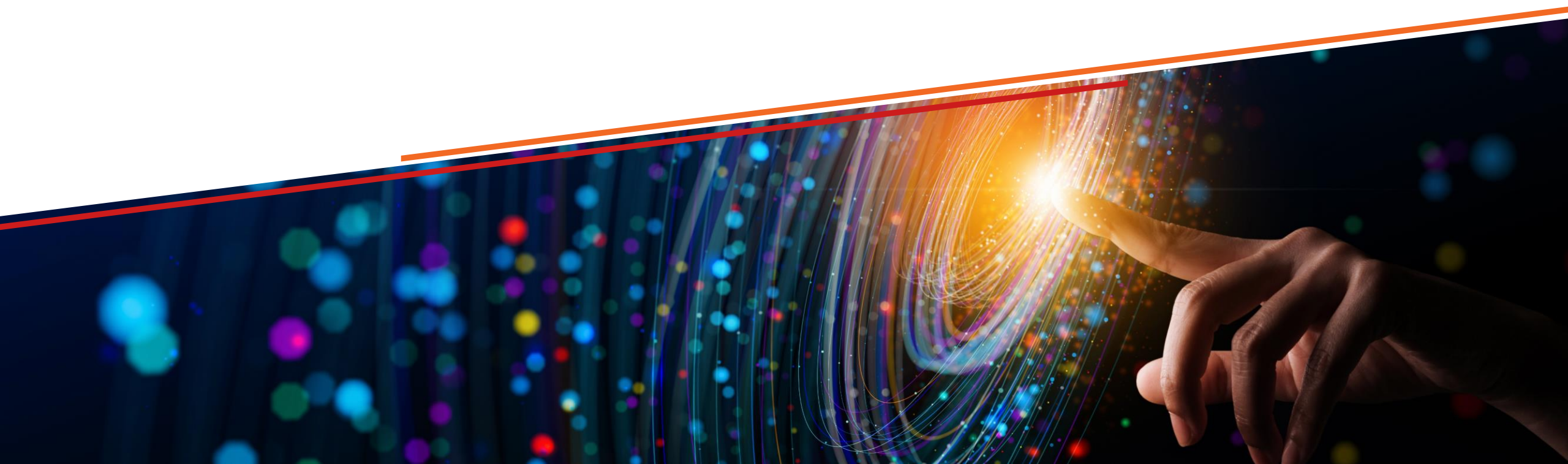


Aras and SSI – Shipbuilding Industry Solution

Alan Mendel, VP Global Pre-Sales and Sales Enablement, Aras
Bruno Benevolo, Director of Enterprise Solutions, SSI

May 2, 2023



Aras & SSI Partnership

A hand is shown on the right side of the image, pointing towards a bright, glowing digital interface. The interface is composed of numerous colorful, swirling light trails in shades of blue, purple, and orange, creating a sense of motion and energy. The background is dark, with scattered bokeh lights in various colors. The overall aesthetic is futuristic and high-tech.

Aras Business Model



Driving Industry Transformation

PURPOSE

Enable our customers to create safe and innovative products that play an **essential** role in our lives



VISION

Transform the way the world makes products



MISSION

Reinvent software for engineering and manufacturing to empower our customers with the **flexibility** to overcome tomorrow's challenges



A Resilient Ecosystem Enables Continuous Transformation

Enterprise SaaS

Powerful | Unmatched capabilities

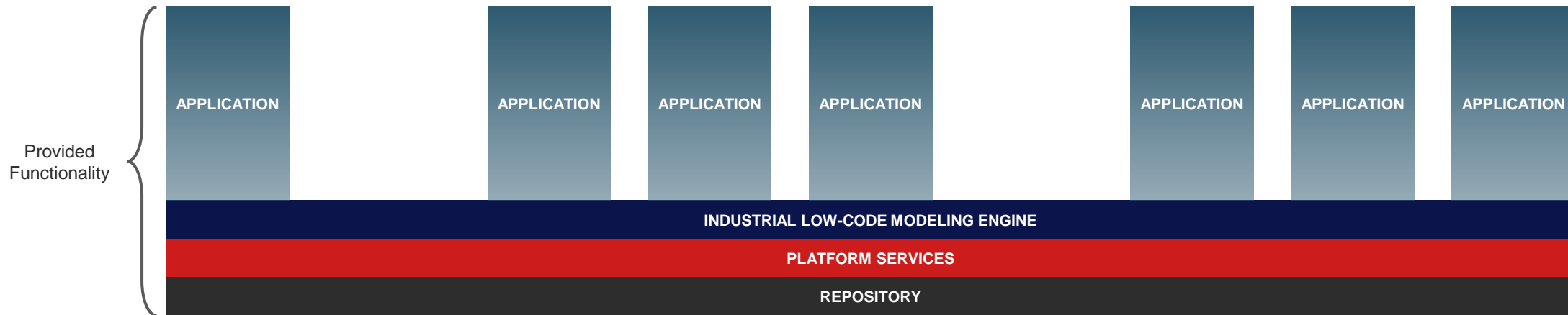
Low-code platform

Flexible | Adapt faster

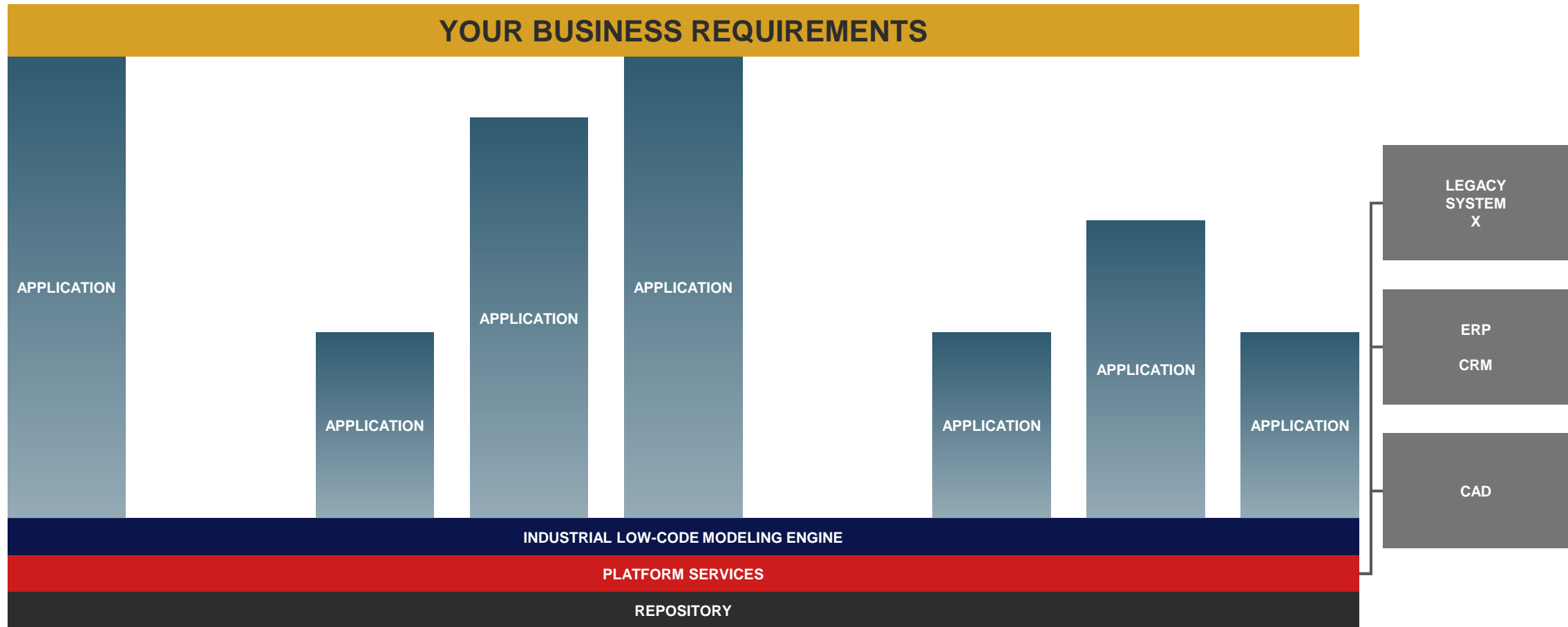
Digital thread

Open | Unlimited connectivity

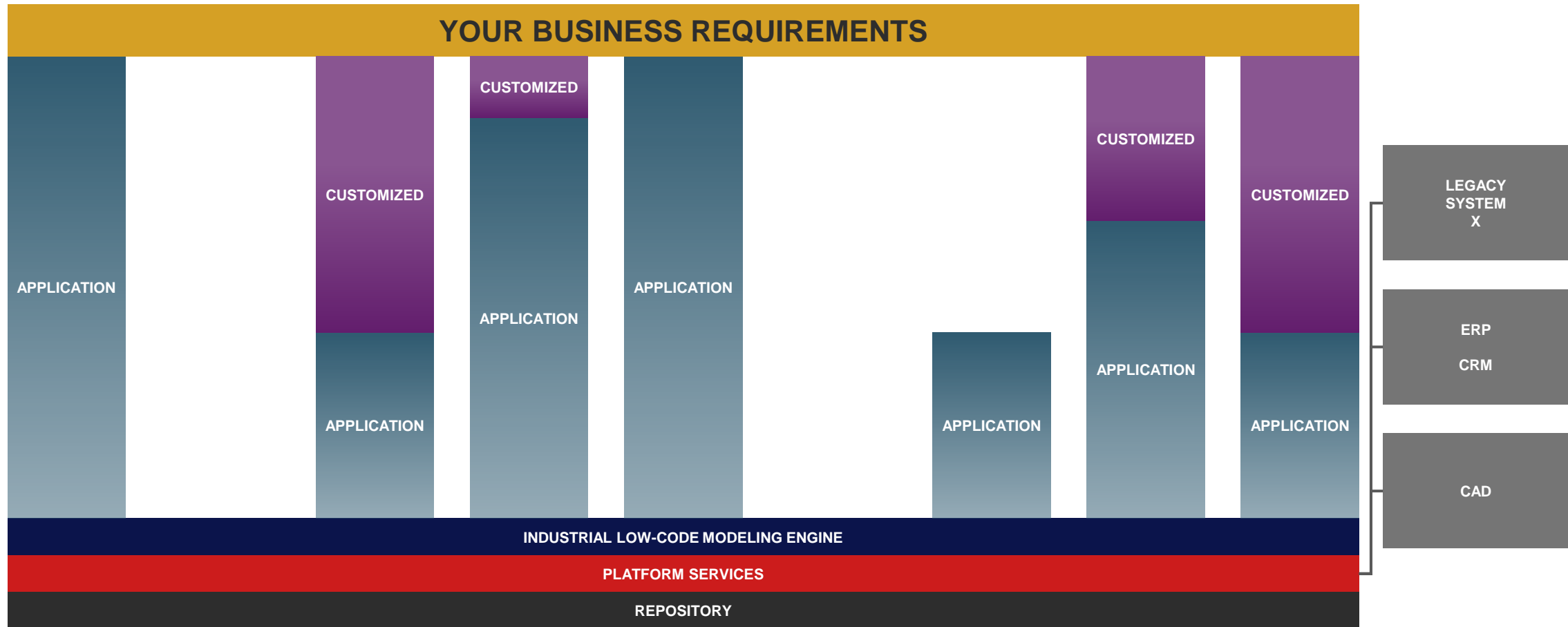
Aras Innovator is a Digital Transformation Platform



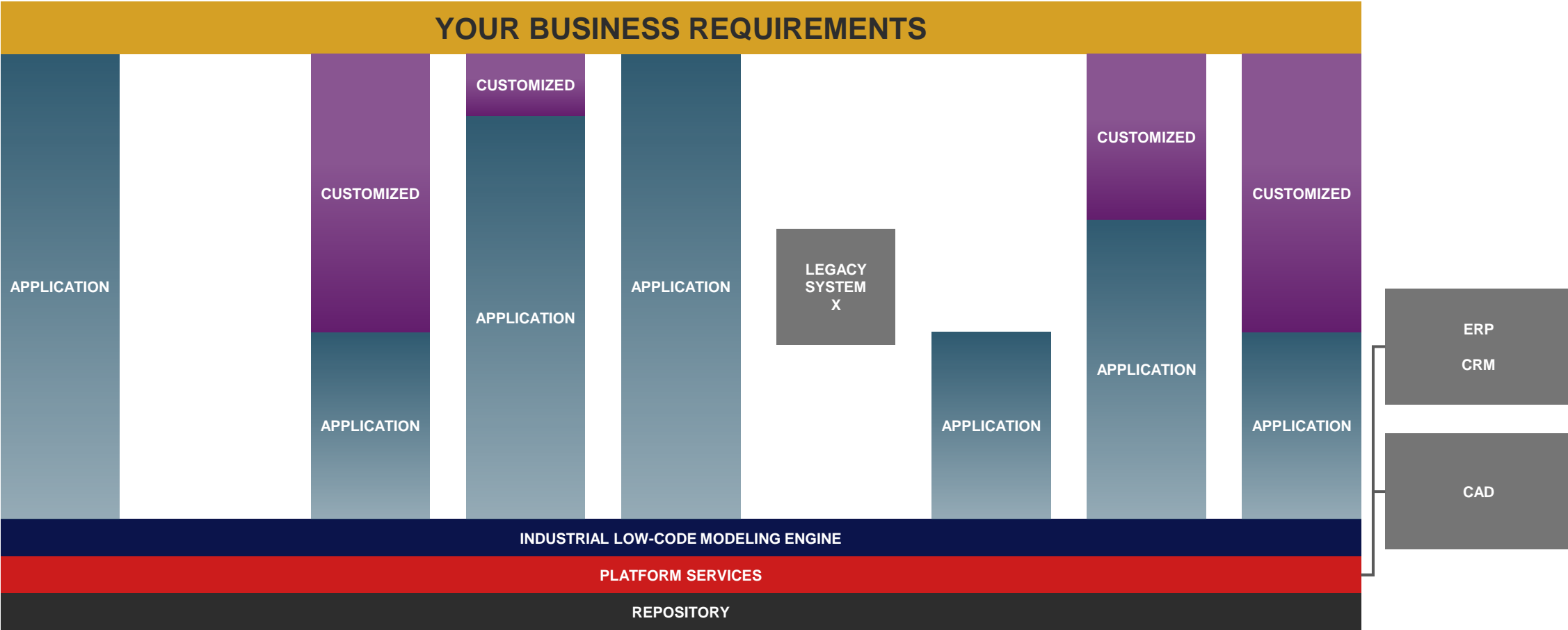
Your Company is Unique



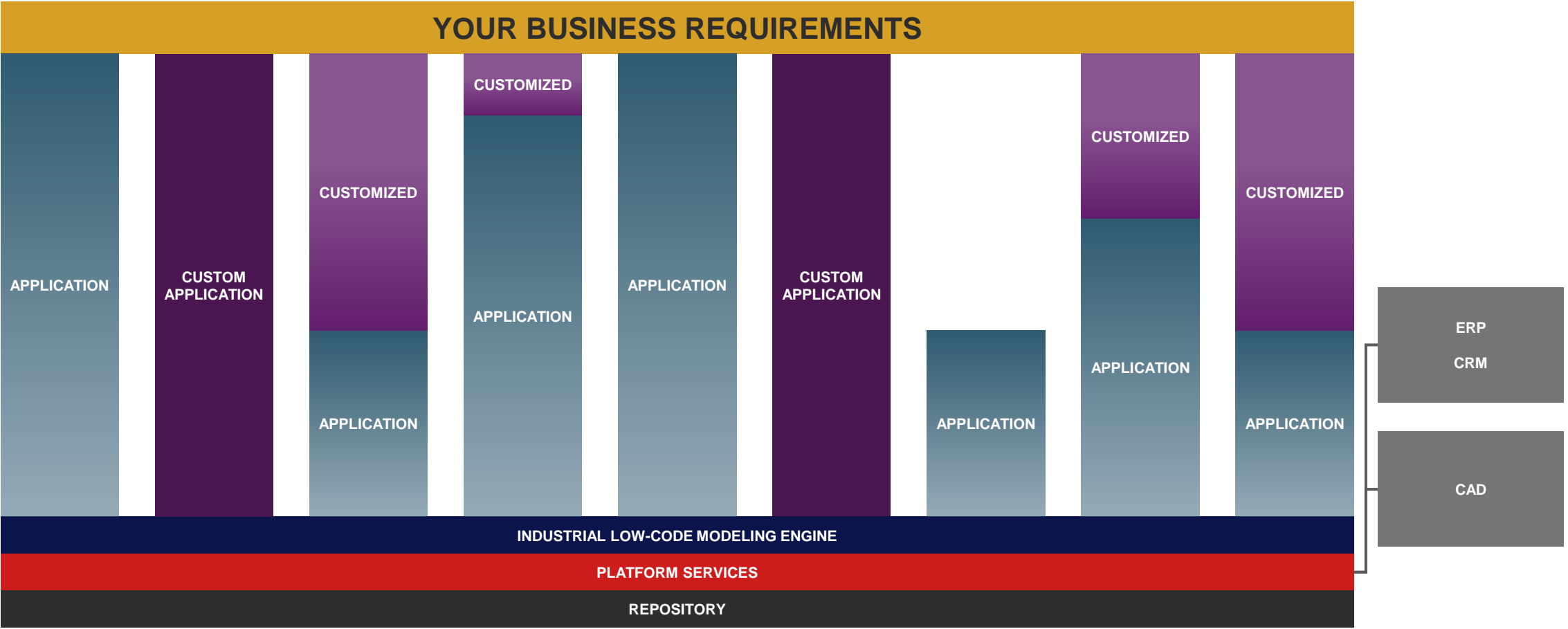
Keep Pace with Your Unique Requirements



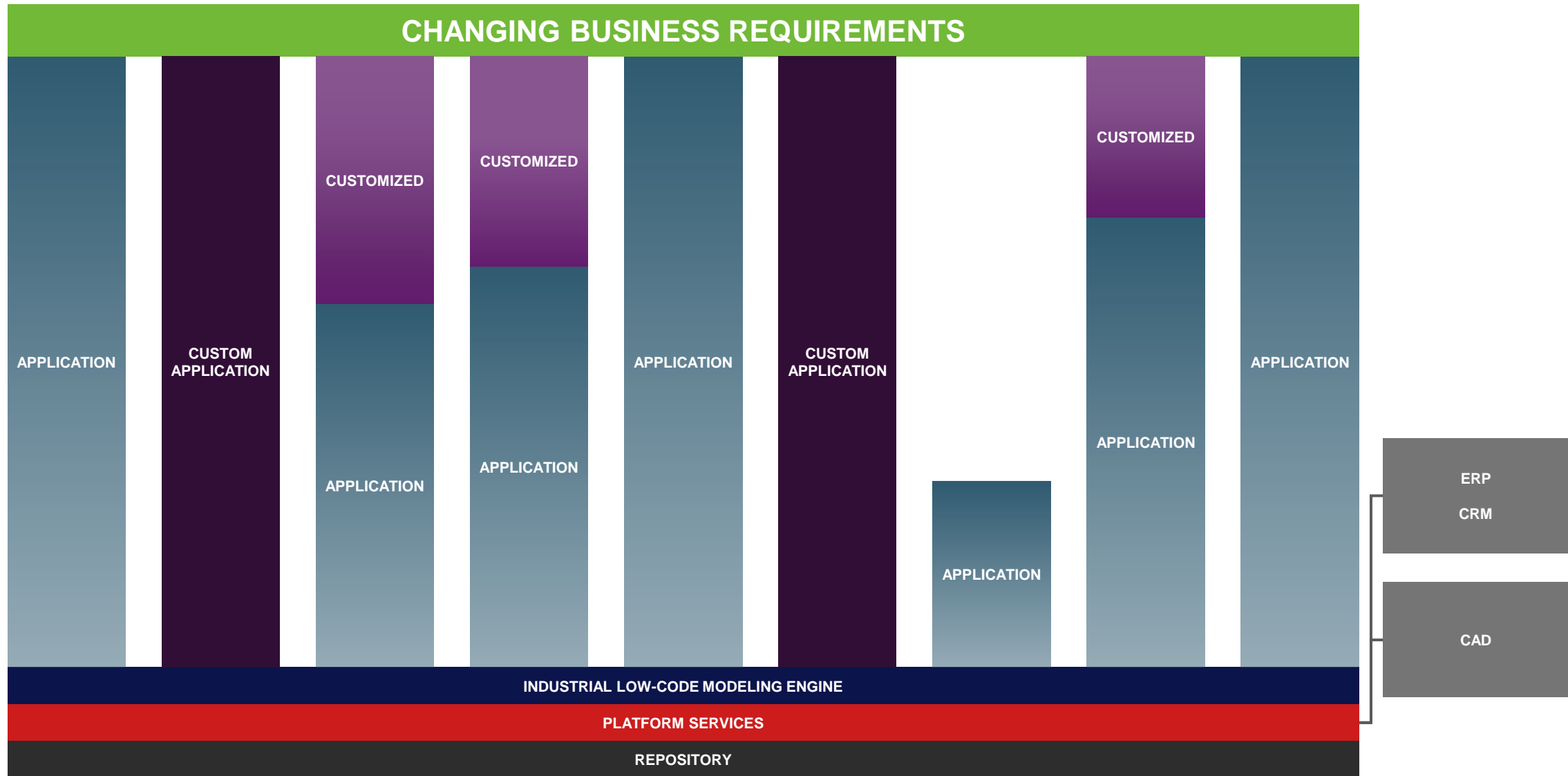
Replace Legacy



Extend Your Digital Thread



Capitalize on Changing Market Dynamics



Aras Platform

ACE23
REIMAGINE YOUR POSSIBILITIES



Business-ready Applications on a Platform Built for Transformation

On-Premise or
Enterprise SaaS

Low-Code Enterprise Platform

Digital Thread
Digital Twin



Requirements
Engineering



Systems
Architecture



Program
Management



Simulation
Management



Variant
Management



Product
Engineering



Component
Engineering



Technical
Documentation



Manufacturing
Process
Planning



Quality
Management
System



Digital
Twin Core

INDUSTRIAL LOW-CODE MODELING ENGINE

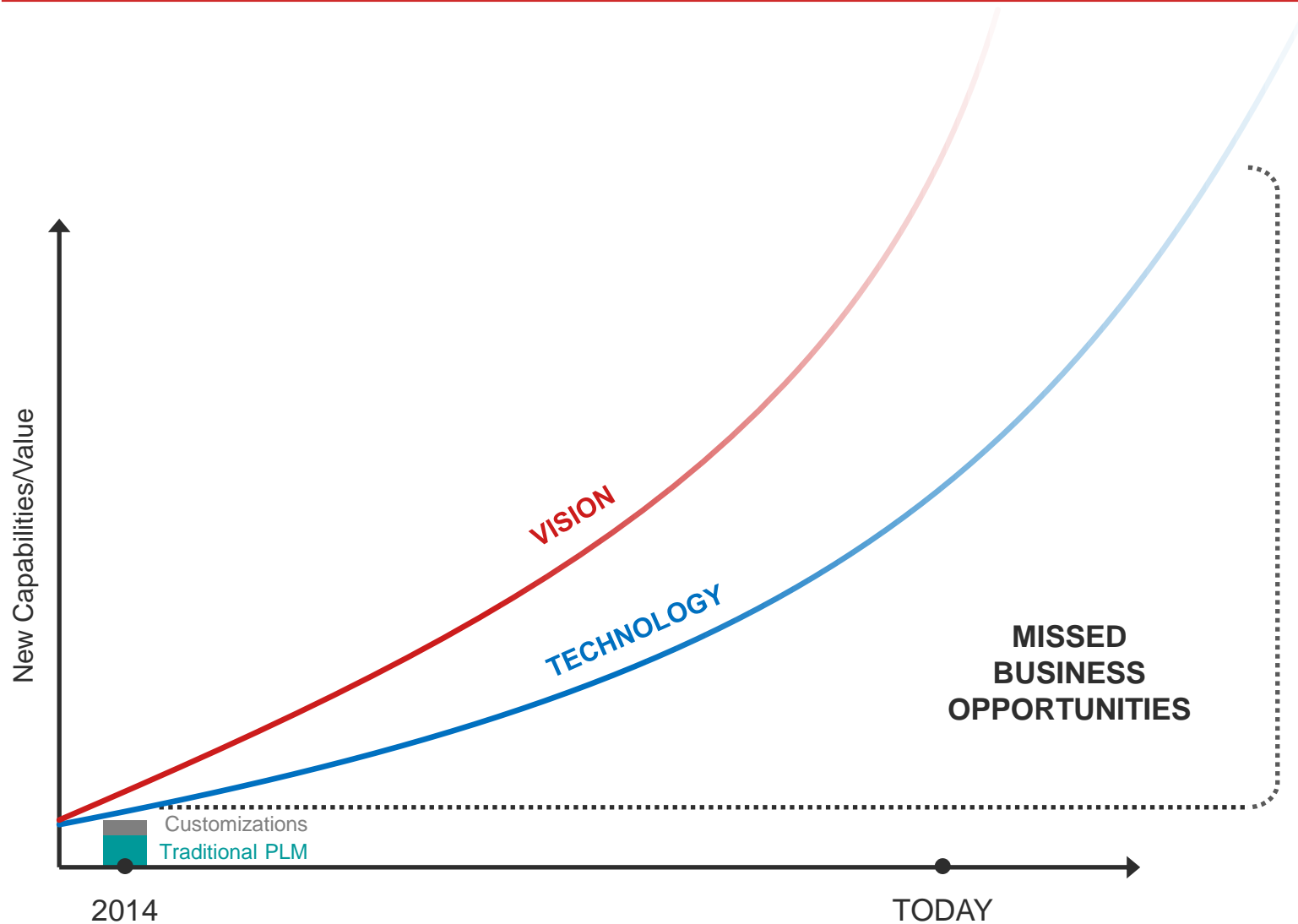
PLATFORM SERVICES

REPOSITORY

Low Code Enterprise Platform – Out-of-the-Box Services



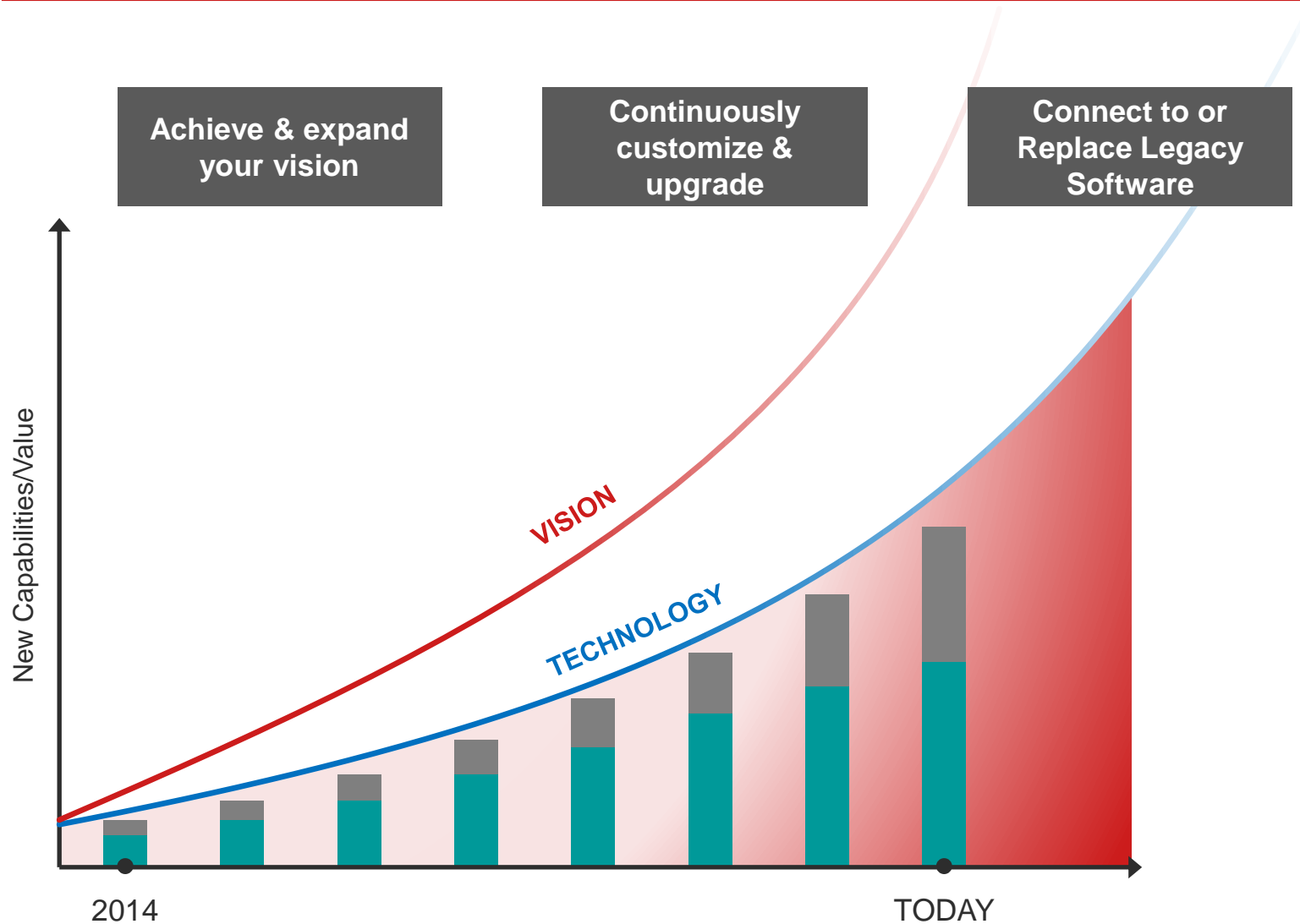
The Value Gap



“By taking a sustainable platform approach, organizations are enabling the enterprise to get their work done in the most efficient way possible and can ensure end-to-end optimization and connectivity that is critical to an organization’s digital transformation.”

