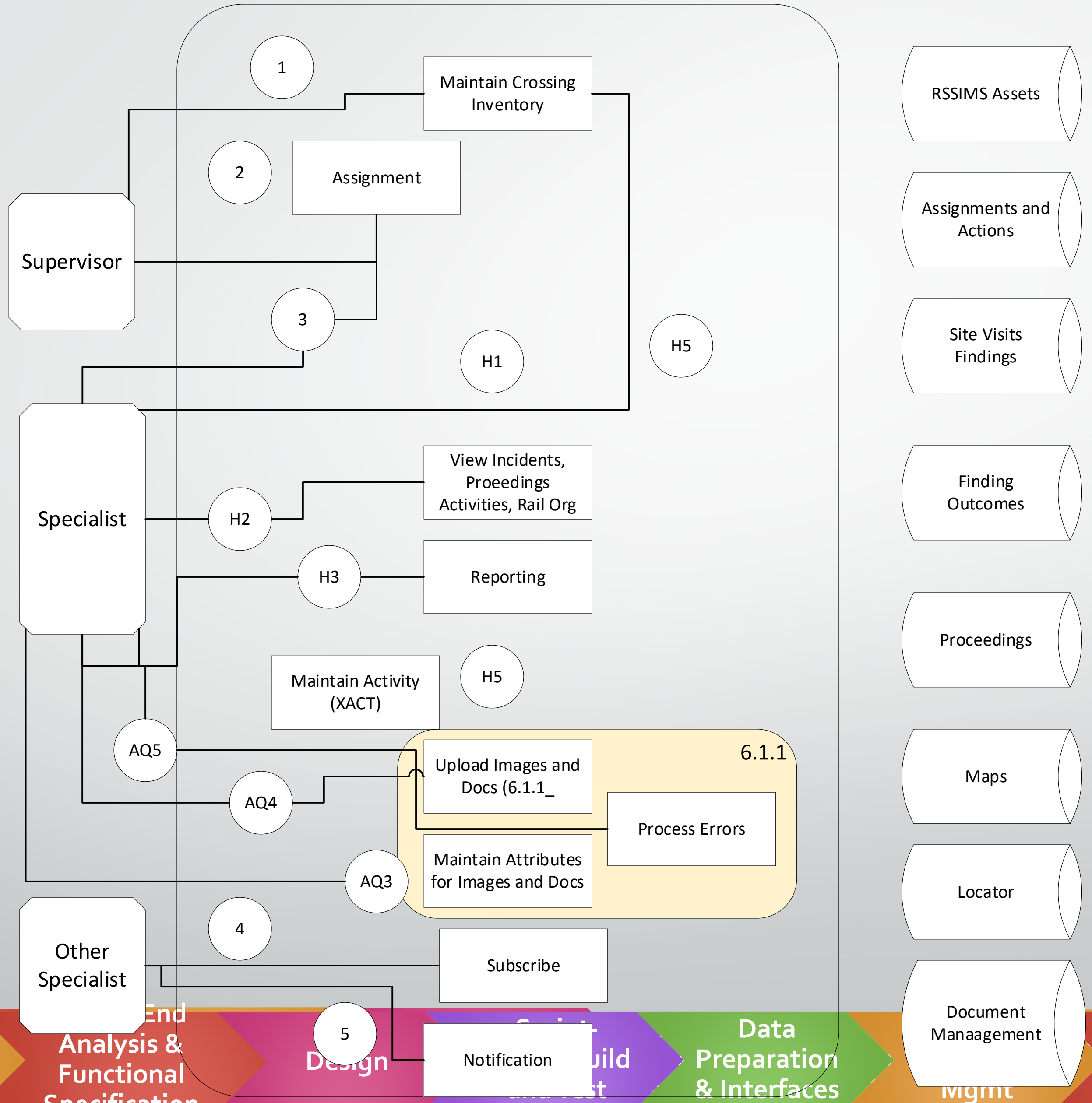
Use Case Node Navigation

Shows how data and messages navigate the major functional nodes of the solution. Makes visible the components (nodes), navigation paths.



