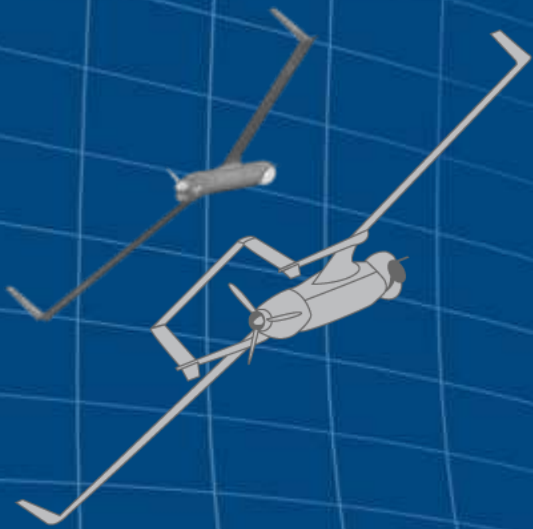


A 3D wireframe model of a mechanical assembly, possibly a landing gear or a similar component, rendered in a light blue color. The model is positioned in the upper left corner of the slide, set against a dark blue background with a subtle grid pattern.

Insitu's PLM Journey (so far)

**When Life Hands You Lemons,
Make Flavored Lemonade**

Insitu, Inc. (a Boeing Company)



Company Overview

Insitu Snapshot

- **Leading provider of Small Long-Endurance Unmanned Aircraft Systems (UAS) and Services**
 - Developer of ScanEagle System
 - Over 590,000 Combat Flight Hours
- **Major Customers:**
 - U.S. Marine Corps
 - U.S. Navy
 - U.S. Army
 - Special Operations Forces (SOF)
 - Australian Defense Force
 - Canadian Defense Forces
 - USAF, DoD Customers
- **Strong Track Record of Historical Growth**
- **800+ Highly Qualified Employees**
- **Proprietary IP and technology partnerships**
- **Location: Columbia Gorge (near Portland, OR)**



