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Hemlock Semiconductor: There is Life After ProcessBook

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AVEVA

There is Life After Processbook

AVEVA World 2025
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Agenda

- About Hemlock Semiconductor (HSC)
- PI Vision Rollout Process Phases
- Learnings
- Recommended Rollout Strategies
- Future Plans
- Q & A

Our headquarters is located in
Hemlock, Michigan.

We create the world's purest
human-made substance:
polysilicon.

Our polysilicon is

99.99999999999%
pure.

Finding an impurity in our polysilicon is the same as searching for one marble in Manhattan.

Fast Facts
About HSC

1961
HSC is founded in Hemlock, Michigan, to supply the electronics and solar industries.

1 of Few
HSC is only one of a select few global suppliers making polysilicon for leading-edge chips.

99.9999999999%
12N is the level of purity we achieve for our product: hyper-pure polysilicon.

2
Owned by two world-leading tech companies: Corning Inc. and Shin-Etsu Handotai

#1
We are the largest electricity user in the state of Michigan.

1,500
Our employees make HSC a best-in-class manufacturer.

700 Miles
Of pipes run throughout the site.

>$1 Billion
In annual revenue

350
Acres of land make up the HSC industrial site

85%
Of our materials and services that we buy are American

YouTube video with more details

HSC serves two vital industries:
semiconductor and solar power.
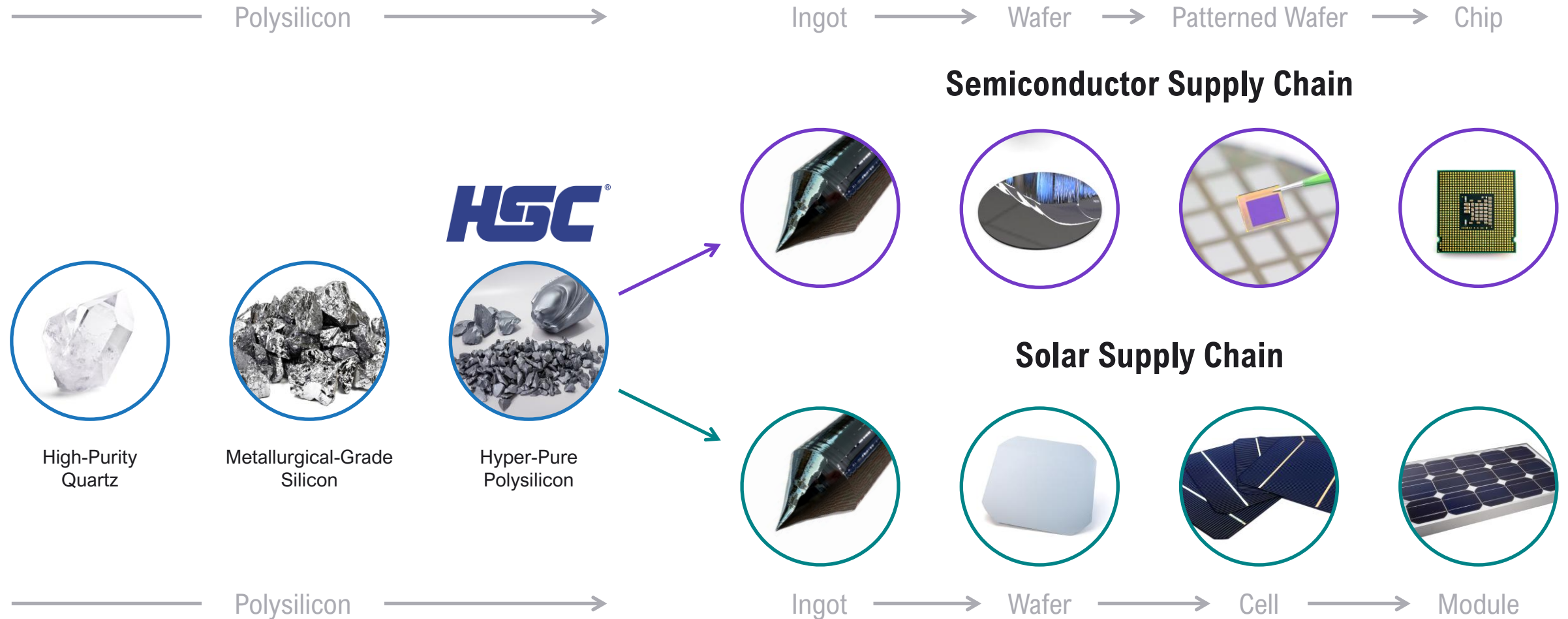
Polysilicon → Ingot → Wafer → Patterned Wafer → Chip

