Mechatronic design with Aras Innovator

Mark Caradonna





Company-wide integrated Product Development

End-to-End Processes

Mechatronic Product Structures

The Right Solution Backbone

The Right Next Steps







Path to End-to-End Processes







Single Source of Truth



Mechatronic product structures require all engineering data in PLM → XPLM direct integrations of authoring tools enable data upload and further processes



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Mechatronic Product Structures in Aras





Consolidated E-BOM



Collaboration at its Best







Sales Purchasing R & D Production Service Others





Design-to-Operate (D2O) - Use Case

Assembly 1: Extender PCB

Cables Connector PCB

Firmware



Assembly 2: Housing







Assembly 3: 3D Printer



Interdisciplinary Product Development (NPID)

A single part change effects many people

2024



Aras Innovator – Enabling a Digital Thread

Visual Collaboration to discuss change



Initiate workflow driven change process

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Engineers make changes and upload them







BOM redlines shown changes made

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	100001-001	А	022224KR1 PCB		Preliminary				
	BB-9090	в	Non-Threaded 63mm Bottom Br	Component	Released				
	BB-9091	А	Threaded 63mm Bottom Bracket	Component	Released				
	BB-9092	Α	Non-Threaded 73mm Bottom Br	Component	Released				
	BB-9093	A	Threaded 73mm Bottom Bracket	Component	Released				
	BC-BELL	А	Bell		Released				
	BC-BELL-2	D	Bell 2		Released				
	BL-3757	Α	SLX Hydraulic Disc Brake Lever	Assembly	Released				
	BL-R550	Α	BL-R550 Brake Lever	Assembly	Released				
	BLT-0001	А	4mm Steel Allen Bolt	Component	Released				
	BR-4069	в	SLX Hydraulic Disc Brake	Assembly	Released				
	BR-6319	С	BR-CX50 Cantilever Brakes	Assembly	Released				
	CA-2923	A	175mm Carbon Fiber Hollow Cra	Component	Preliminary				
	CA-3191	Α	170mm Aluminum Alloy Turbine	Component	Preliminary				
	CA-4221	А	170mm Carbon Fiber Hollow Cra	Component	Preliminary				
	0-4-9910	A	170mm Alaminam Alloy Tarbine	Component	Preliminary	•			
	CB-4581	Α	Steel Spider Bolts	Component	Preliminary				
	CN-6732	A	11-Speed nickel-plated steel chain	Component	Preliminary				
	CN-6733	A	10-Speed nickel-plated steel chain	Component	Preliminary				
	CN-6734	A	9-Speed nickel-plated steel chain	Component	Preliminary				
	CN-6735	А	6/7/8-Speed nickel-plated steel c	Component	Preliminary				
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ECO form, Workflow, & Impact Matrix

ECO-00001014	
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 ECO Number Tite ECO-0000101 Change location of SD Card slot to avoid interference with bolt Change Reason Move location of slot for SD Card to go through Change Coordinator Change Coordinator Team Prioduct Team Priority 1 - High 2 - Normal 3 - Low Impact Matrix Attachments EDRs SignOffs 	Begin Submit to Planning Start Submit ECO Cancel Change

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Item Number	Name	Revision	State	Sequence	Quantity	Unit	Item Action	EDR Grouping	
□ ···· ✿ <u>MP2942</u>	Body	A	In Change			EA	Revise		<u>MP2942</u>
MP2667	Spacer Black 5-16 in length .14in I	В	Released	5	1	EA			
• <u>MP2322</u>	RGB LED Strip Common Anode	С	Released	10	1	EA			
MP2660	Spacer Black 1-2 in length .14in ID	В	Released	15	2	EA			
<u>Ф МР2939</u>	Body Fan Assembly	A	Released	20	1	EA			
MP2940	Body Hardware	A	Released	25	1	EA			
MP2941	Body Panels	A	In Change	30	1	EA	Revise		<u>MP2941</u>
Ф <u>МР2194</u>	Thing-O-Matic 2 Front Panel	В	Released	5	1	EA			
Ф <u>МР2196</u>	Thing-O-Matic 2 Back Panel	A	Released	10	1	EA			
<u>— Ф мр2199</u>	Thing-O-Matic 2 Right Panel	А	Released	15	1	EA	None		
	Thing-O-Matic 2 Right Panel	A	Released	10					
Ф <u>МР2193</u>	Thing-O-Matic 2 Top Panel	С	Released	20	1	EA			



CAD Integrations in Aras Innovator

Engineering Tools





Possible EDA Data Model







Demo Process

Demo part1 – Purchase

k Innovator

Purchase department sets electronic connector state to end of life

Altium Designer

- ECAD designer opens project file from ARAS Innovator
- Indication of invalid component when saving
- Design change in Altium
- Safe ECAD design with parts list synchronization

Demo part 3 – MCAD

SWX ·

- MCAD Loads Model into SWX.
- MCAD loads new Model to SWX and replace old Version with new one



Demo part 2 - ECAD









Mechatronic BOM







Conclusion



End-to-End Processes



Compare E-BOM & M-BOM



Automation





Component libraries synchronization

MCAD ECAD Collaboration





Fast communication



Development history

Thank you.



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