Products & Services

Product Lines

Unmanned Aircraft



Launchers



Retrievers



Ground Control Station



Services

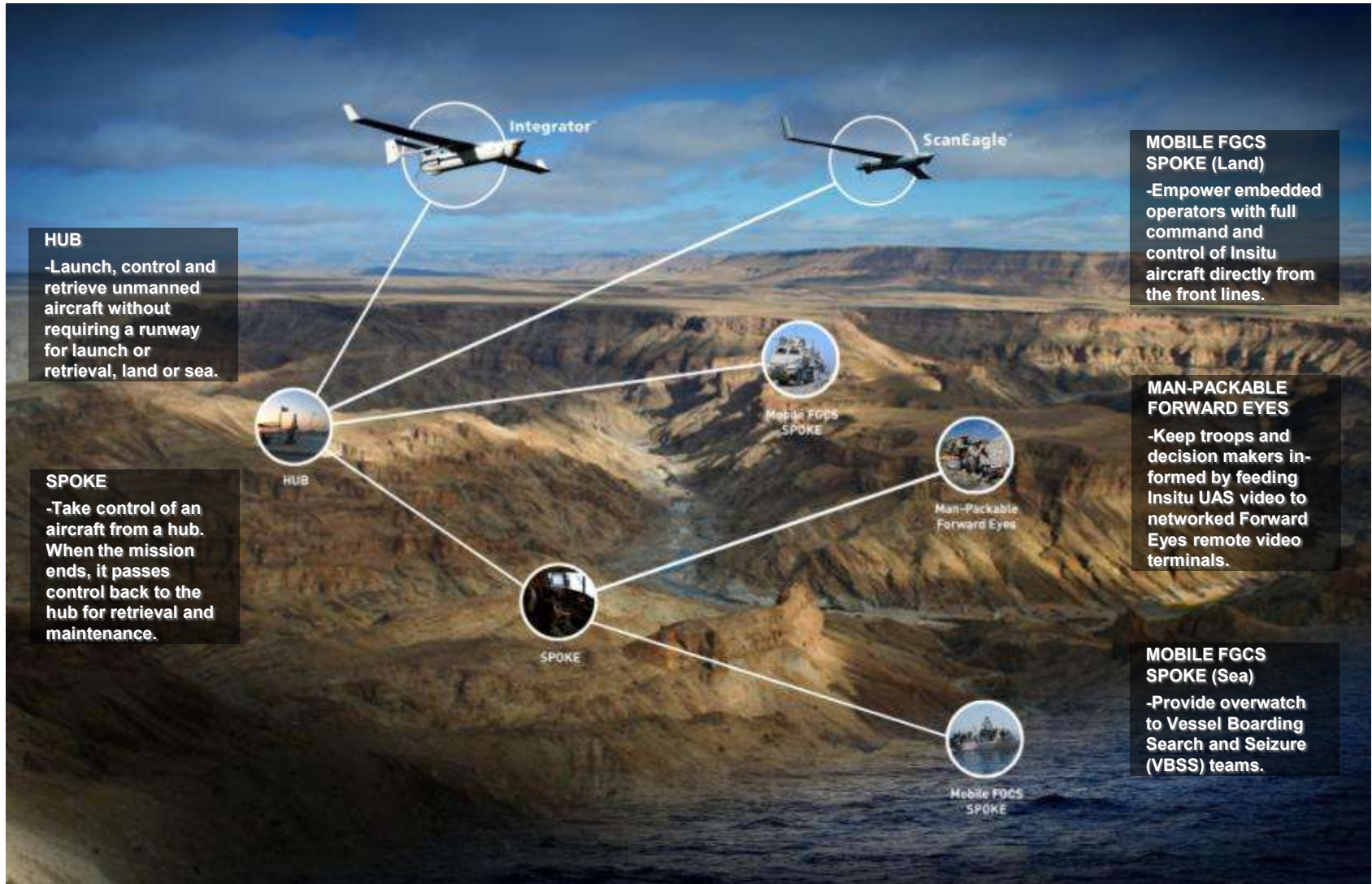
Training



Deployment Operations



Hub & Spoke

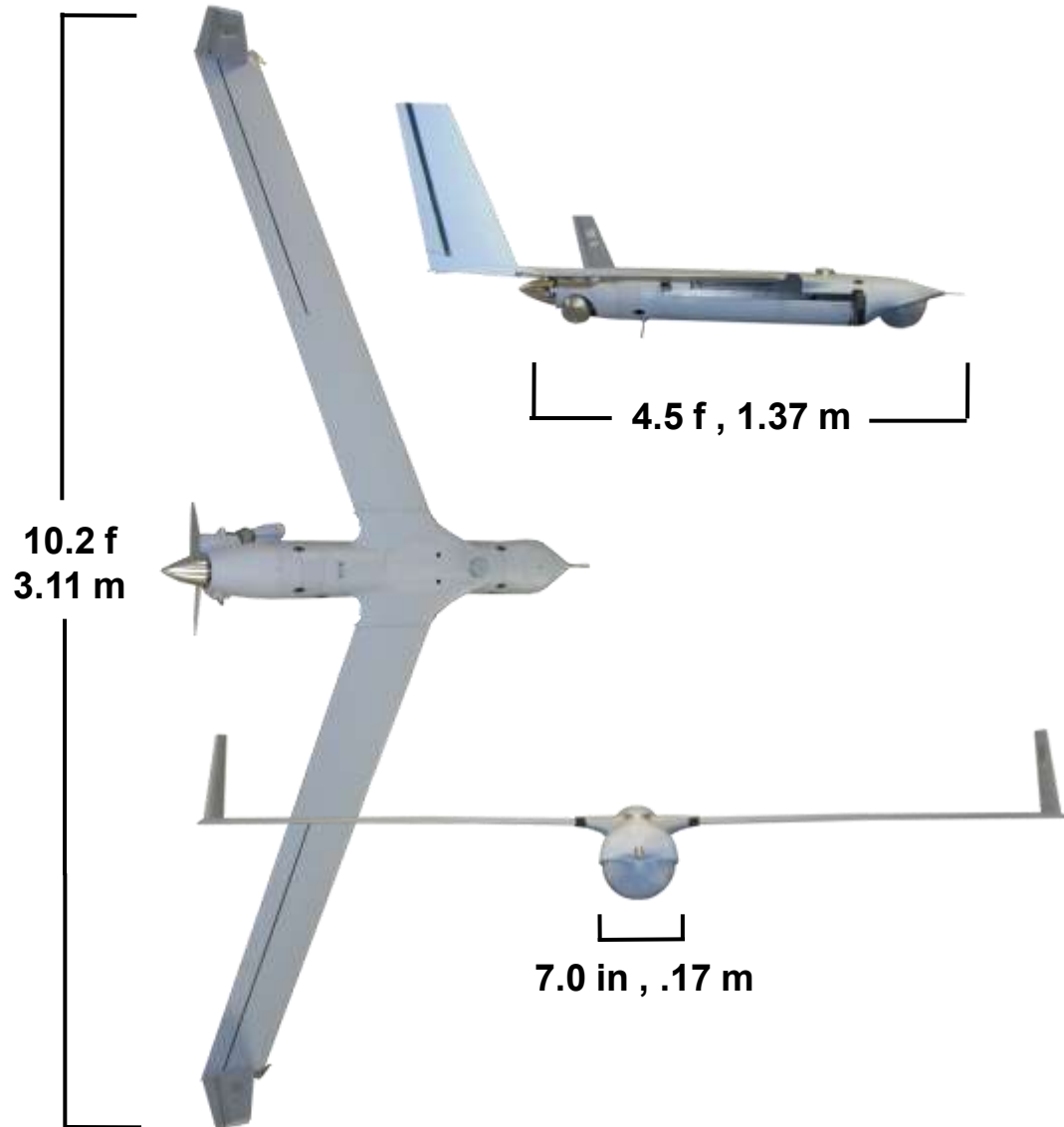


ScanEagle

QUICK SPECS

GTOW	44.0 lbs
Fuel + Payload	12.4 lbs
Max level speed	82 kts
Cruise speed	55 kts
Ceiling	20,000 ft
Endurance	24+ hours
Total Operational Hours	590,000+
Shipboard Sorties	2,800+

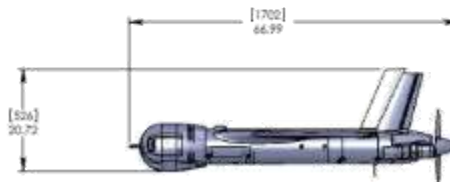
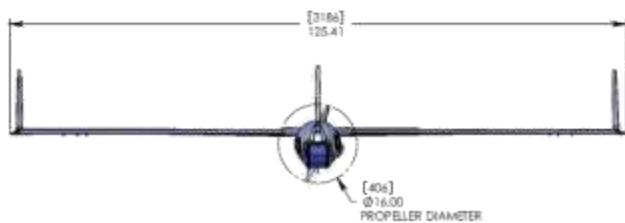
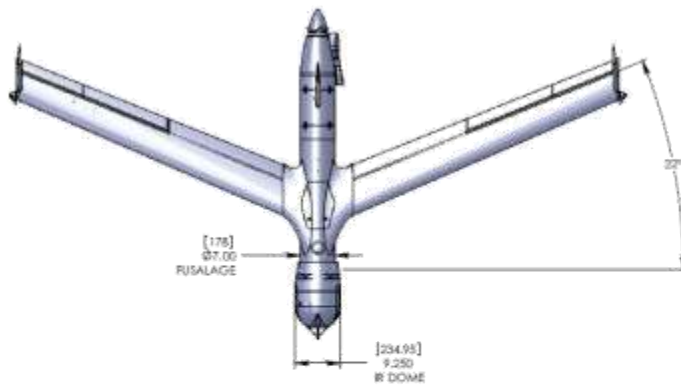
- 90% solution / 3% cost
- Heavy Fuel Option, JP-5, JP-8 or Jet-A
- Mode 3C Transponder
- Automated Launch / Retrieval
- Fully Autonomous
- Small physical and personnel footprint
- Wide weather envelope



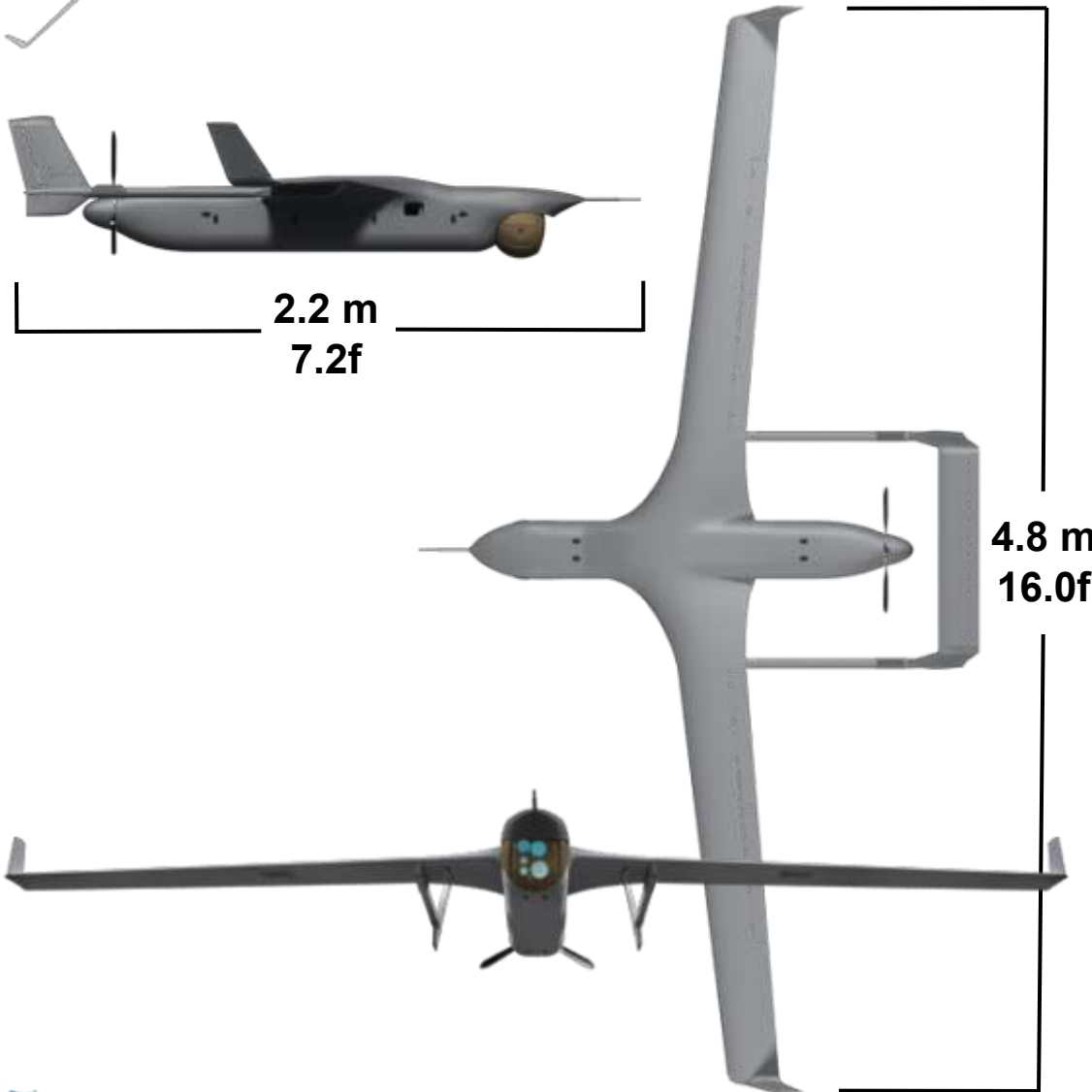
NightEagle

QUICK SPECS

Optical Zoom Steps	2.5° (4x) - 10° (1x) FOV
Added Digital Zoom Steps	1x - 4x
Full Range of Zoom Steps (Optical & Digital)	1x - 16x
Articulation	+75 to -45 (120°)



Integrator



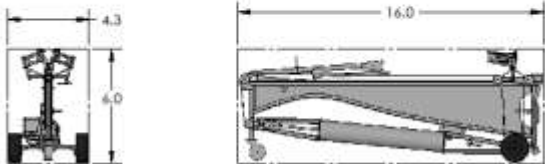
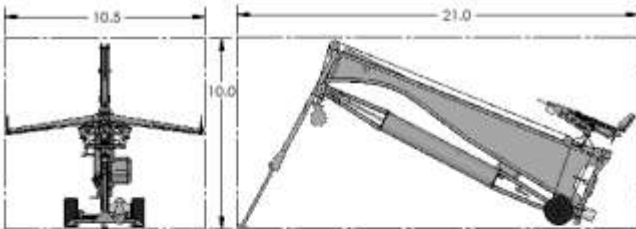
QUICK SPECS

