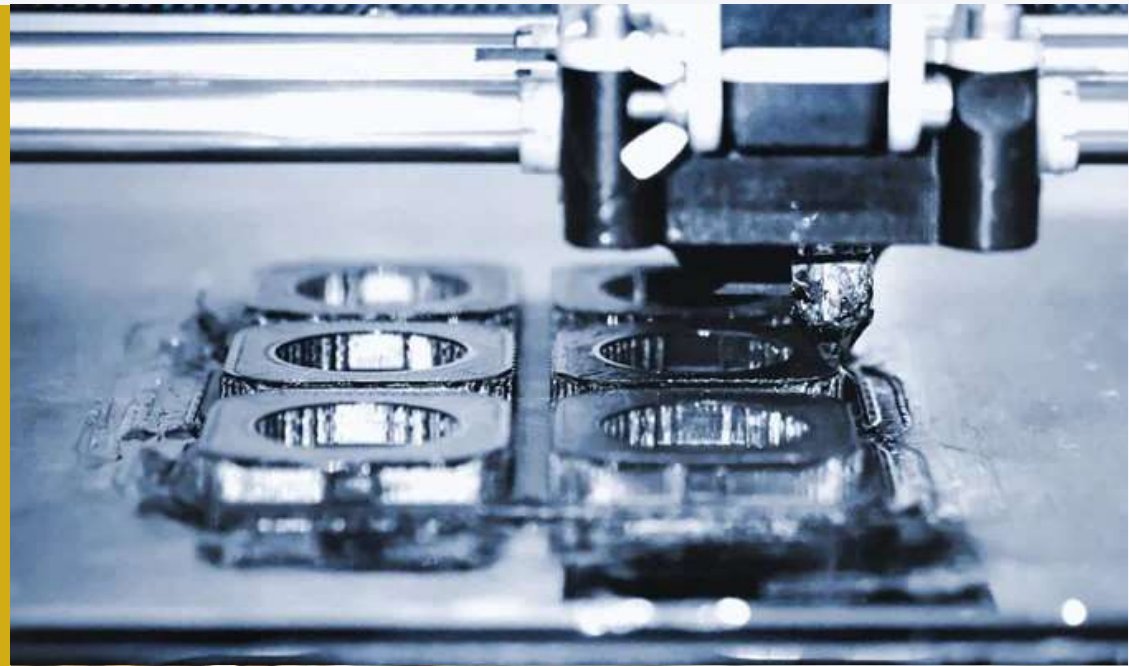




DRAFT

# Quoting + Scheduling for Additive Manufacturing

March 2023



<https://www.twdigital.us>



DRAFT

# Situation

- The services provided by Additive Manufacturing service companies extend well beyond making the AM parts themselves
- Examples:
  - Sandblasting
  - Painting
  - Coating
  - Machining
  - Assembly
- Many companies are not using specific software to manage quoting + scheduling
- Companies that are using software (ERP), are forced into a “part number” centric process
- Part number centric a poor fit (square peg/round hole) for the Build-To-Order business and leads to **long quoting times**

DRAFT

# Problem

- Combination of services offered is a large number (many part numbers if using ERP)
- Quoting and scheduling typically done by hand (whether Excel or ERP)
- With typical strike rates (won / quoted) of 30%, the **work put into 7 out of 10 quotes is wasted**
- Knowing an accurate delivery date at the time of quote is too difficult to be done by hand... "standard leadtime" used instead (N weeks)

DRAFT

# Opportunity

- **DashQ can determine an accurate price and accurate delivery date in under 60 seconds!**
- Rapid quoting with accurate prices and delivery dates will improve profitability in a number of ways:
  - Faster response to customer RFQ (first in greater chance to win)
  - Better understanding of cost to manufacture. DashQ enables refinement over time
  - Encourage Sales to drive up pricing to improve gross profit
  - Detailed analysis of cost and price vs value delivered (features delivered) becomes possible – enables improvement of pricing strategies

DRAFT

# Benefits

- Dramatically improve response time to customer RFQ
- Ensure pricing is properly related to cost with zero oversight
- Establish a stronger connection (and understanding) between customer feature choices and cost to deliver (manufacturing process/tasks)
- Zero manual creation or maintenance of manufacturing routers
- Granular visibility of cost to manufacture and pricing vs product features (attributes) – with no manual effort
- Adding new products/features or manufacturing process changes can be done with very low effort compared to conventional ERP