1. User selects to pay by Credit Card, provides card info.
2. Request is posted to the External Web Server
3. Web Server launches CC click-through page, passing internal Submission ID for traceability.
4. Web Server passes pending CC request to App Server.
5. App Server stores pending CC request to database.
6. Customer completes CC payment in click-through page, CC processor calls-back to PRDMS to indicate payment completed or failed.
7. Web-Server captures incoming postback from the CC processor, passes it to App Server.
8. App Server stores record of pending CC payment, adding the unique identifier returned by the CC processor.
9. Later, the App Server checks the CC processor's FTP server and finds a new file. App Server imports the file to record the successful CC transaction.
10. App Server sends notification of the successful/failed payment

Navigation of Functional Nodes – 6.2.1 Crossing Inventory



Supervisor

Specialist

Other Specialist

1

Maintain Crossing Inventory

2

Assignment

3

H1

H5

H2

View Incidents, Proeedings Activities, Rail Org

H3

Reporting

Maintain Activity (XACT)

H5

AQ5

AQ4

AQ3

6.1.1

Upload Images and Docs (6.1.1_

Process Errors

Maintain Attributes for Images and Docs

4

Subscribe

5

Notification

RSSIMS Assets

Assignments and Actions

Site Visits Findings

Finding Outcomes

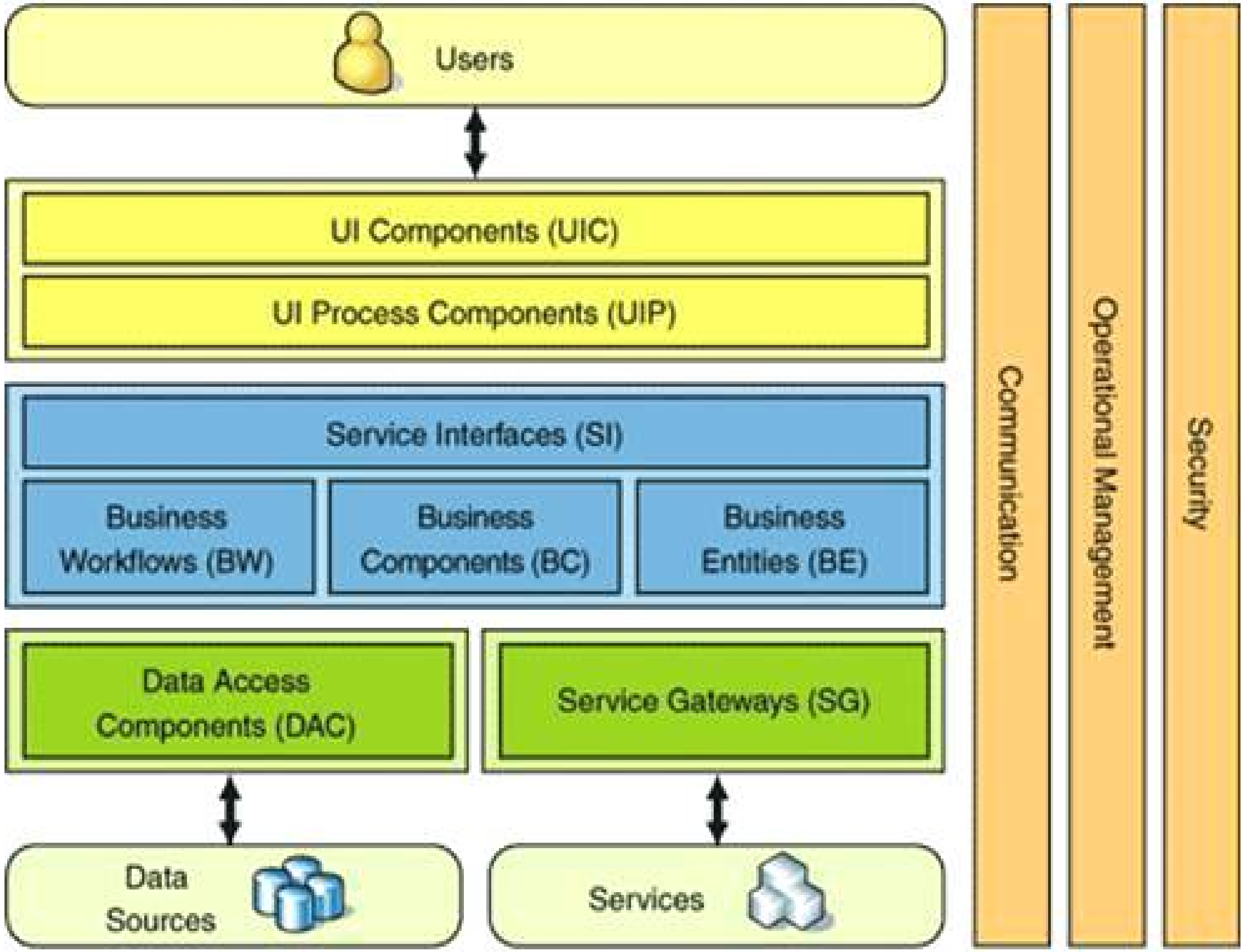
Proceedings

Maps

Locator

Document Manaagement

Security Architecture



System Architecture

This is the most commonly depicted architecture. But it really needs to be “unpacked” or decomposed to understand the diverse functions that each responsibility assigned. This is where the Conceptual Architecture helps by separating responsibilities such as document management, orchestration, workflow, address verification, integration management and other capabilities that may be consolidated in the beginning in a single product.

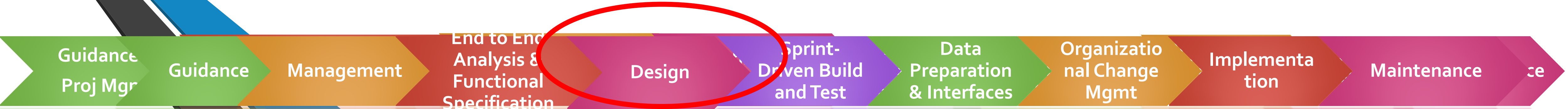
Architecture

Tips, Tricks, and Traps

To be completed

The Design Deliverable demonstrates that the Charter and Contract expectations will be met and also demonstrates there is sufficient guidance to ensure the Sprint-driven development that follows will be efficient and responsive. The Deliverable is a Compilation of work products underway for months. The Analysts will ensure the work products are aligned, refactor when needed, and organize working papers to verify documentation of decisions, assumptions, and guidance.

- Ensure alignment of Design with Contract, Charter, and approved analysis deliverables
- Triangulate work products to ensure consistency with one another
