

ERP, MES and ShipbuildingPLM: Understanding Their Roles

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Challenges in shipbuilding









What is the PLM Platform role?



- Product and manufacturing engineering information-oriented data
- Digital assets
- Configuration control
- Change management



What is the ERP platform role?



- Production planning, forecasting, sourcing, cost tracking
- Physical assets
- Transaction oriented



What is the MES platform role?



- Production and logistic execution, execution feedback
- Physical assets
- Event oriented



Typical Shipyard Activities/Functions



6 1 Work Order Management

Typical Shipyard Activities/Functions - PLM



7 1 Work Order Management



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Typical Shipyard Activities/Functions - ERP



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8 1 Work Order Management

Typical Shipyard Activities/Functions - MES



9 1 Work Order Management



PLM-ERP-MES: Connected Systems in a Shipyard



Example: ABOM/EBOM Workflow





Example: Model Based MBOM Workflows



Example: PLM-MES Integration

















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Work Package Composition



* Collection of parts & pieces



Automatic Detail Planning

 Model Drawings Production Drawings 	BOM BOM	Structure	Changes	
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DRILL FEEDER ASSEMBLY 03-03	Assembly	А	1	
E DRY BULK DISCHARGE ASSEMBLY	Assembly	A	1	
E STRIPPING PUMP ASSEMBLY 03-03	Assembly	A	1	
- O 321 PIPE ASSEMBLY	Assembly	А	1	BOM Structure
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⊞ 🏠 <u>321-529-BW</u>	Assembly	А	1	automated detail
⊞ 🏠 <u>321-533-FW</u>	Assembly	А	1	plan in
🕀 🗘 321-544-LFL	Assembly	А	1	FIOOrZPIAN MES
<u> </u>	Assembly	А	1	
⊞ 🏠 <u>321-573-MA</u>	Assembly	А	1	
<u>321 STRUCTURE ASSEMBLY</u>	Assembly	А	1	
- C240X10X9T	Plate	А	1	
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Information structure of Work Package (example)

Department	Workshop1	Division	Welding Division	Team	Team1	Principal	Bob Builder	
Task package number		N02-C1		Task package	name	Section N02-C1 Fabrication		
Construction Mechanical process area area		according area. Accomply		Volume type	Section fabrication	Volume unit	Piece	
		ocessing area,	Assembly	Target working hours	25h	Actual working hours	23.5h	
Planned start time	15 Oct 2024	Actual start time	16 Oct 2024	Planned completion time	15 Oct 2024	Actual completion time	16 Oct 2024	
Work package process		Reference drawing	321-N02C1-N02C1					
Cutting → Fit-up → Welding → Plate assembly → Panel assembly → Grinding → NDT			Tray	N02-C1				
			Remark	Number of op	Number of operators: 4			



FLOOR2PLAN

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Projects

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Model Views	A BOM BOM Structure Production Documentation Files Where Used Changes
	Parts ∨ ☆
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321-OutfitS011P	321-OutfitS050P Stiffener A 1 0.819
C 321-OutfitS011P	321-OutfitS037S Stiffener A 1 0.807
321-OutfitS011S	321-BL-1 Spool A 1 90.142
321-OutfitS040P	321-BW-5 Spool A 1 22.268
321-OutfitS050P	321-BL-3 Spool Connect to MES Platforms
321-OutfitS037S	
★ A299	< Prev Next > Page: 1 of 1 Figure 1 gening Smart Shipbuilding



PLM-ERP-MES: Connected Systems in a Shipyard





Interface Guidelines

- PLM/ERP/MES interfaces need to support multiple use cases across the shipbuilding lifecycle.
- Focus on business processes first, technology to support integration should be driven by use cases.
- Make sure Change Management scenarios are accounted for.
- Connectors should be considered a baseline technology foundation, requiring additional configuration for specific use cases.



SOA Architecture SOAP Services RESTful Services





MES has a key role to play integrating the deck plate with the shipyard business

PLM, ERP and MES need to be integrated as peer platforms

The SSI Platform provides the required capability for interface development







Questions?

Thank you!