# Smart Quote

- Guided selling
- Rapid product pricing based on options selected
- Works without support of:
  - Excel
  - ERP
  - Lengthy inside sales processes

The screenshot displays the 'Qty & Material' configuration page within the Smart Quote application. The interface is divided into several sections:

- Navigation Menu (Left):** Categorized into SALES (Pipe Line, Smart Quote, Quotes, Orders, Promotions, Customers), PRODUCTION (Orders, Schedule, Queues), ITEMS (Items), COMPANY (Analysis, Setup, Products, Tasks), and HELP.
- Header:** Includes a search bar, a 'Search' button, a notification bell, and a user profile for 'Ted Christiansen Additive Manufacturing (Demo)'.
- Breadcrumbs:** Home > Smart Quote (AdditiveMfg) > Qty & Material
- Main Content Area:**
  - Quantity:** A field labeled 'QTY' containing the value '1'.
  - Material:** A dropdown menu labeled 'MATERIAL' with 'Material One' selected.
  - Next:** A blue button for navigation.
  - Attributes:** A table with columns 'Attribute' and 'Value'.
- Footer:** A row of buttons for 'Setup', 'Pages', 'Attributes', 'Rules', 'Tasks', and 'Item Mapping'. The Tailwater Digital logo is visible in the bottom left corner.

# Smart Quote

- Provides structure to quoting making processes “sticky”
- **Improves profitability:**
  - Target margins are achieved with ZERO oversight
  - Reduction of sales expense

The screenshot displays the 'Qty & Material' configuration screen within the Smart Quote software. The interface is divided into several sections:

- Left Sidebar (Navigation):** Categorized into SALES (Pipe Line, Smart Quote, Quotes, Orders, Promotions, Customers), PRODUCTION (Orders, Schedule, Queues), ITEMS (Items), and COMPANY (Analysis, Setup, Products, Tasks). A HELP section is also present at the bottom.
- Top Header:** Includes a search bar, a 'Search' button, a notification bell, and a user profile for 'Ted Christiansen Additive Manufacturing (Demo)'.
- Breadcrumbs:** Home > Smart Quote (AdditiveMfg) > Qty & Material
- Main Content Area:**
  - Quantity (QTY):** A text input field containing the value '1'.
  - Material (MATERIAL):** A dropdown menu currently showing 'Material One'.
  - Next:** A blue button for navigating to the next step.
  - Attributes:** A section with a table header containing 'Attribute' and 'Value'.
- Bottom Navigation:** A row of buttons for 'Setup', 'Pages', 'Attributes', 'Rules', 'Tasks', and 'Item Mapping'.
- Footer:** The Tailwater Digital logo is located in the bottom left corner of the interface.

# Smart Quote

- Automatically generates:
  - Router
  - BOM
- Configuration can be added to Sales Quote or Sales Order (DRAFT)
- **Quote in less than 60 seconds!**

The screenshot displays the 'Smart Quote' software interface. On the left is a purple sidebar with navigation options: SALES (Pipe Line, Smart Quote, Quotes, Orders, Promotions, Customers), PRODUCTION (Orders, Schedule, Queues), ITEMS (Items), and COMPANY (Analysis, Setup, Products, Tasks). The main content area shows a 'Summary' page with a breadcrumb trail: Home > Smart Quote (AdditiveMfg) > Qty & Material > Dimensions > Finish > Options > Pricing. The user is identified as Ted Christiansen, Additive Manufacturing [Demo].

**Price per Unit**

Description	Price (Gross)
Base	\$5018.16
<b>Total</b>	<b>\$5018.16</b>

**Routing**

Task	Process	Time [min]	Cost	Price (Gross)
MIXING	Mix Powder	180.0	\$225.00	\$270.00
MACHINEPREP	Machine Prep	120.0	\$150.00	\$187.50
BUILD-1-START	Build 1 Start	30.0	\$37.50	\$45.00
BUILD-1	Build 1	2400.0	\$3000.00	\$3600.00
BUILD-1-COOLDOWN	Build 1 Cooldown In Machine	180.0	\$225.00	\$270.00
BUILD-1-BREAKOUT	Build 1 Breakout	420.0	\$525.00	\$630.00

On the right side, there are several action buttons: 'Add To Sales Quote' (with 'Create + Add' and 'Q1002 (Customer One)' options), 'Add To Sales Order' (with 'Create + Add'), 'Create Promotion' (with 'Create'), and 'Schedule' (showing 'Start: 03/16/2023' and 'Finish: 03/18/2023').