- Provide content for presentations used to assist reviewers in their verification responsibilities



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Design Deliverable Most Contracts call for Preparation of a Design Deliverable that makes clear that requirements will be met and guide the detailed design and guide the development of the solution and what to test from a system and from a user perspective. The work products described above for Specification and Design and Architecture are verified for alignment.

Resources and References – A Delivereable Expectation Document (DED) reviewed and approved early in the project sets forth the outline, description of content including their scope, depth and format. The work products prepared to date are used to verify the Deliverable compiles and aligns them with one another and traces to the functional specification and Project Charter.

Key Participants – Participants in the Deliverable Review need to have actively participated in review of work products described above that go into the Deliverable. The Deliverable is reviewed for responsiveness to prior critiques, the work products are aligned, and that any known major disruptions addressed. Project Sponsor, Product Owner, Product Owner Delegate, Contract Manager, CIO, CTO, Leads for Servers, Network, Security, Database, Applications, Cloud Computing. The persons doing the signoff must have several weeks lead time for notification on when to expect the document. The participatnts must be established early enough in the process to ensure their engagement during the preparation and review of the work products that go into the Design Deliverable.

Expertise Needed – People from different areas of expertise need to work together as it is rare for one person who have skills that cross the dimensions of the Design Deliverable. For example, a database specialist can go through the model to verify with a subject matter expert that the data needs are met and the design will enable adding new capabilities from the Road Map over time.

Usage Throughout the Project – When the Product Owner approves a change then updates are needed to process models, use cases, user stories and possibly the database design. All of these changes that resources must be made available to make. By keeping work products in an electronic format that plans for modifications and history of changes, it will be much quicker to keep work products up to date. Hardcopy work products are dangerous in that they quickly become obsolete, it is hard to distribute changes, and too eas for someone to rely upon an out of date version.

