

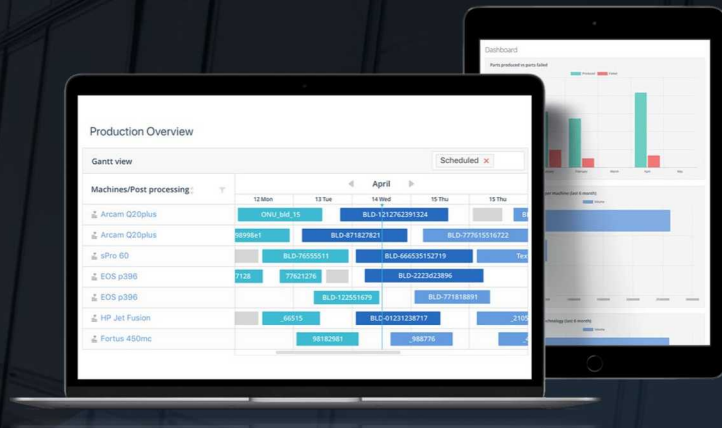


AMFG

Autonomous
Manufacturing

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Who we are:

AMFG is a leading additive manufacturing workflow automation software with integrated machine learning to streamline production and integrate supply chains.

What workflow automation software vendors can offer:

1. End-to-end workflow functionality with scalable architecture
2. Integration across ERP, CRM, Machines etc (Open standards or direct)
3. Consulting to define processes & cost formulas, create documentation etc
4. Distinct solutions for specific tasks (*this is purposefully vague*)

→ All major players offer solutions for above points - but the solutions are different

→ Use a **requirements checklists** when selecting a vendor:

<https://amfg.ai/whitepapers/additive-manufacturing-mes-software-the-essential-guide-whitepaper/>