- CIMdata

Achieve Sustainable Digital Transformation



aras
INNOVATOR

OPEN

FLEXIBLE

SCALABLE

UPGRADEABLE

"Aras offers the best combination of customizability along with fast, easy and low-cost upgrades compared with competing PLM providers."

- CIMdata, 2021

Fastest Growing in Our Category

Why Partners Want to Work with Aras

35%

ARR growth in 2022

95%

gross retention rate of subscriptions

550+

subscribers worldwide

800+

employees globally

35%

product development

40%

support

150+

partners worldwide

Aras & SSI Partnership



Aras & SSI – Shipbuilding Industry Solution



Building with Aras

- Concurrent Engineering
- Configuration Management
- Store "Work in Progress" CAD models (SSI)
- Part BOM Management
 - Planning BOM and Integration with ERP System
- Replaced legacy PLM and various mainframe systems
- Customer portal access

Why Aras?

- Flexibility and ease of use
- Rapid application development
- Total cost of ownership
- Met DoD security and access requirements for restricted data



Building with Aras

- Create a single source of truth, containing all product information, with Aras as the consistent data source
- Change management—using their Aras PLM ecosystem to fully identify the impact of change, including the estimated cost of change against identified baselines with financial and schedule impacts

Why Aras?

- Ability to manage BOMs directly in Aras vs Excel spreadsheets, create a master parts catalogue and establish a single location for change impact analysis
- The platform is designed to manage data across the entire lifecycle
- Upgradeability



Building with SSI & Aras

- In partnership with SSI, Austal is currently implementing ShipbuildingPLM to control and release configuration managed 3D product models and production deliverables for the numerous vessels in their shipbuilding programs.
- Includes close coordination with design and engineering and seamless integration with production and the supply chain through their chosen ERP platform

Why SSI Shipbuilding PLM?

- "Austal is committed to becoming the premier naval shipbuilder in the Indo-Pacific region." said Andrew Malcolm, Austal's Chief Digital Officer.
- "We measure this not only in terms of capacity of our shipyards located around the region, but in terms of quality, performance, and reliability. Our work with SSI is about building the capability to be more effective, agile, and innovative."



Supporting the Warfighter with Rapid Deployment & Best TCO



Figure 3: Digital Engineering Goals




Rapid Prototyping
 Rapid Deployment
 Continuous Improvement
 Open and Upgradeable
 Ease of Use & Training
 Affordable & Sustainable
 Best Total Cost of Ownership



**Building a more
sustainable
future with Aras**



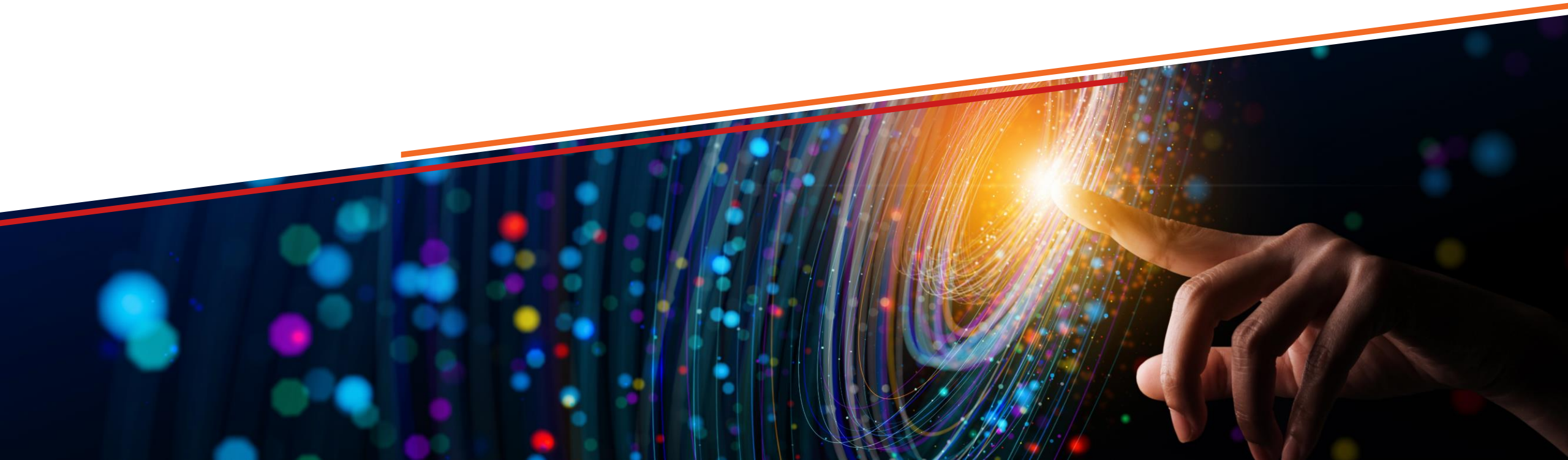
ACE23

REIMAGINE YOUR POSSIBILITIES

Equipping Shipbuilders to meet the new Naval reality

Bruno Benevolo, Director of Enterprise Solutions, SSI

May 2, 2023



Agenda

01

Who is SSI

An introduction to SSI, who we are, and what we do

02

Shipbuilding Information Management

Unique challenges require industry specific solutions

03

New Naval Reality

Accelerated Delivery, Increased Complexity, Constant Change

04

Digital Shipbuilding

A walkthrough of the SSI solution applied to real world shipbuilding use cases, with a focus on how it is empowered by PLM



Who is SSI?

We empower you to focus on the Business of Shipbuilding



SSI by the Numbers

30+
years

Trusted
and stable

1
business

Business of
shipbuilding

500+
shipbuilders

Global
company



SSI HQ Victoria, BC, CA



SSI USA Mobile, AL, US

Key Clients



ROBERT ALLAN LTD.
NAVAL ARCHITECTS AND MARINE ENGINEERS



30+ Years of Successful Partnerships

First Workboat
Bender Shipbuilding
OSV/PSV
1992

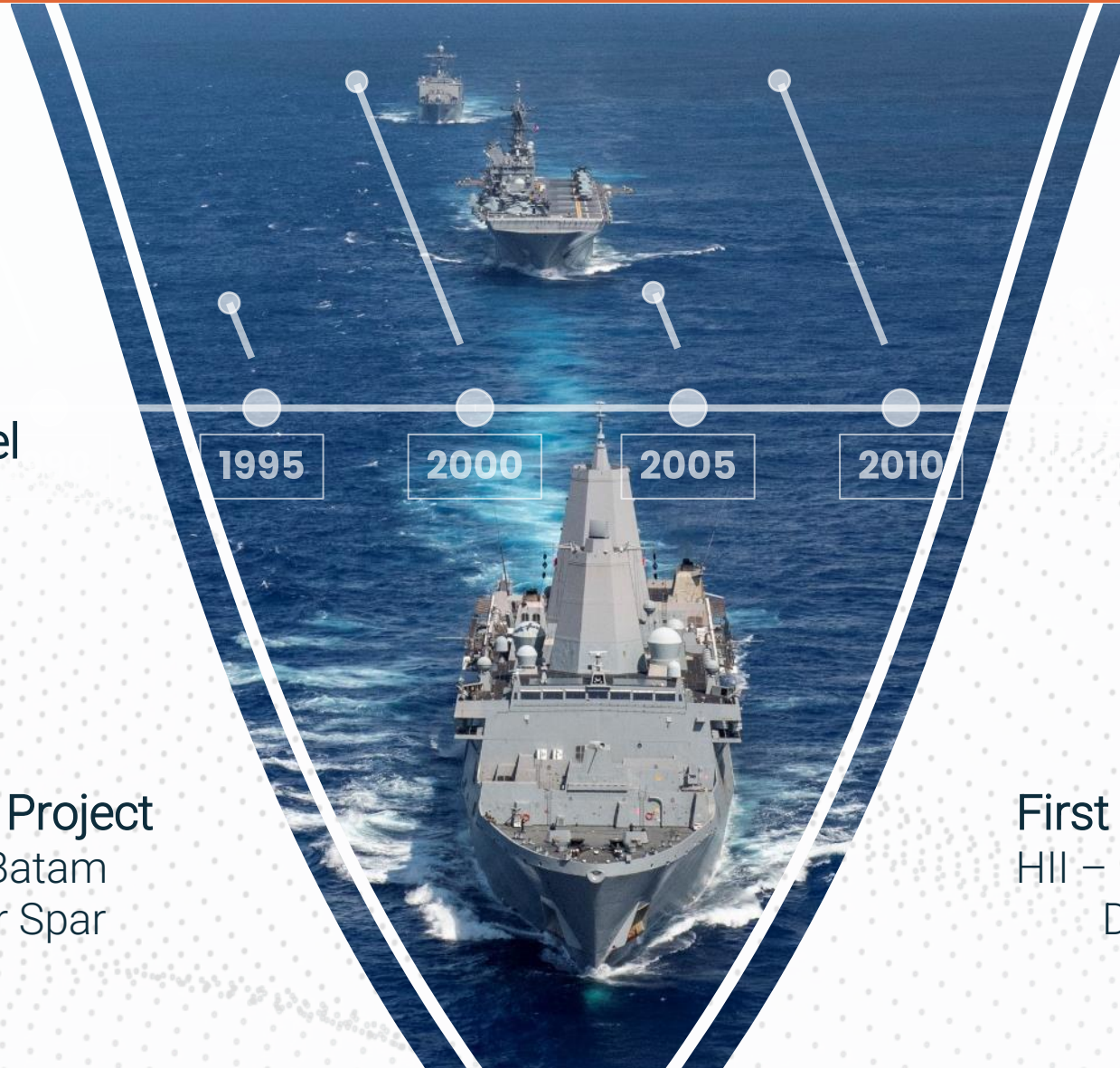
First Luxury Vessel
Vripack Yachts
Super Yacht
1995

First Offshore Project
McDermott Batam
Devil's Tower Spar
2003

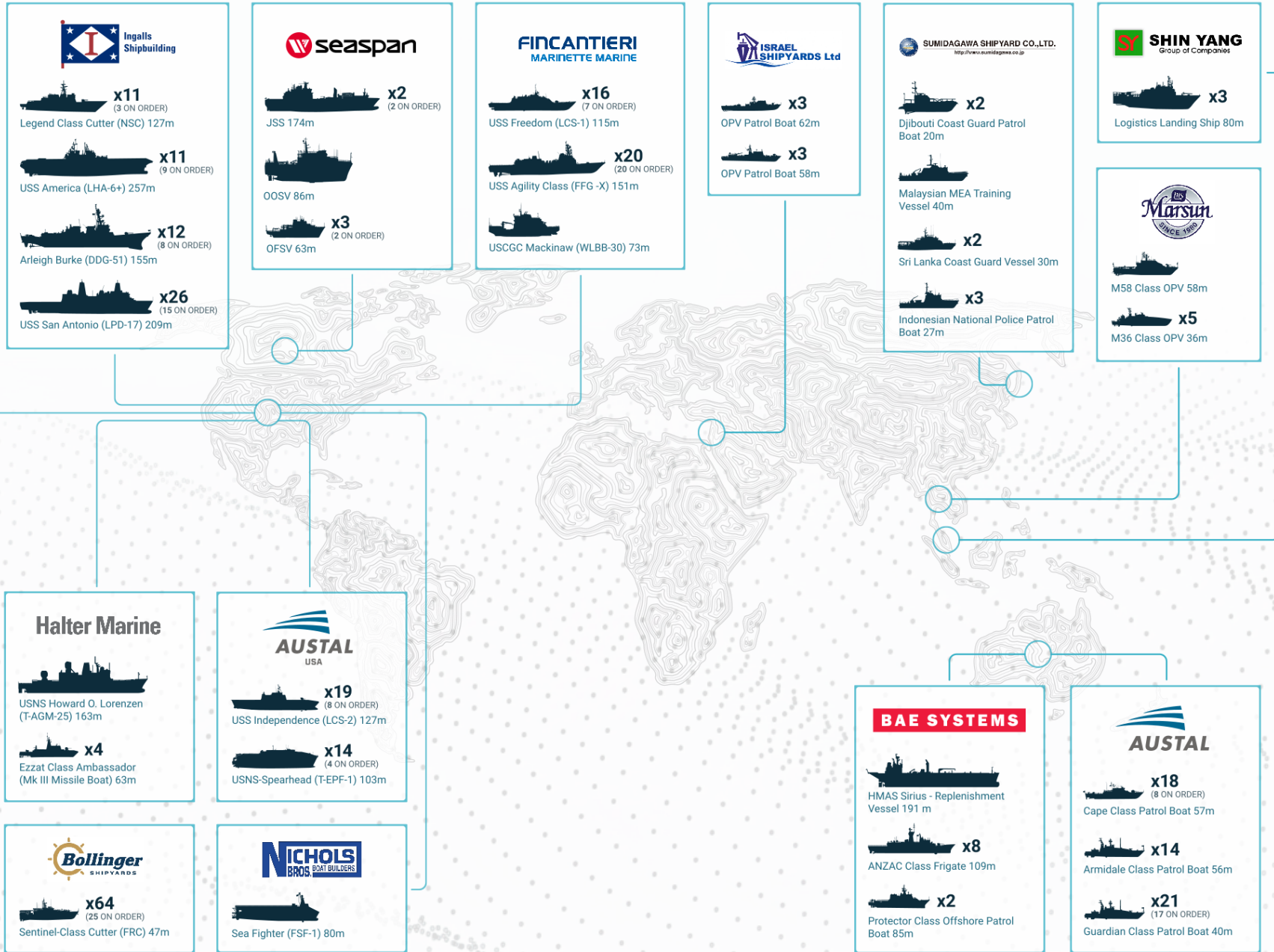
First Fast Ferry
Austal Limited
Benchijigua Express
2004

First Combat Vessel
Fincantieri MMC
Littoral Combat Ship
2005

First Major Combatant
HII – Ingalls Shipbuilding
DDG-51 Flight II
2011



750+ Naval Defense Projects



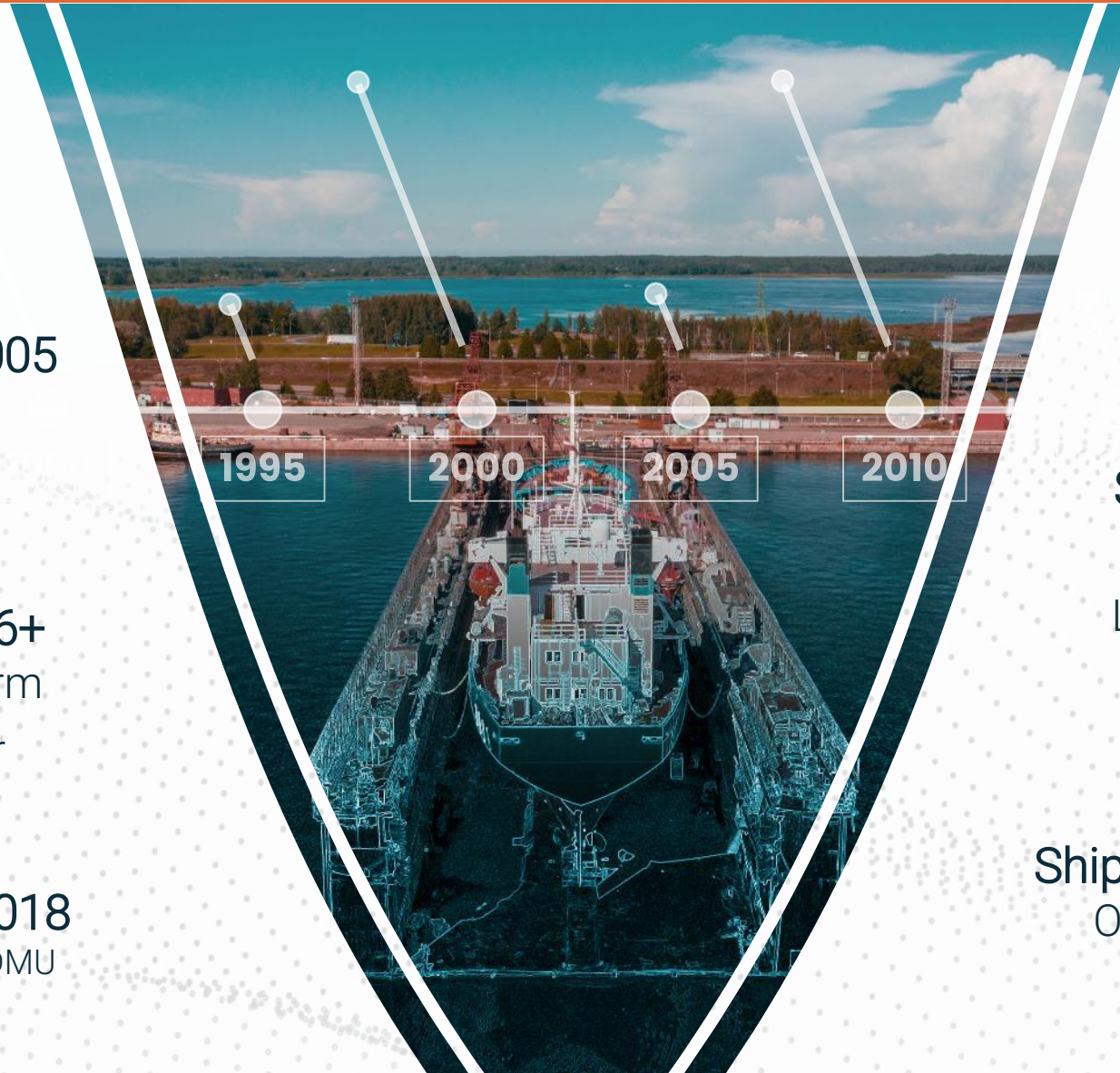
30+ Years of Shipbuilding Technology

CAD-Link 95+
Standard Format
DWG

ShipConstructor 2000-2005
Microsoft SQL Server
Standard Data Platform

ShipConstructor 2006+
Standard Model Platform
Microsoft SQL Server

ShipExplorer 2018
3D Product Model DMU



EnterprisePlatform 2014+
PublisherLT
Publishing Platform

**ShipConstructor integration
with Aras at HII 2016+**
Leveraging EnterprisePlatform
and 3D Model visualization

ShipbuildingPLM 2019+
Open PLM Platform
Aras Innovator



Shipbuilding Information Management

Unique challenges requiring industry specific solutions

Initial Design



Specifications
Requirements
General Arrgt.
3D Model

Hull design
Hull calculations
Simulations



Basic Design



Requirements
3D Model
Catalogs
Functional Design

Suppliers
Simulation
ABOM/EBOM
Class package



Detail Design



Requirements
Catalogs
Functional Design
3D Model
Design review

VFI
Change mgmt.
EBOM/MBOM
Hull effectivity



Assemble



Robots/Industry 4.0
Change mgmt.
AR / VR
Quality control
Assembly 3D/2D



Arrangements
Lifting and turning
Hull effectivity
3D Model (as-built)
Testing / Trials



Fabricate



Robots/Industry 4.0
Spools
Nests
3D printing
CNC



Pipe shop
CNC
Hull effectivity
Quality control

Prepare



3D Model
Schedules
Build Strategy
Change mgmt.
MBOM



Resources
2D drawings
Yard constraints
Hull effectivity
...

Digital Twin



Requirements
VFI
3D Model (As-is)
3D Model (As-built)
BOMs
2D documentation



Multi-CAD
AR / VR
Laser Scanning
Functional design



Repair / Refit



Digital Twin
Change mgmt.
Collaboration
Paper drawings



Laser Scanning
Suppliers
Simulations



Operations (ISS)



Digital Twin
Ship records
Manuals
Maintenance records
IoT / AI / etc..

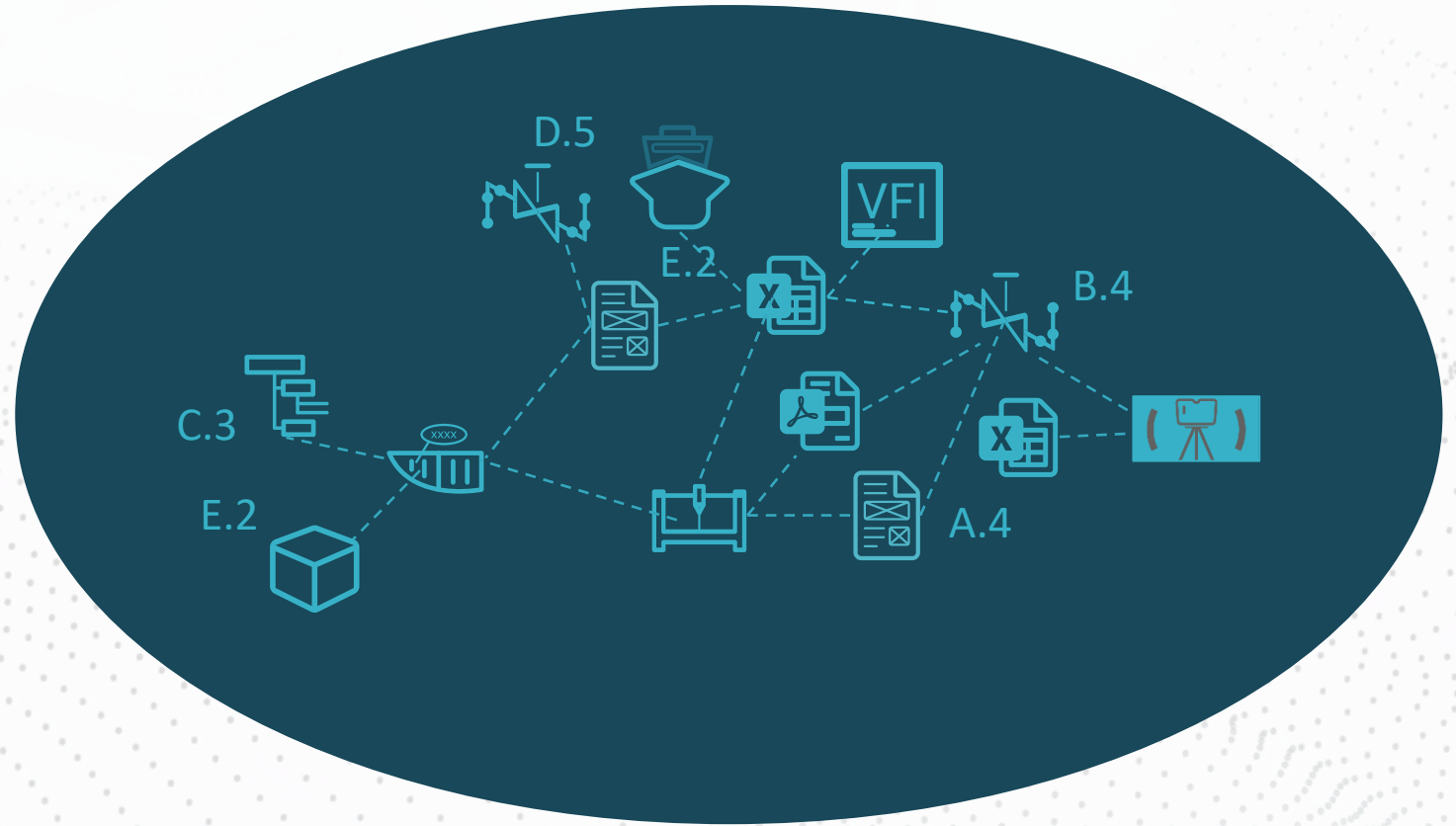


Regulations
Resources
Environment
Commissioning
...



Shipbuilding Lifecycle Product Data and Relationships

Configuration control of product data and relationships throughout the shipbuilding lifecycle has been a significant challenge for SSI clients



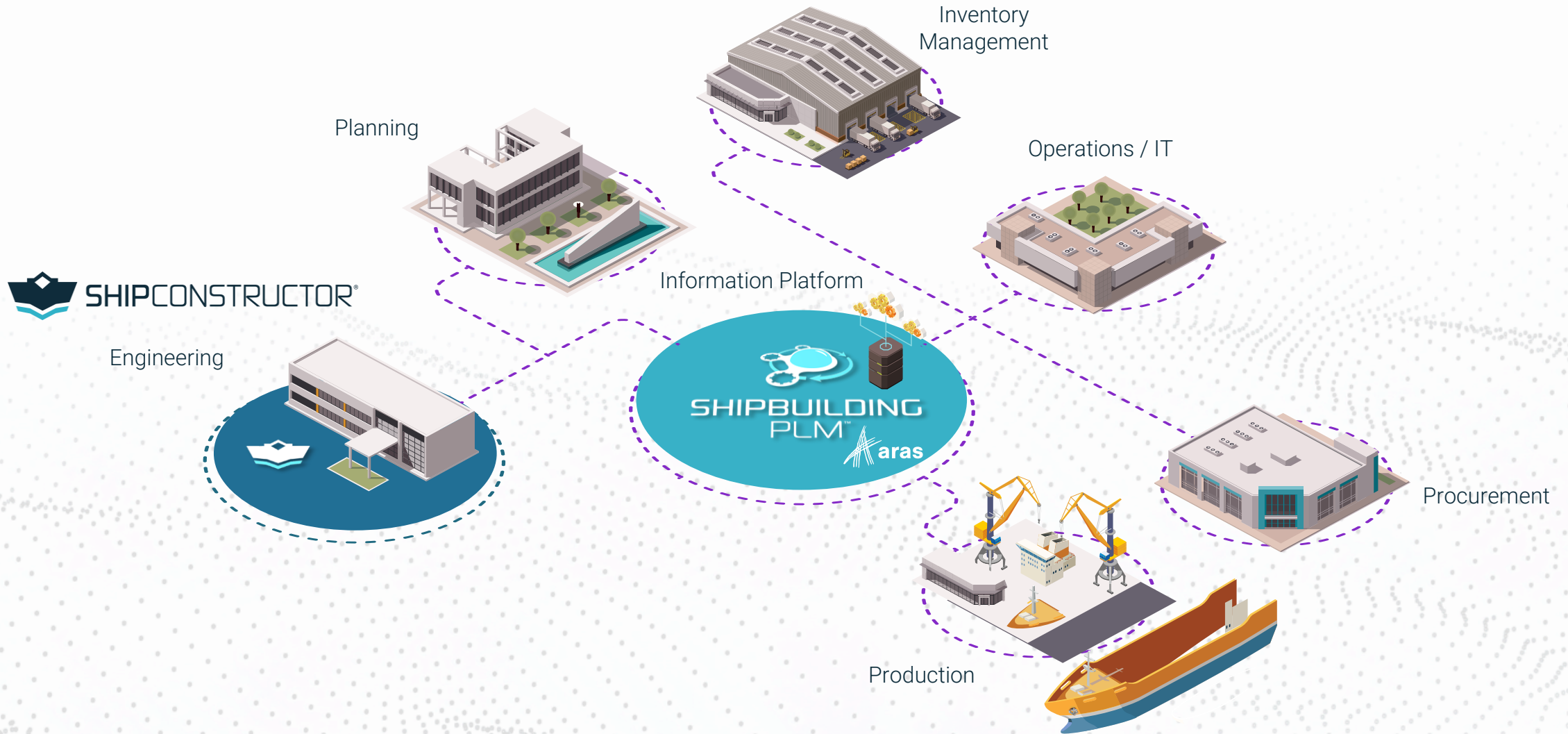
ShipbuildingPLM

ShipbuildingPLM is a vertical information management solution for shipbuilders.