# Quote Detail

- While in DRAFT, users can update:
  - Description
  - Discount
  - Leadtime
  - Validity
  - Line Item (Edit)
- Add Notes
- Add line items

Search... Search

Ted Christiansen  
Additive Manufacturing [Demo]

Customer	Postal Code	Validity (Days)	Lead Time (Weeks ARO)
Customer One	77005	30	5

### Profitability

Price Gross	Discount %	Price Net	Cost	Net Margin %
\$5,183.16	0.00	\$5,183.16	\$4,312.94	16.8

Update Description Update Discount Update LeadTime Update Validity Update Delivery

History Notes Attachments Meta Data Delete

### Line Items (1 total)

Add Smart Quote

Position	Description	Unit Price Net	Quantity	Extended Price Net
10	AdditiveMfg Base \$5018.16 Finish \$165.00 AdditiveMfg QTY=50, MATERIAL=Material One, X=100 [MM], Y=100 [MM], Z=100 [MM], VOLUME=1000000, SURFACEAREA=60000, PARTWEIGHT=1 [KG], PAINT=YES, FINISH=VAPORSMOOTH, EXPEDITE=NO	\$5,183.16	1.0	\$5,183.16
Price Net Total				\$5,183.16

# Quoting Discounting

- The Discount applied to the Quote can be updated when the Quote is in DRAFT status
- Customer target net margin determines whether approval required or not

Search... Search

Ted Christiansen  
Additive Manufacturing [Demo]

Customer	Postal Code	Validity (Days)	Lead Time (Weeks ARO)
0% => Price: \$5183.16, Net Margin: 16.8% (Approval Required)			
1% => Price: \$5131.33, Net Margin: 15.9% (Approval Required)			
2% => Price: \$5079.50, Net Margin: 15.1% (Approval Required)			
3% => Price: \$5027.67, Net Margin: 14.2% (Approval Required)			
4% => Price: \$4975.83, Net Margin: 13.3% (Approval Required)			
5% => Price: \$4924.00, Net Margin: 12.4% (Approval Required)			
6% => Price: \$4872.17, Net Margin: 11.5% (Approval Required)			
7% => Price: \$4820.34, Net Margin: 10.5% (Approval Required)			
8% => Price: \$4768.51, Net Margin: 9.6% (Approval Required)			
9% => Price: \$4716.68, Net Margin: 8.6% (Approval Required)			
10% => Price: \$4664.85, Net Margin: 7.5% (Approval Required)			
11% => Price: \$4613.01, Net Margin: 6.5% (Approval Required)			
12% => Price: \$4561.18, Net Margin: 5.4% (Approval Required)			
13% => Price: \$4509.35, Net Margin: 4.4% (Approval Required)			
14% => Price: \$4457.52, Net Margin: 3.2% (Approval Required)			
15% => Price: \$4405.69, Net Margin: 2.1% (Approval Required)			
16% => Price: \$4353.86, Net Margin: 0.9% (Approval Required)			
17% => Price: \$4302.02, Net Margin: -0.3% (Approval Required)			
18% => Price: \$4250.19, Net Margin: -1.5% (Approval Required)			
19% => Price: \$4198.36, Net Margin: -2.7% (Approval Required)			
0% => Price: \$5183.16, Net Margin: 16.8% (Approval Required)			

Update

Line Items (1 total)

Add Smart Quote

Position	Description	Unit Price Net	Quantity	Extended Price Net
10	AdditiveMfg	\$5,183.16	1.0	\$5,183.16

<https://www.twdigital.us>

# Quoting Communication

- PDF is generated using a customizable HTML template
- Can be sent to customer directly from within DashQ

Additive Manufacturing [Demo]  
123 Any Street  
Houston, TX 77005

Tuesday, March 14, 2023

**Customer**  
Customer One  
123 Any St  
Houston, TX


**Quote #** Q1001

In response to your inquiry, we are pleased to submit the following quotation.