Frequency of Update – With the ability to make date stamps visible for minor changes and authorization levels established and observed, work products can be continuously refined; major changes need to go through change control.

Work Products – The Design Deliverable is a compilation of work products that is formally approved by pre-designated personnel.

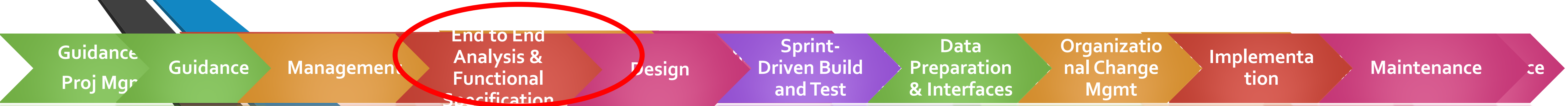
Assembling the Design Deliverable

Tips, Tricks, and Traps

To be completed

This is a very brief section that describes the role of the Business Analysts in the Build and Test workflows.   The mechanics of Agile can work very well in the build workflow. These mechanics include backlog management, assigning work to a Sprint, use of a Sprint team with a scrum master and team with developers supported by SMEs and skills for analysis and testing, and the end of sprint rituals for assessment of what was learned and velocity to inform future sprint planning and performance.

- Project Charter
- Project Sponsor, Owner, and Steering Committee
- Stage Gates, Budget Approvals, and Project Oversight



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Tips, Tricks, and Traps ….

Sprint-Driven Build

The Backlog is well defined in a hybrid approach. The end to end analysis and functional specification are done, the Minimum Viable Product formulated. User Stories may be identified but still need "grooming".

Decisions and Business Rules are maintained in their own repository. So when new ones are found or better defined through grooming or in a Sprint, the repository must be updated. This reduces accidental duplication.

Analysts can conduct a "Design specification" sprint to ready a use case for development in a Build Sprint that follows. Getting Decisions, rules, data, and features flushed out before the Development sprint aids in estimating and avoids delays.

The attitude that functionality not completed in the assigned Sprint can be carried over to another Sprint is very dangerous. Deadlines exist for a reason. Inability to complete work as scheduled must be elevated to determine if the entire schedule needs to be adjusted. There is no such thing as "catching up".

Leaving Rule specification to a Development Sprint is high-risk: may take time to get agreement among needed SMEs, may delay the developers, or a placeholder may get lost. The Decision/Rule repository must be kept current.

Build and System Test

Scope –

Resources and References –

Key Participants –

Expertise Needed –

Usage Throughout the Project –

Frequency of Update –

Work Products –

Build and System Test

The Product Owner ensures the Business Analysis Team is actively engaged with the Technical Team throughout the Build and Test activities.

- Analysts are best positioned to evaluate any change control item to understand any change will impact what comes before, during, and after the target of the change.
- Complete Business Rule specification and verification of Decision understanding on Sprint Teams.
- Verify that Each Use Case Decision Identifier is mapped to a corresponding code component in the Build. Ideally each Business Rule has an identifier that is also maintained as a Label in the Code Base.
- Sequence Diagrams emphasize component (top-down thinking), visibility, re-use of functionality. The graphical depiction enables the software engineer to explain understanding of the functionality in way that the Analysts can verify.
- Participate in System Test execution so that flaws do not get passed and then delay User Acceptance Testing
- Perform all interaction with the Subject Matter Experts on needed clarifications or changes.

How Analysis & Specification Support Build and Test

The Product Owner ensures the Business Analysis Team is actively engaged with the Technical Team throughout the Build and Test activities.