Cruise Speed	55 knots
Dash Speed	80+ knots
Service Ceiling	>15,000 ft / 4572M
Empty Weight	75 lbs / 34.0kg
Max Takeoff Weight	135 lbs / 61.2 kg
Payload	25 lbs/11kg & 250W / 15hrs 37.5 lbs/17kg max. payload 350W max. payload power

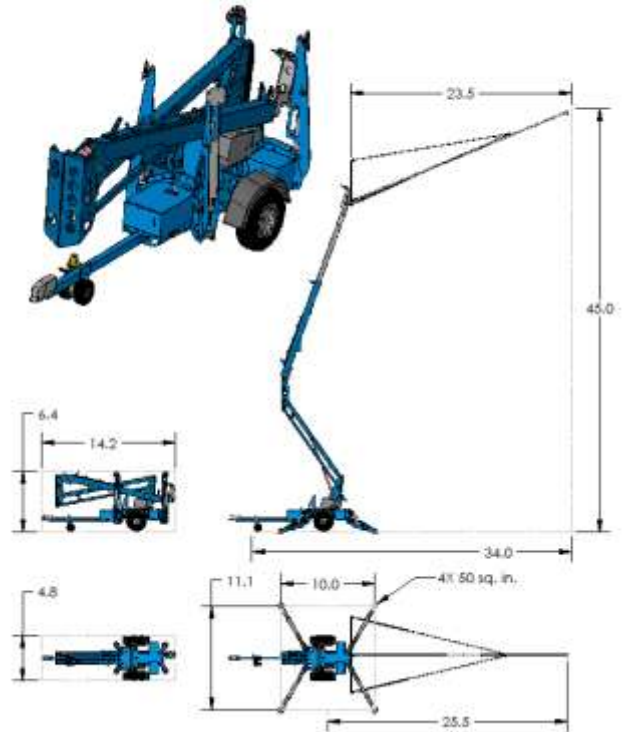
- System interoperability with ScanEagle
- Drastic payload envelope increase over ScanEagle
- iPhone™ like integration platform

Launcher / Skyhook

LAUNCHER - DIMENSIONS IN FEET



SKYHOOK - DIMENSIONS IN FEET



ScanEagle Operator Workstation

Aircraft Health

- Telemetry Data
- Digital Checklists and Emergency Procedures

Aircraft Operation

- Topographical map view
- Drag and Drop navigation
- Waypoint set up

Camera

- Imagery
- Operation
- Manipulation



Single Person Aircraft Operation / Video Manipulation

Insitu Services Overview

Field Service Reps and Ops Support



Training



Demo Team



Custom Engineering



Flight Demonstrations



Ship Installations



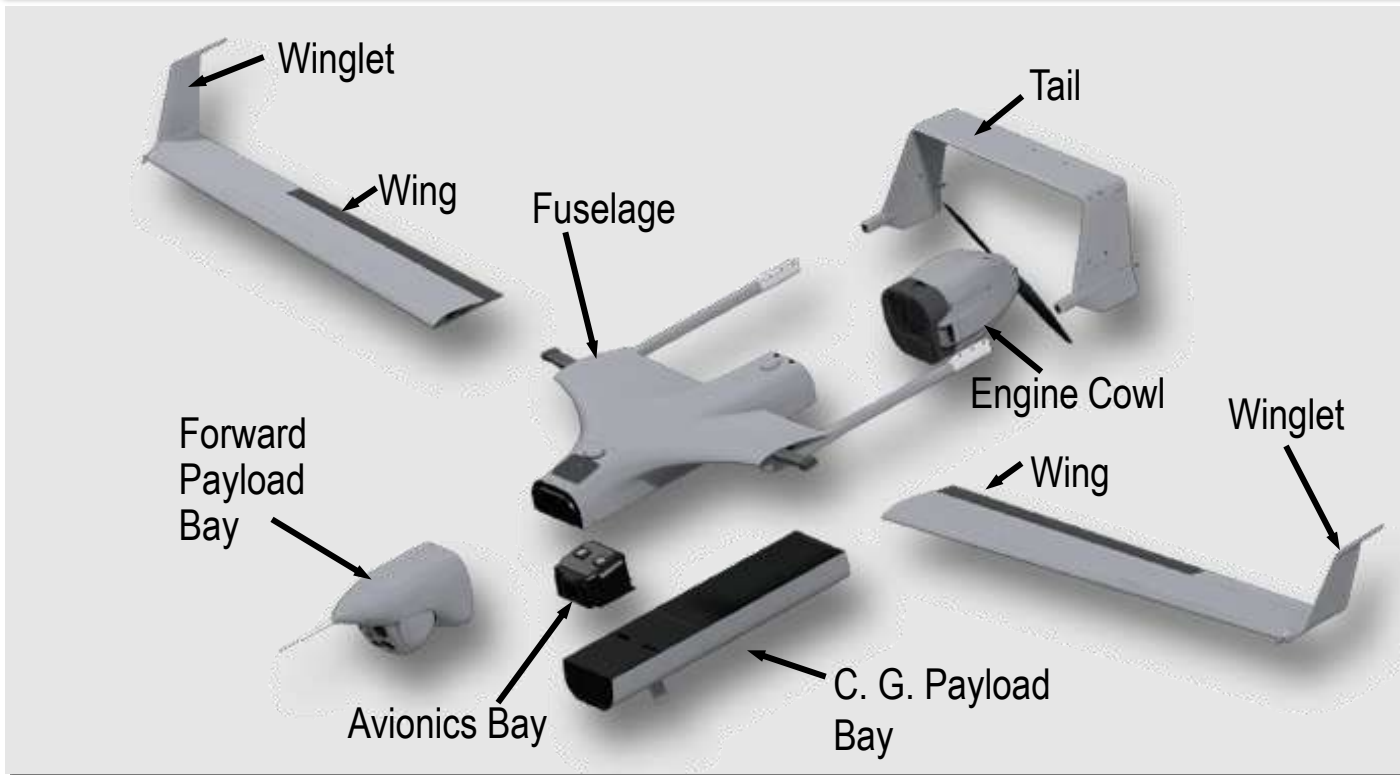
Basic Maritime Installation

- 32+ Completed Ship Installations
- 2,800+ Sorties
- 24/7 Ops
- Surveillance range over 100 – 200 km
- Offers complete integration
- Installation does not 'foul' or interfere with flight deck operations



Aircraft Modularity

Modularity allows flexibility for operations and maintenance



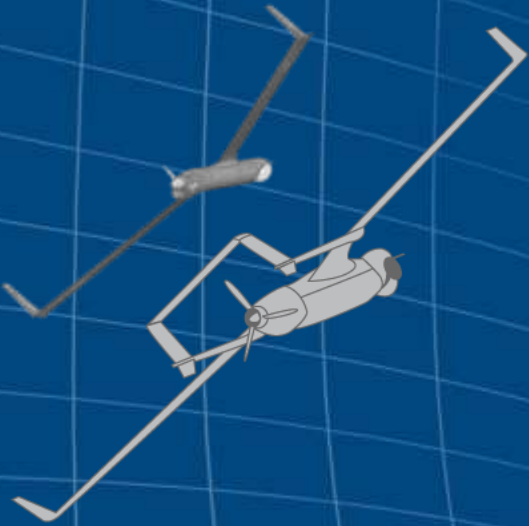
NightEagle



- 1100' AGL
- 3500' Slant Range



- FOV: 25° - 2°
- Continuous Zoom
- Roll over tilt + forward look
- Same Modes as current production models
 - Direct, Stabilized, Hold



The Way We Were



Why PLM?