**Items**

Pos	Description	Qty	Net Price	Extended Price
10	<b>AdditiveMfg</b>	1.0	\$5183.16	\$5183.16
	Base		\$5018.16	
	Finish		\$165.00	
	<b>AdditiveMfg</b> QTY=50, MATERIAL=Material One, X=100 [MM], Y=100 [MM], Z=100 [MM], VOLUME=1000000, SURFACEAREA=60000, PARTWEIGHT=1 [KG], PAINT=YES, FINISH=VAPORSMOOTH, EXPEDITE=NO			
	Price Net SubTotal			\$5183.16

Delivery (Weeks ARO): 5  
Validity (Days): 30  
Payment Terms:  
**Notes:**  
Regards,



# Customer Detail

- Target gross margin (determines quote discount without approval)
- Notes
- Line Item Templates (repeat orders)
- People

Search... Search

Home > Customers > Detail

## Customer Detail

New Quote Edit Delete Sales Quotes Sales Orders Contract Pricing Analysis

Number	Name	Gross Margin Target		
C1000	Customer One	20%		

Address	City	State	ZIP	Country
123 Any St	Houston	TX	77005	United States

Notes Add

Date	Note
------	------

### Line Item Templates

Product	Description	Cost	Price	Gross Margin
---------	-------------	------	-------	--------------