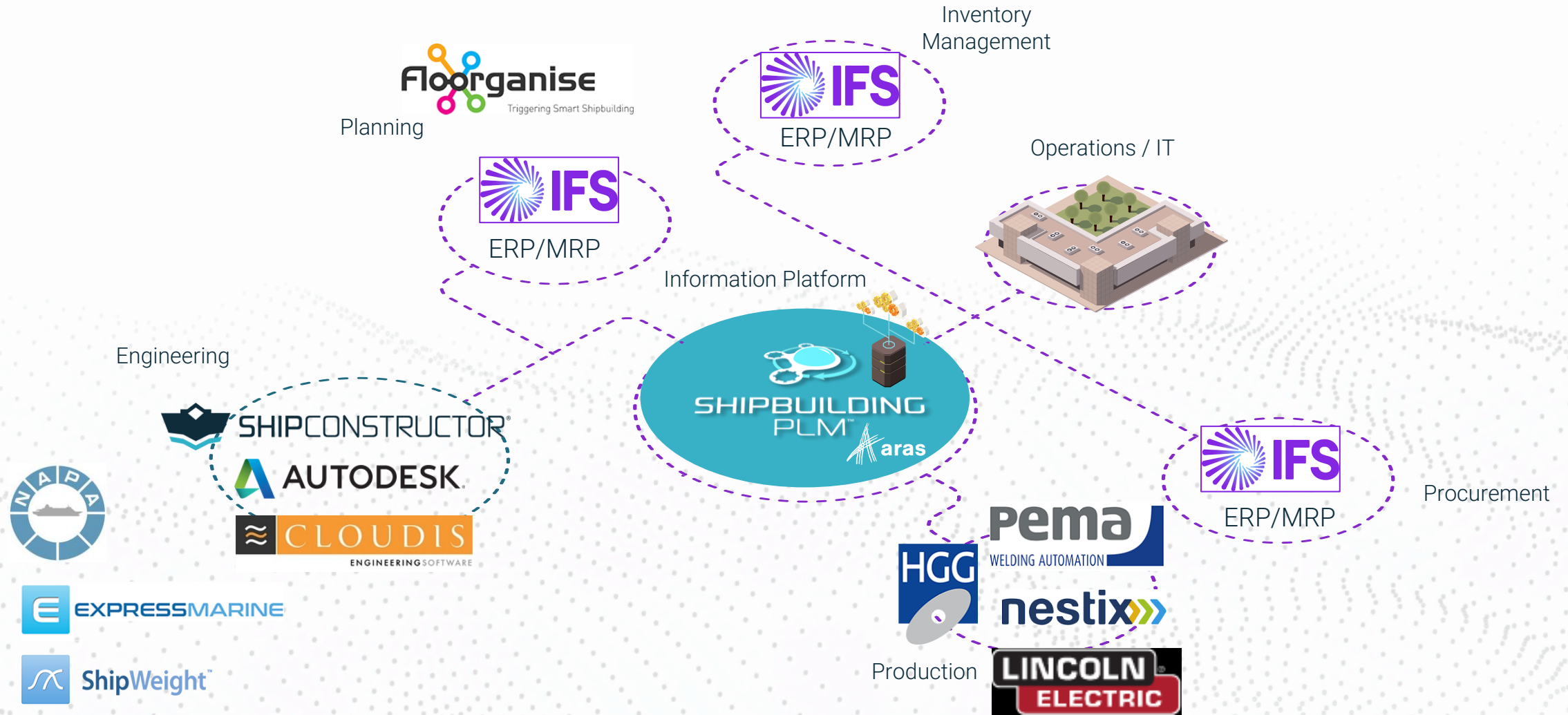
Developed by SSI with Aras Innovator, a resilient and highly adaptable low-code PLM platform.



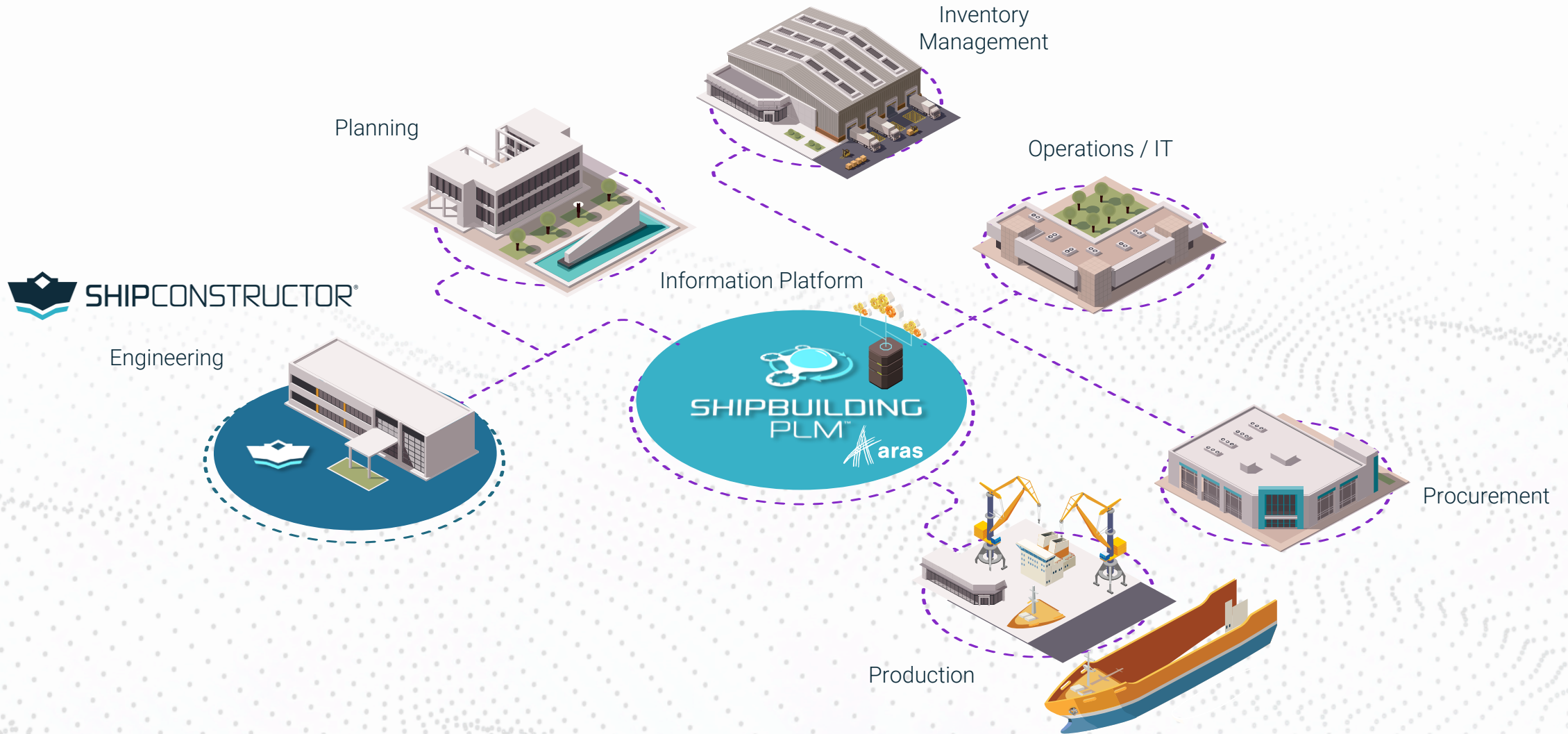
SSI Open Information Platform



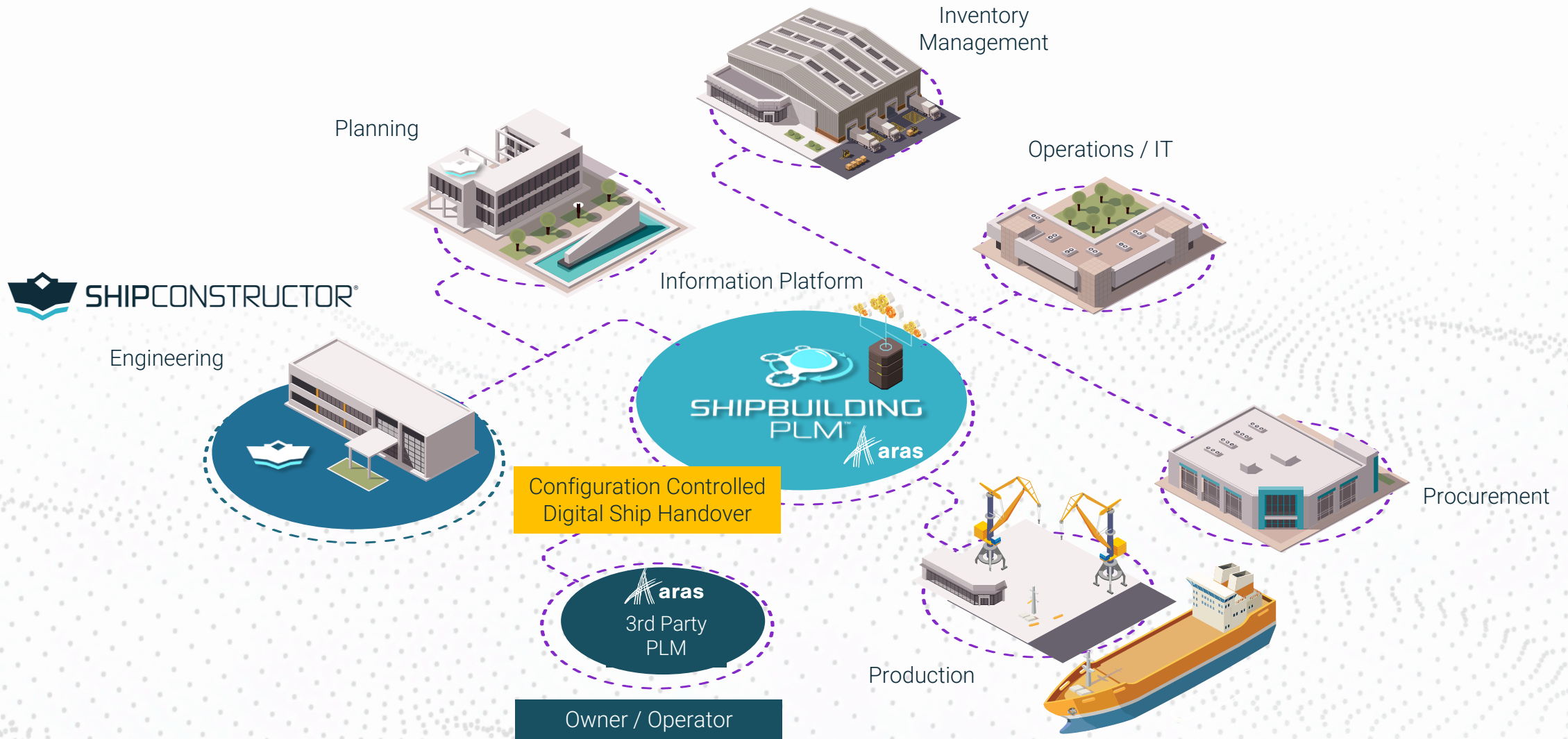
SSI Open Information Platform



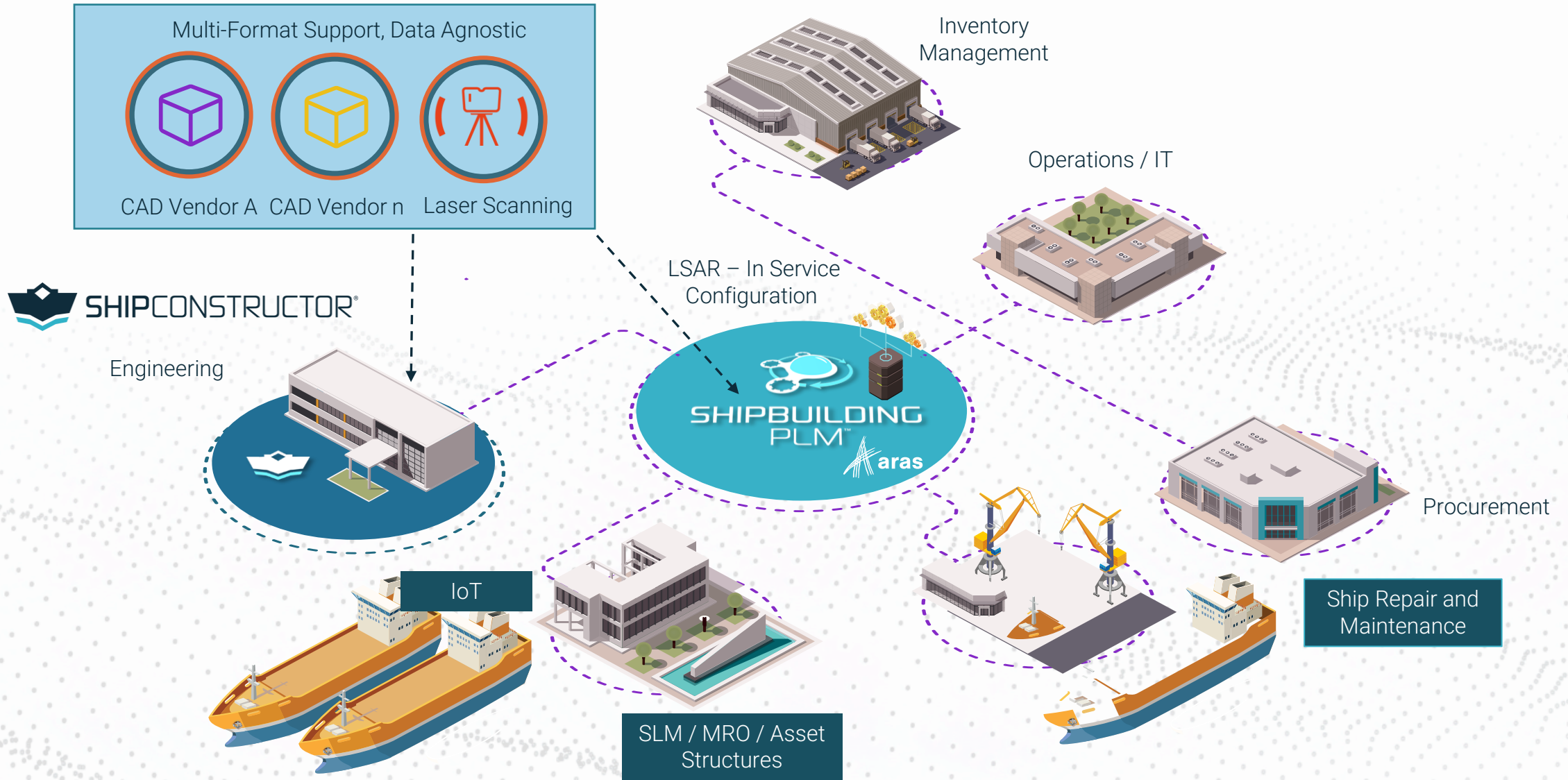
Building the Digital Ship



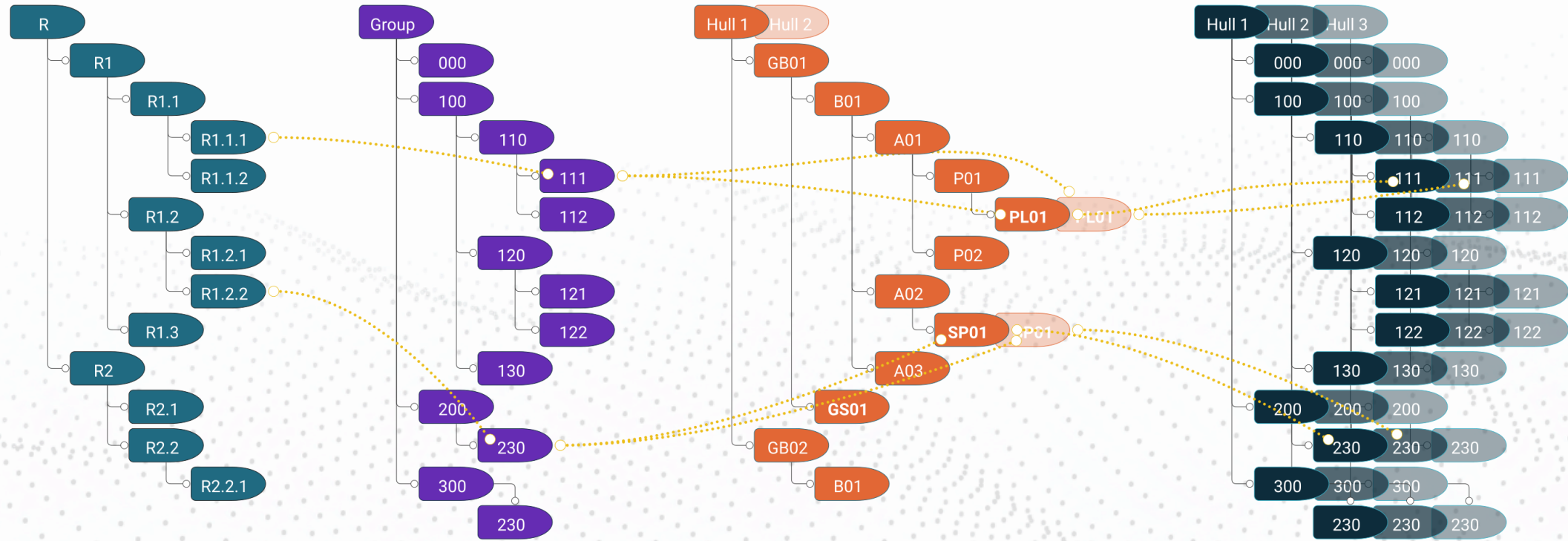
Digital Ship Handover



Maintaining the Digital Ship



Manage Information through the Ship Lifecycle



Requirements Breakdown Ship Work Breakdown Product Work Breakdown (multi-Hull) Ship Work Breakdown (per Hull)





New Naval Reality

Accelerated Delivery, Increased Complexity, Constant Change

Navy Shipbuilding Demand

- New threats and theaters of operation, renewed focus on blue water
- New rates of Navy expansion a global phenomenon.
- New methods of warfare and integrated weapons systems.
- New integrated powerplants.
- Need to reorganize disrupted supply chains
- Demand for improved fleet sustainment operations and increased use of autonomous vessels for an effective strategic global presence.

Significant opportunity for Shipbuilders

Shipyard “co-delivery” of a physical and digital ship has become a key strategic requirement for the Navy to address future fleet sustainment goals.



Significant challenges for Shipbuilders

Accelerated Delivery, Increased Complexity, Constant Change



Building the Digital Ship

Configuration control of Engineering data throughout the lifecycle



Shipyard process improvements are needed

- Improve requirement driven design validation as newbuild designs become more complex and incorporate new technologies.
- Improve shipyard Part Catalog management for new Part definitions.
- Improve tracking of procurement demand for LLI (Long Lead Items)
- Increase capacity to absorb accelerated rate of design change
- Improve communication of Engineering change across the shipyard.
- Improved integration with manufacturing processes.
- Deliver a Digital Ship with the required data set for improved fleet sustainment operations.

Shipyards have struggled with digital transformation initiatives. Where are the constraints and bottlenecks?



Shipyard Digital Transformation Constraints

Shipbuilding specific business processes and legacy data systems

- Shipbuilding processes are often more complex and industry specific than other manufacturing industries, which often leads to a proliferation of in-house legacy systems and challenges for PLM vendors
- Transition from legacy “in-production” systems to a new system architecture with more efficient data driven processes is hard, and requires an incremental strategy for technology adoption and roll-out.

Shipyard digital transformation initiatives have often taken too long to generate effective results, losing political sustainment mid-stream.



CAD/CAM/PLM Platform Built for Shipbuilding



Solution for
Design and Engineering of Ships



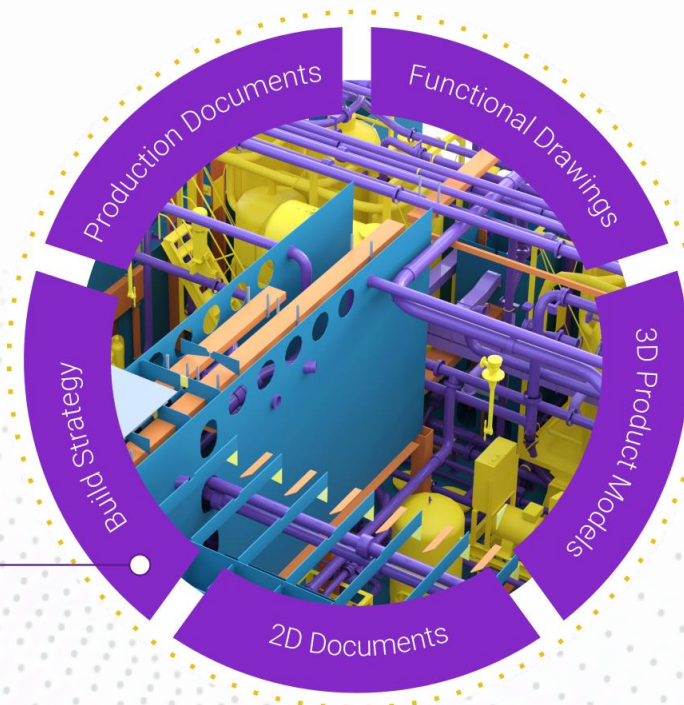
Solution for
Management of Shipbuilding Projects