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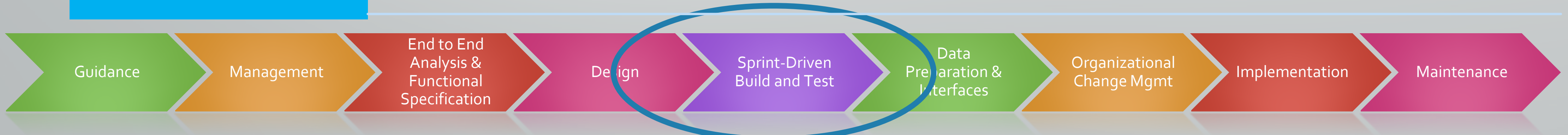
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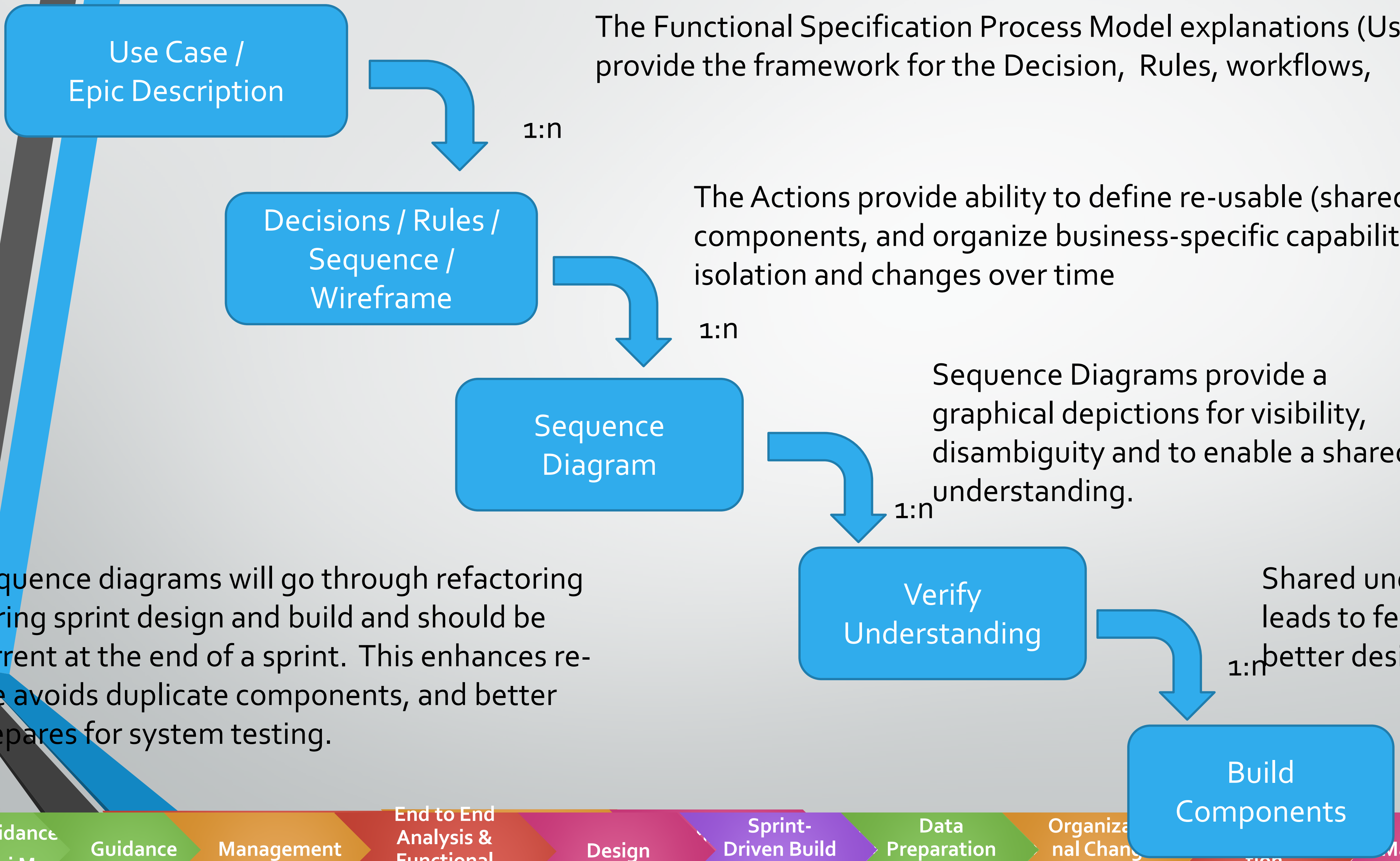


Use Case / Epic Description

1:n

Decisions / Rules / Sequence / Wireframe

1:n

Sequence Diagram

1:n

Verify Understanding

1:n

Build Components

The Functional Specification Process Model explanations (Use Cases) provide the framework for the Decision, Rules, workflows,

The Actions provide ability to define re-usable (shared) components, and organize business-specific capabilities for isolation and changes over time

Sequence Diagrams provide a graphical depictions for visibility, disambiguity and to enable a shared understanding.