- **Examples of Insitu-produced controlled documents:**
 - Specifications, drawings, technical data packages
 - Product release files and change records
 - Policies, processes and procedures
 - Training manuals, maintenance manuals and schedules
- **Multiple disconnected product data libraries:**
 - PDMWorks (MCAD models, drawings, some part/document state information)
 - Shared drives (specifications, drawings, ECAD, change records, ...)
 - ERP system (product information to the “Buy” level only, no design-level data, no documents)



Why PLM? (cont)

- **Major issues:**
 - **Manual change process, revisioning and status accounting – very labor intensive**
 - **Manual syncing of part property information amongst systems – usually one system was never correct**
 - **Disconnected data – no way to perform an impact analysis**
 - **Data access – most Engineers did not have an ERP account, most Manufacturing personnel did not have a PDMWorks account**
- **Rapid company growth and addition of new products required a more sophisticated documentation library and process**



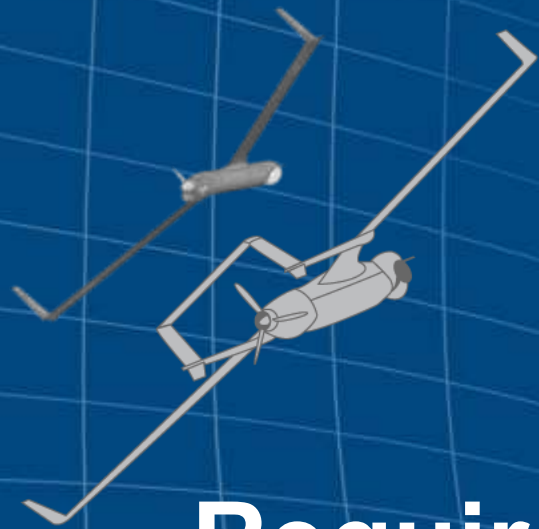
Goals

- **Create efficiency in the storing and retrieval of Insitu product documents**
- **Provide a central definition of product configurations and a repository for their associated documents**
- **Alleviate rework and disorder with regard to document storage and version control**
- **Consolidate numerous legacy systems into a common system**
- **Ensure the speedy retrieval of the current document version**
- **Improve availability of product data across the extended enterprise**
- **Provide the ability to link data and documents, which will make possible and/or improve the retrieval of relevant data**
- **Allow Insitu employees and suitable vendors to access current and appropriate documents or sets of documents in an efficient manner**

Strategy

- PDM will be the first step in Insitu's PLM solution
- Dedicate a team to the project
- Evaluate Insitu's PLM needs and select a supplier/partner to meet those needs
- Recognize that processes, and therefore requirements, will change as we implement






Requirements Gathering and Solution Selection

Jun – Dec 2009


PDM Map Day

■ Gathered Requirements, Enhancements, Business Rules, Risks

PDM Requirements		REQUIREMENT	ENHANCEMENT	BUSINESS RULE	RISK	USE CASE	NOTES
	1. PDM Map Day 2. Other Sources						
FR-049	USE CASE: Delete / retire part number					Y	Q: retire the Part or the Part Number? Catherine 6/26
vague	Automatic CID: generation - fill out all the necessary fields		Y				What is intent? Default fields pre-filled and auto-generated? Or required fields identified? Catherine 6/26
FR-027	On-Demand docs / user manuals / maintenance manuals / embedded objects / linked and updated	Y					Q: what is definition of "on-demand"? Does it require a different set of requirements than those shown? Catherine 6/26
	Electronic maintenance / repair logs and links to PDM		Y				Redundant - covered by 137 (KKH)
FR-034	Schematic of system; future and current	Y					Q: Need schematic of system or schematic of product revisions or both? Catherine 6/26
vague	Part numbers assigned to single CI; preventing reuse	Y					Q: What is "CI"? How does this differ from the requirement of having unique identifiers and unique part numbers? Catherine 6/26
PM	Phased implementation	Y					Project Management Requirement. Catherine 6/26
vague	Data integrity check	Y					Need more info: Does this refer to data scrubbing? Or to checking integrity of data once it is in the PDM system? Catherine 6/26
PM	System testing	Y					Project Management Requirement. Catherine 6/26
risk	Pilot on X-230 or X-300: combining new PDM project and New product project at the same time multiplies risk				Y		
risk	Training: lots of training to start more late to keep quality high				Y		
IR-009	Linkage to Sapphire as maintained BOM tail Number tracking. (?)		Y				Q: Does this require more than what is captured in IR-009? Catherine 6/26
	Part numbers: can they be reused after deletion, thereby causing confusion?				Y		Redundant - covered by 131 (KKH)
IR-005	Based on User Roles in PDM, Vault access and projects.			Y			

Vendor Demos

- PDM Team formalized requirements (Correlated to Map Day)
- Weighted requirements
- Evaluated demos – seven systems

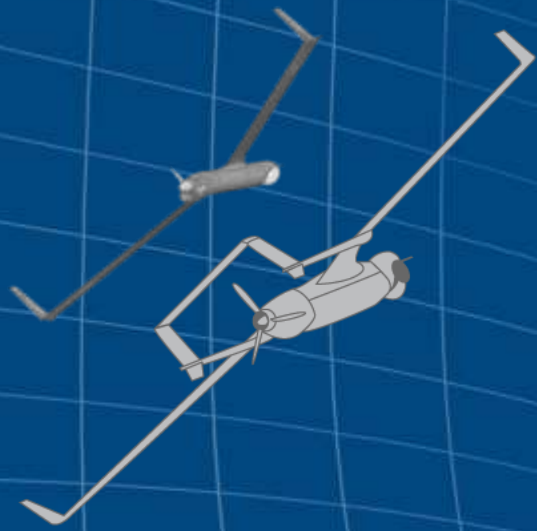


ID	Requirement	Product 1		Product 2		Product 3	
		Scoring Factor	Weighting Factor	Scoring Factor	Score	Scoring Factor	Score
Functional Requirements							
FR-001	Supports standard document naming conventions	Fully satisfies	Very high importance	Substantially satisfies	5	Substantially satisfies	10
FR-002	Ability to publish an index of controlled documents	Fully satisfies	High importance	Partially satisfies	8	Substantially satisfies	8
FR-003	Ability to scan document repository and link to documents	Fully satisfies	Medium importance	Fully satisfies	9	Substantially satisfies	6
FR-004	Documents can be referenced and opened from a document repository	Fully satisfies	High importance	Fully satisfies	12	Does not satisfy	0
FR-005	Support complex relationships between documents	Fully satisfies	Very high importance	Partially satisfies	10	Fully satisfies	15
FR-006	Provide mechanism for someone other than the author to update a document	Substantially satisfies	Very low importance	Substantially satisfies	3	Fully satisfies	3
FR-007	Provide a mechanism for users to annotate documents	Substantially satisfies	Medium importance	Partially satisfies	6	Partly satisfies	3
FR-008	Current revision of a document must remain available to all users	Does not satisfy	Very high importance	Fully satisfies	15	Partly satisfies	5
FR-009	Ability to see which user has a document checked out	Partly satisfies	Very high importance	Partially satisfies	10	Fully satisfies	15
FR-010	Allow users to publish a PDF rendition of documents	Fully satisfies	High importance	Partially satisfies	8	Does not satisfy	0



Results

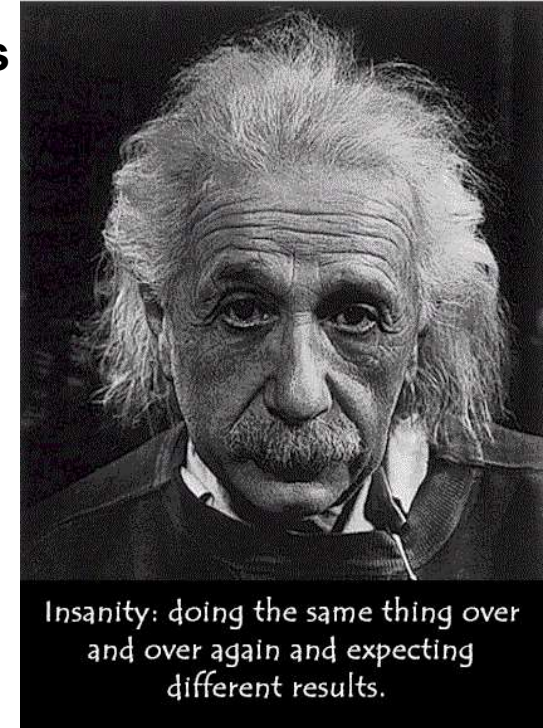
- Chose vendor short list – three systems, one of which was Aras Innovator
- Released a Request for Proposal to PDM vendors on short list
- Requested customized vendor demos using Insitu use cases and data sets
- Completed final weighted requirements matrix and determined scores
- First choice was Aras Innovator due to its capabilities and flexibility
- Executive leadership was not comfortable with “open source software” concept
- Parent company was recommending one of the Big-Box systems
- Went with second choice, one of the Big-Box systems



