Small Enough to Care, Big Enough to Handle

The Role of OEMs in the AM Supply Chain of the Energy Industry

RM Forum 2024 – Gianluca Acquistapace


FUENTES
VALLAND
S.P.A.

Valland3D

Valland3D is the new Advanced Manufacturing Department of **Valland S.p.A**, an Italian manufacturer of high quality and tailor-made Ball, Gate and Check Valves

2016 → First AM tests

2020 → First polymeric 3D printer

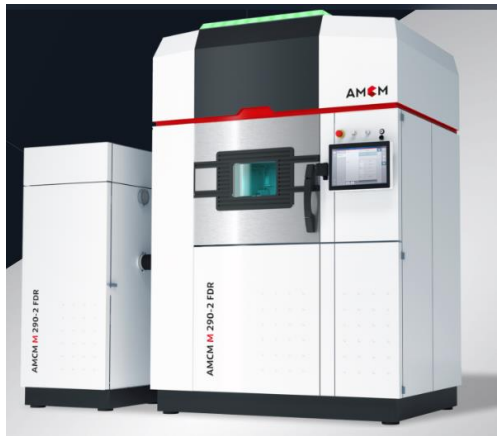
2022 → Valland3D

Valland3D – Advanced Manufacturing Department for Energy

Competences:

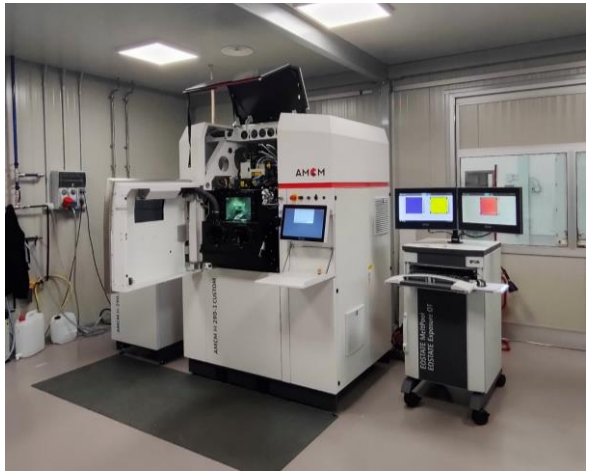
- Material Science
- Additive Manufacturing
- Reverse Engineering
- DfAM
- Oil&Gas -> Offshore, Subsea, Severe Service
- Hydrogen
- Product LCA according to ISO 14044 – Carbon Footprint

AMCM – M290 1kW



Main materials:

- F316L
- Inconel 718
- Aluminium alloys
- Copper



AMCM – M290 1kW 3D Printer in the new Valland3D printing lab

Climate Controlled Cabin in our facility exclusively dedicated to the AMCM – M290 1kW and AMCM – M290 400 W

EOS – M290 400 W

EOS – M290 400 W 3D Printer in the new Valland3D printing lab

AM in Valland – AM Capability for 2023

Model	Technology	Materials	Build Size
2 x **Ultimaker - S5**	FDM (polymers)	PLA, PETG, ABS, PC ,PP, PA (Nylon), PC-ABS, Iglidur, PVDF, PA-GF, PA-CF, PP-GF, PP-CF, TPU, Others (more than 50 certified materials)	330x240x300 mm
2 x **WASP - 4070 FLEX** (Specifically developed for flexible materials)	FDM (polymers)	TPU, TPE, PP, PA, PVDF	Ø400x700 mm
3NTR - A4SP (Specifically developed for technopolymers)	FDM (polymers)	PAEK, PEK, PEKK, PPSU, PPSU-CF, PC-ABS, PA, PA-CF, PA-GF, Iglidur	300x171x200 mm
2 x **Formlabs - Form3** (resin 3D printer)	SLA (polymers)	Standard resin, Tough resin, Durable resin, Flexible resin, Rigid resin, High-temp resin, Castable resin, Silicon resin 40A	145x145x180 mm 330x200x300 mm
AMCM - M290 1kW	DMLS / LB-PBF (metal)	Aluminum (AlSi10Mg, AlF357), CobaltChrome MP1, MaragingSteel MS1, ToolSteel 1.2709, NickelAlloy (HX, **INC625, INC718**, INC939), StainlessSteel (CX, PH1, 17-4PH, **316L**, 254), Titanium (Ti64, Ti64ELI, Ti64 grade5, Ti64 grade23, TiCP grade2), Copper, CaseHardeningSteel 20MnCr5	250x250x330 mm
EOS - M290 400W	DMLS / LB-PBF (metal)	Aluminum (**AlSi10Mg**, AlF357), CobaltChrome MP1, MaragingSteel MS1, ToolSteel 1.2709, NickelAlloy (HX, INC625, INC718, INC939), StainlessSteel (CX, PH1, 17-4PH, 316L, 254), Titanium (Ti64, Ti64ELI, Ti64 grade5, Ti64 grade23, TiCP grade2), Copper, CaseHardeningSteel 20MnCr5	250x250x330 mm