Shared understanding leads to fewer mistakes, better design.

Sequence diagrams will go through refactoring during sprint design and build and should be current at the end of a sprint. This enhances re-use avoids duplicate components, and better prepares for system testing.

Build and Test

Tips, Tricks, and Traps

System Test has three major objectives:

End to End Testing to make certain the functionality, technology and data hold together

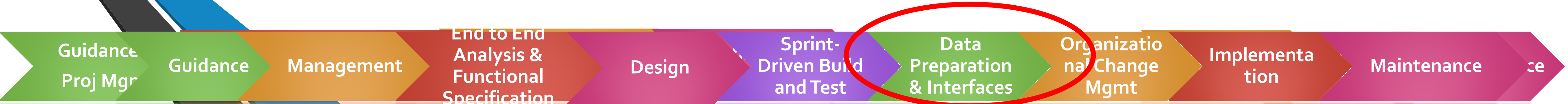
Identify performance bottlenecks and resolve through a combination of database changes, refactoring components and orchestrations, and possibly platform resizing.

Detect coding errors missed in Sprint-driven development.

The Analysts and Subject Matter Experts will advise on what to test especially to ensure that complex Decisions and Rules are implemented correctly. Quality Asurance analysts, (ie: professional testers) are best positioned to write the tests, execute them, document discrepancies, and manage the process for remediation and re-testing (regression testing.)

The Business Analysts stay engaged during the Sprint-Driven development to ensure that the coding effort is complete and does not kick the can down the road to force detection of incomplete coding as part of System Testing.

- Data Dictionary to verify correct understanding to map from legacy to target
- Evaluate analysis of database contents for irregularities in values, list of values (codes)
- Aid in understanding parent-child data relationships
- Liaison between the data conversion developers and the subject matter experts for their effective and efficient involvement
- Resolving the “data of record” when multiple sources are integrated



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Tips, Tricks, and Traps ….

Data Preparation

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How SME's and Analysts Support Data Readiness

The Product Owner ensures the Business Analysis Team is actively engaged with the Technical Team throughout the Data Conversion effort.

Analyst support for Data Readiness includes….

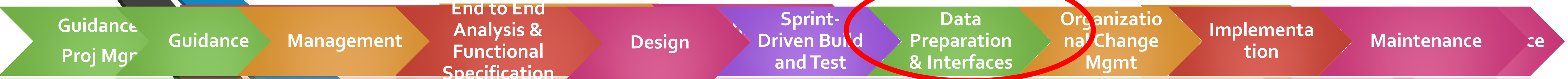
- The Data Dictionary is critical to guiding the mapping from legacy to the target database. Data Names do not accurately convey meaning. Conversion to inform the dictionary and vice versa.
- Legacy systems are notorious for having data items "re-used" for entirely different purposss than what the documentation may indicate. Code Values change over time. "A's" become "3's" and "B's" become "11's". The Users will have the best memory of business changes that led to code value changes.
- The Analyst Team understands best how data will be used—this informs where to add keys, when to allow redundancy for the sake of performance efficiency. .

The Business Analysts should have strong rapport with Subject Matter experts as well as more indepth knowledge of the organization's objectives, processes, operational practices and strategies. The Program area managers and Project Sponsor have the lead in preparing for the success of the people who will use the new solution.

Ways in which the Business Analyst can aid in Organizational Change Management…

- Align Organizational Practices with Solution Capabilities
- Training for Staff Planning, Preparation, Concentrated and Continuous Support
- Transition Campaign
- Supporting Key User Evangelists and Power Users
- Help Desk
- Collecting and Triage of Refinement Recommendations
- Onboarding new staff

The



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How SME's and Analysts Support User Acceptance

The Product Owner ensures the Business Analysis Team is actively engaged throughout User Acceptance Testing

Analyst support for User Acceptance includes….