Big-Box Implementation

Big-Box Implementation

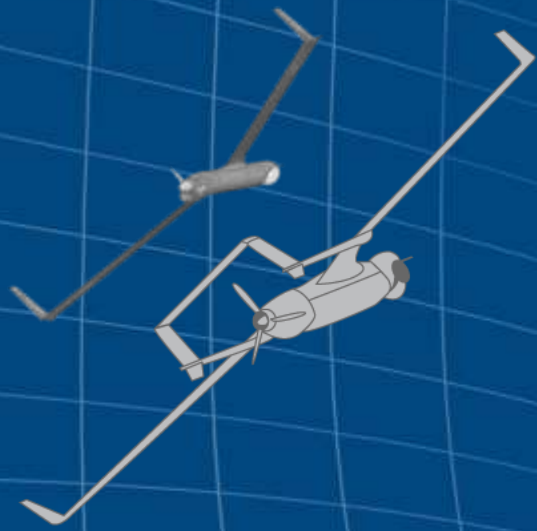
- Jan 2010: Engaged vendor team of solution experts
- Three months and three complete revisions to produce an acceptable SOW
- Trained Insitu PDM Team
- Vendor PM #1 lost to personal constraints; spin up new PM
- Vendor PM #2 relieved due to lack of progress
- Engaged third-party consulting team of process experts; spin up new team
- Three more months and little progress due to immature and changing processes
- By Nov 2010, we were almost **ONE YEAR** behind schedule and severely **OVER BUDGET!**



Reset, Please



- Aras was becoming more widely accepted in industry and we better understood their subscription service
- PDM Team met with Executive leadership and requested a re-eval
- Permission granted
- Conducted Aras Discovery Workshop which resulted in a SOW documenting the phasing, steps, project plan and cost
- Aras Innovator was the clear choice
- Feb 2011: Presented findings to Executive leadership; decision was unanimous to change course and proceed with Aras Innovator



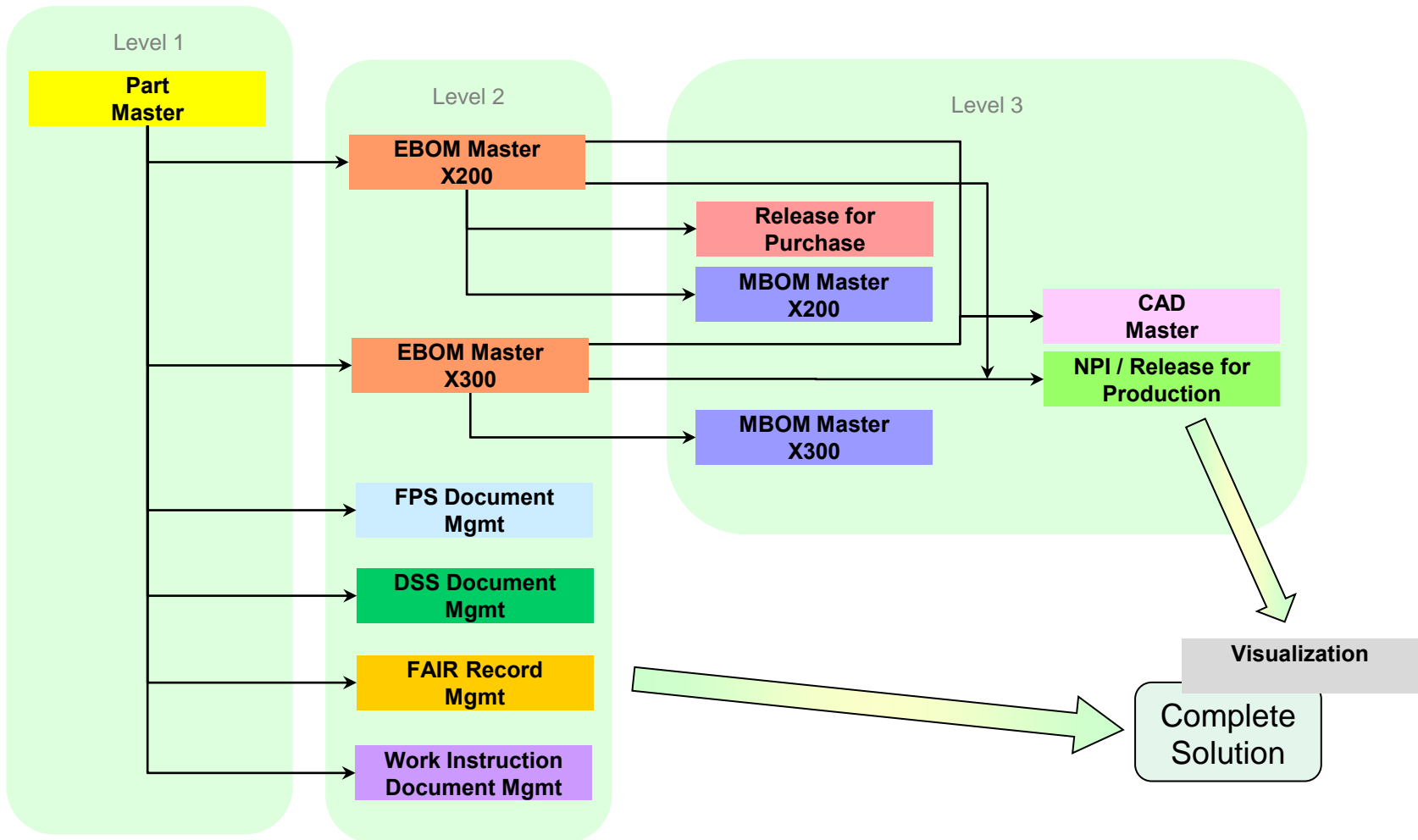
Be Different

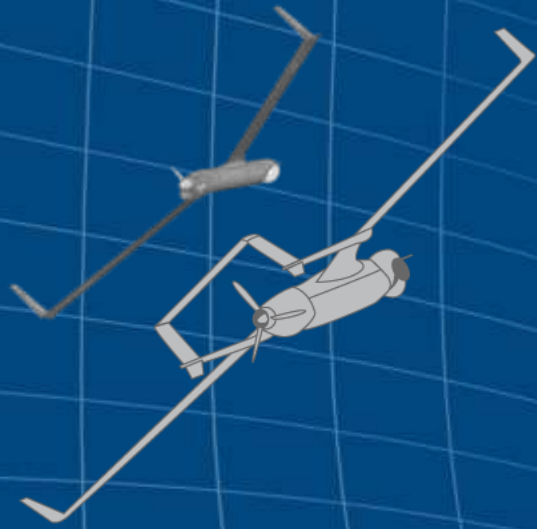


Root Cause

- **Root cause of our big-box implementation issues was that we were trying to implement a solution which requires well-defined and stable processes**
- **Aras Innovator was the perfect solution because it allows us to quickly and easily change the solution as our processes mature and change**
- **Aras Innovator also allows us to approach our PDM implementation using Agile Software Development methodologies:**
 - **Attack one feature/process at a time and roll it out**
 - **Plan at a high-level, but gather detailed requirements only for the feature at hand – everything else is likely to change**
 - **Real-world use is the only way to determine the real requirements; everything prior to that is just guessing**
 - **Use visual and behavioral prototypes to flush out requirements**