AM in Valland –Post Processing

Competences:

- Heath Treatment
- Sandblasting
- Final Machining
- Surface Treatment

OEM-Centric Approach

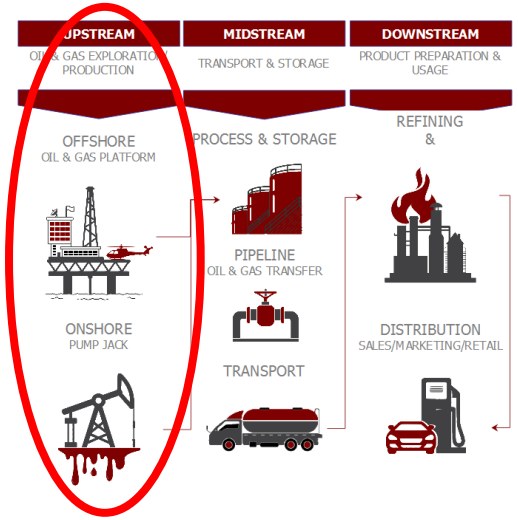
OEM: Definition and characteristics

OEM (Original Equipment Manufacturer)

Company that produces components used by another company in its final product.

- OEMs typically specialize in making a certain component or part
- Expertise and know how
- Specialized Equipments
- High efficiency

Role of OEMs in traditional manufacturing



End User:

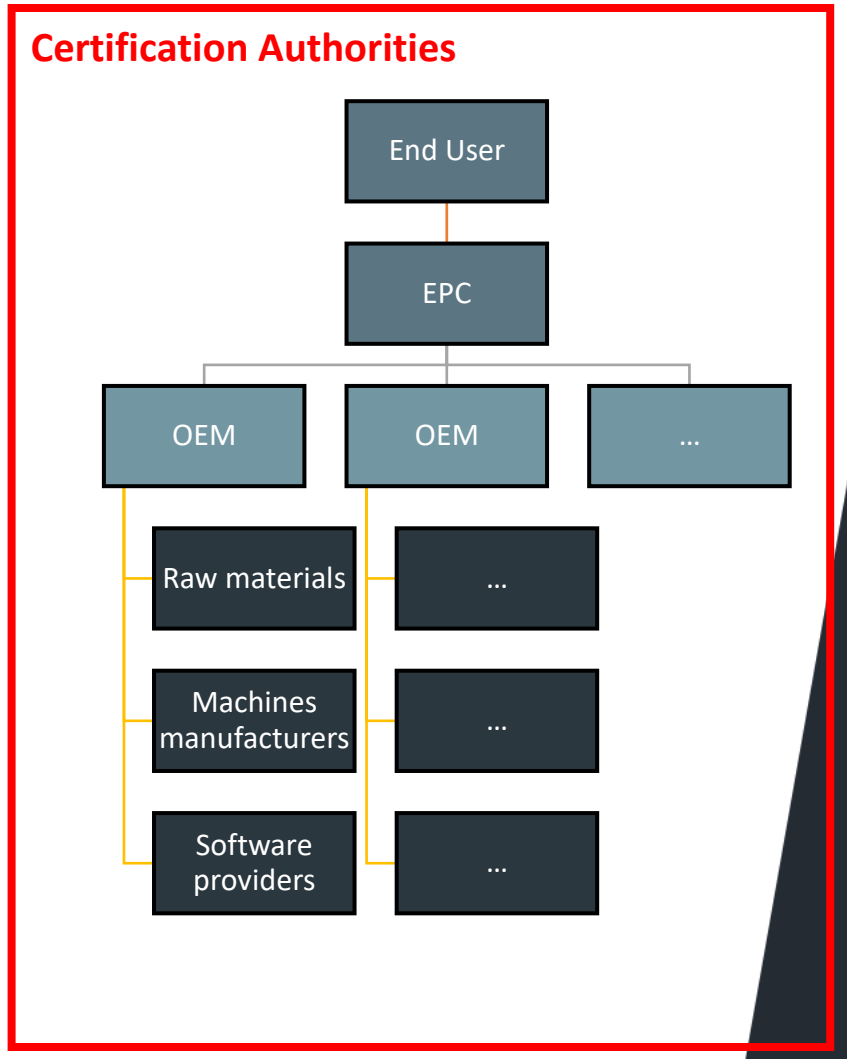
Commissioning of the job

EPC:

Equipment, procurement and construction

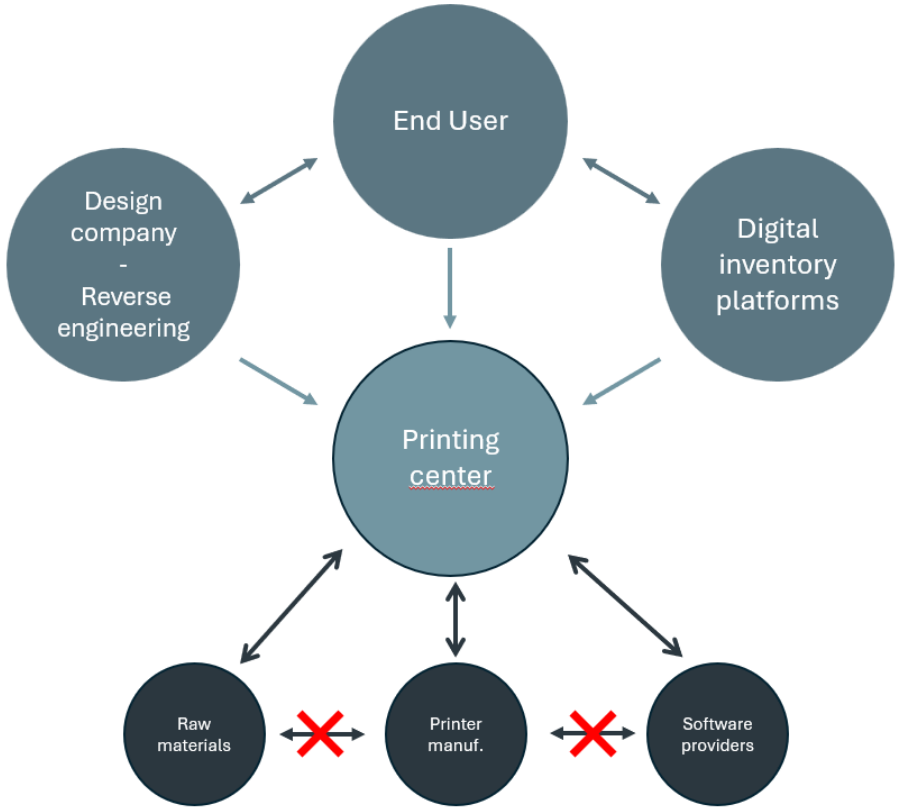
OEM:

Design IP, manufacturing of the part, product certification and testing



Role of OEMs in AM: Two different path

On-Demand manufacturing



Suitable for spare parts, refurbishment, one-of-a-kind, …

Pros:

- High flexibility
- On-demand production (no warehouse)
- On-site manufacturing
- Much shorter LT (traditional manufacturing)

Cons:

- Higher process complexity
- Higher Lead time (Design, certification, printing, testing)
- Higher cost (a lot of work for a single component)
- Spare parts are not Designed for AM
- Long and difficult certification process
- Low associated quantities

Role of OEMs in AM: Two different path

OEM – Centric approach

Suitable for new parts

Pros:

- OEM takes care of product certification
- Long term production
- Short Lead Time (Just need to print and test!)
- Lower cost-per-part
- Parts are Designed for AM (lower process complexity)

Cons:

- Lower Flexibility

Responsibility of OEMs

OEMs have some duties - Deep understanding of:

- Industrial field
- Product engineering (DfAM, simulations, …)
- AM Manufacturing process
- AM available technologies
- Materials for AM
- Applicable standards

Our experience with Digital Inventories

Digital Inventory and On-Demand Manufacturing: Opportunities and Challenges

Opportunities with Digital Inventory:

- Improved stock management and reduced lead times for procurement.
- Facilitates just-in-time and on-demand production, avoiding costly inventories of spare parts.
- Greater flexibility in production and adaptability to specific customer needs.

Challenges with Digital Inventory:

- Digitalizing complex components requires integration with traditional processes and strong collaboration with suppliers.
- The certification process for digitalized components can be longer, especially in sectors like Oil & Gas.
- The need for investments in technological infrastructure and ensuring data security, particularly during the transition to a fully digitalized business model.

Supporting OEMs and Operators:

- Operators can support the transition by collaborating in co-design initiatives with OEMs, reducing feedback times and facilitating the integration of digital processes and advanced manufacturing.

Business Model Implications and Next Steps for Valland

Implications for the Traditional Business Model:

- The shift to a model based on digital inventory and on-demand production reduces the need for large physical warehouses, shifting the focus to the ability to produce critical components flexibly and quickly.
- Better cash flow management and reduced operating costs related to spare parts storage.

Selecting Components:

- Focus on high-value components that can benefit the most from on-demand production.
- Collaborate with customers to identify the most requested parts and those that can be easily digitalized.

Next Priorities for Valland:

- Increase the number of digitalized and published components within the digital inventory, prioritizing the OEM-centric approach.
- Strengthen collaboration with operators and customers to ensure a smooth transition to a digital approach and new technologies.

Business Model Implications and Next Steps for Valland

Active customer involvement is essential to provide constant feedback and operational data to improve digitalization and production processes.

Conclusion

Are we just scratching the surface of what's possible with AM?

Beyond spare parts and flexibility, it's time to challenge the status quo and redefine the future of manufacturing.

*The question isn't 'Is AM ready for us?' but **'Are we ready for AM?' Embrace the shift, drive the change.***

Thank you!

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