SHIPBUILDINGPLM™

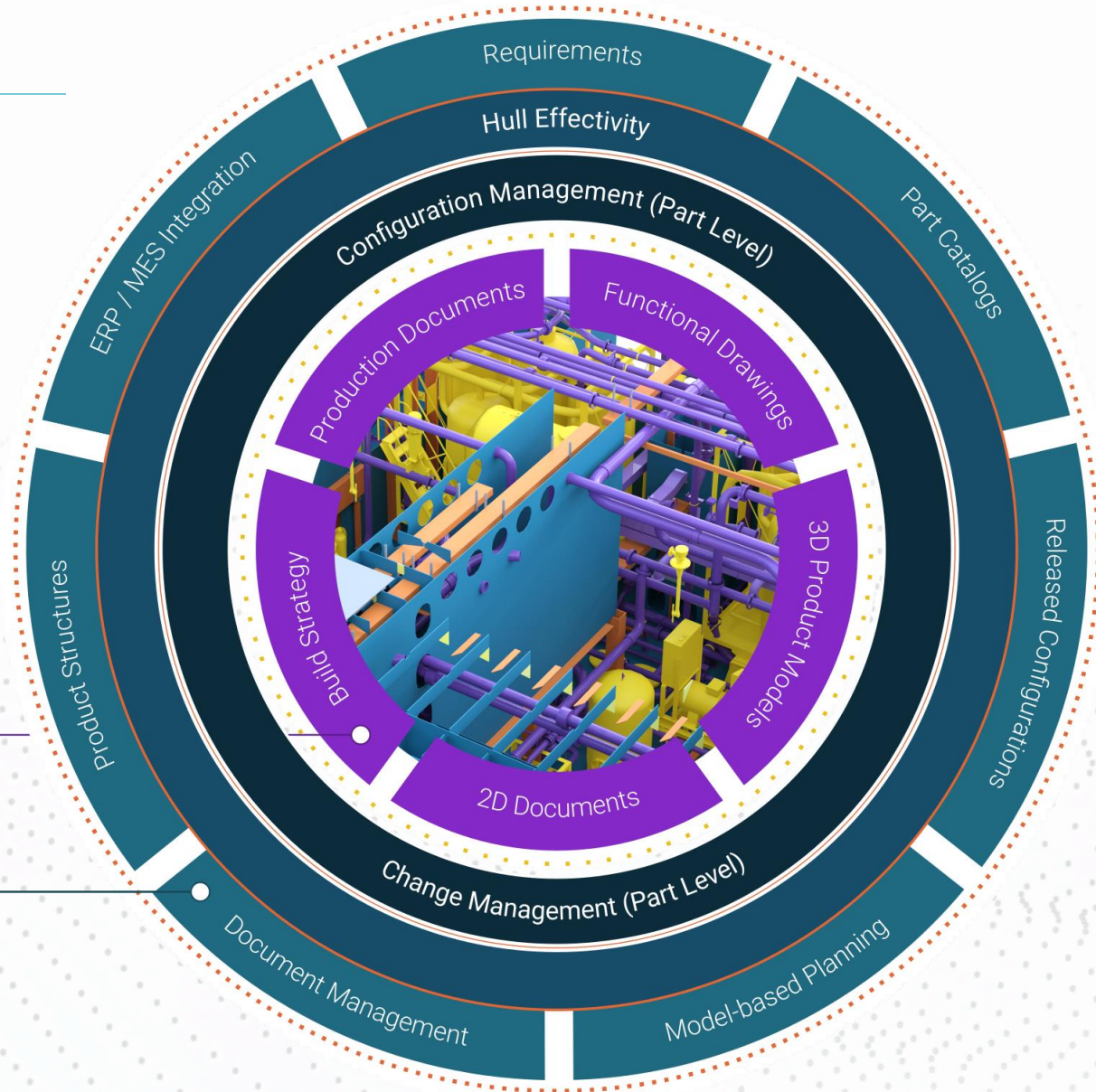


Platform Scope

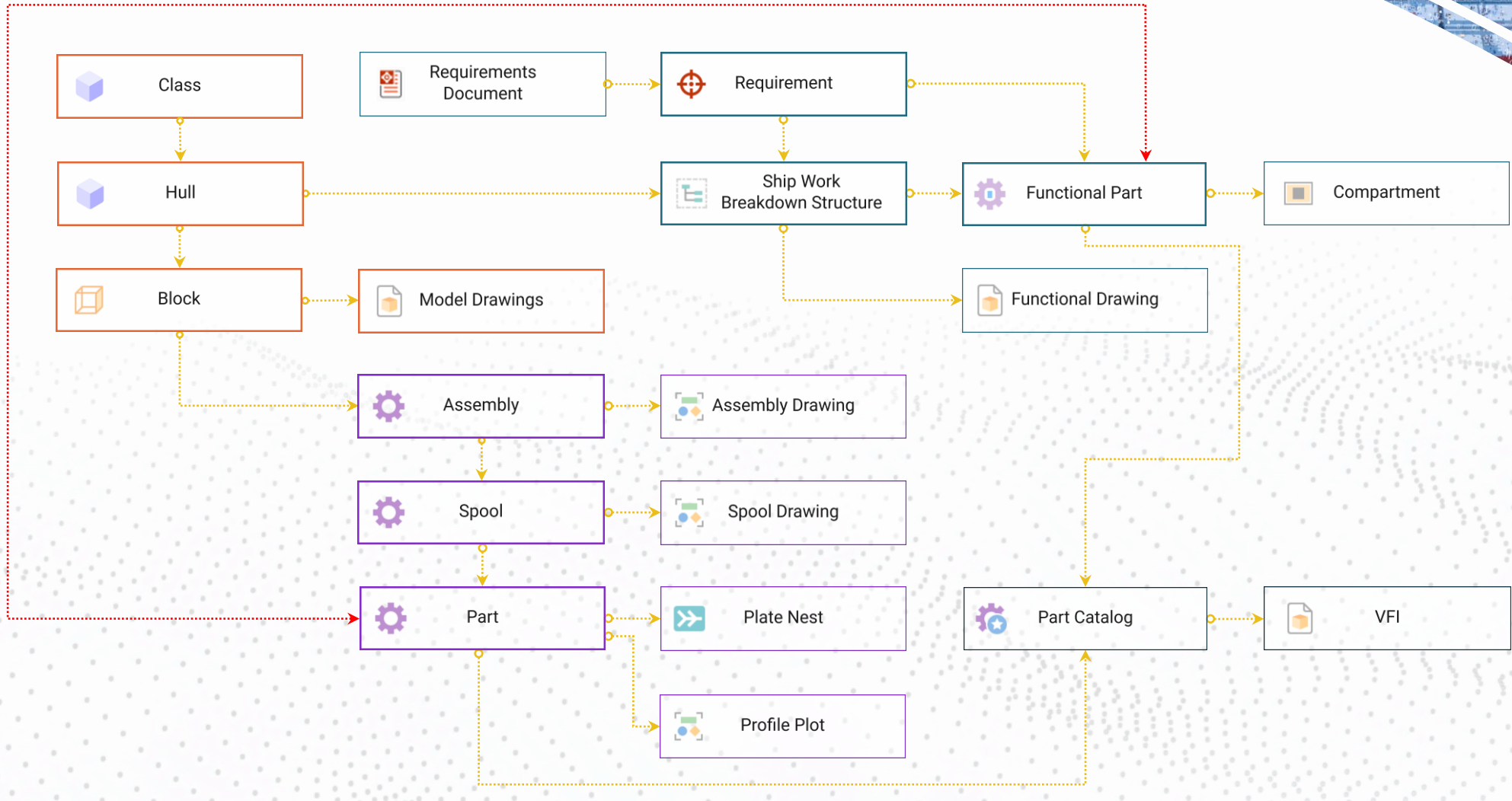


Platform Scope

*Shipbuilding specific
CAD/CAM/PLM platform*



A Ready-to-Use Ship PLM Data Model



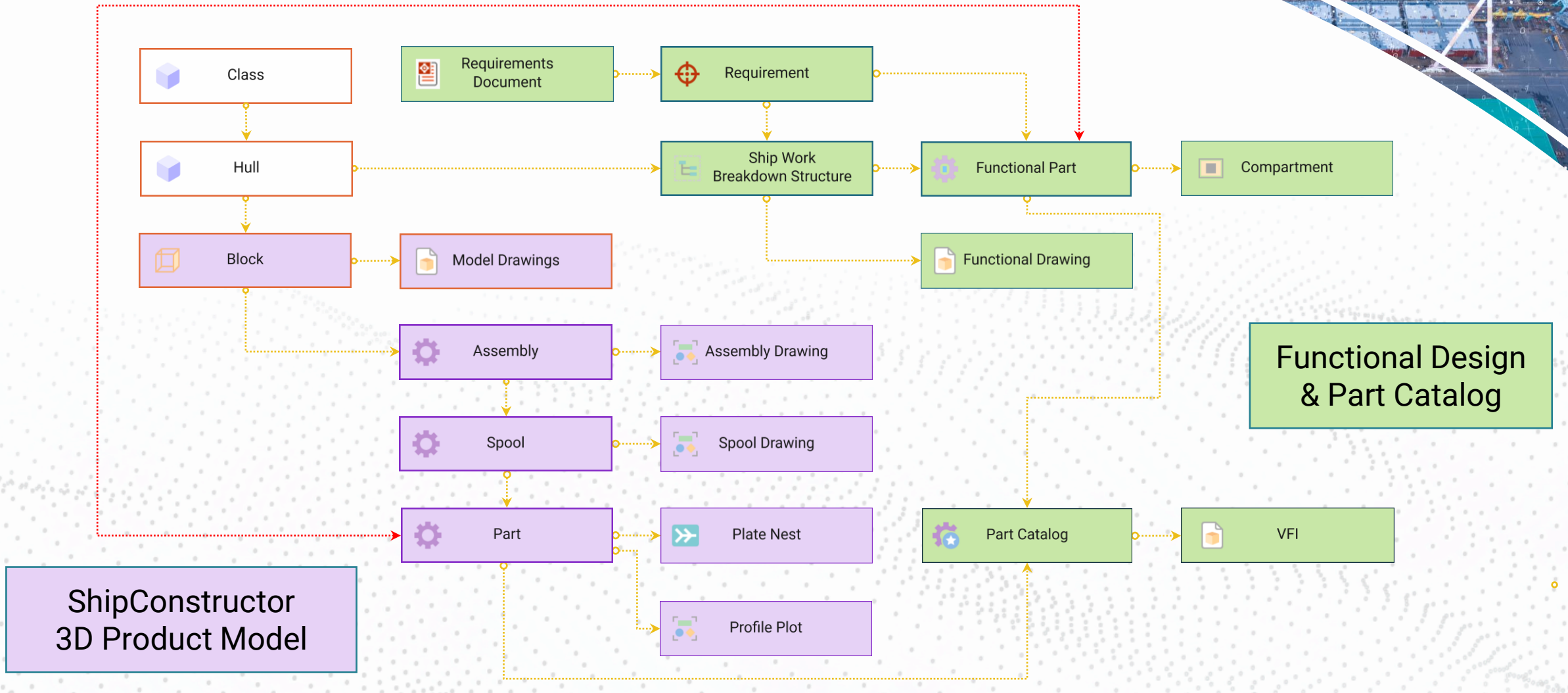
Shipbuilding Data

Shipbuilding Workflows

Shipbuilding Relationships

Shipbuilding Experience

A Ready-to-Use Ship Data Model



Shipbuilding Data





















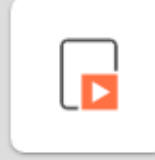
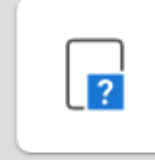


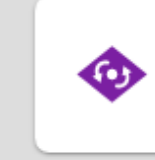




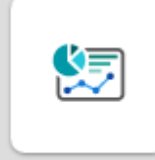

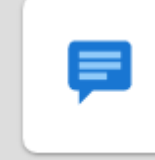



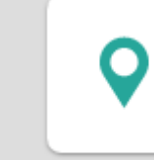









Shipbuilding Workflows

Shipbuilding Relationships

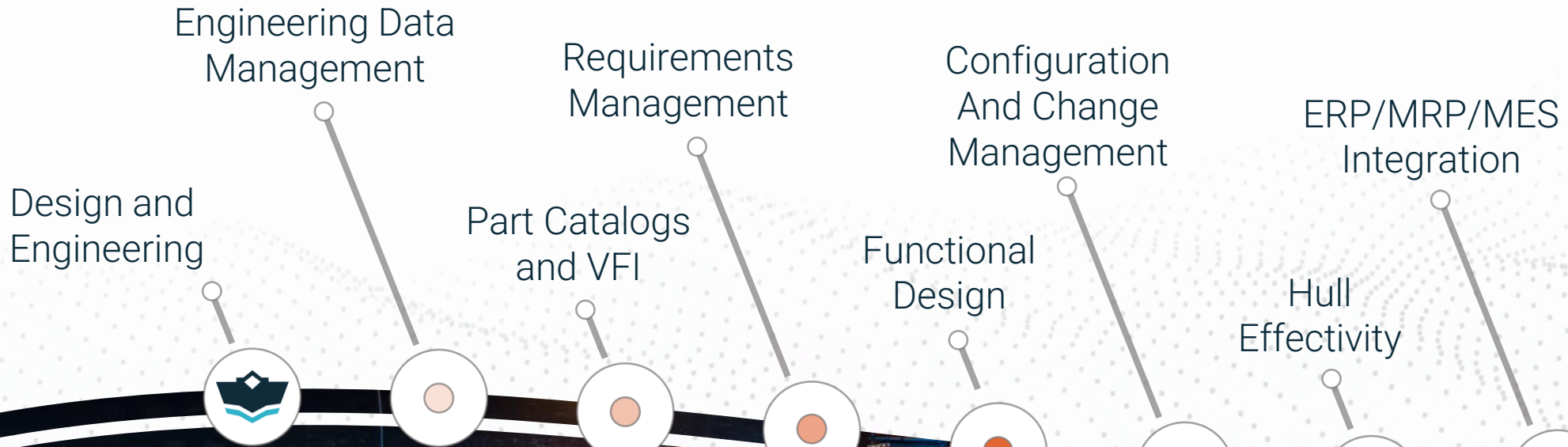
Shipbuilding Experience

Contents

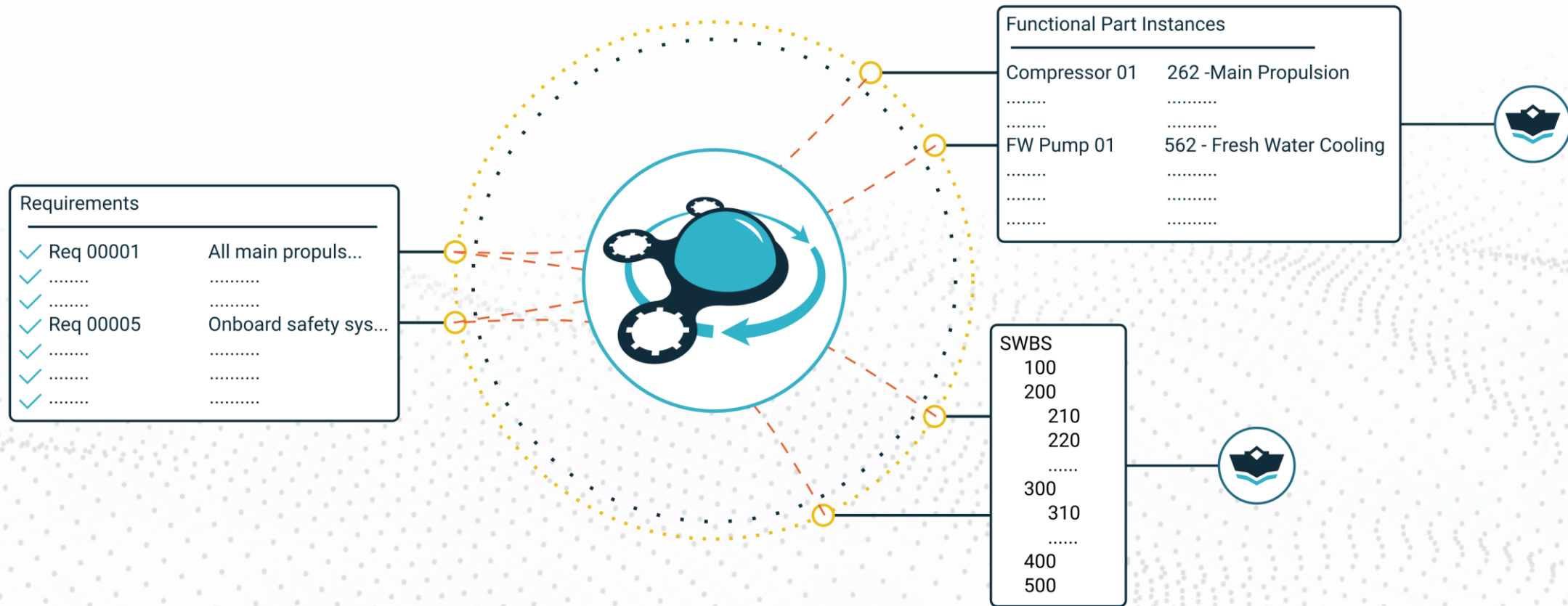
- > Documents
- ▼ Functional Design
 - Compartment
 - Functional Parts
 - SWBS
- ▼ Product Model
 - Blocks
 - Classes
 - Hulls
 - Model Drawings
 - Part Catalog
 - Parts
 - Plate Nests
 - Product Structures
 - Production Drawin...
 - Profile Nests
- > Change Management
- > My Innovator
- > Portfolio
- > Sourcing
- > Administration

 CAD Documents	 Documents	 Compartments	 Functional Parts	 SWBS	 Blocks	 Classes	 Hulls	 Model Drawings
 Part Catalog	 Parts	 Plate Nests	 Product Struct...	 Production Dr...	 Profile Nests	 BROs	 DCOs	 Delta Objects
 Deviations	 ECNs	 ECOs	 ECRs	 EDRs	 PRs	 Rework Orders	 SSI CROs	 SSI FCOs
 SSI RCOs	 Waivers	 Dashboards	 Extended Prop...	 My Discussions	 My InBasket	 My Reports	 Customers	 Locations
 Manufacturing	 Factory	 Person with gear	 Cinema	 Key	 ID card	 Grid	 DNA	 Hexagon

A PLM Implementation for Shipbuilders



Manage Requirements



Initial / Concept Design

Basic / Functional Design

Detail Design & Production

MRO

573 x

573 ☆

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SWBS

Hull [HULL2](#) Class [PSV](#)

Created By: Innovator Admin
 Created On: 2023-04-22 08:20:44
 Modified By: Innovator Admin
 Modified On: 2023-04-27 12:43:40
 Locked By:
 Major Rev: A
 Release Date:
 Effective Date:
 Generation: 3
 State: Preliminary

Has Parts Has Drawing Has Children Changes Pending

WBS Children Functional Parts Functional Drawings SWBS Hierarchy **Requirements**

Requirements ☆

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Requirement Number	Title	State
REQ-000000001	System to discharge 500ST of cargo per hour	Draft
REQ-000000002	Cargo capacity of system holding tanks shall be a total of 10,0...	Draft
REQ-000000003	The system shall have four indepenent cargo segregations to a...	Draft
REQ-000000004	Valve actuators that are electrically operated shall have a prote...	Draft

SWBS x 573-001 x REQ-000000001 x

REQ-000000001 ☆

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Requirement

Requirement Number: REQ-000000001 Revision: A State: Draft Managed by: [CM](#)

Title: System to discharge 500ST of cargo per hour Owned By:

Type: Requirement Category: Operations Group: System Tier: System

Complexity: Low Priority: Low Risk: Low

Documents **Where Used SWBS** Where Used Functional Part External Links

🔄 🗑️ 🗑️ | 2 🔄 🗑️ 🗑️

SWBS Number	Name	State	Class
573	573 - CARGO HANDLING SYSTEMS	Preliminary	PSV

- Contents**
- > Documents
 - Compartment
 - Functional Parts
 - SWBS
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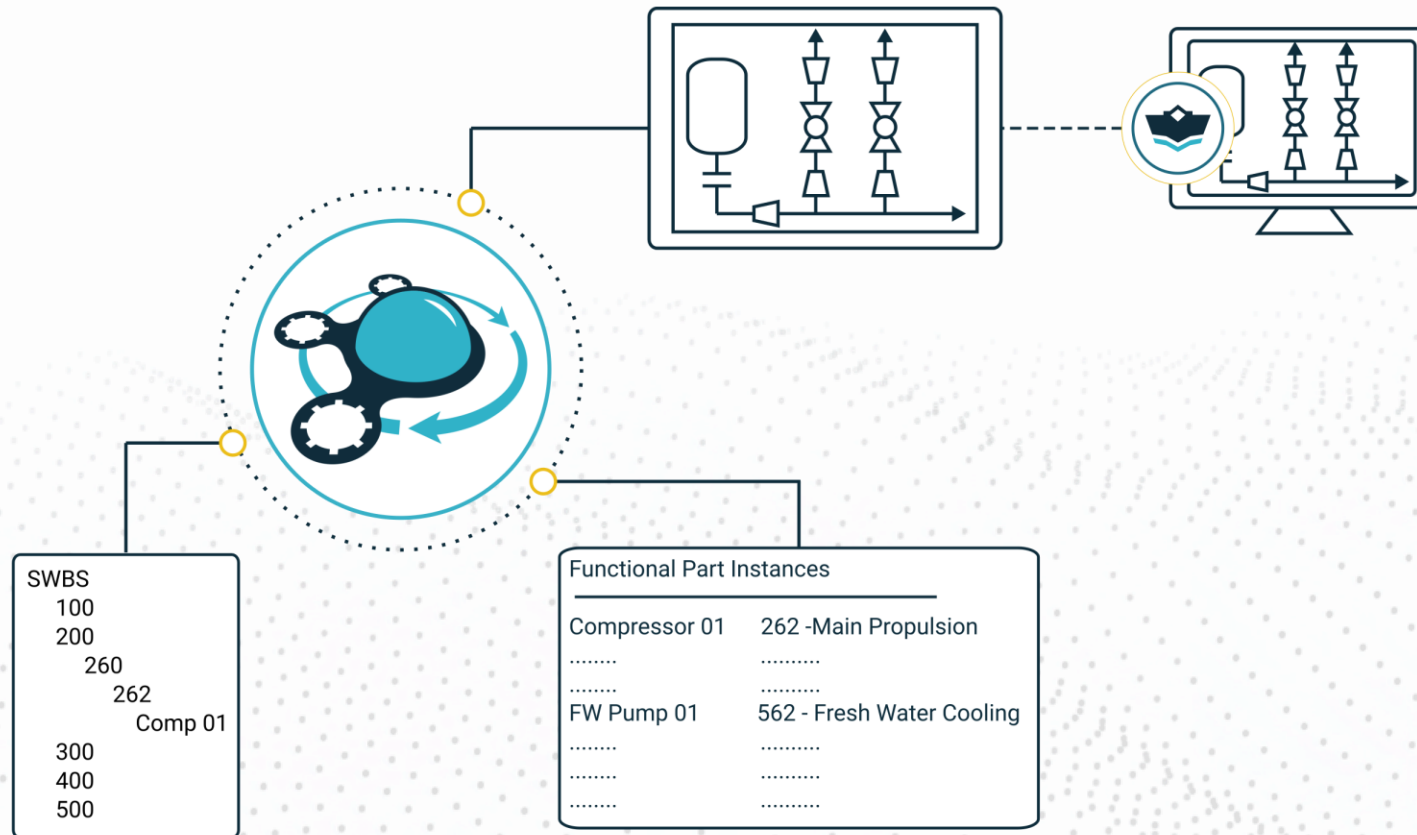
SWBS x

SWBS ☆

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Number	Name	Revision	State
500	500 - Auxiliary Systems	A	Preliminary
504	504 - Instruments And Instrument ...	A	Preliminary
508	508 - Thermal Insulation For Pipin...	A	Preliminary
510	510 - Hvac Systems	A	Preliminary
520	520 - SEA WATER SYSTEMS	A	Preliminary
530	530 - Fresh Water Systems	A	Preliminary
540	540 - FUELS AND LUBRICANTS HA...	A	Preliminary
550	550 - Compr.Air & Fire Exting.Syste...	A	Preliminary
560	560 - SHIP CONTROL SYSTEMS	A	Preliminary
570	570 - Handling Systems	A	Preliminary
571	571 - REPLENISHMENT - AT - SEA ...	A	Preliminary
572	572 - SHIP STORES & HANDLING ...	A	Preliminary
573	573 - CARGO HANDLING SYSTEMS	A	Preliminary
573-001	573 - CARGO HANDLING SYSTEMS	A	Preliminary
FPN-000017	EX BARRIER 792-734-01	A	Preliminary
FPN-000040	322-BH-111	A	Preliminary

Create the Functional Design



Initial / Concept Design

Basic / Functional Design

Detail Design & Production

MRO

573 x

573 ☆

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Hull HULL2 Class PSV

Created By: Innovator Admin
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 Locked By:
 Major Rev: A
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 State: Preliminary

Has Parts Has Drawing Has Children Changes Pending

SWBS Children Functional Parts **Functional Drawings** SWBS Hierarchy Requirements

CAD Documents ☆

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Document Nu...	Revi...	Name	Type	State	Nativ
573-001	A	573 - CARGO HANDLING SYSTEM...	Mechanical/Draw...	Preliminary	

< Prev Next > Page: 1 of 1 | 1 Results | 🔍

SWBS x 573-001 x

573-001 ☆

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413.30-C3004
 DISCHARGE UNIT
 2000mm X 2000mm
 36bar #20deg

FROM STORAGE TANK
 150-16HCD1-P-001
 125-16HCD1-P-002
 100-16HCD1-P-005
 80x100
 611.32-B2002
 80-16HCD1-PA-X06
 50x80
 80x50
 611.33-B2002
 100-16HCD1-PA-X09
 611.30-B2002
 80-16HCD1-PA-X07
 50x80
 80x50
 611.31-B2002
 150-16HCD1-P-003
 FROM STORAGE TANK
 100x80
 125-

- Contents**
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 - Profile Nests
 - > Change Management
 - > My Innovator
 - > Portfolio
 - > Sourcing
 - > Administration

SWBS x 573 x

573 ☆

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🔗
⋮

SWBS



SWBS Number: 573 Name: 573 - CARGO HANDLING SYSTEMS

Hull: [HULL2](#) Class: [PSV](#)

Created By: Innovator Admin Has Parts: Has Drawing: Has Children: Changes Pending:
 Created On: 2023-04-22 08:20:44
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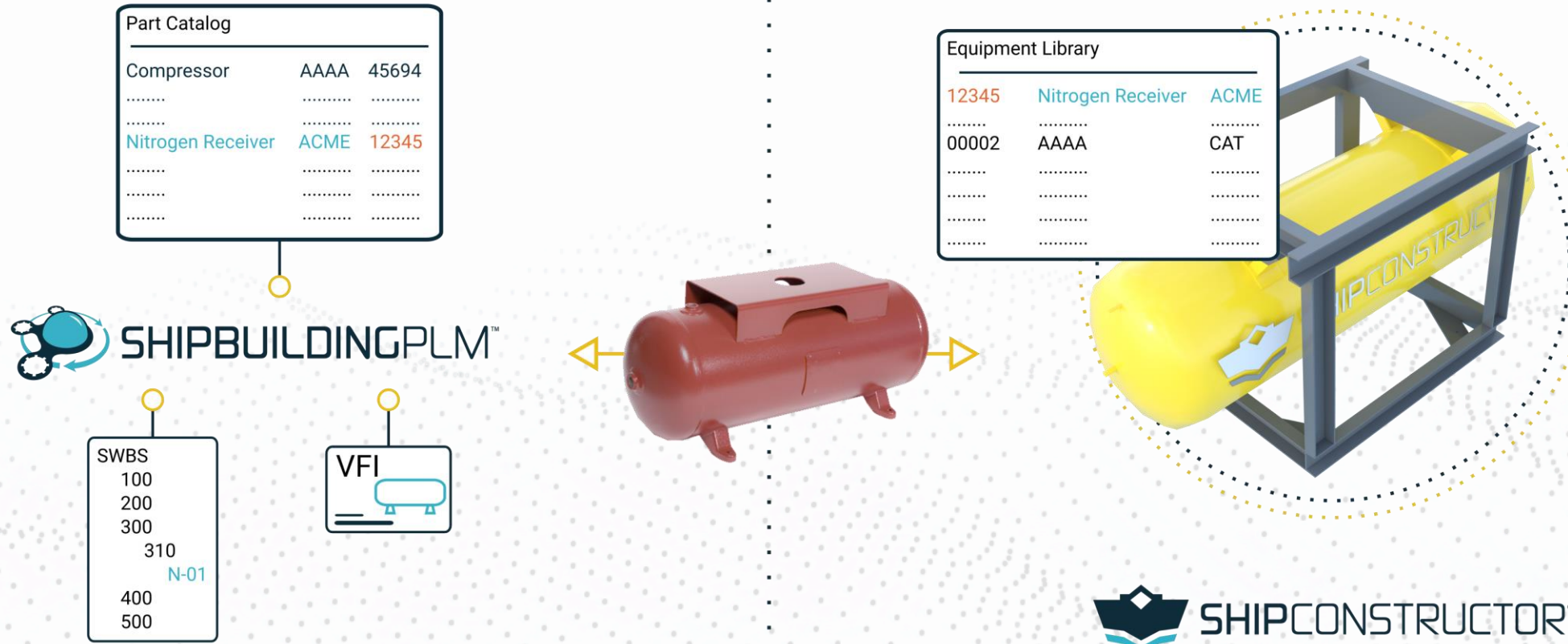
- SWBS Children
- Functional Parts**
- Functional Drawings
- SWBS Hierarchy
- Requirements
- Changes
- SWBS Parent

Functional Parts ☆

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🗑️
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🔗
⌵

Part Number	Name	Type	Revision	State	Class [...]	Hull [...]	Changes	Tag	Part Catalog [...]
FPN-000017	EX BARRIER 792-734-01	Tag	A	Preliminary	PSV	HULL2	<input type="checkbox"/>	510.10-B3002	EX BARRIER 7...
FPN-000040	322-BH-111	Tag	A	Preliminary	PSV	HULL2	<input type="checkbox"/>	611.30-A3004	The A10125 ...
FPN-000045	Drill Cutting Feeder 202&204	Tag	A	Preliminary	PSV	HULL2	<input type="checkbox"/>	413.30-C2000	Drill Cutting F...
FPN-000056	332-MA-207	Tag	A	Preliminary	PSV	HULL2	<input type="checkbox"/>	612.30-A3002	25150-IAS
FPN-000061	312-MA-159	Tag	A	Preliminary	PSV	HULL2	<input type="checkbox"/>	611.20-C3001	B25150 357V...
FPN-000065	STARTER FW COOLING PUM...	Tag	A	Preliminary	PSV	HULL2	<input type="checkbox"/>	513.30-C2004	STARTER FW...

Manage Parts Catalog and VFI



Initial / Concept Design

Basic / Functional Design

Detail Design & Production

MRO

Part Catalog

SS1-001504 B25150 357V20 COTS-Part

Description
PN2.5MPA DN150 Ball valve

Created By: Innovator Admin
Created On: 2023-04-22 08:22:53
Modified By: Innovator Admin
Modified On: 2023-04-27 03:06:10
Locked By:
Major Rev: A
Generation: 1
State: Request

Weight 6.80 **Unit** kg

Classification Society

Foundation Requirement

Model In ShipConstructor

Valves

Manufacturer: Johnson Pump & Valv
Model Number: BALL123
Valve Type: Ball - 2 Piece
Flange Face: Raised Face 150#
Body Material: Cast Steel
Trim Material: Carbon Steel
Actuation Type: None
Class Approved:

NSN - National Stock # **ERP Product Group** **ShipConstructor Catalog ID**

2FC224C7-35E2-436F-B3E3-1E1F495AEBF6

Number	Name	Revision	State	Type	Class	Hull
FPN-000598	312-MA-167	A	Preliminary	Tag	PSV	HULL2
FPN-000418	322-MA-65	A	Preliminary	Tag	PSV	HULL2
FPN-000887	332-MA-371	A	Preliminary	Tag	PSV	HULL2
FPN-000661	332-MA-96	A	Preliminary	Tag	PSV	HULL2
FPN-000247	312-MA-140	A	Preliminary	Tag	PSV	HULL2

B10050 351V4...

B10050 351V40 -ST

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Part Catalog

Part Number	Name	Type
SSI-001825	B10050 351V40 -ST	COTS-Part
Description		State
PN1.0MPA DN50 Remote control butterfly valve		Request
		Classification
		Foundation Requirement
NSN - National Stock #	ERP Product Group	ShipConstructor Catalog ID
		09DB27BD-C233-488B-868A-5F1E56AC275B
		Model In Sh <input checked="" type="checkbox"/>

BOM Catalog Parents Documents **VFI Documents** ShipConstructor Parts Fur

Documents

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Document Nu...	Revi...	Name	Type	State
5193706	A	Keystone Butterfly Valve Cut Sheet	VFI	Preliminary
7744728	A	Keystone Electric Actuator Cut S...	VFI	Preliminary

Page: 1 of 1 | 2 Results


7744728

7744728

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Keystone EPI2
Electric Actuator

- The EPI2 is an intelligent quarter-turn electric actuator designed for direct mo... this all-in-one actuator fits all the features of larger, heavier actuators into a ne...