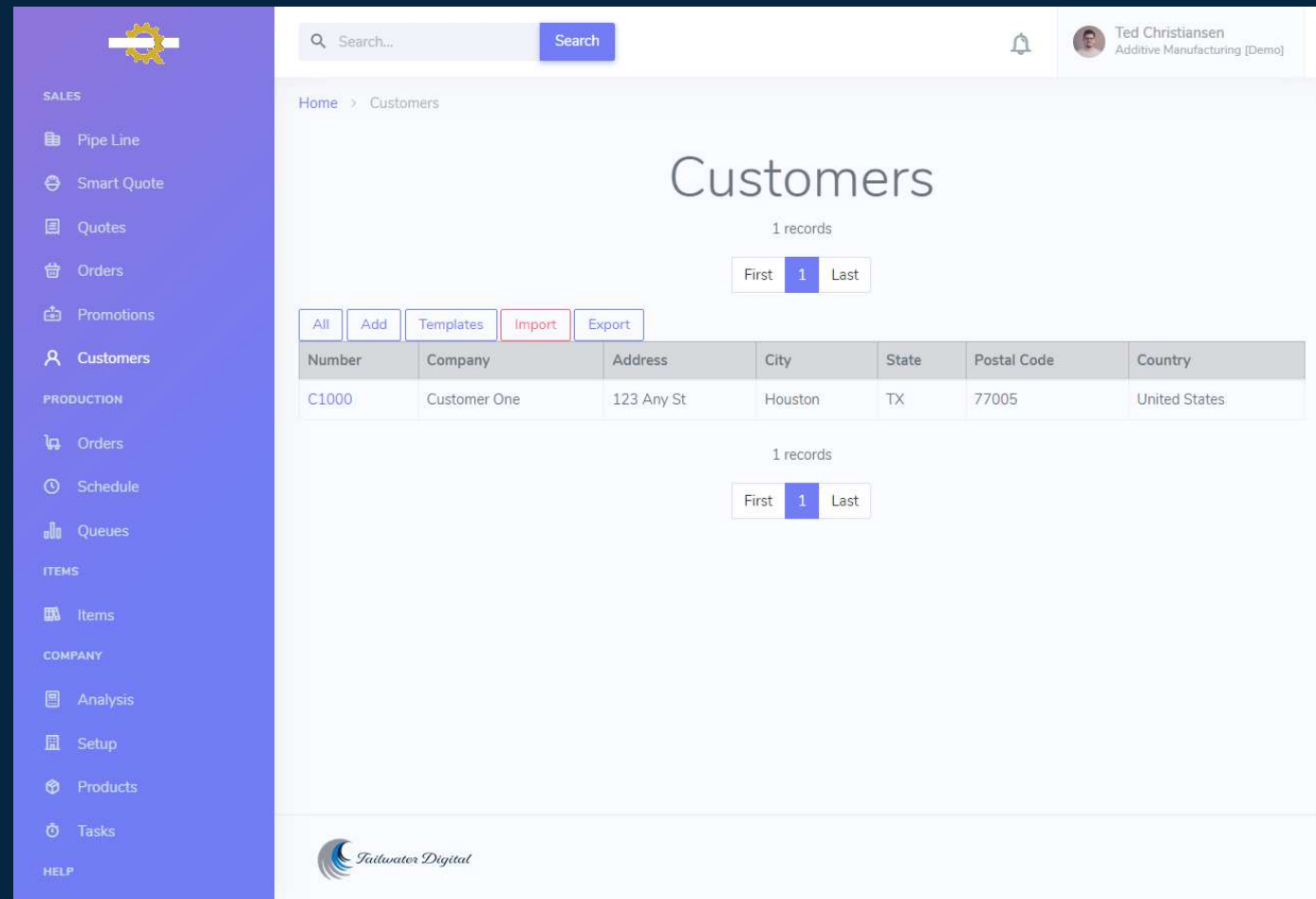
People Add

First	Last	Email
-------	------	-------

Tailwater Digital

# Customers

- Can be managed within DashQ  
\*\*OR\*\*
- Imported from another source
  - Excel
  - DashQ API (other systems)



The screenshot displays the Tailwater Digital DashQ interface. The left sidebar contains a navigation menu with categories: SALES (Pipe Line, Smart Quote, Quotes, Orders, Promotions, Customers), PRODUCTION (Orders, Schedule, Queues), ITEMS (Items), COMPANY (Analysis, Setup, Products, Tasks), and HELP. The main content area shows the 'Customers' page with a search bar at the top right, a user profile for Ted Christiansen, and a breadcrumb trail 'Home > Customers'. The page title is 'Customers' with '1 records' below it. A pagination control shows 'First 1 Last'. Below this is a table with columns: Number, Company, Address, City, State, Postal Code, and Country. The table contains one record: C1000, Customer One, 123 Any St, Houston, TX, 77005, United States. Below the table, another pagination control shows 'First 1 Last'. The Tailwater Digital logo is visible at the bottom left of the page.

# Sales Orders

- While in DRAFT, users can update:
  - External Reference
  - Promise Date
- Add Notes
- Add line items

The screenshot displays a 'Sales Order Detail' page in a web application. The interface includes a search bar at the top, a user profile for Ted Christiansen, and a navigation sidebar on the left. The main content area shows a progress bar for the order status (Draft, Finalized, Completed) and a table of order details. Below this, there are sections for Meta Data, Profitability, and Line Items (1 total).

**Order Details Table:**

Status	Number	Customer	Zip Code	Promise Date	From SalesQuote	Ext Reference
DRAFT	SO1002			04/16/2023	Q1002	

**Meta Data Table:**

Label	Value

**Profitability Table:**

Price Gross	Disc %	Price Net	Cost	Net Margin %
\$5183.16	0.00	\$5183.16	\$4312.94	16.8

**Line Items (1 total) Table:**

Line #	Description	Unit Price Net	Quantity	Extended Price Net
10	Base	\$5018.16	1.0	\$5183.16
	Finish	\$165.00		

# Production Orders

- Sales Order Line Items are converted to Production Orders
- Change status (Released, WIP, etc)

Search... Search

Home > Production Orders

## Production Orders

Production Schedule Queues Assignment Export

**WIP (1)**

10 25 50

Seq #	PR#	SQ#	SO#	Line #	Customer	Part Index	Qty	Actions	Promise Date	On Time [d]
1	PR1000-10-1	Q1000	SO1000	10	Customer One	1	1.0	Action -	04/12/2023	27

**Released (1)**

10 25 50

Seq #	PR#	SQ#	SO#	Line #	Customer	Part Index	Qty	Actions	Promise Date	On Time [d]
2	PR1001-10-1	Q1001	SO1001	10	Customer One	1	1.0	Action -	04/12/2023	27

**Planned (0)**

10 25 50

Seq #	PR#	SQ#	SO#	Line #	Customer	Part Index	Qty	Actions	Promise Date	On Time [d]
-------	-----	-----	-----	--------	----------	------------	-----	---------	--------------	-------------