Challenges Our Customers Face



Disconnected
Systems



Complex & Manual
Processes



Lack of
Traceability



Long
Lead Times



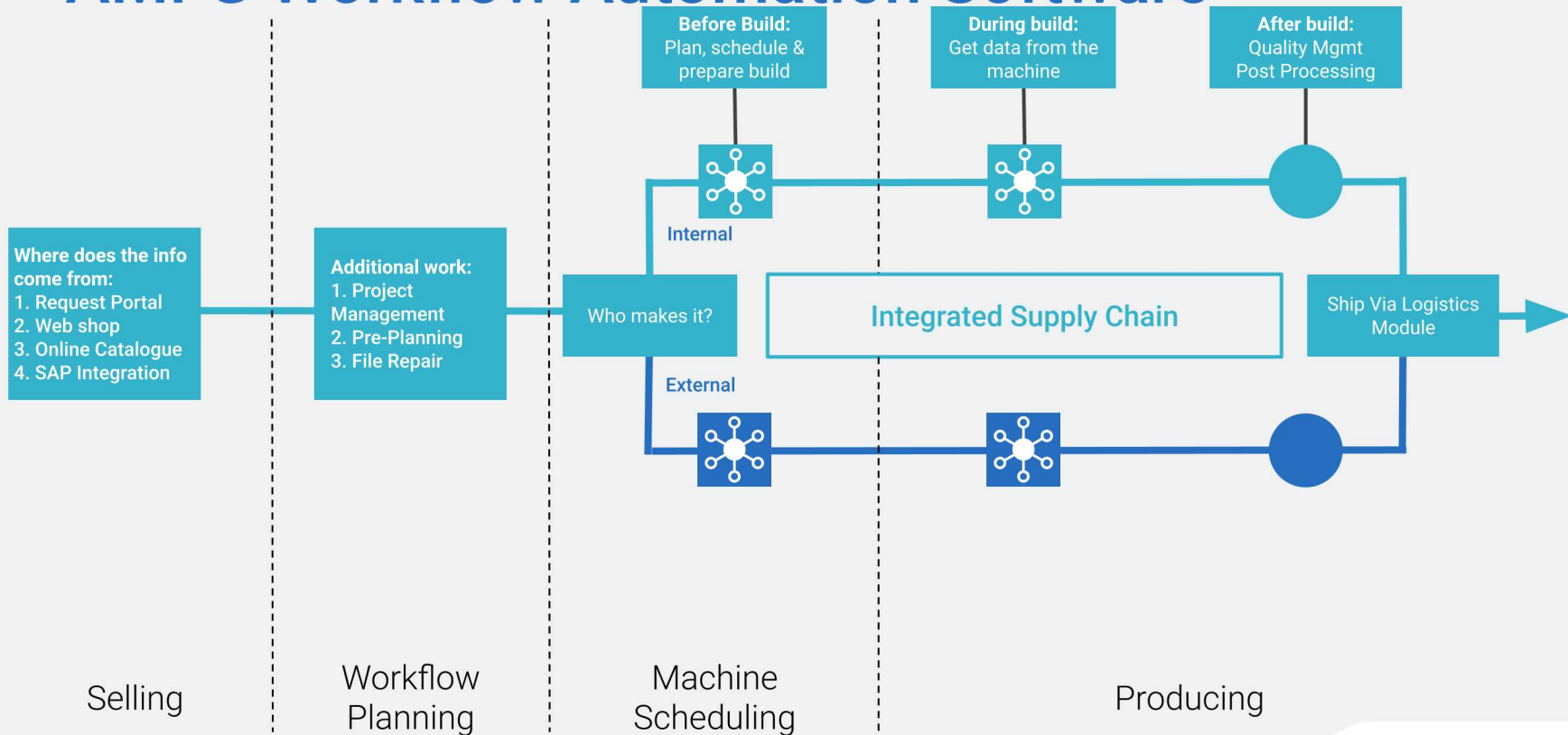
Low
Productivity

Workflow automation software:

Connects Systems, automates Processes and provides Traceability: Improves Lead Times and Productivity

→ It does not replace having Procedures

AMFG Workflow Automation Software



Machine integration

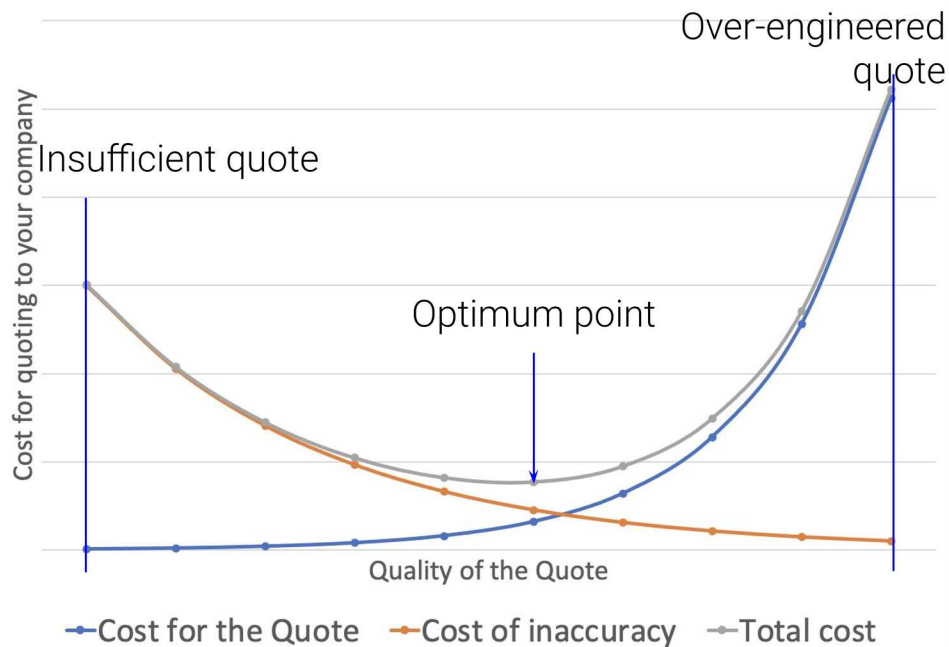


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Selling

Consideration points before automating tasks



Automated quotation tools reduce reliance on manual processes and replace them with clearly defined rules.