B10050 351V4...

B10050 351V40 -ST

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Part Catalog

Part Catalog

Part Number
 SSI-001825

Name
 B10050 351V40 -ST

Description
 PN1.0MPA DN50 Remote control butterfly valve

Created By: Innovator Admin
 Created On: 2023-04-22 08:23:01
 Modified By: Innovator Admin
 Modified On: 2023-04-26 12:36:03
 Locked By:
 Major Rev: A
 Generation: 1
 State: Request

NSN - National Stock #

ERP Product Group

ShipConstructor Cata
 09DB27BD-C233-488E

BOM Catalog Parents Documents VFI Documents **ShipConstructor Parts** Fur

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Part [...]	Type	Generation	Revision	State
321-BH-2	Pipe	1	A	Prelimi
321-BH-5	Pipe	1	A	Prelimi

Page: 1 of 1 | 2 Results

321-BH-2

321-BH-2

Edit
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Part

Name
321-BH-2

Piece Type
Valve

Stock Name
B10050 351V40 -ST

Weight
16.9


CG (LCG, TCG, VCG)
(30984, -900, 1800)

Class / Hull / Block
[PSV](#) / [HULL2](#) / [321](#)

SWBS
SWBS/500 - Auxil

Full Assembly Name
MILLENNIUMFALCON/321/Unassigned Pipe

Last Auto Update



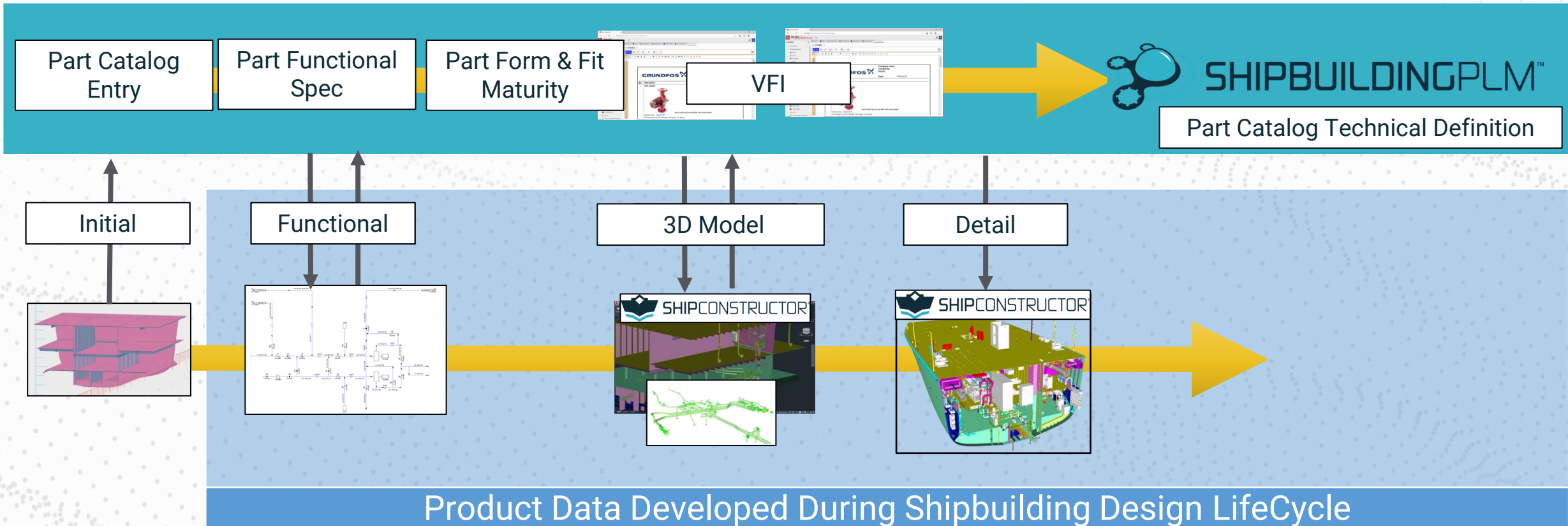
Model Drawings Production Drawings Files Requirements Where Used Requi

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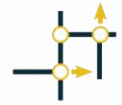
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Model Drawing [...]	Type	Revision	Generation	State
321 BH	Pipe System Model	A	2	Preliminary

Part Catalog Maturity Management



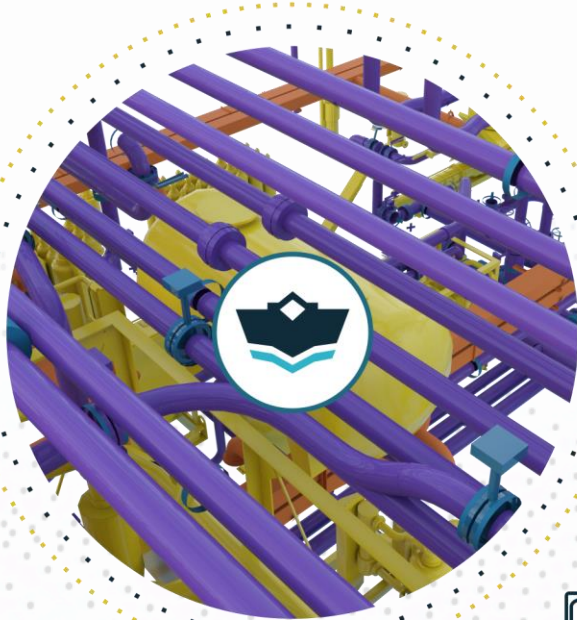
Create the 3D Product Model



responsive
model

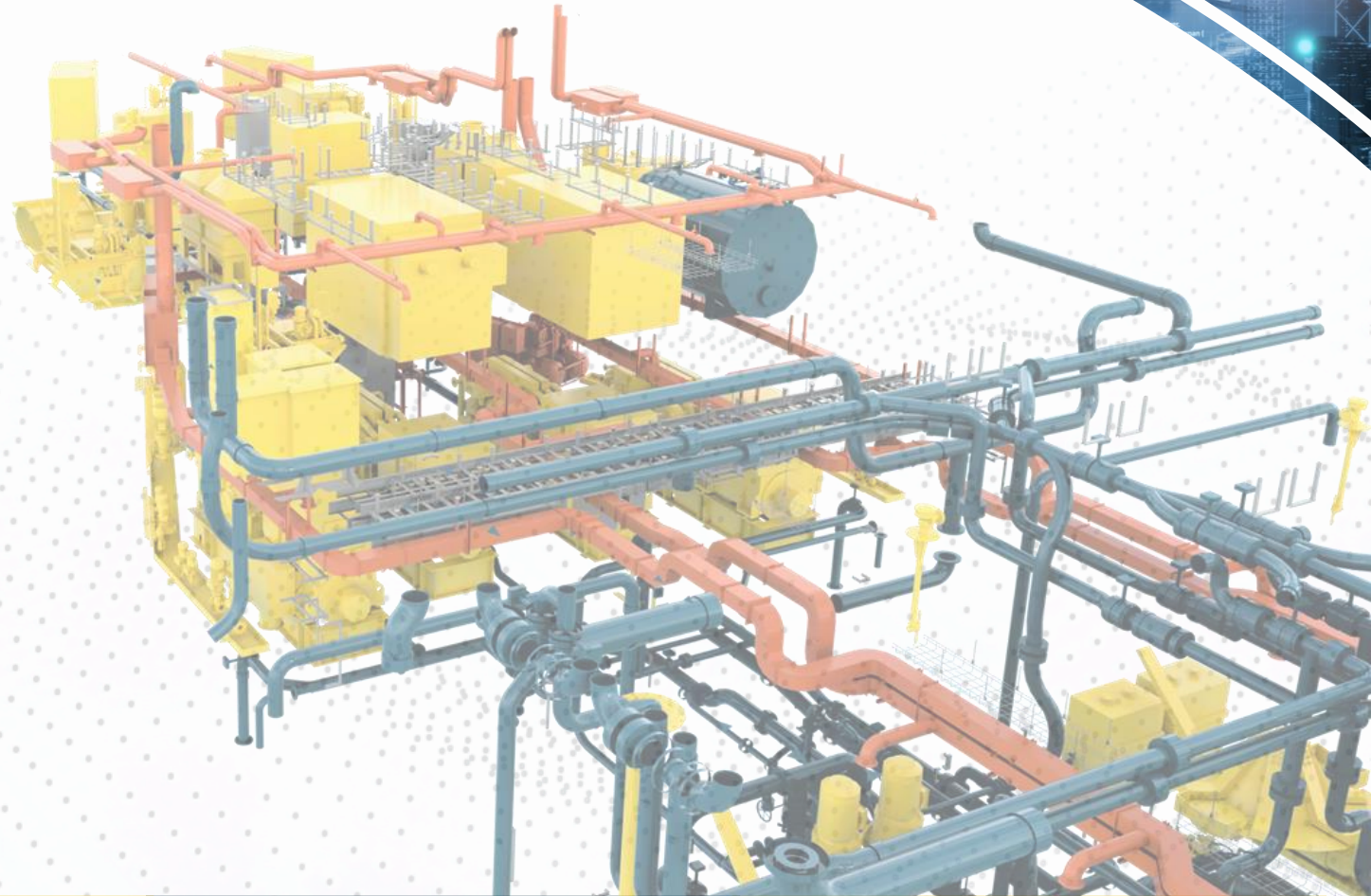


automatic
routing



ANSI
DIN
JIS

spec
driven



connected to
other disciplines



connected to
functional design

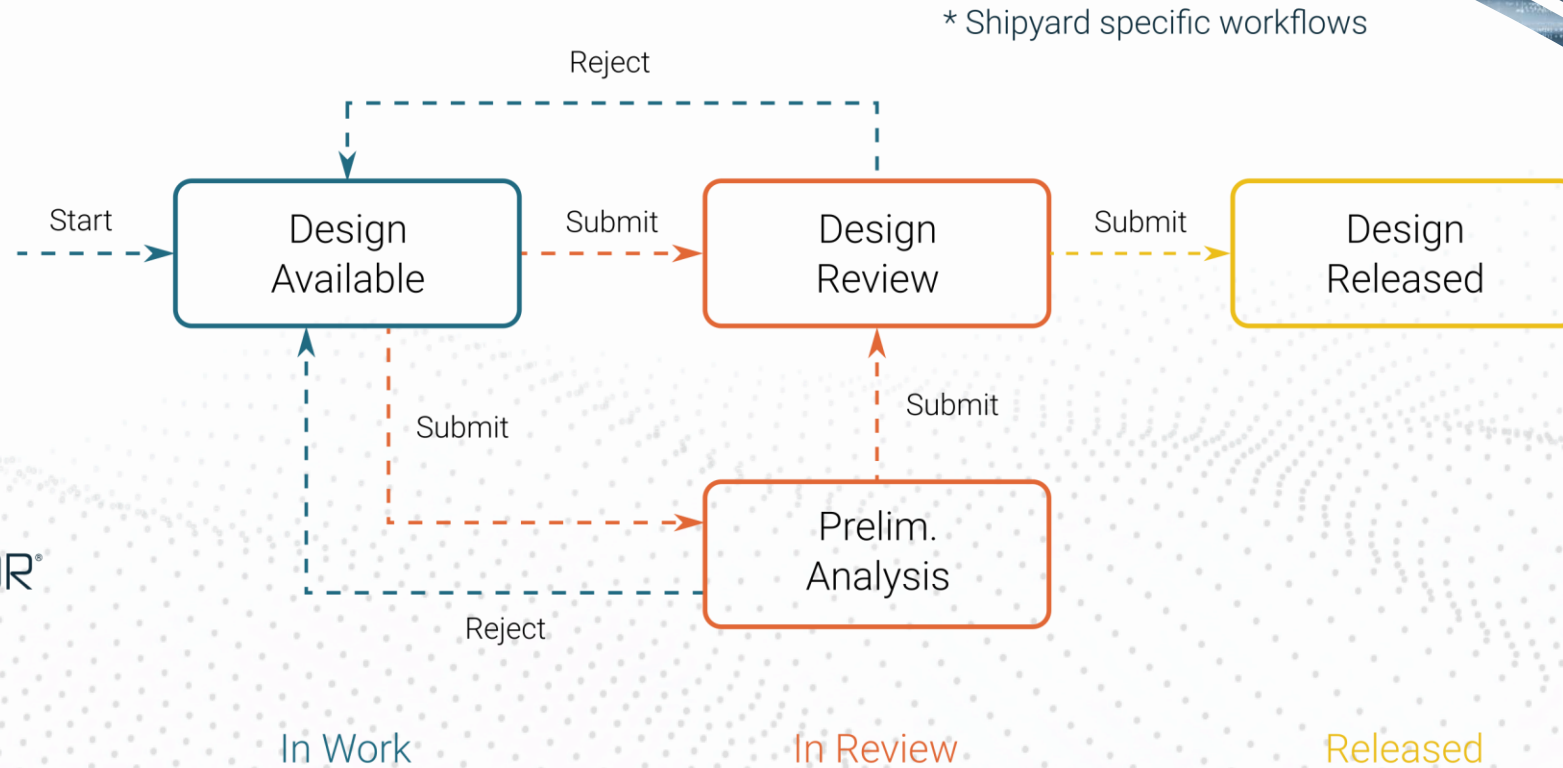
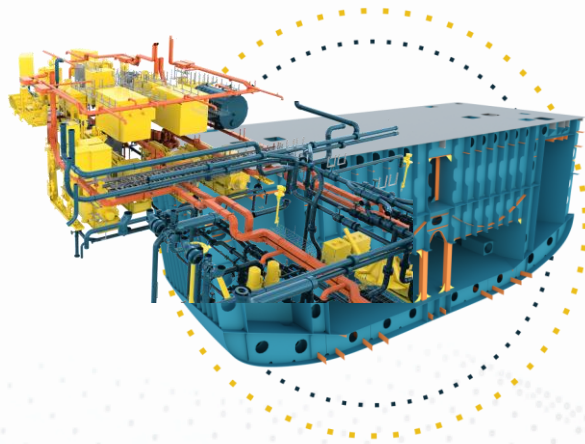
Initial / Concept Design

Basic / Functional Design

Detail Design & Production

MRO

Review and Release the Baseline



Initial / Concept Design

Basic / Functional Design

Detail Design & Production

MRO

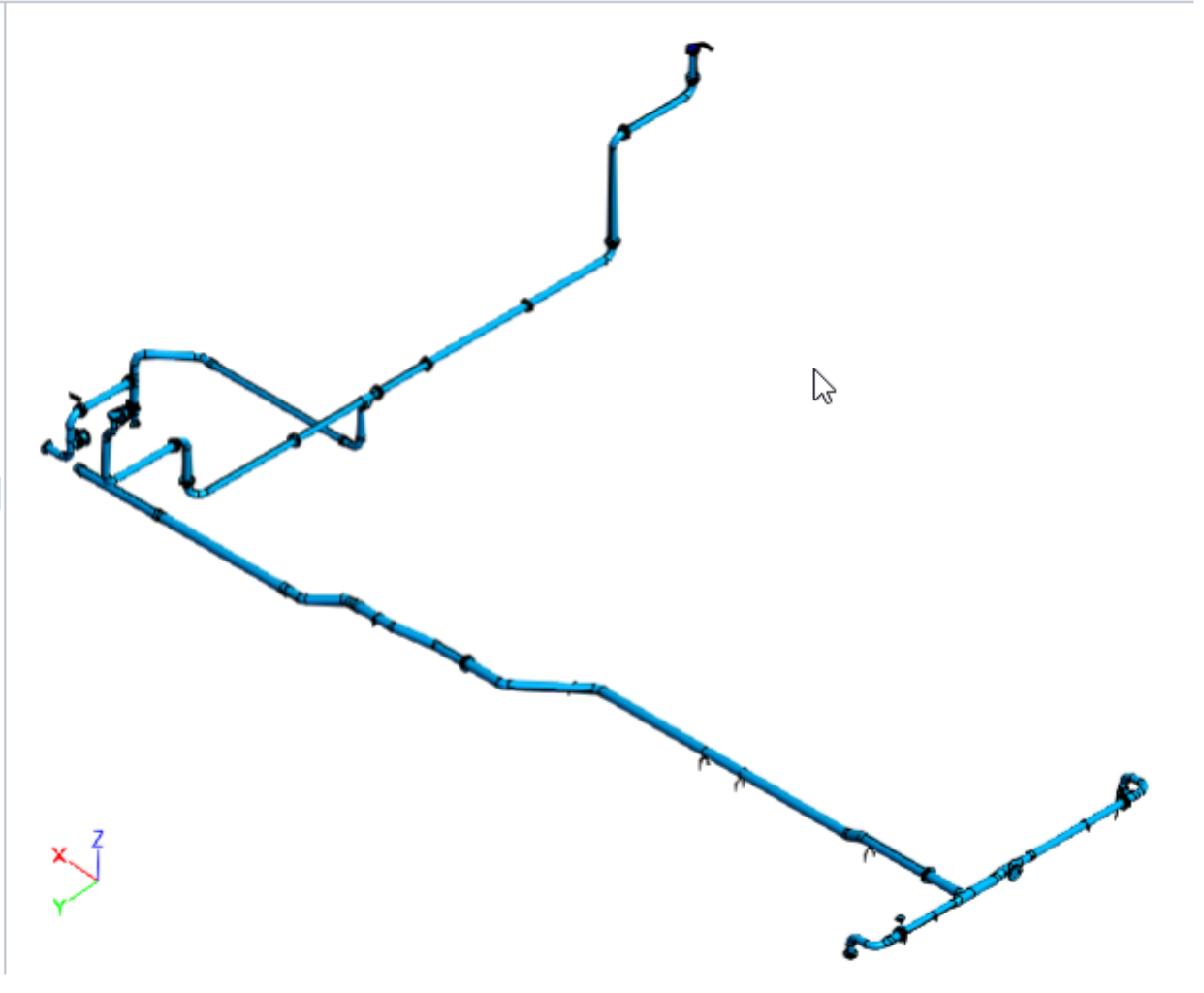
- Contents**
- Documents
 - CAD Documents
 - Documents
 - Functional Design
 - Compartments
 - Functional Parts
 - SWBS
 - Product Model
 - Blocks
 - Classes
 - Hulls
 - Model Drawings
 - Part Catalog
 - Parts
 - Plate Nests
 - Product Structures
 - Production Drawin...
 - Profile Nests
 - Change Management
 - BROs
 - DCOs

Product Structu... x SWBS x 533 - POTABLE ... x

533 - POTABLE WATER ☆

Model Views

	Part	State	DPN Status
<input checked="" type="checkbox"/>	533 - POTABLE...	Preliminary	
	312-FW-1	Preliminary	
<input checked="" type="checkbox"/>	312-FW-10	Preliminary	
	312-FW-10	Preliminary	
<input checked="" type="checkbox"/>	312-FW-11	Preliminary	
	312-FW-11	Preliminary	
<input checked="" type="checkbox"/>	312-FW-12	Preliminary	
<input checked="" type="checkbox"/>	312-FW-13	Preliminary	
<input checked="" type="checkbox"/>	312-FW-14	Preliminary	
<input checked="" type="checkbox"/>	312-FW-15	Preliminary	
<input checked="" type="checkbox"/>	312-FW-16	Released	
<input checked="" type="checkbox"/>	312-FW-17	Released	
<input checked="" type="checkbox"/>	312-FW-18	Preliminary	



312 x

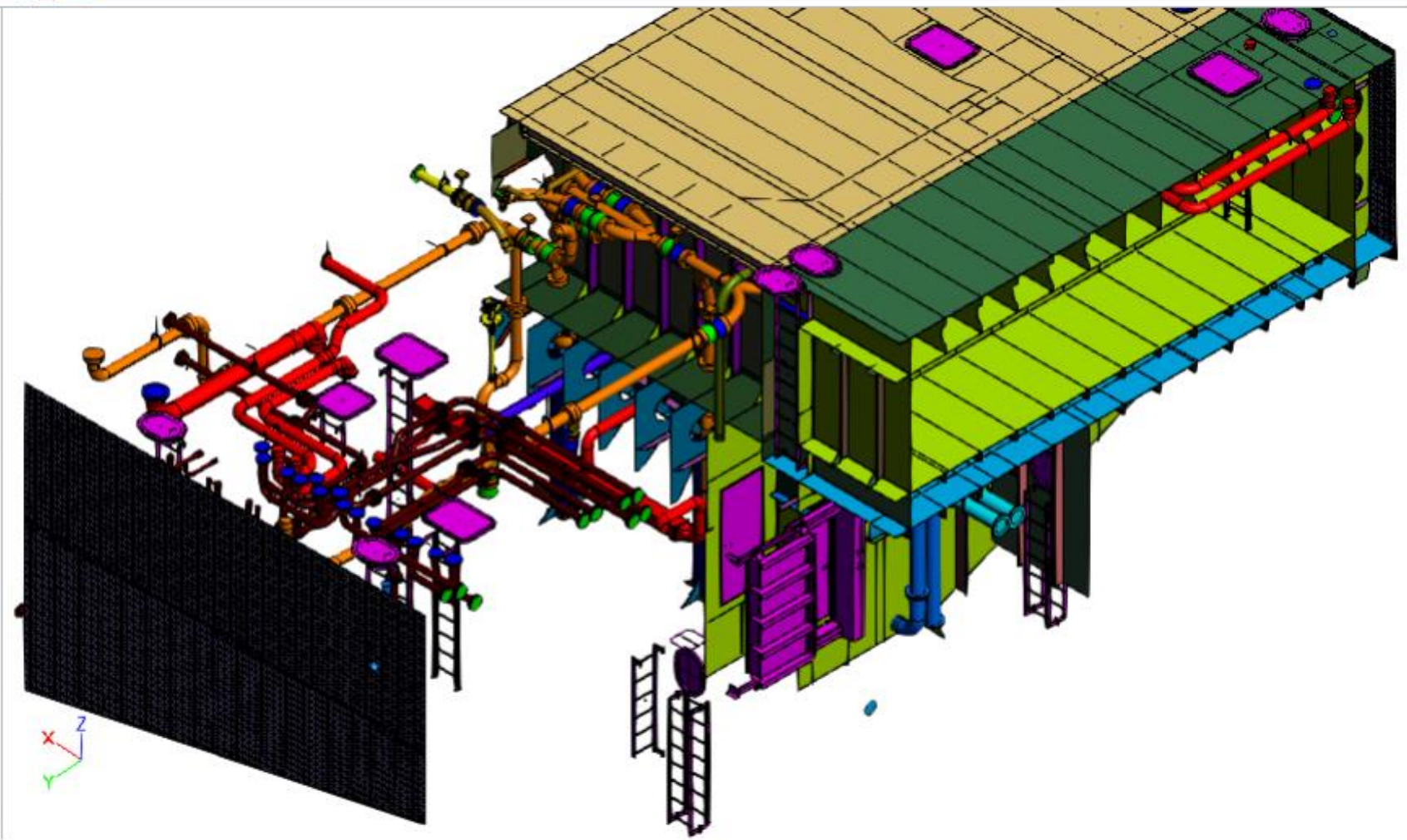
312 ☆

Edit [undo] [redo] [view] [delete] [share] [more]

[tools] [Default] [print]

Model Views

Part	State	Di
312	Preliminary	
Unassign...	Preliminary	
Unspooled...	Preliminary	
Unassign...	Preliminary	
Unassign...	Preliminary	
Unspooled...	Preliminary	
SHELL	Preliminary	
Unassign...	Preliminary	
Unassign...	Preliminary	
312P	Preliminary	
Unassign...	Preliminary	
Unassign...	Preliminary	
Unassign...	Preliminary	



311 x 311 x

311 ☆

Edit [Refresh] [Undo] [Redo] [Zoom In] [Zoom Out] [Home] [Share] [More]

[Layers] [Tools] [Default] [Export]

Model Views

[Refresh] [Isolate] [Add] [Hide] [Eye] | 2 [Undo] [Redo] [Close]

Part	State
<input checked="" type="checkbox"/> Unassigned Equipment	Preliminary
<input checked="" type="checkbox"/> FG.tabu45du	Released
<input checked="" type="checkbox"/> 700LADDER	Released
<input checked="" type="checkbox"/> Drill Cutting Feeder 207	Preliminary
<input checked="" type="checkbox"/> 20FG650	Released
<input checked="" type="checkbox"/> FG.tabu45du	Released
<input checked="" type="checkbox"/> 850LADDER	Released
<input checked="" type="checkbox"/> FG.tabu45du	Released
<input checked="" type="checkbox"/> 20FG650	Released
<input checked="" type="checkbox"/> 400X600RKG.B	Released
<input checked="" type="checkbox"/> 20FG650	Released
<input checked="" type="checkbox"/> 400X600RKG.B	Released
<input checked="" type="checkbox"/> 20FG650	Released



ShipbuildingPLM Production Design Digital Thread

The image displays four screenshots from the aras INNOVATOR software interface, illustrating the digital thread in shipbuilding PLM. The screenshots are interconnected by arrows, showing the flow of information between different views and data points.

Top Left Screenshot: Shows a 3D model of a ship hull section. The left sidebar lists various parts, including 312-D2L04-D1P021C, 312-D2L04-D1P025S, 312-D2L04-D1P020C, 312-D2L04-D1P019C, 312-D2L04-D1S016C, 312-D2L04-D1S012C, 312-D2L04-D1S014C, 312-D2L04-D1F003C, and 312-D2L04-D1S015C.

Top Right Screenshot: Shows the assembly data for D2L04-D1. The data includes:

- Name:** D2L04-D1
- Type:** SSI/Assembly
- Part Count:** 13
- Weight:** 1398.169
- Rank:** STAGE4
- CG (LCG, TCG, VCG):** (21080, -62, 4699)
- Full Assembly Name:** MILLENNIUMFALCON

Middle Screenshot: Shows the part detail view for 312-D2L04-D1P021C. The data includes:

- Name:** 312-D2L04-D1P021C
- Piece Type:** Plate
- Stock Name:** PL15
- Weight:** 157.782
- CG (LCG, TCG, VCG):** (22408, 0, 4517)
- Full Assembly Name:** MILLENNIUMFALCON3123125D3M02-D2/D2L04-D1
- Last Auto Update:** [Blank]

Bottom Left Screenshot: Shows the plate stock management screen for 312_PL15-001. The data includes:

- Plate Stock Name:** PL15
- NCMachine Name:** NULL
- Heat Number:** [Blank]
- Nest Status:** Created
- Nest Stock Utilization:** 44.1300684
- Nest Date:** 6/22/2020
- Export Date:** [Blank]
- Area All Parts:** 8828013.2800

Bottom Right Screenshot: Shows a table of CAD Documents and Production Documentation. The table has columns for Name, Type, Product Structure, Revision, Generation, State, and ShipConstructor GUID.