**Reserved (0)**

10 25 50

Seq #	PR#	SQ#	SO#	Line #	Customer	Part Index	Qty	Actions	Promise Date	On Time [d]
-------	-----	-----	-----	--------	----------	------------	-----	---------	--------------	-------------

# Production Schedule

- Viewable in different ways
- Button click change of priority with **automatic schedule recalculation**

Search... Search

Home > Schedule > Next 1 Days

## Schedule Next 1 Days

View Update Queues Production Orders Export

#	Sequence	No	Sales Order	Line #	Customer	Part Index	Planned Start	Planned Finish	Promise Date	On Time [d]
1	Update	PR1000-10-1	SO1000	10	Customer One	1	03/14/2023 09:02 AM	03/16/2023 06:12 AM	04/12/2023	27
2	Update	PR1001-10-1	SO1001	10	Customer One	1	03/15/2023 08:00 AM	03/16/2023 12:17 PM	04/12/2023	27
Max								03/16/2023 12:17 PM		

Status Types:  
Reserved  
Planned  
Released  
WIP  
Completed

Tailwater Digital

<https://www.twdigital.us>





# Task Time Clocking

- Time data collected via tablets at each workstation
- Time data analyzed via AI to automatically update Task models



Work Cell: **MACHINE1** Ted ▾

**Next**

**PR1003-10**  
SalesOrder: SO1003 (Customer #1)  
Planned Start : 03/10/2023 16:30:48

**PR1001-10**  
SalesOrder: SO1001 (Customer #1)  
Planned Start : 03/10/2023 16:30:48

**Messages**

Dismiss	03/13/2023 :
Dismiss	03/13/2023 :
Dismiss	03/13/2023 :

**PR1000-10 / SO1000 (Customer #1)**

- Planned Start : 03/10/2023 08:20:48
- Duration [Minutes]: 200.000
- Planned Finish : 03/10/2023 11:40:48
- Quantity Completed: 0 of 10
- Description: Machining

**Clock In**

# Integrations

- Just-Plan-It
  - <https://www.just-plan-it.com/>
- QuickBooks (Online)
  - Coming soon

The screenshot displays the Just-Plan-It software interface. At the top, there is a navigation bar with tabs for 'Update', 'Understand/Schedule', 'Report', 'Execute', and 'Settings'. Below this is a toolbar with icons for Undo/Redo, View, Navigate, and Highlight. A dropdown menu for 'Shopfloor Data' and a 'Job Note' field are also visible. The main area shows a Gantt chart with a task list on the left. The task list includes:

Task #	Name	Job	Process Time
1	Default		+
2	ENGINEERING		+
1	DESIGN		
3	BUILD		+
1	ROUTER_PROG		
2	CNC_PROG		
3	PRESSBRAKE_PROG		
4	ROUTER_SETUP		
5	CNC_SETUP		
6	PRESSBRAKE_SETUP		
7	ROUTER		
8	CNC		
9	PRESSBRAKE		
10	WELDING		
11	ASSEMBLY		
12	FINISH		

The Gantt chart shows a timeline from July 2022 (Wk 29) to September 2022 (Wk 39). A red vertical line indicates the 'Planning Start' date, and a green vertical line indicates the 'Date Time Now'. The chart area is currently empty, suggesting no tasks are scheduled.