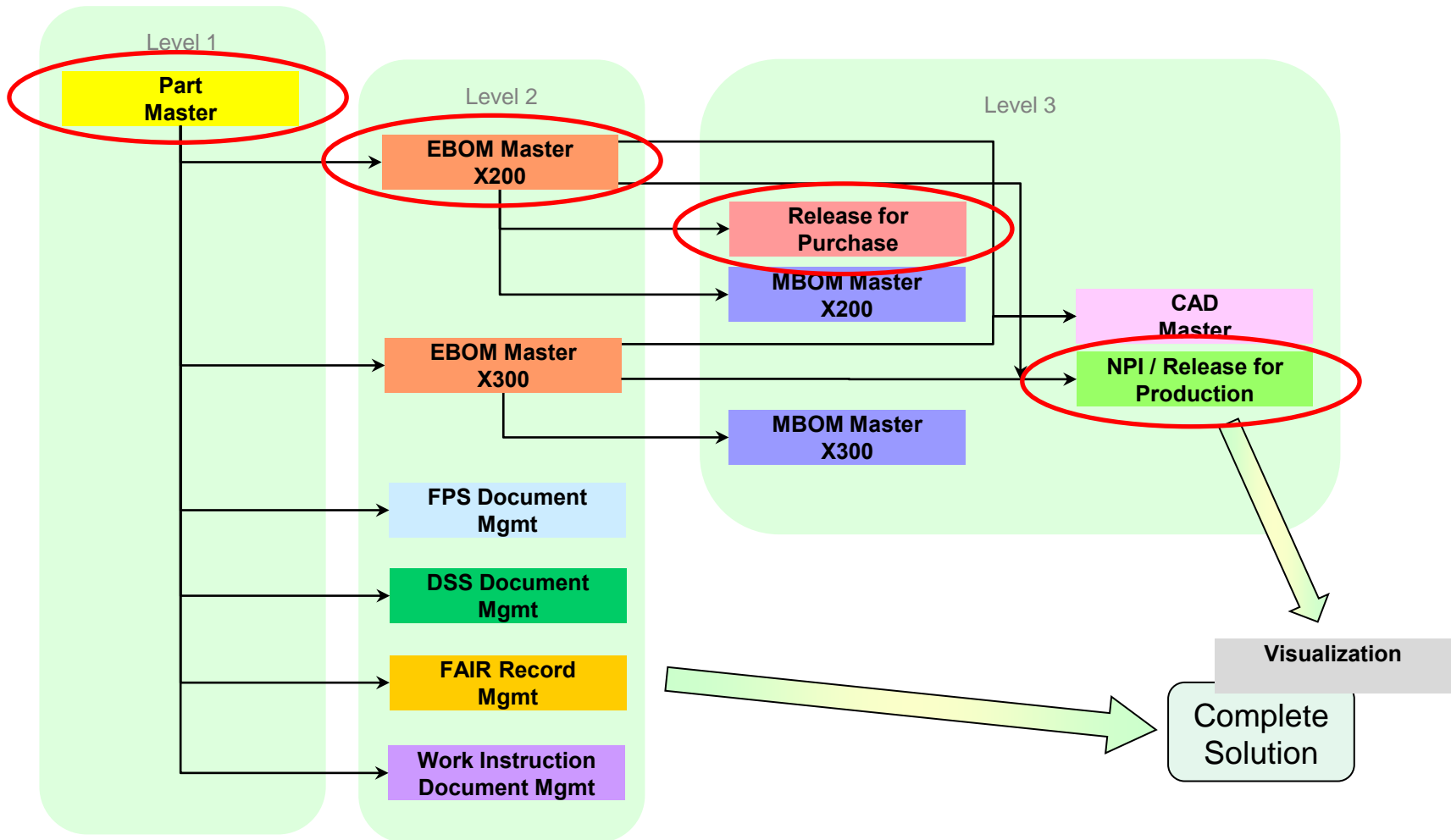
Feature List Sequence Diagram





PDM Project Phase I

Phase I Scope



Where We Were

- **Change in Design (CID) process issues**
 - Paper form – very manual, disconnected data
 - Slow and cumbersome
 - Large design change packages = bottlenecks
 - Difficult to perform impact analysis
 - Manual checks
 - Lack of visibility of change status



Yuck!

The Goal & The Challenge

■ The Goal

- Speed up the release process, and
- Provide for formal change control earlier in the design process

■ The Challenge

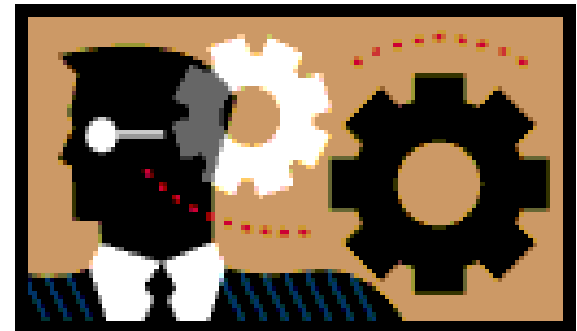
- Implement the following in Aras Innovator in 60 days:
 - Part Master
 - Engineering Bill of Materials (EBOM)
 - Problem Reporting (PR)
 - Engineering Change Request (ECR)
 - Engineering Change Notice (ECN)



Develop the Process

- **Develop the Process:**

- **Process development led by CMII-trained personnel**
- **Assembled a multi-disciplined team, with representatives from each affected department**
- **Used CMII as the process model and made tweaks from there**
 - **Identified the deltas:**
 - **CID Process vs. CMII Process**
 - **CID Form vs. PR/ECR/ECN Forms**
- **Defined requirements**
- **Got buy-in!**



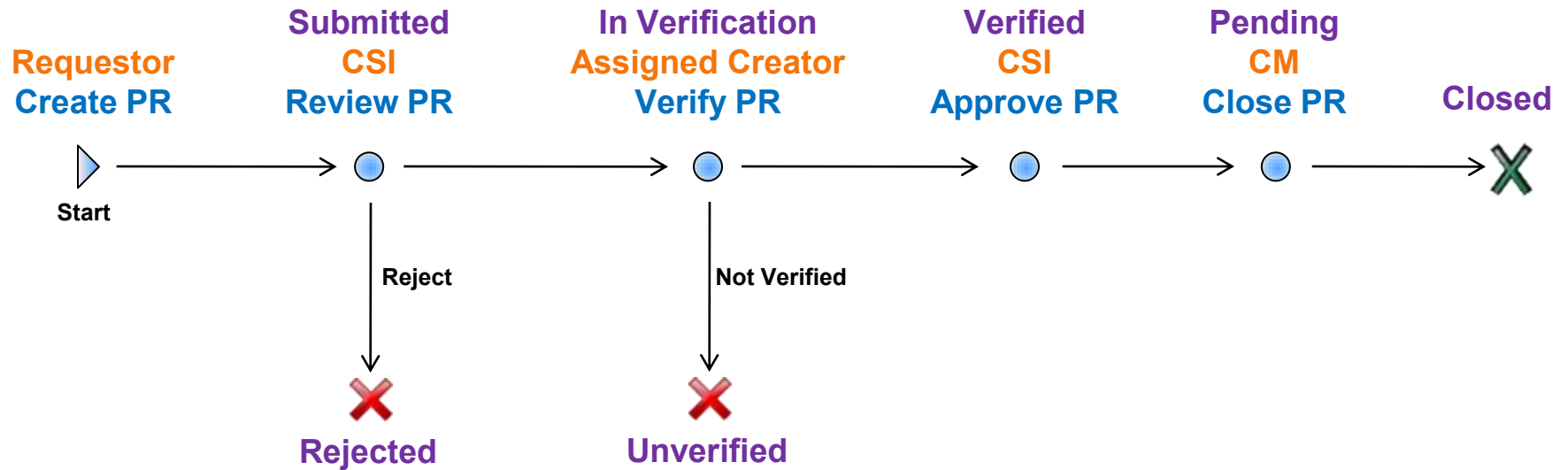
Implement the Solution

- **PDM Core Team comprised of Aras Innovator-trained personnel and an Aras consultant**
- **Learned the OOTB functionality of the Product Engineering solution, which implements the CMII change process**
- **Trained the primary users (CM) on OOTB functionality**
- **Worked in parallel with process development – required tight collaboration with the process team**
- **Configured/customized as necessary – 140 item changes**
- **Migrated the data – 13,000 parts cleansed, formatted, migrated and validated**
- **UAT, UAT and more UAT**