Name	Type	Product Structure	Revision	Generation	State	ShipConstructor GUID
D2L04-D1	Assembly	PRIMARY	B	2	Preliminary	fe36b28f-5f4-4cb2-b102-8103b78d4c60
D3M02-D2	Assembly	PRIMARY	B	2	Preliminary	a63b3081-600a-4777-a1ca-140ee624e105
312S	Assembly	PRIMARY	B	2	Preliminary	288a500d-3aba-4c14-a1f0-00470ac546fe

N01-C1 x

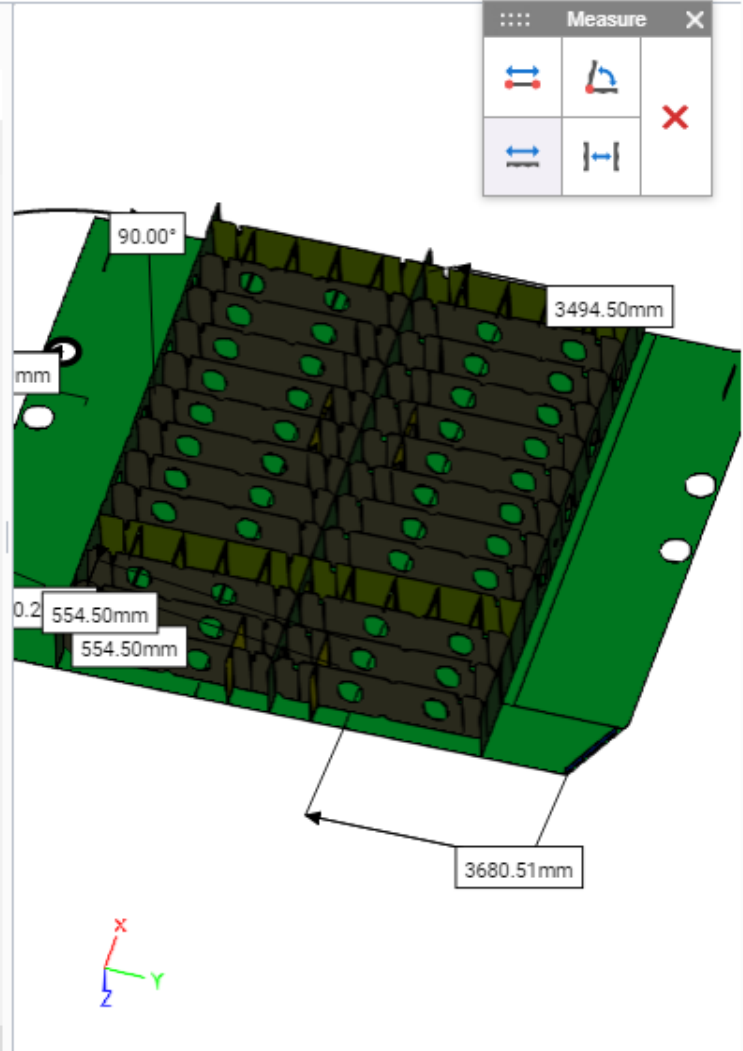
N01 x 321-N01-C1-N01-C1 x

N01-C1 ☆

321-N01-C1-N01-C1 ☆

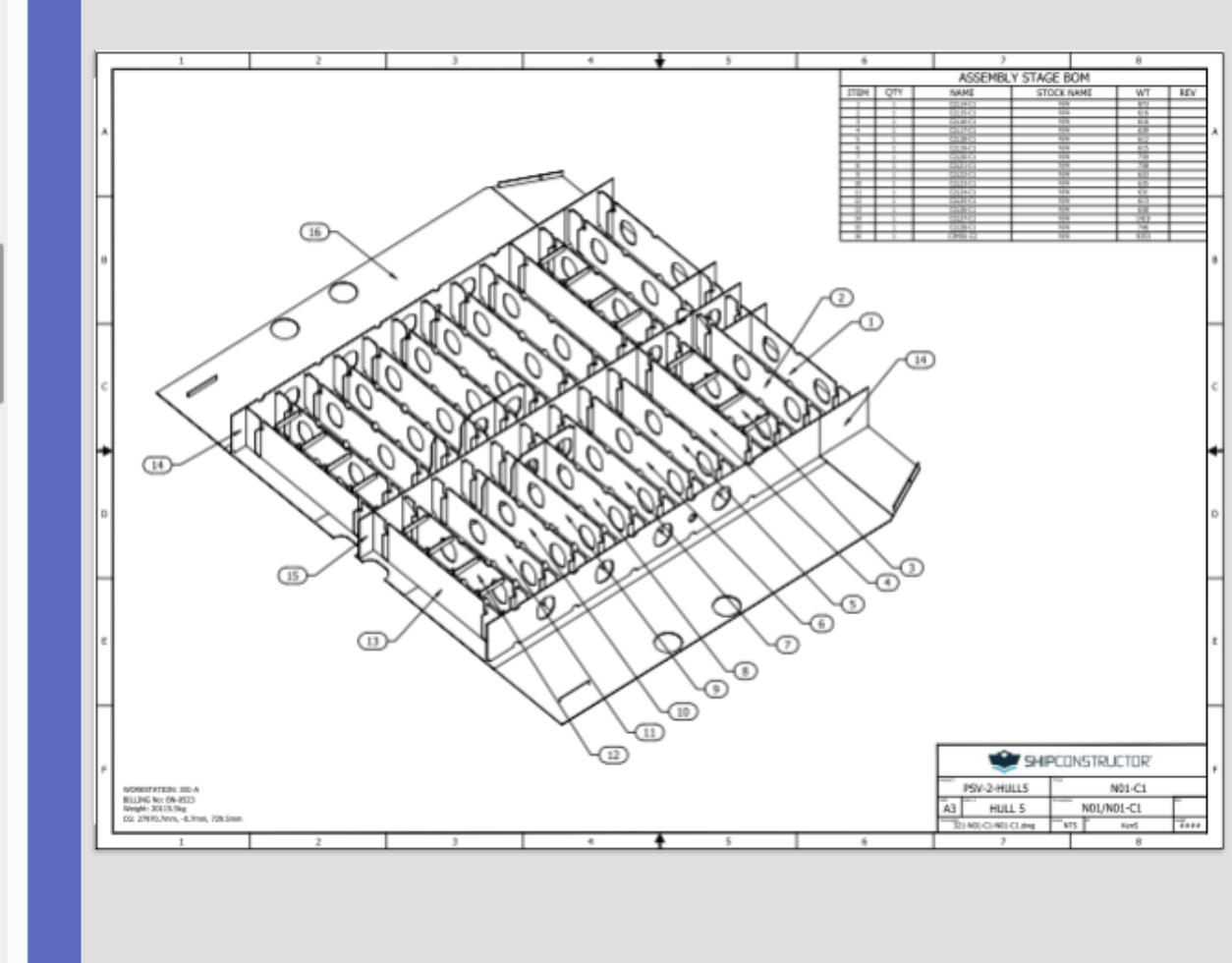
/ 1

- Model Views
- SS1_View3D_Part2
- N01-C1
 - C2L16-C1
 - 321-C2L16-C1P025P
 - 321-C2L16-C1P025S
 - 321-C2L16-C1S011P
 - 321-C2L16-C1S011S
 - 321-C2L16-C1S012S
 - 321-C2L16-C1S012P
 - C3M01-C2
 - C2L21-C1
 - C2L17-C1
 - C2L25-C1
 - C2L24-C1
 - C2L15-C1
 - C2L27-C1
 - C2L22-C1



Measure

/ 1

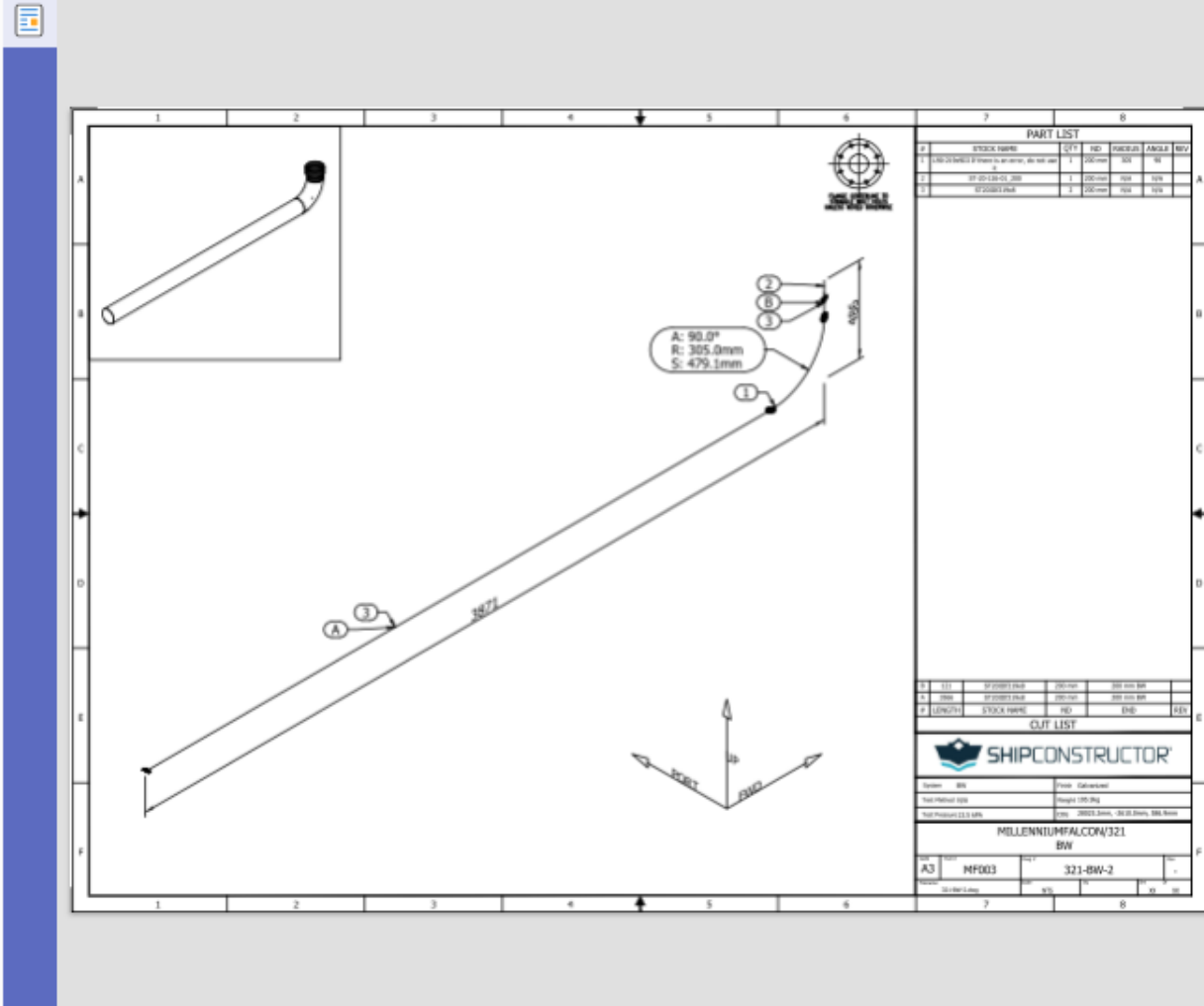
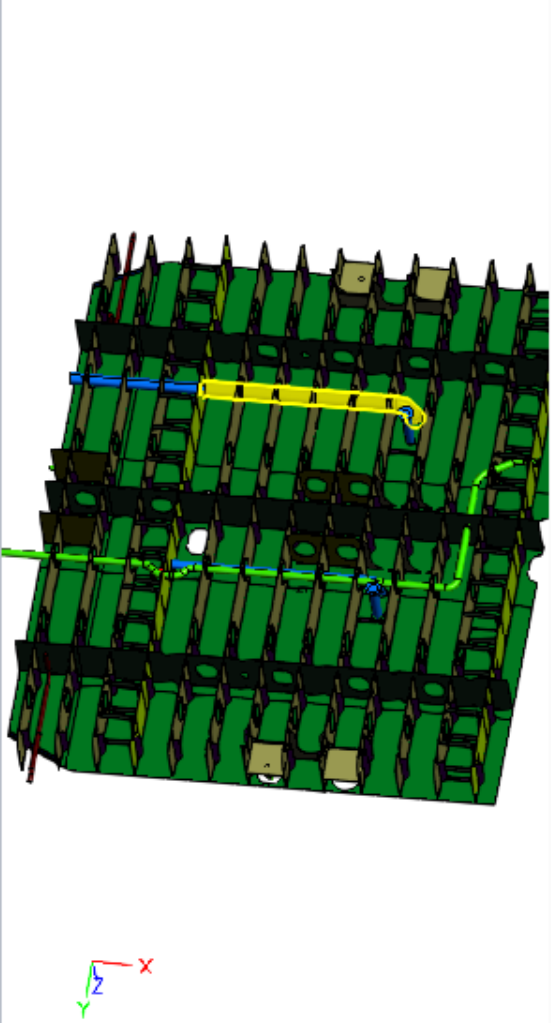




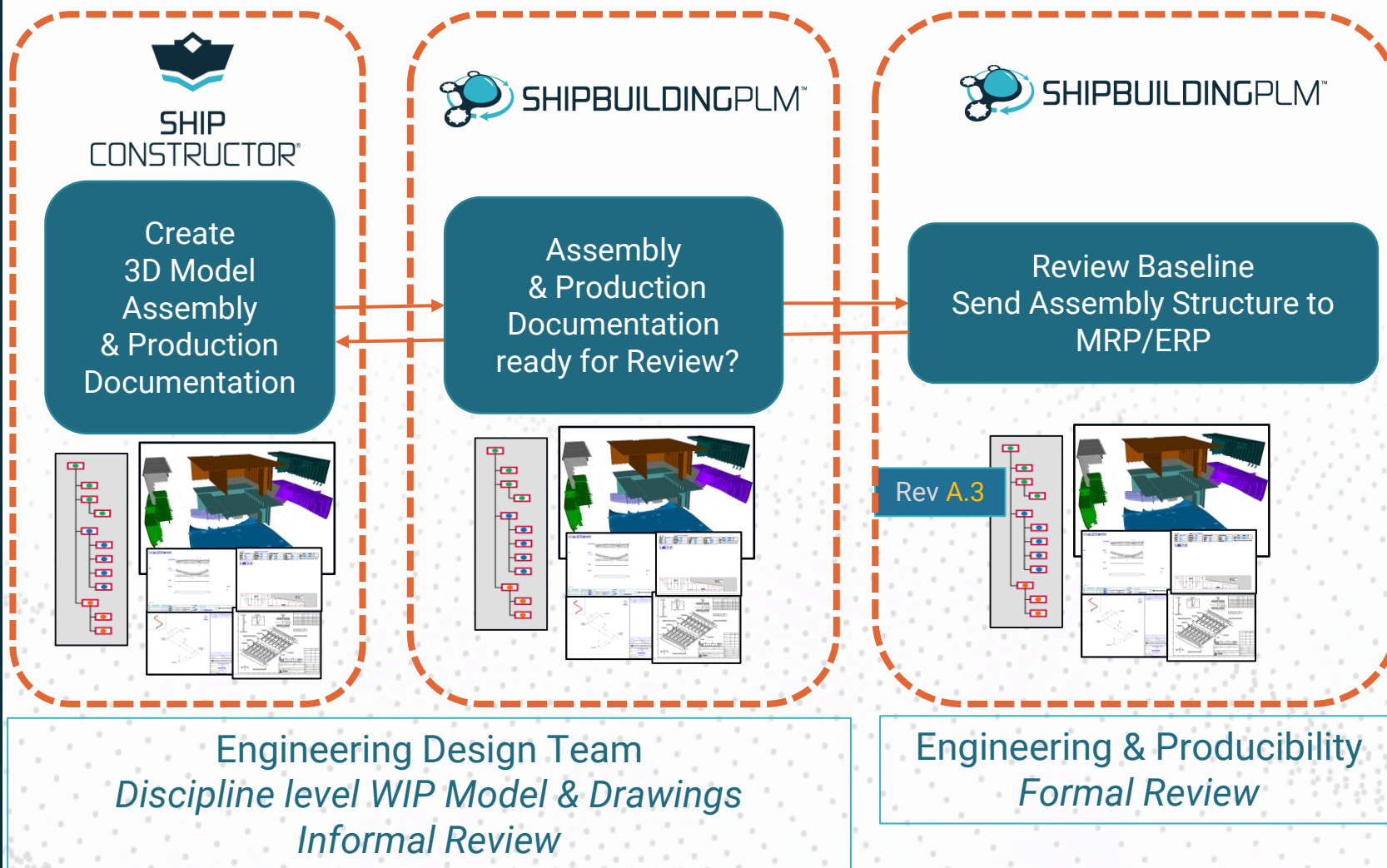
Model Views



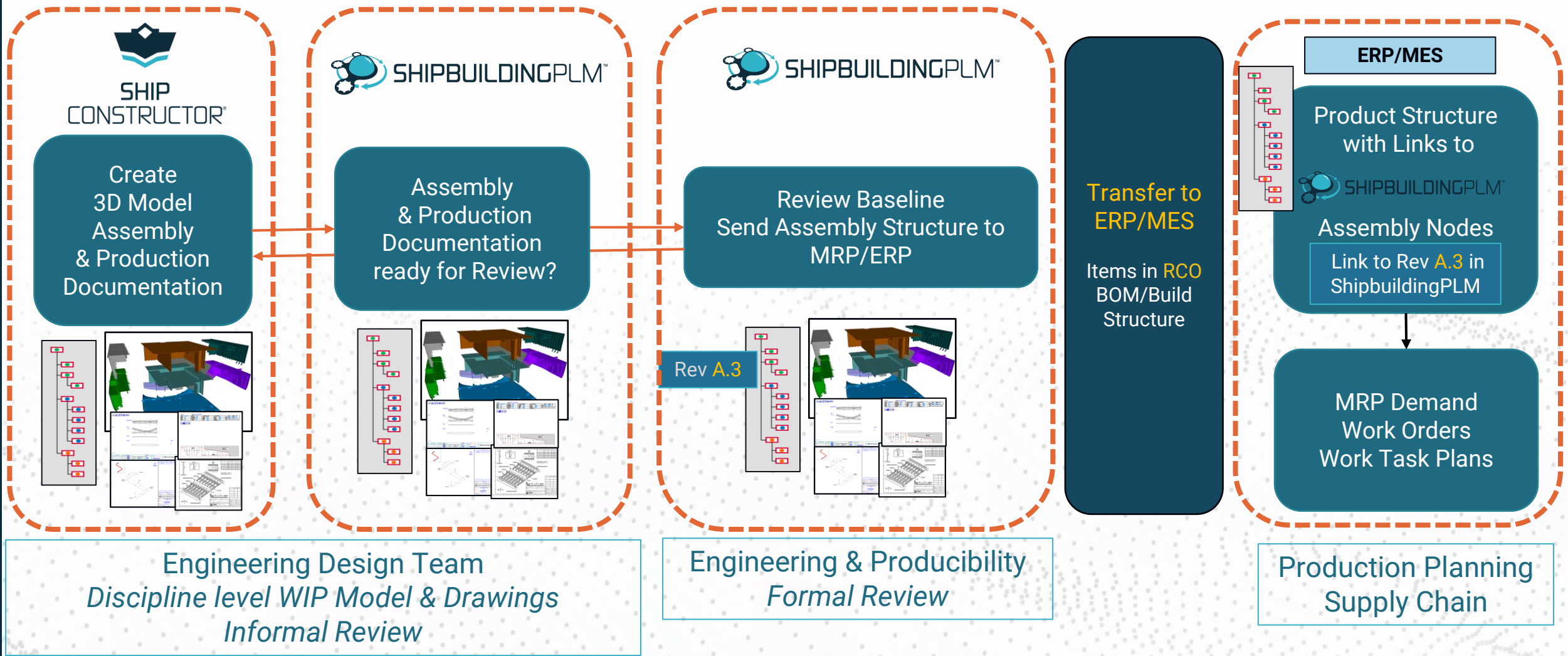
- | SSI_View3D_Part2 | State |
|------------------|----------|
| -Static-94 | Released |
| -Static-90 | Released |
| -Static-96 | Released |
| 321-BW-1 | Released |
| 321-BL-1 | Released |
| 321-BW-5 | Released |
| 321-BL-3 | Released |
| 321-BW-9 | Released |
| 321-BW-3 | Released |
| 321-BW-2 | Released |
| 321-BW-15 | Released |
| 321-BW-12 | Released |
| 321-BW-27 | Released |
| A305 | Released |
| 321-BL-5 | Released |
| 321-BL-9 | Released |



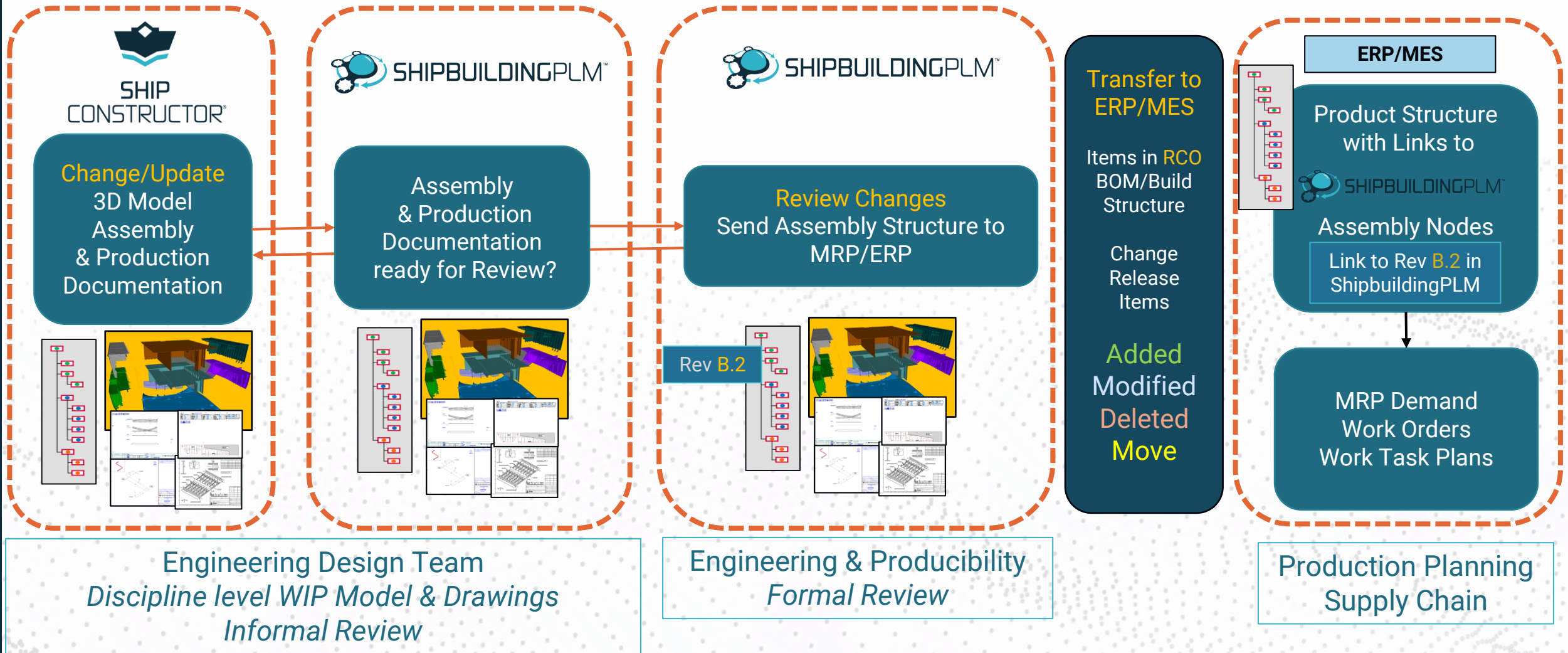
Downstream integration with Production Planning



Downstream integration with Production Planning



Downstream integration with Production Planning



SSI RCO

Created By: Innovator Admin
 Created On: 2022-10-18 09:45:39
 Modified By: Innovator Admin
 Modified On: 2022-10-18 11:00:51
 Locked By:
 Major Rev: 1
 Generation: 1
 State: Released

Number RCO-000008 **Title** Change to Spool outfitting

Description
 Change to Spool outfitting

Hull [HULL5](#) **Team** [SSI Reference Hull Team](#) **Top Level Assembly** [N01](#)

Model Views

SSI_View3D_Part2

- C2L08-C1
- C2L04-C1
- C2L03-C1
- C2L07-C1
- C2L06-C1
- C2L05-C1
- C2L12-C1
- C2L11-C1
- N01-C1
- C2L13-C1
- C2L10-C1
- C2L02-C1
- Outfit
- C2L09-C1
- 321-BW-4
- 321-BW-11

Affected Items

	Classification	Action	Old Numbe...	Old R...	Old G...	New Numbe...	New R...	New Ge...
	SSI/Assembly	Change	N01	A	1	N01	B	2
	SSI/Assembly	Change	Outfit	A	1	Outfit	B	2
	SSI/Spool	Move	321-BW-4	A	2	321-BW-4	A	2
	SSI/Spool	Move	321-BW-11	A	2	321-BW-11	A	2
	Assembly	Add				321-N01-N01	A	2
	Assembly	Add				321-C2L45-C...	A	1

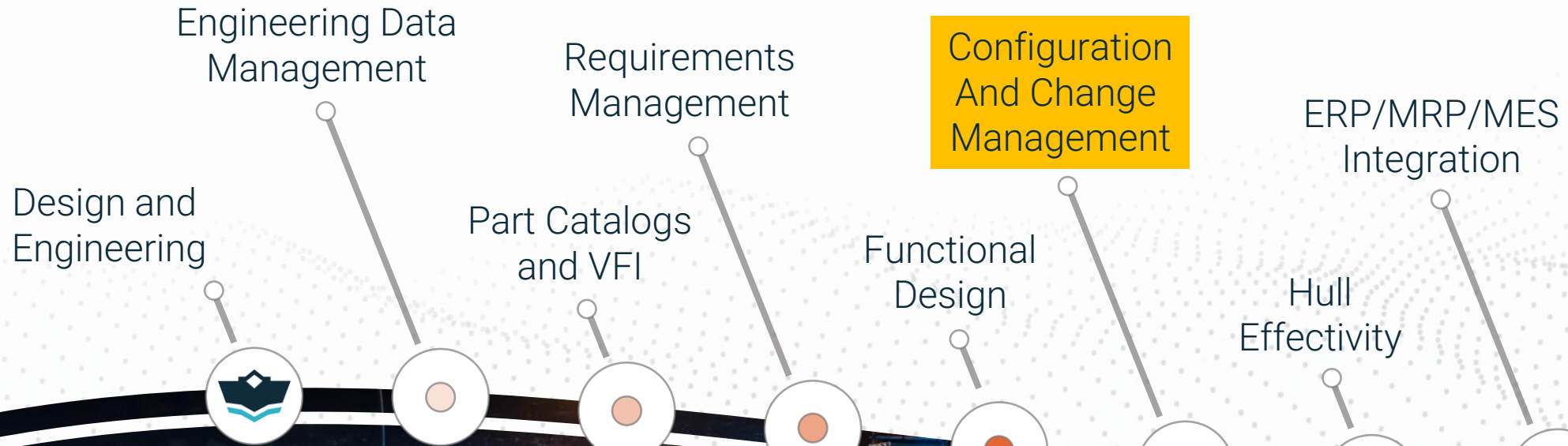
Shipyard integration is a key requirement

- Shipyards can often have a legacy culture of isolated departments, generating resistance to multi-discipline collaboration and integration.
- An experienced workforce can show resistance to change, preferring new systems to adapt to current processes (e.g. drawing centric), rather than investigating new processes with improved efficiency (e.g. 3D Model, part centric).
- A younger workforce can embrace new technologies faster (VR, AR, AI) but often still needs to “learn shipbuilding”, a steep learning curve.

Improved collaboration across shipyard disciplines is a key requirement for shipbuilders to address accelerated delivery schedules.