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How SMEs and Analysts Support Training

The Product Owner ensures the Business Analysis Team is actively engaged throughout Training Preparation and Execution

Analyst support for Training includes….

- Too often Training is treated as an Event rather than as a Continuous Process.
- The Training Plan deserves considerable attention to address the challenges in getting user specialists to have the time to gradually learn and apply the capabilities and embrace the advantages of the new solution.
- The Analysis Workshop SMEs are in the best position to explain the new Solution to their peers. But because they have already had months to digest the new concepts they may underestimate the time their colleagues will require.
- Solution Training must be aligned with changes to the operating division's organization, desk procedures, escalation process, supervision, and job classifications and descriptions.
- New users—transfers, people moving from one role to another and new hires, will all need both an orientation and the ability to gradually accumulate expertise.
- Training and re-enforcing past training should be available through multiple approaches and available on-demand, not just in scheduled sessions.

Tips, Tricks, and Traps ….

Organizational Change Management

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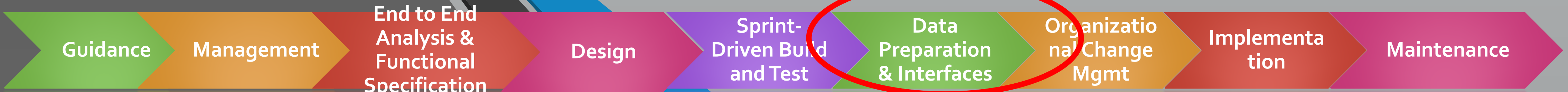

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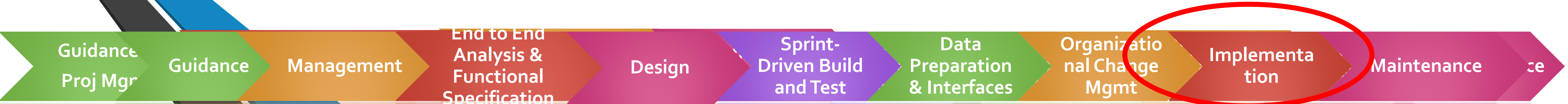
- Assign users to Roles
- Release Management
- Smoke Test
- On-Site support for confident transition—
- Effective use of the system—continuous training support



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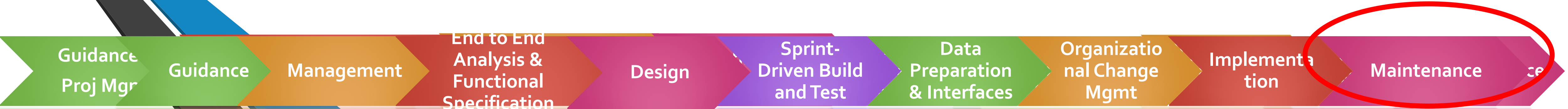
- Rapid response to user questions and concerns in initial weeks
- Document Questions and Triage what needs developer attention
- Assess questions for needed improvements in the user experience, online help, training
- Consultation with Key Users and Evangelists
- Fast analysis of any potential defect in rules, workflow, user experience



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Implementation

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Tips, Tricks, and Traps ….

Maintenance

The natural temptation is to shift resources to other projects. While a new system is built there is a backlog of needs from other systems; and typically some resentment. So it is hard to get resources to keep a new system in top shape.

Maintenance is too frequently viewed as unglamorous—lacking in the excitement associated with new systems development. But the just-built system has the most recent technology, best documentation, and the most satisfied users in the enterprise. The Product Owner is now the most knowledgeable individual for understanding how the system works, where the opportunities for improvement are.

The Product Owner will have a long list of ideas for improvements: perfections, refinements, new functionality, integrations, analytics.

There may be budget for a developer but not a business analyst. At least one of the subject matter experts from the development effort is interested in becoming a more formally trained business analyst. The Project Executive and Owner would be well served to use the new system as the vehicle to transform the SME into an analyst.

The analyst should control all communication from the Owner with the Developer. All requests for changes should be evaluated by the Analyst before having the developer launch into coding. All changes must be documented and verified by the Analyst.