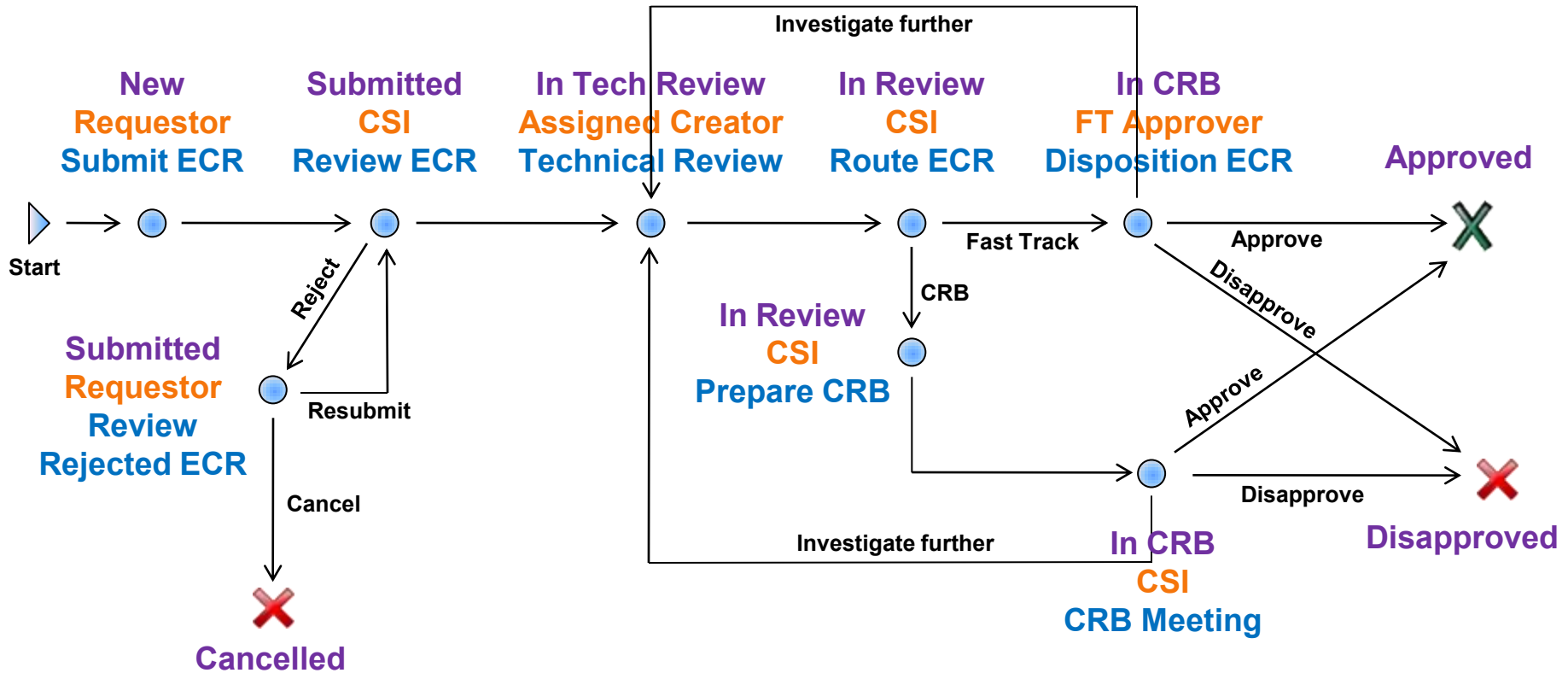
Problem Report (PR) Workflow

Legend: **PR state**
Responsible Party
Activity



Engineering Change Request (ECR) Workflow

Legend: **ECR state**
Responsible Party
Activity



Train and Roll Out

- **Developed training materials**
 - **Part I – General tool usage**
 - Logging on, general navigation, searching, features, logging off
 - **Part II – Process**
 - Parts, EBOMs, PR, ECR and ECN
- **Hands-on training with user exercises**
- **160 users trained**

- **Rollout was a success and scarily quiet!**
- **Continue to release updates as necessary**
 - First update occurred two weeks after rollout
 - Second update was four weeks after that



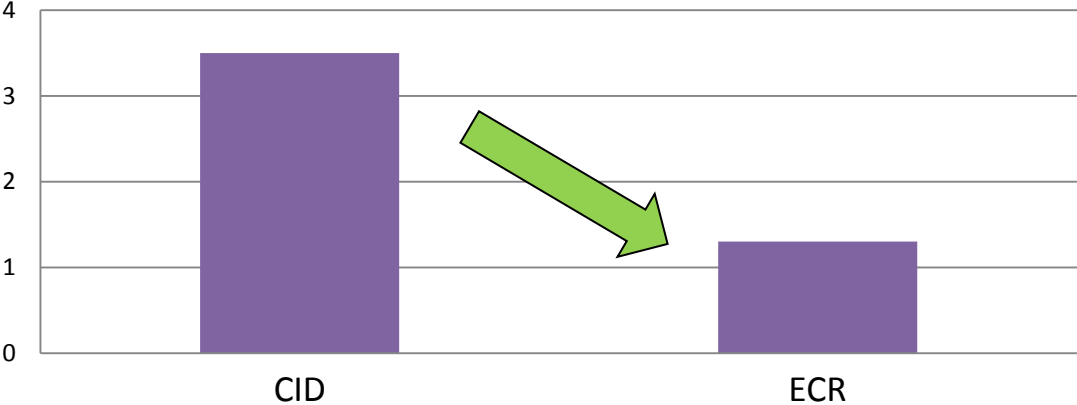
Achievements

- **Early release of long-lead items**
- **Release from the bottom up vs. all at once**
- **Where-used visibility and ability to perform impact analysis**
- **Fast-track release vs. a required meeting**
- **Formal release and control of the design at point of purchase vs. at release for production**
- **Searchable and linked information**
- **Ability to easily build upon the base system put in place**

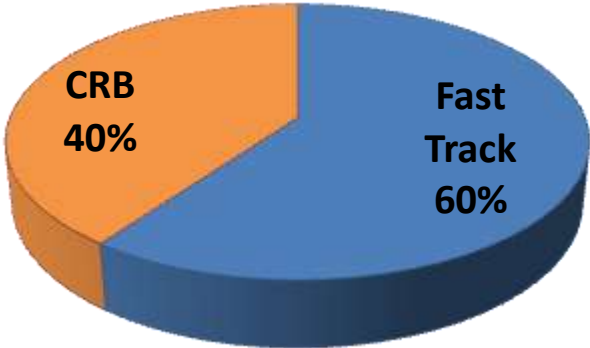


Metrics – The Proof!

Avg # Days/Part from Submittal to Approval

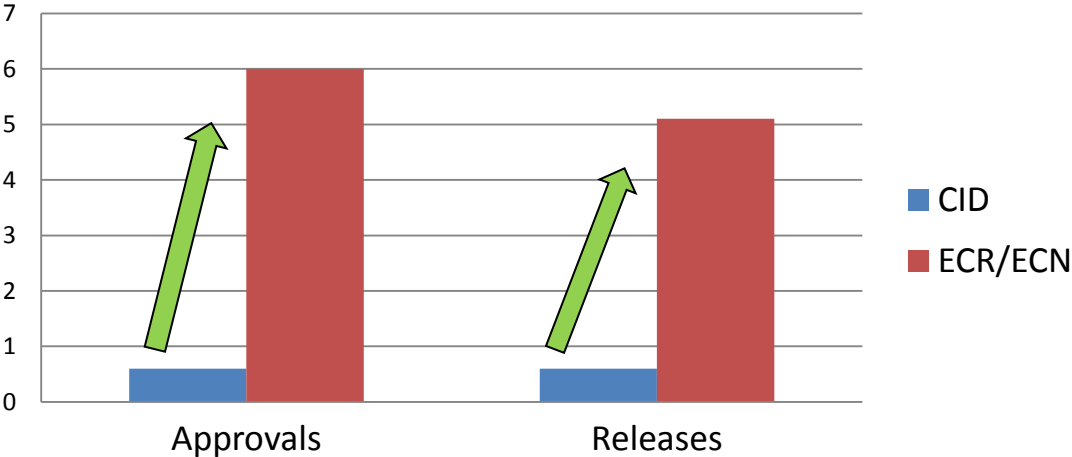


Fast Track vs. CRB



CMII Standard: 75-85% of changes should be Fast Track (FT)

Avg # Approvals & Releases per Week



Key Elements of Success

- **Executive support from the top**
- **Project sponsor**
 - Set schedule and committed to it
 - Provided business resources
- **Project team**
 - **Business reps:** CMII certified, committed to the project, willing to adopt the solution mainly out-of-the-box
 - **Solution reps:** Trained in Aras Innovator, knowledgeable on Engineering and CM processes (some CMII certified), Aras developer
 - Daily morning meetings
- **Formal training provided to the user base, both on the new process and the new platform**
- **Aras Innovator is easily configurable, easily customizable, and very intuitive**



The Goal & The Challenge

■ Did we reach The Goal?

● Speed up the release process

Yes! Less time in corrective action = faster release

● Provide for formal change control earlier in the design process

Yes! Release at point of purchase, not production introduction

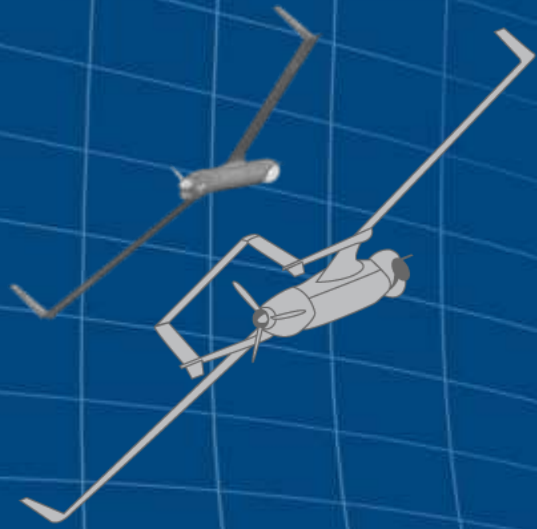


■ Did we meet The Challenge?