A PLM Implementation for Shipbuilders



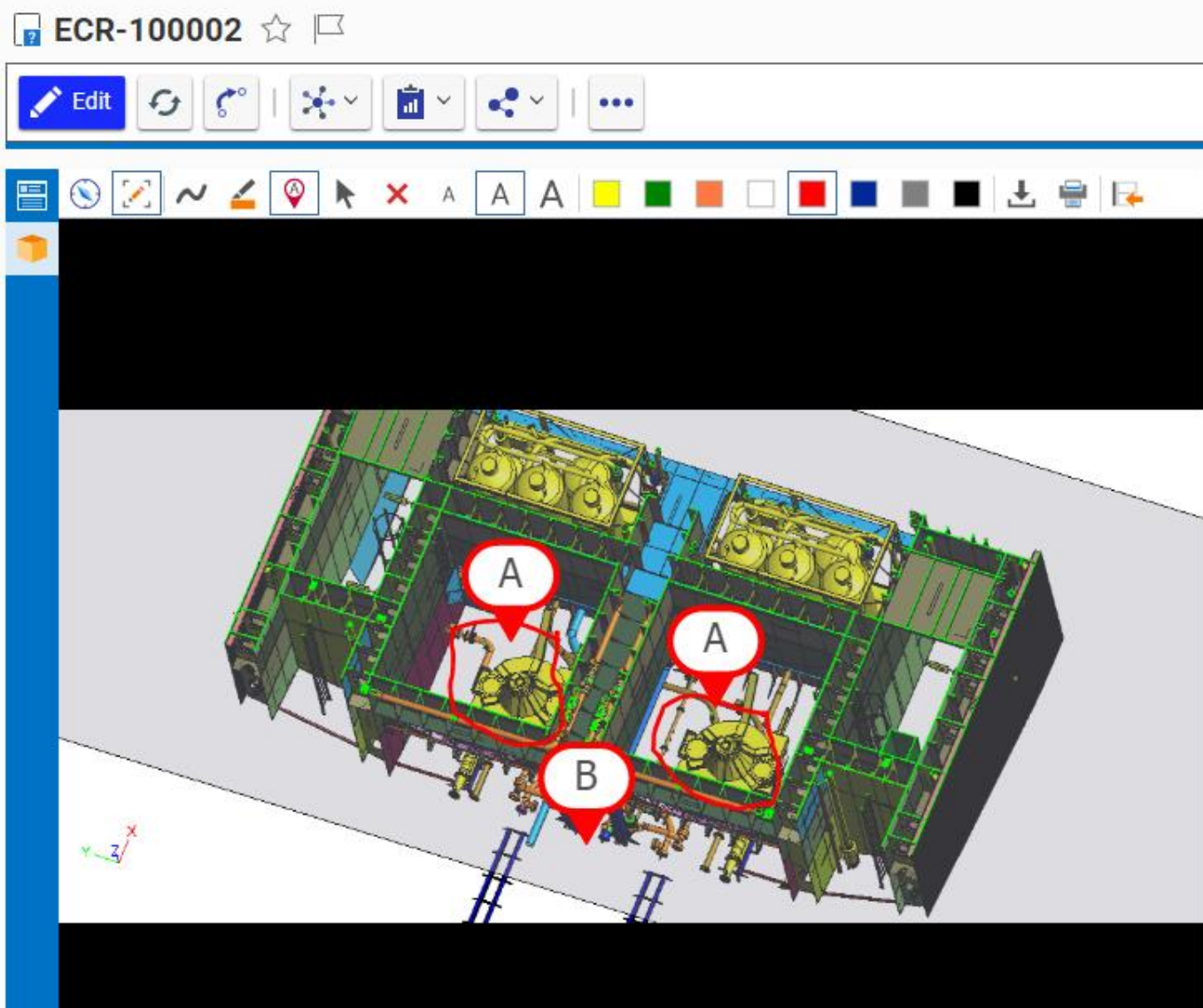
Change Management

Understanding Engineering Change



SHIPBUILDINGPLM™

- Contents**
- > Administration
 - ▼ Change Management
 - BROs
 - DCOs
 - Deviations
 - ECNs
 - ECOs
 - ECRs
 - EDRs
 - PRs
 - Rework Orders
 - SSI ECOs
 - Waivers
 - ▼ Design
 - Blocks
 - Classes
 - Drawings
 - Hulls
 - Parts



Discussion Search messages... 🔍

Enter a comment...
Use @ to mention people

Include snapshot

Innovator Admin Today at 6:35 AM ECR-100002 A - New

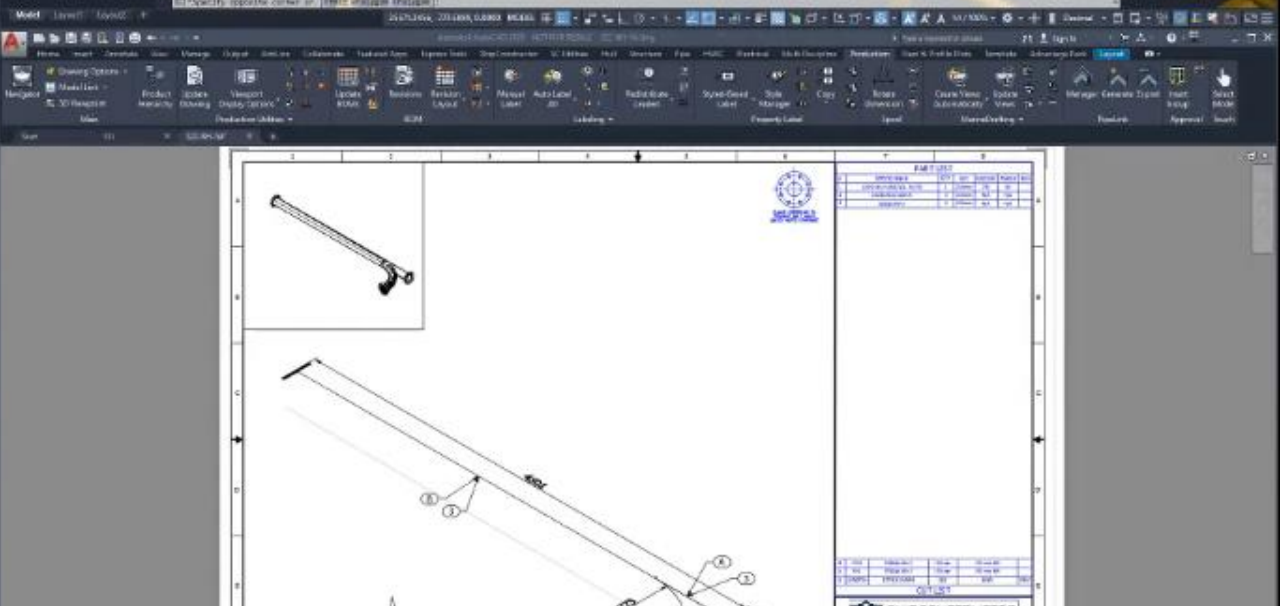
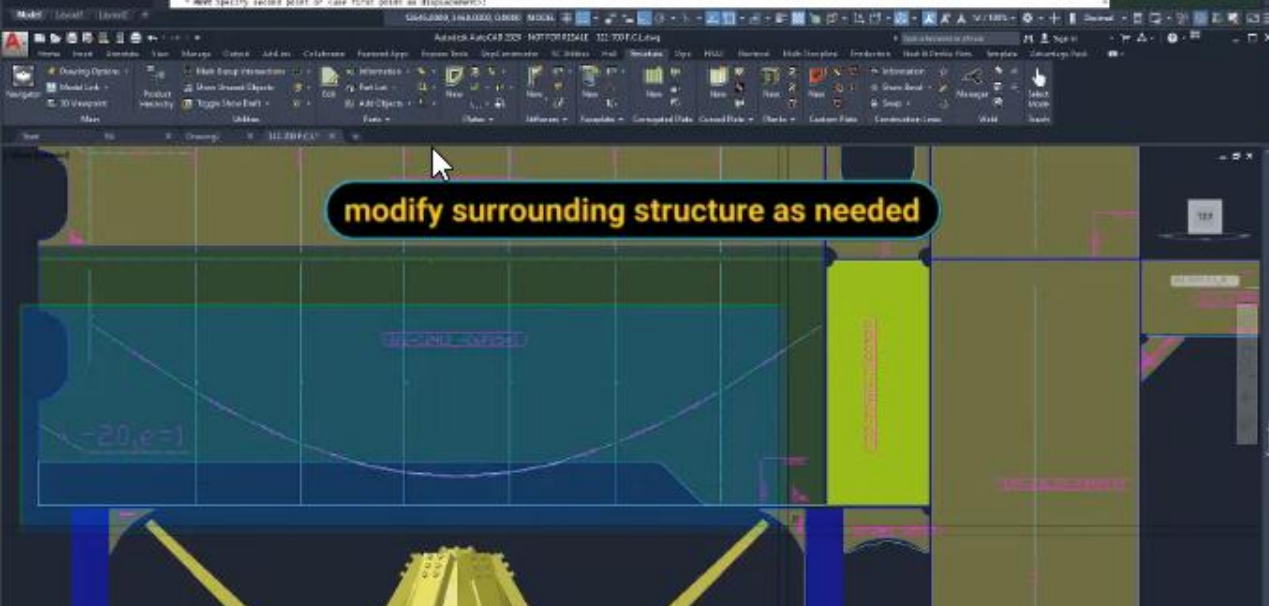
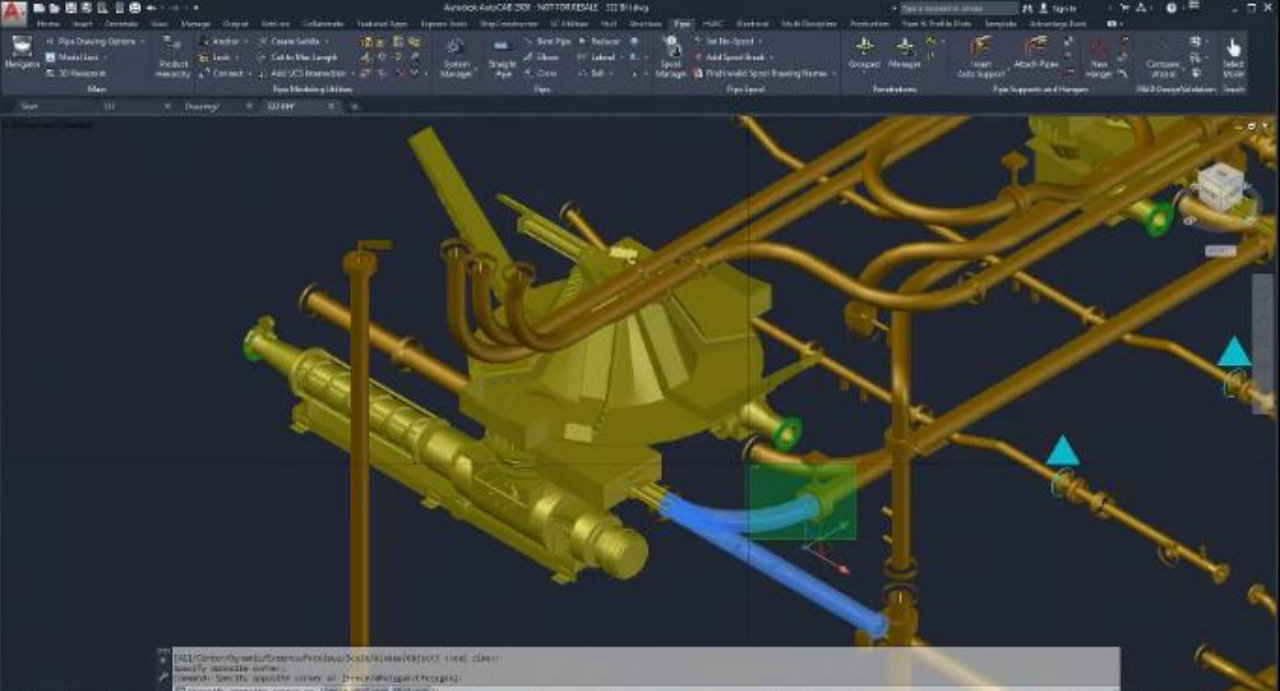
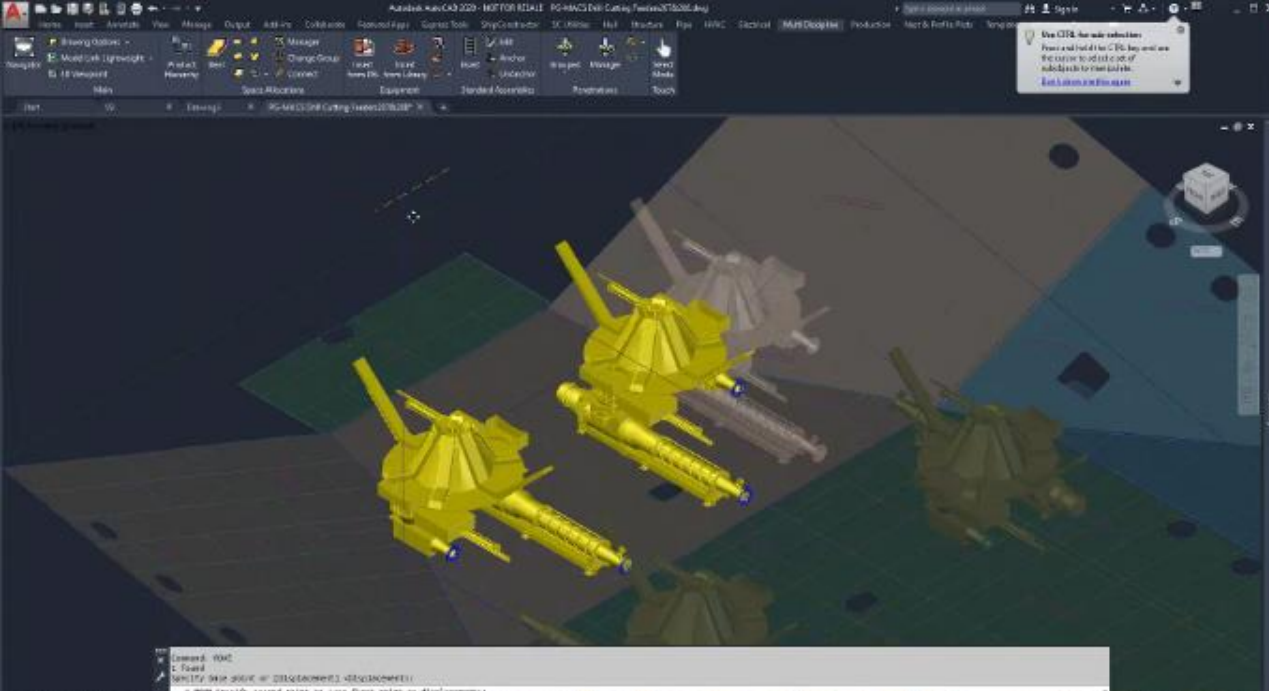
(A) - Pipe move drill feeders inboard 300mm update pipe systems and spool drawings

(B) structure make changes to assemblies and update production drawings including any updated nests arrangements and request CNC output to be updated

[Less](#)



[Flag](#) | [Edit](#) [Reply](#) [Erase](#)



Executing Change in ShipConstructor

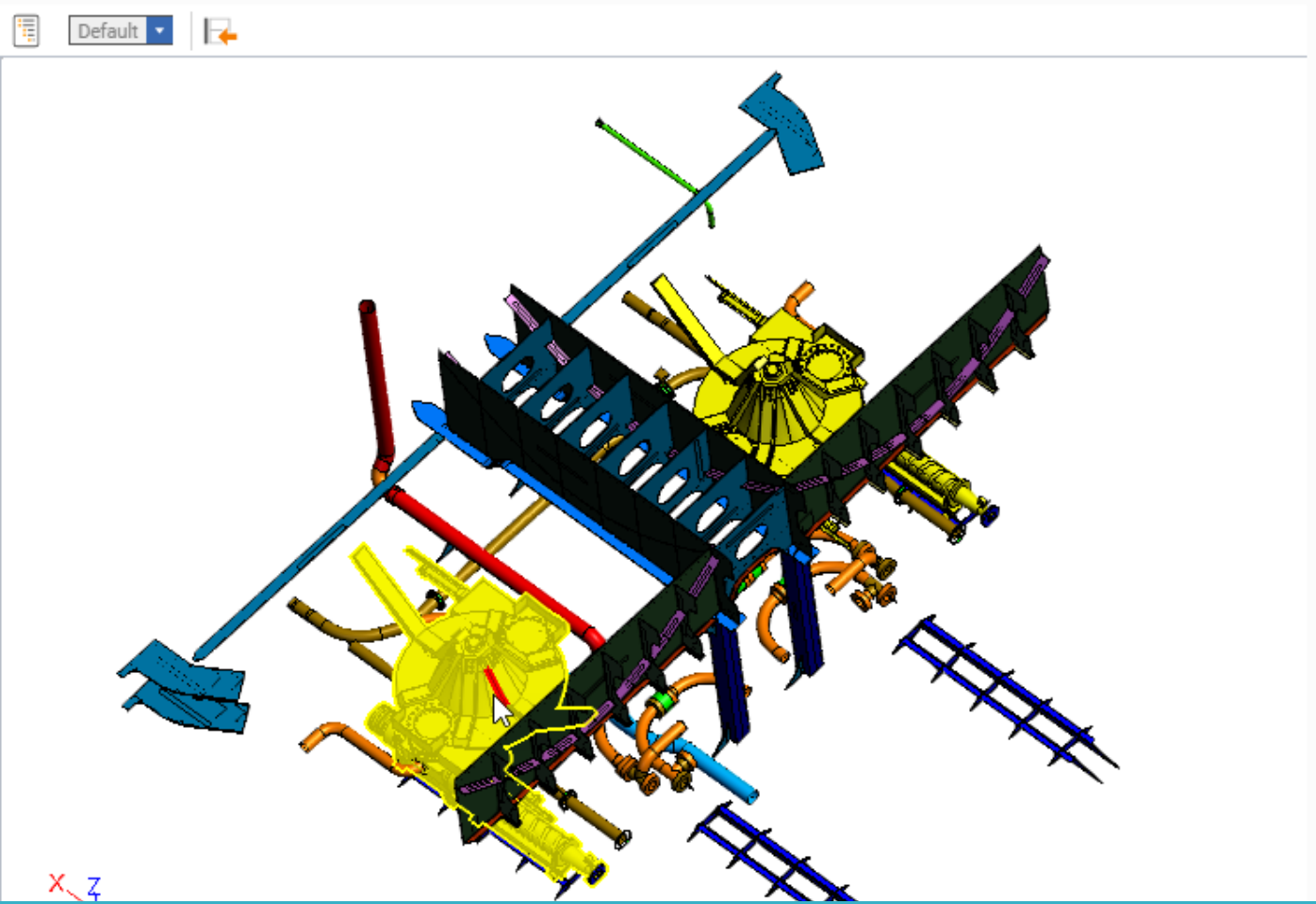


- Administration
- Change Management
 - BROs
 - DCOs
 - Deviations
 - ECNs
 - ECOs
 - ECRs
 - EDRs
 - PRs
 - Rework Orders
 - SSI ECOs
 - Waivers
- Design
 - Blocks
 - Classes
 - Drawings
 - Hulls
 - Parts

Delta-00044 ☆ □

Edit ↻ ↺ | ↻ | 🗑️ | 🔄 | ⋮

- Model Views
- SSI_View3D_Delta
- Drill Cutting Feeder 205
 - 322-T S098S
 - 322-C2M12 -C2P210S
 - A319
 - 322-MA-92
 - A3197
 - 322-MA-20
 - A3058
 - BKT300X10
 - A1922
 - A3191
 - BTK350X400X15R50



- Contents
- Design
 - Blocks
 - Classes
 - Drawings
 - Hulls
 - Parts
 - Plate Nests
 - Product Structures
 - Profile Nests
- Documents
 - 3D CAD Model Dra...
 - CAD Documents
 - Documents
- Extended Classification
- My Innovator
 - Extended Property ...
 - My Discussions
 - My InBasket
 - My Reports

Delta-00044 ☆

Edit

Affected Items

Affected Items ☆

Hidden

Type	Classification	Action	Old Number [...]	Old Rev...	Old Gen...	Interchang...	New Number ...	New Re...	New Ge...	In Build
	Assembly	Change	322-322S-322S	A	1	<input type="checkbox"/>	322-322S-322S	B	2	
	Spool	Change	322-MA-17	A	1	<input type="checkbox"/>	322-MA-17	B	2	
	Spool	Change	322-BL-1	A	1	<input type="checkbox"/>	322-BL-1	B	2	
	Spool	Change	322-MA-12	A	1	<input type="checkbox"/>	322-MA-12	B	2	
	Spool	Change	322-VT-2	A	1	<input type="checkbox"/>	322-VT-2	B	2	
	Profile Plot	Add				<input type="checkbox"/>	322_FB300x15	A	1	
	Spool	Change	322-MA-15	A	1	<input type="checkbox"/>	322-MA-15	B	2	
	Assembly	Change	322-C2M12_-...	A	1	<input type="checkbox"/>	322-C2M12_-...	B	2	
	Spool	Change	322-3450 A.BL	A	1	<input type="checkbox"/>	322-3450 A.BL	B	2	
	Spool	Change	322-MA-13	A	1	<input type="checkbox"/>	322-MA-13	B	2	
	Spool	Change	322 BH	A	1	<input type="checkbox"/>	322 BH	B	2	

312 x Blocks x 312S x

312S ☆

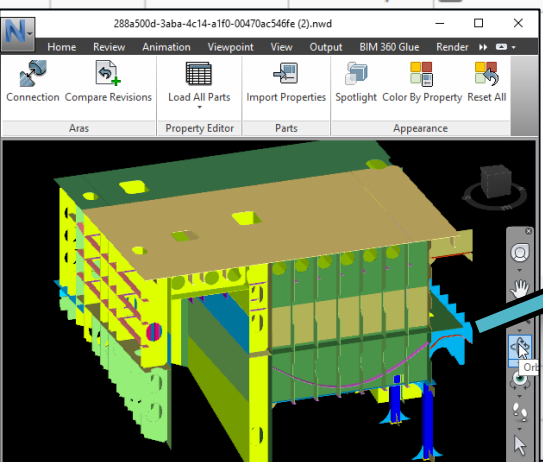
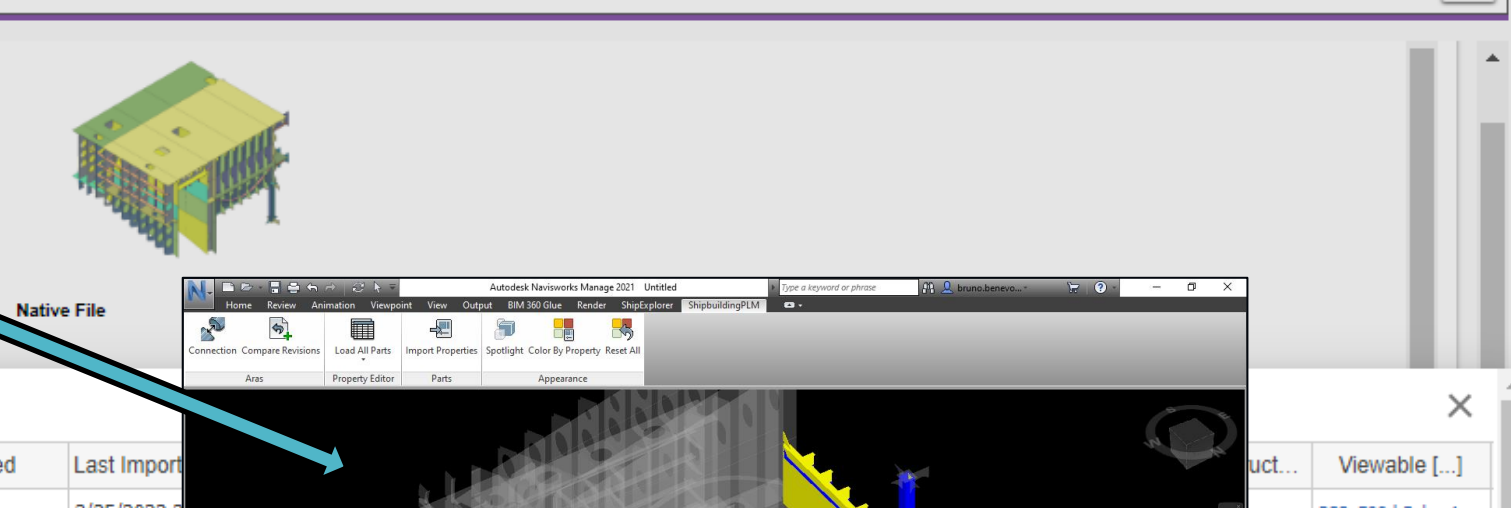
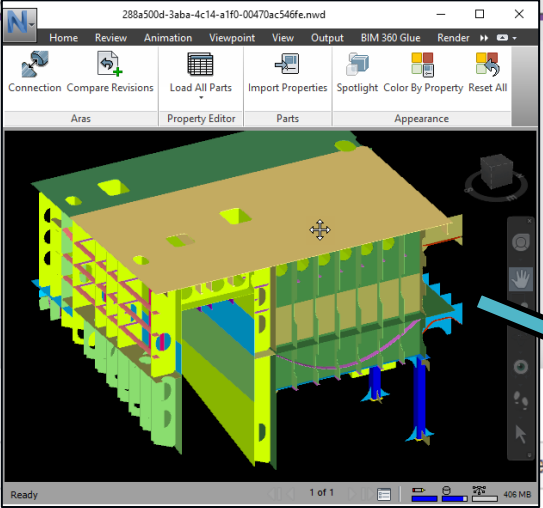
SSI/Assembly

Created By: SSI Connector
 Created On: 2022-03-25 02:11:24
 Modified By: SSI Connector
 Modified On: 2022-03-31 04:29:04
 Locked By:
 Major Rev: B
 Release Date:
 Effective Date:

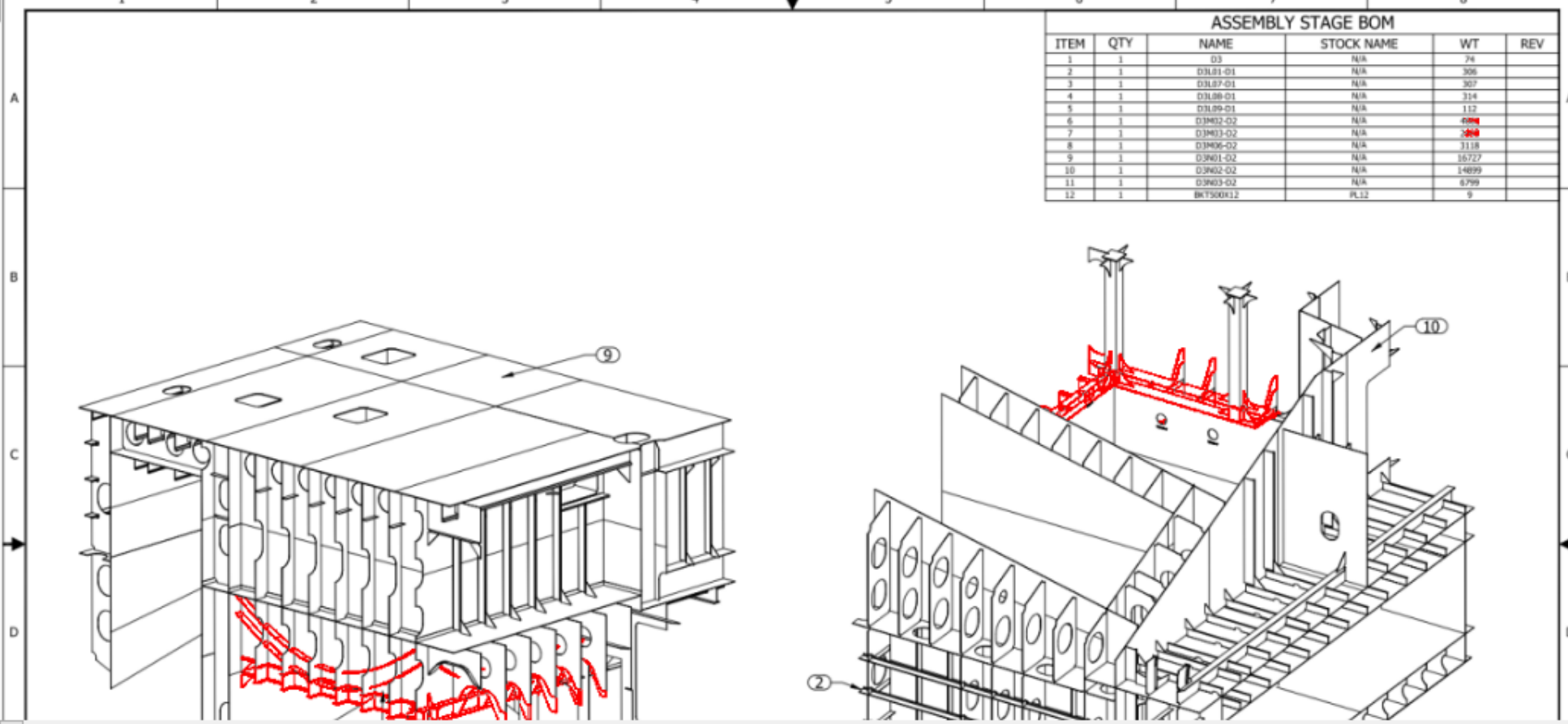
Item versions

Name	Type	Version	Status	Last Import
312S	Assembly	A	In Change	3/25/2022 2...
312S	Assembly	B	Preliminary	3/31/2022 4...