Consider your business case:

1. What quality do you need?
2. What aspects can you automate?
3. What exceptions are there?

Advantages of automation are:

- Consistent, robust quotes: Improves quality
- Employee utilisation: Reduces cost
- Improved scalability: Future-proofs an organisation

→ The right vendor will support the complexity you require

Workflow planning

PART **IN-HOUSE** **PARTNERS**

Part ID: PRT00005643
Production center: ACEO Production Center
Shipping deadline: 30 May 2020
Additional file: NTR_Din_Drawing.pdf
QA_Measure_Report.pdf

Technology: SLS
Machine group: S-Print 1000
Material: Accura Composite 100
Complexity: Low
PPS: Support removal, Sanding, Gap filling, Priming & painting

Labor time (Sanding): 1-2h
Layers (Priming & painting): 2
Lacquer (Priming & painting): Yes
Quantity: 20

Manage workplan

Support removal
Additional file:

Sanding
Labor time: 1-2h
Additional file:

Gap filling
Additional file:

Polishing
Additional file:

Epoxy coating
Additional file:

Vapor smoothing
Layers: 2
Lacquer: Yes
Additional file: NTR_Din_Drawing.pdf

Some orders will require complex post-processing workflows with many steps. Workplans manage the sequence of production steps:

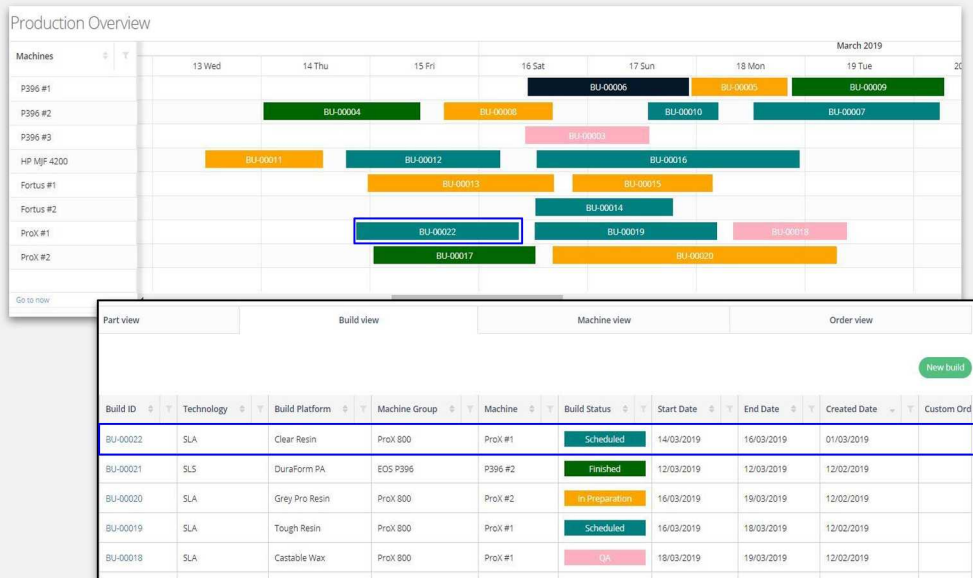
- Define sequence of steps
- Manage documentation
- Individual pass/fail assessment at each stage (Automated re-queueing/planning of failed parts)
- Outsourcing of pieces of work

A strong solution should:

1. Enable templates for repeat parts
2. Provide flexibility for prototype parts

→ Understanding your workflow is crucial to selecting the right software

Machine Scheduling



Achieve greater efficiency & visibility across your operations:

- Complete production planning and scheduling tools, including overview of machine status and availability
- Complete production overview, including interactive Gantt chart for scheduling
- Part prioritisation & tracking throughout project lifecycle

Scheduling needs can vary, but should automate:

1. Assignment of parts to builds
2. Nesting & slicing
(for high-mix operations, not needed for repeat production)
3. Planning of builds on machines
4. Machine Integration to send builds to the machine and receive a live data feed

Producing

Actionable, real-time factory view

- Live updates and analytics across machines and sites
- Real-time notifications on errors, maintenance, and all stats and status available through the machine

A typical sequence looks like this:

1. AMFG: Submit Build File
2. Slicer: Slice STL and create task
 - a. HP slices on the machine
 - b. EOS uses its own SDK
 - c. Stratasys uses GrabCAD Print
3. AMFG: Auto-queue build file on printer
4. Customer: Confirm build start
5. AMFG: Receive build updates
6. AMFG: Build completion