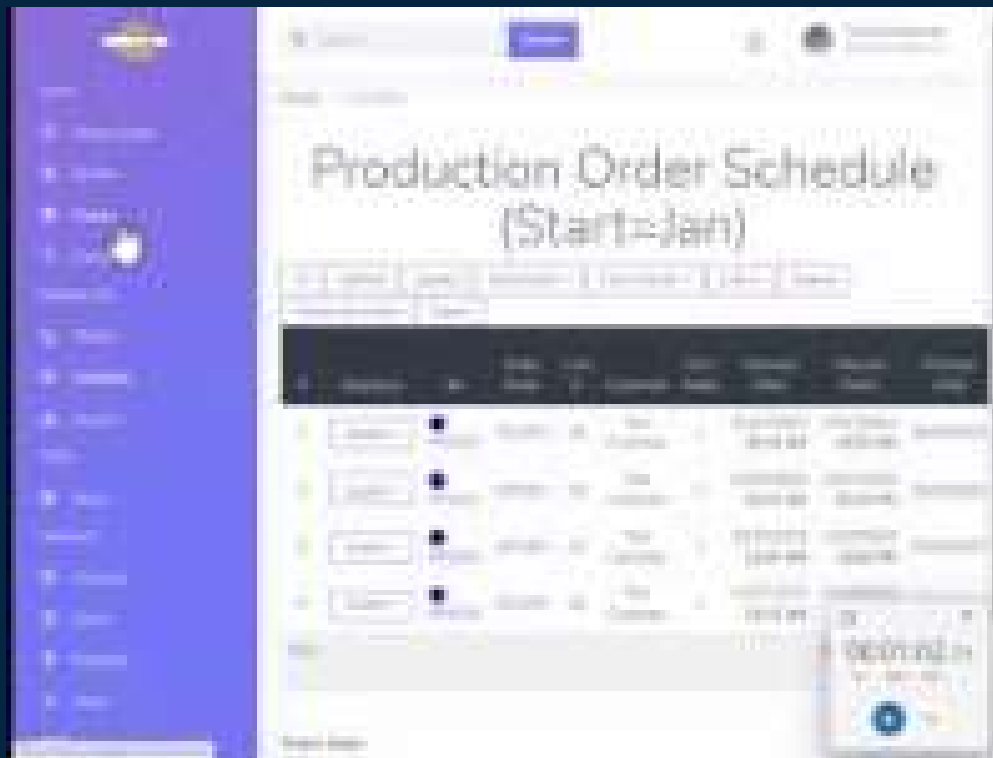
<https://www.twdigital.us>

# DashQ in Action



**DRAFT**

<https://www.twdigital.us/Videos/679896DA-E4CA-4A76-8A83-135C48FBCAF3/Detail>



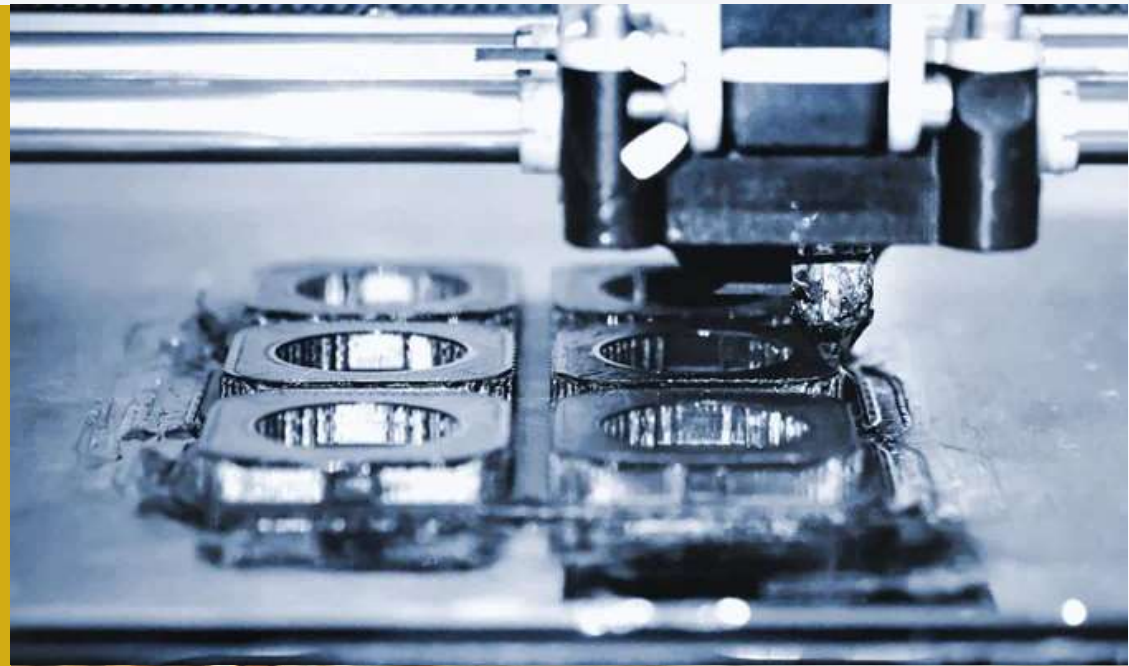
<https://www.twdigital.us>



DRAFT

# Quoting + Scheduling for Additive Manufacturing

March 2023



<https://www.twdigital.us>