D3L01-D1
D3N02-D2



Released	<input type="checkbox"/>	3/25/2022 2...	PRIMARY	aa2ae8c...	aa2ae8ca-2f66-467...
Preliminary	<input type="checkbox"/>	3/31/2022 4...	PRIMARY	29b4ab0...	29b4ab04-9003-43...



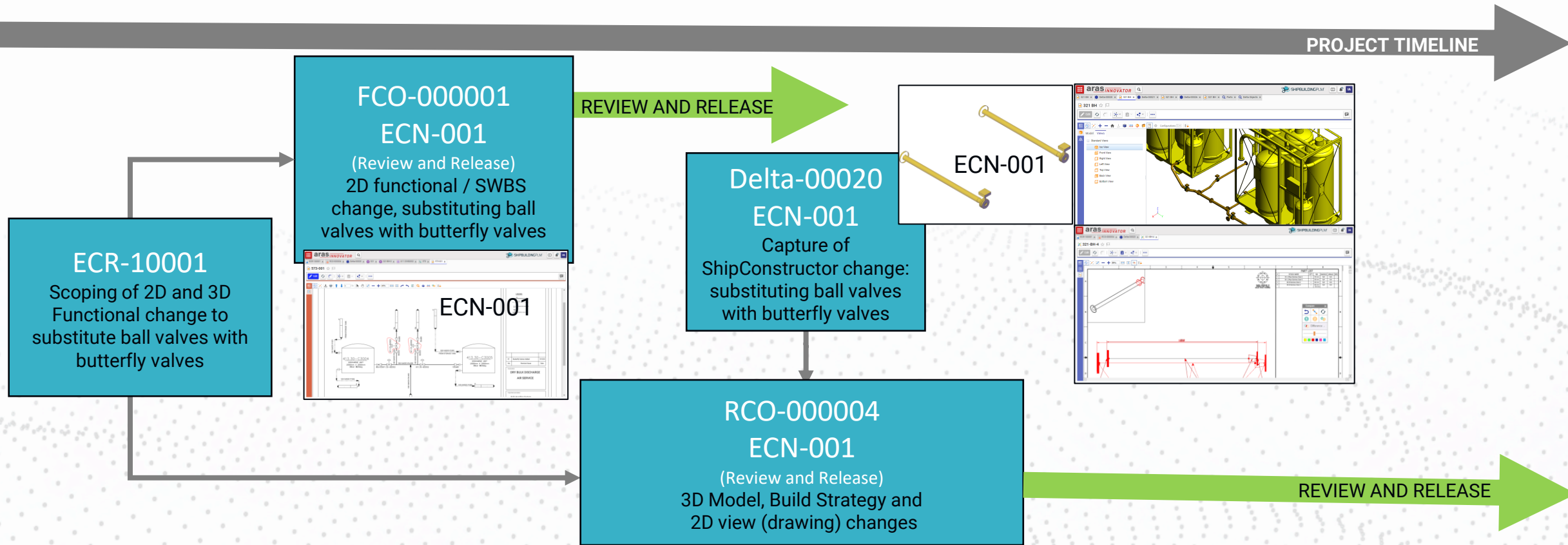
Comparison tool interface with options for undo, redo, and comparison modes (1, 2, 1/2). Includes a 'Difference' dropdown and a color selection palette.

Functional and Detail Design Change



Story: All valves in the Cargo Handling System (SWBS 573) for Hull 2 and beyond must be actuated

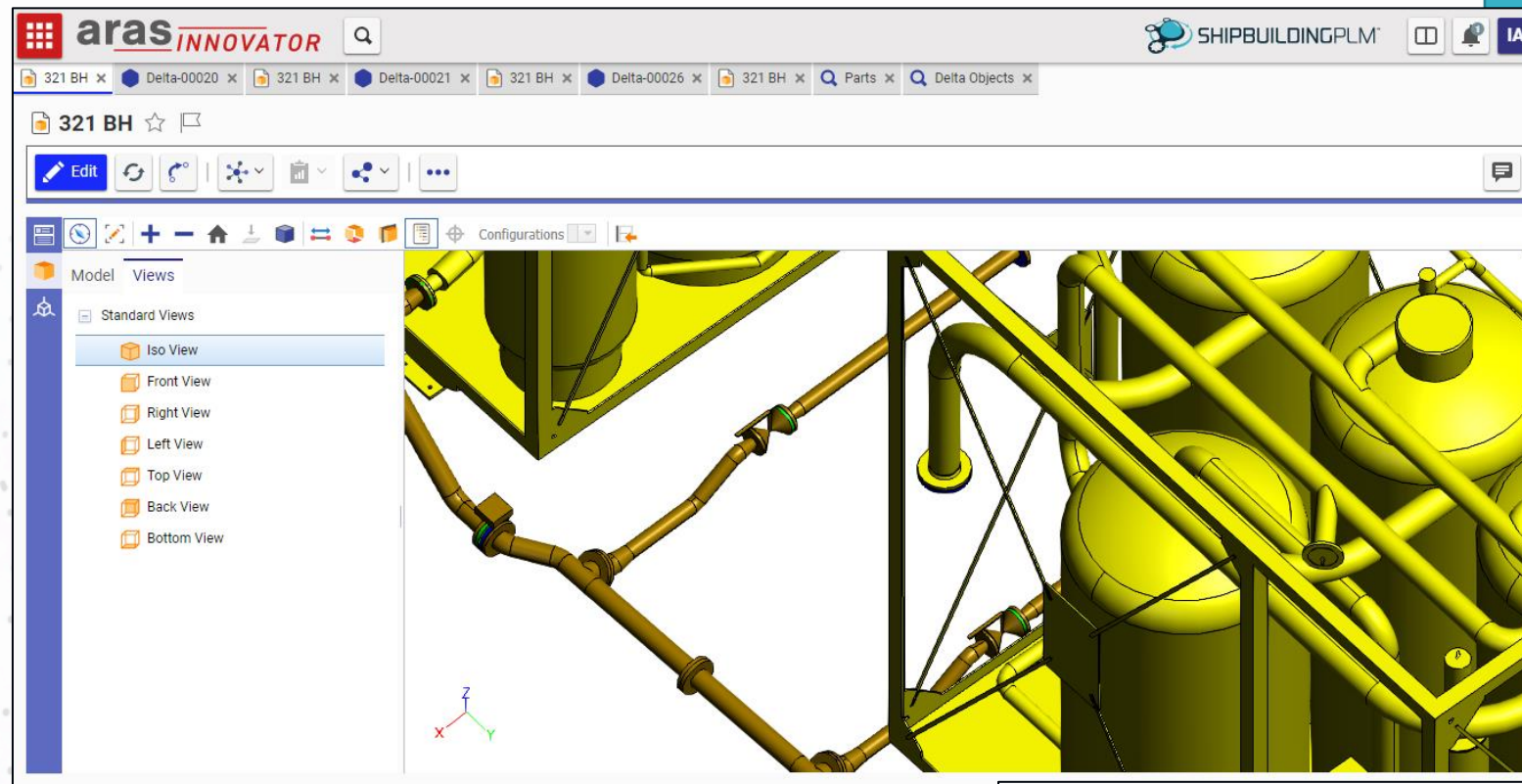
Functional and Detail Design Change



Multi-Hull Change Traceability



Hull 1
Delivered



Hull 1 System 573 3D Model
Original Ball Valves

Multi-Hull Change Traceability



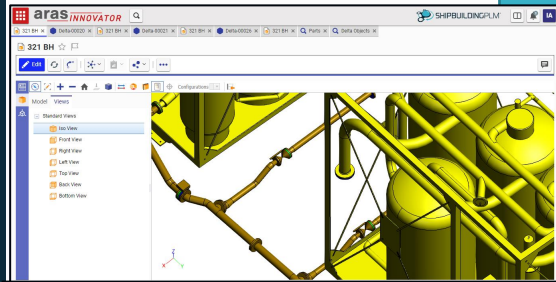
Hull1
Delivered

Hull 2

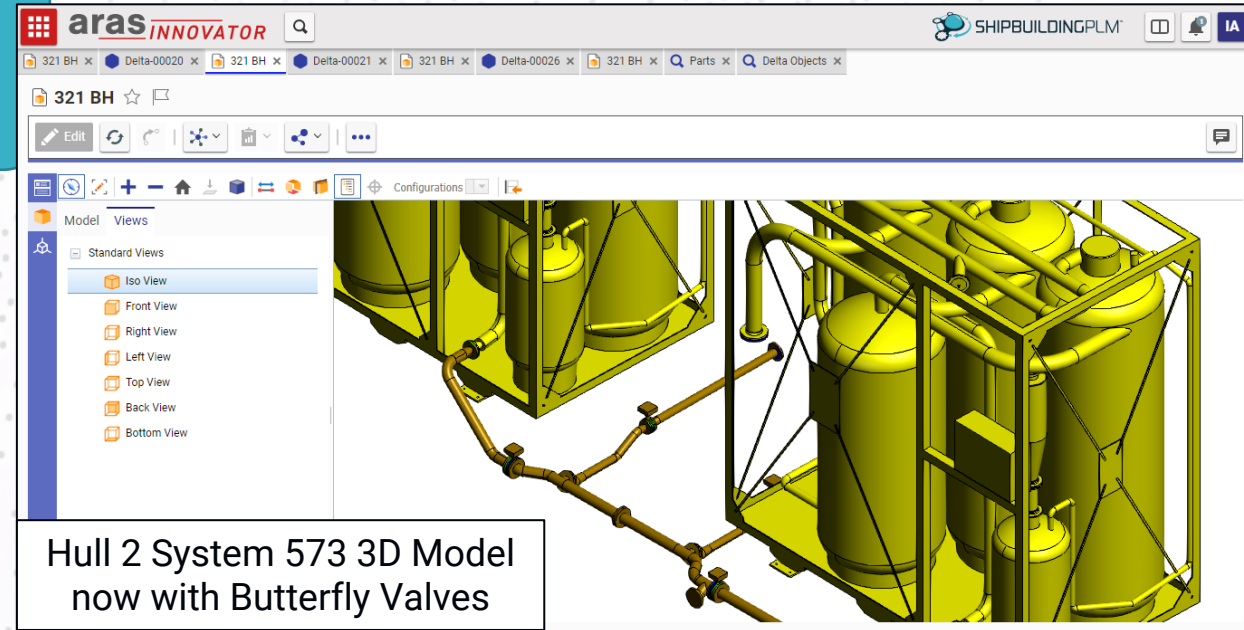
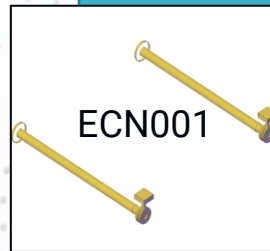
Hull 1
Delivered



Functional change
to change ball
valves to butterfly
valves – ECN-001



Hull 1 System 573 3D Model
Original Ball Valves



Hull 2 System 573 3D Model
now with Butterfly Valves

Multi-Hull Change Traceability



Hull1
Delivered

Hull 2

Hull 5

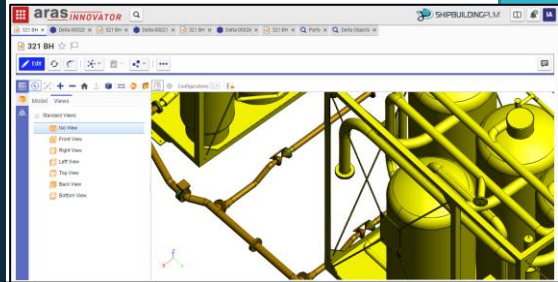
Hull 1
Delivered

Functional change
to change ball
valves to butterfly
valves – ECN-001

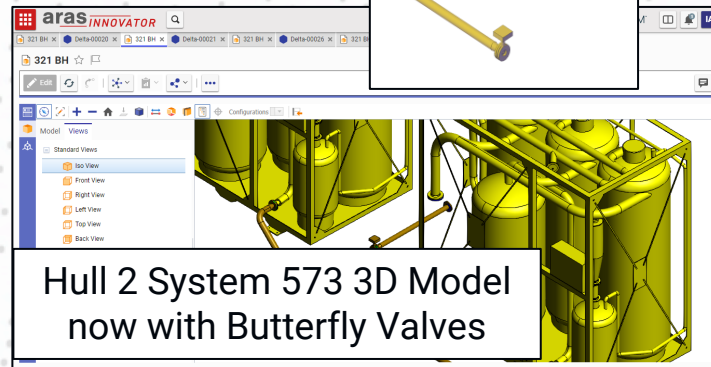
Transfer to Class
Model

Rotate the valve to
provide better
access

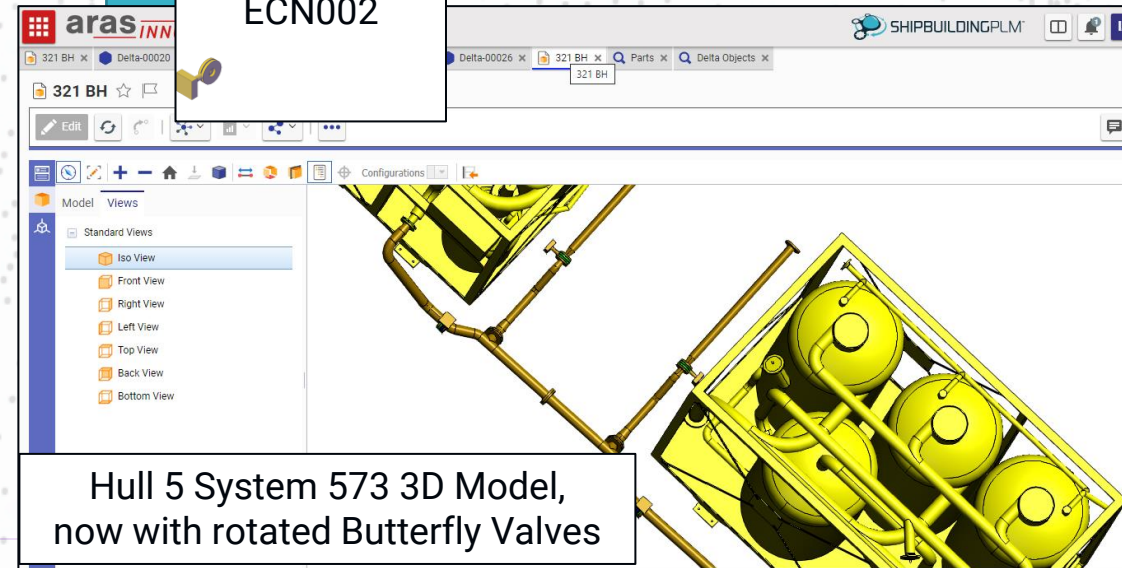
ECN002



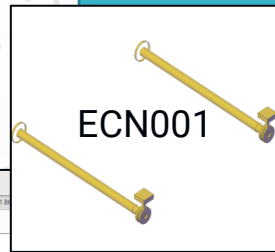
Hull 1 System 573 3D Model
Original Ball Valves



Hull 2 System 573 3D Model
now with Butterfly Valves



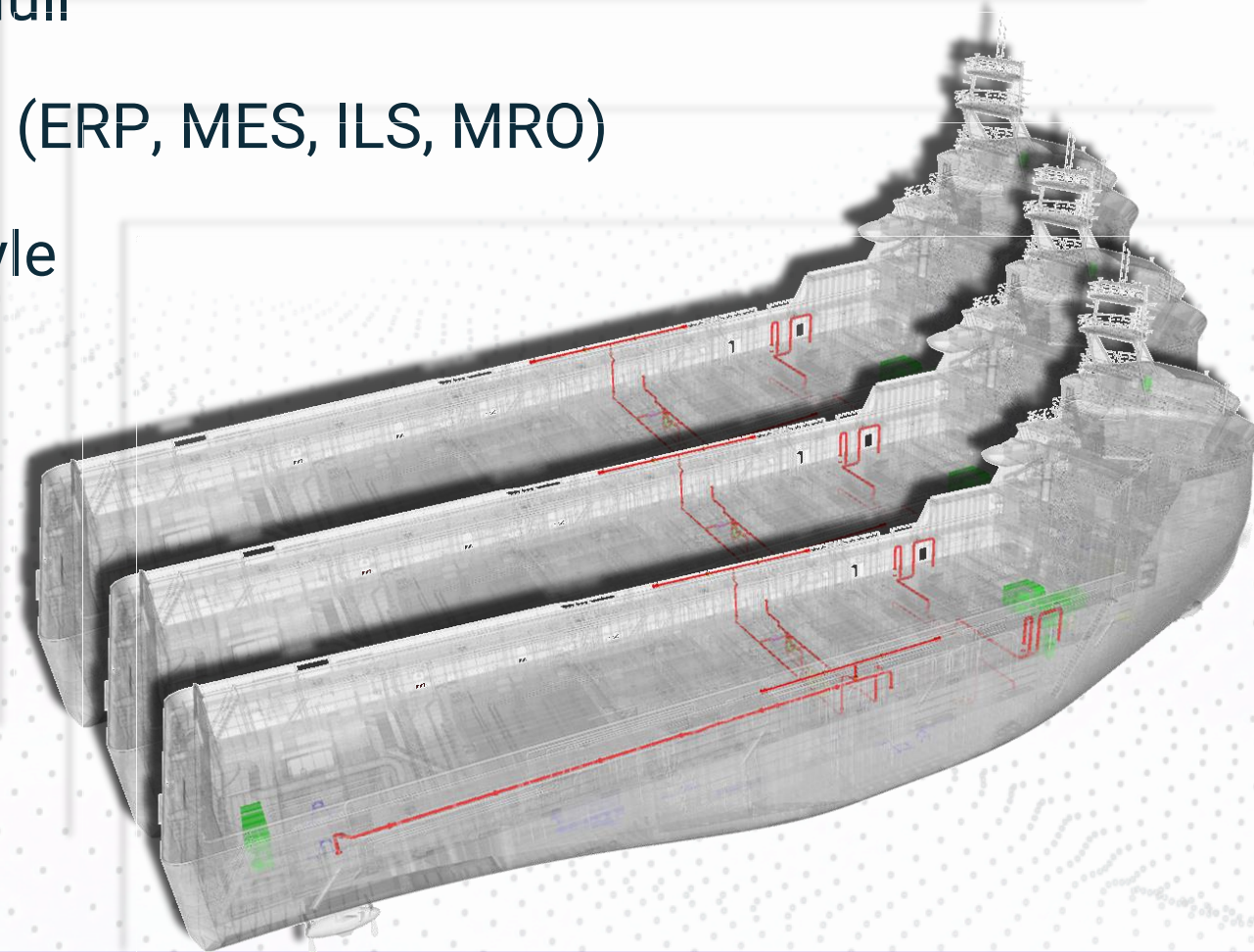
Hull 5 System 573 3D Model,
now with rotated Butterfly Valves



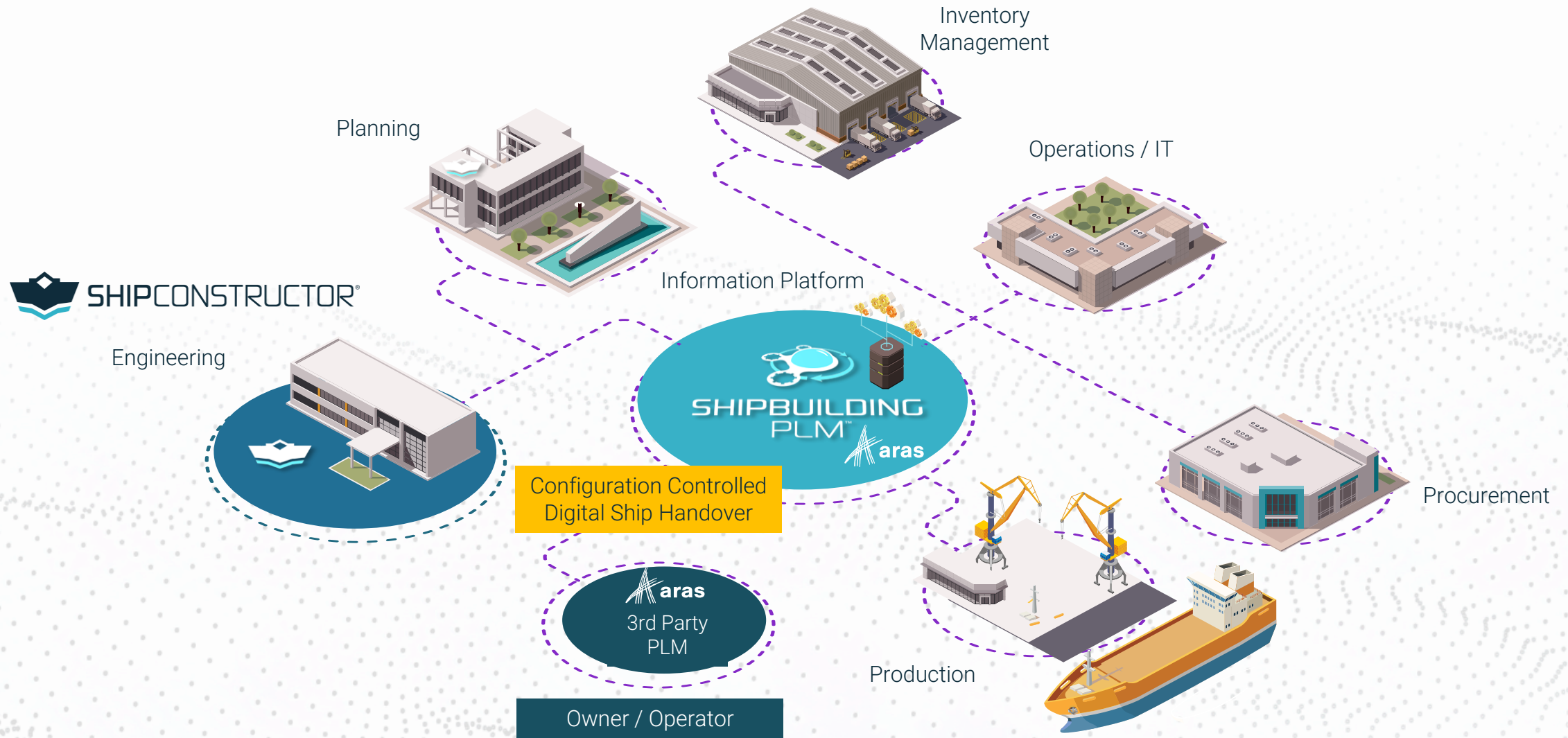
ECN001

Configuration Controlled Digital Ship

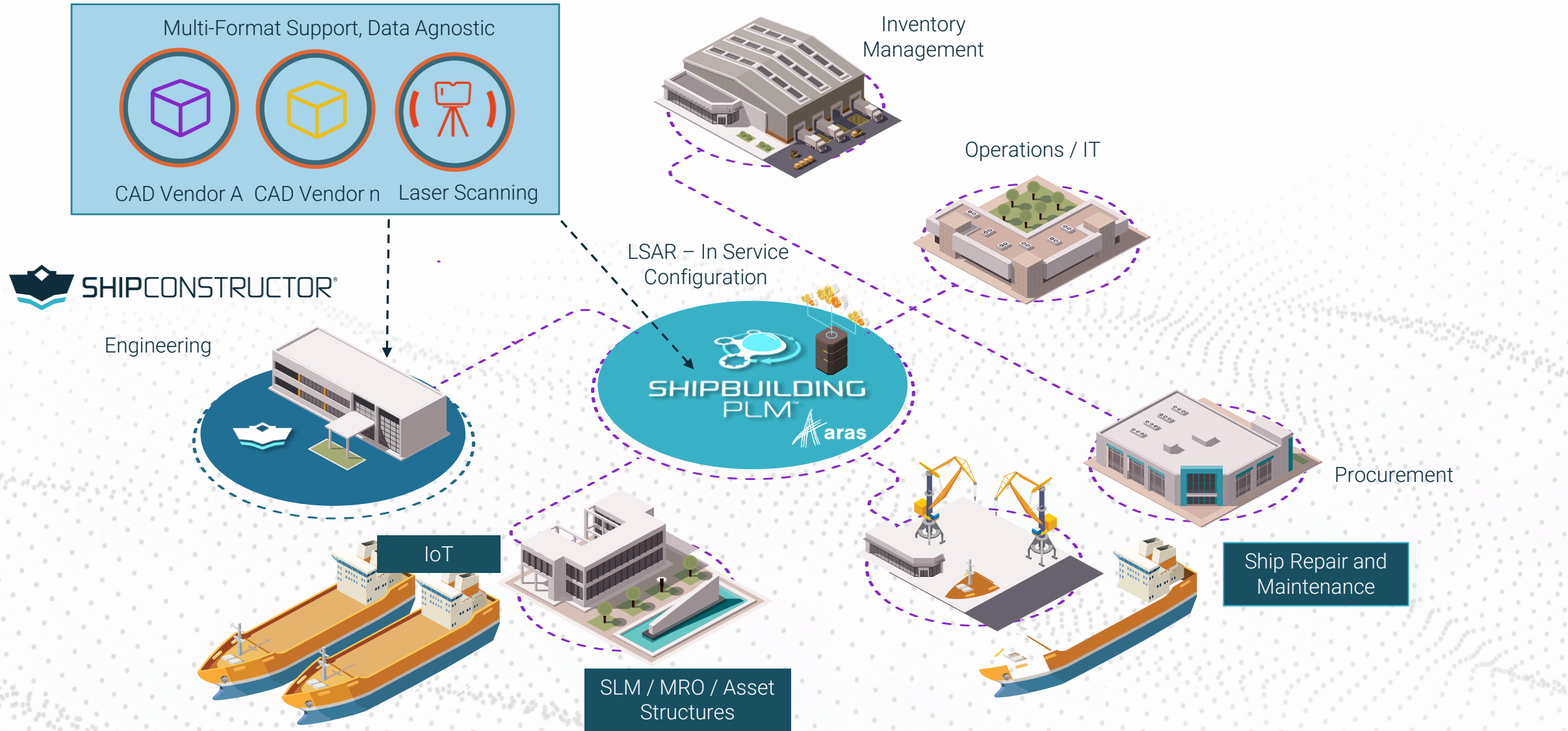
- Part Instance traceability for each Hull
- Supports downstream stakeholders (ERP, MES, ILS, MRO)
- Supports the full Shipbuilding Lifecycle
- Easy to understand and use



Digital Ship Handover



Maintaining the Digital Ship



Shipyard process improvements with ShipbuildingPLM

- Improve requirement driven design validation as newbuild designs become more complex and incorporate new technologies.
- Improve shipyard Part Catalog management for new Part definitions.
- Improve tracking of procurement demand for LLI (Long Lead Items)
- Increase capacity to absorb accelerated rate of design change
- Improve communication of Engineering change across the shipyard.
- Improved integration with manufacturing processes.
- Deliver a Digital Ship with the required data set for improved fleet sustainment operations.

Aras & SSI

An important partnership
for the shipbuilding industry

Aras Innovator

Resilient and highly adaptable,
low-code PLM platform

SSI ShipbuildingPLM

Vertical PLM solution for Shipbuilders
Shipbuilding focused team

ACE23

REIMAGINE YOUR POSSIBILITIES