● Implement in 60 days

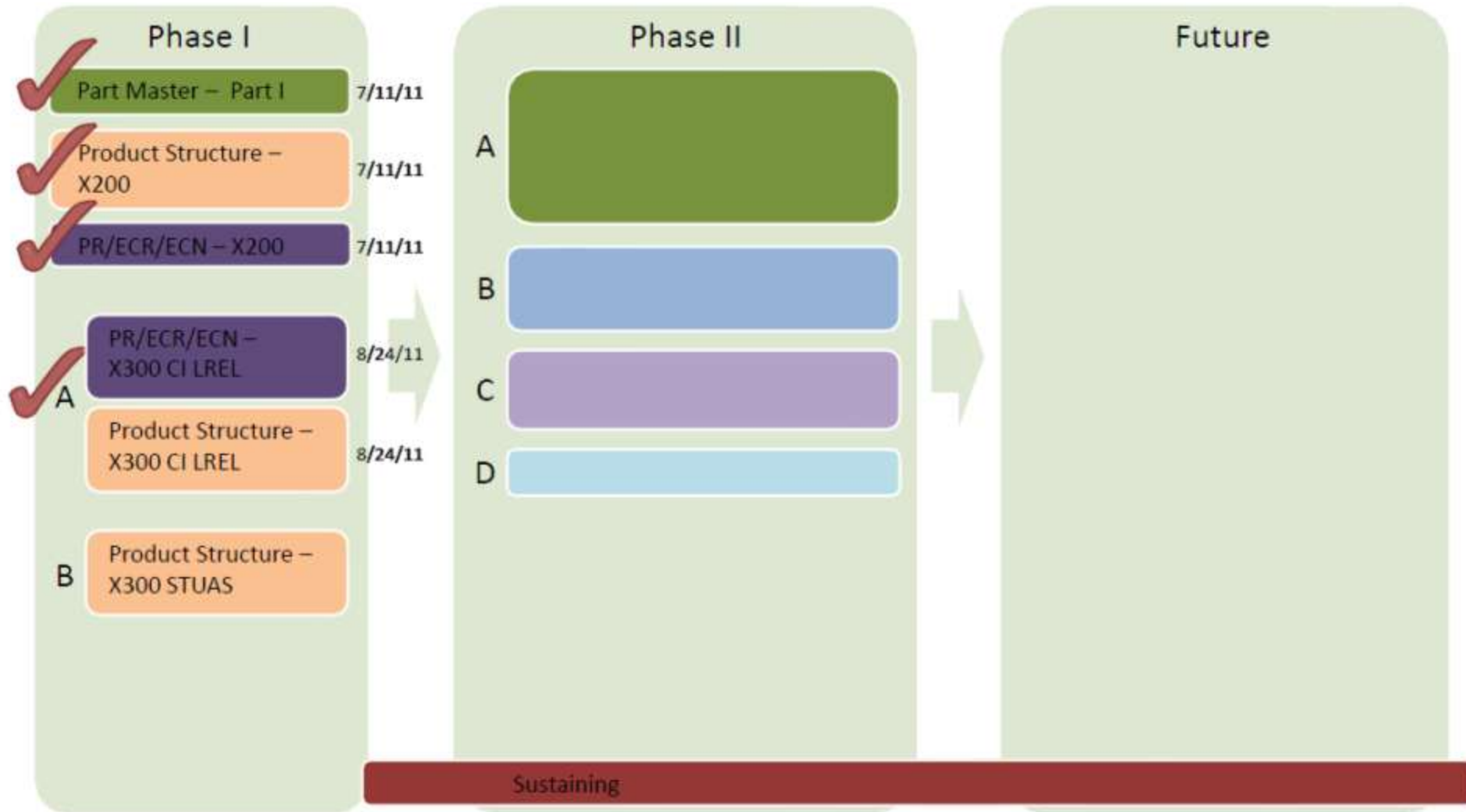
Yes! 4/11/11 - 6/6/11 = 56 days

(including data cleansing, formatting, migration and validation)

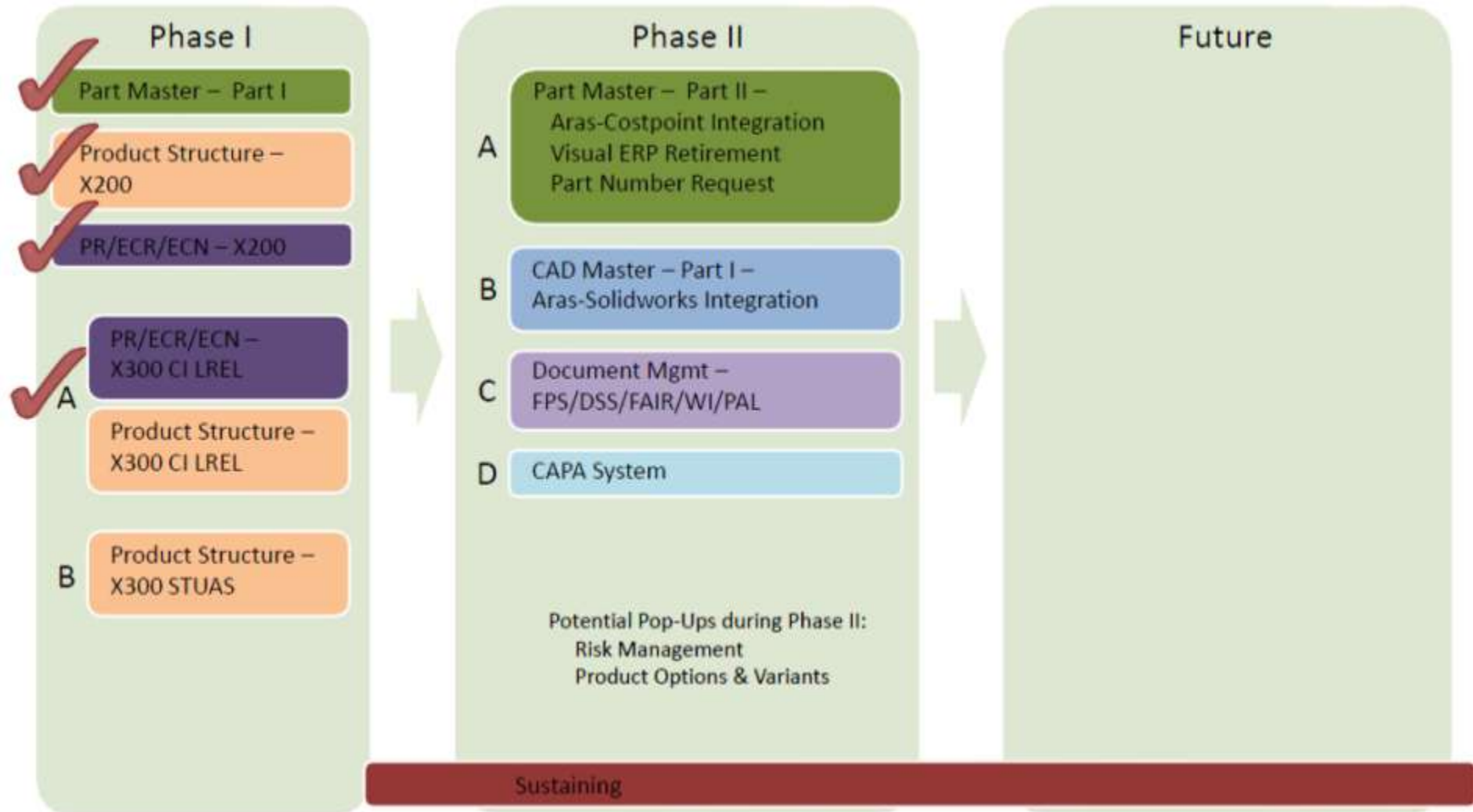


To Infinity and Beyond!

Accomplishments



Current Activity – Phase II



Future Phases