Semiconductor Supply Chain

HSC

Solar Supply Chain

High-Purity Quartz

Metallurgical-Grade Silicon

Hyper-Pure Polysilicon

Polysilicon → Ingot → Wafer → Cell → Module

PI Vision Rollout
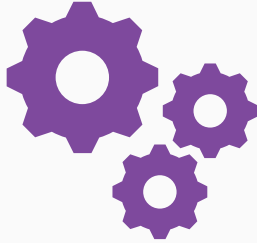
Problem

- ProcessBook has been retired by AVEVA
- Becoming more incompatible with Windows 11+ (slow shutdown, OCX unregistering, etc.)

Solution

- PI Vision!

PI Vision Advantages

- Browser Based
- Much Easier to Learn and Use
- Easier Administration
  - No client installs
  - Better traceability of who is using what
- Administration Portal Provides Good Visibility and User Control

Rollout Process

- Took Approximately 1 Year
- Piloted with a small team of representative users
- Dozens of Training Sessions
  - Covered approximately 75% of user base(about 400 users)
- ProcessBook Conversion
  - Resulting in Approximately 6,700 displays
  - Around 60-70% PIW's
  - End User Would Validate Before Making Available to the General User Base

Rollout Phase 1 – Pilot Team

- Identified key users (engineers and operators)
  - 10 – 12 Users
- Did an initial conversion of ~1,000 displays
- Conducted in-depth training
  - Two Solid Days of Training(16 hours)
  - Became Power Users
- Pilot team worked mostly with PI Vision 2022

Pros

- Very Easy and Pleasant to Use

- ProcessBook Conversion Worked "Well Enough"

Cons

- Editing Multiple Objects was Difficult

- Customization Capabilities Were Minimal

- Large Admin Tasks Were Difficult (Mass Security Changes Would Fail, etc.)

- Tag Search was Too Rudimentary

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Rollout Phase 2 – Waiting and Training

- PI Vision 2023 improved performance, conversion, and added features (new symbols, etc.)

- Beginning in October 2024, began teaching 2-hour training sessions three times per week

- During this time, developed an initial security model and conversion timeline

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Rollout Phase 3 – Installation and Release

- PI Vision 2024 released in Q4 2024
  - Massive Improvement in Security Configuration
  - New Symbols
  - Better Display Listing Options
- It can't be overstated how valuable it was to have Vision 2024 online before Go-Live.
- Conversion of Central (and Controlled) Site Displays

Rollout Tasks

- ProcessBook Files Locked Down/Frozen
  - Central file share of ProcessBooks was set to read-only for non-PI admins.
- New Client Install Package No Longer Includes ProcessBook
- File Share Established for Conversion of Personal User Displays

Conversion Learnings

- ProcessBook Conversion Tool Is Good, But Has Issues
  - Reporting is poor. If a file fails to convert, error report simply reports that the failure occurred.
  - Conversion of displays with datasets can be problematic.
  - We recommend deleting unused datasets from display before conversion.
  - Conversion works better if ProcessBook is installed on machine where conversion is taking place
    - Folder structure automatically created by conversion tool based on original hierarchy from the PDI and PIW files.
  - Embedded graphics (.jpg, .bmp, etc.) often break conversion. Remove them before converting.

Security

- Security is one aspect we need to revisit
- We configured AD groups to controlled who has read or write access to displays.
- Every user has their own personal folder
- Sharing is currently an "all or nothing" affair. Share with World or keep it private.
  - More granular sharing will require multiple AF identities to be created and maintained by PI team.
  - Because this, one user cannot share a display with a single other user without creating an identity for each employee.
  - We still have not yet developed a good solution to this.

Folder Security
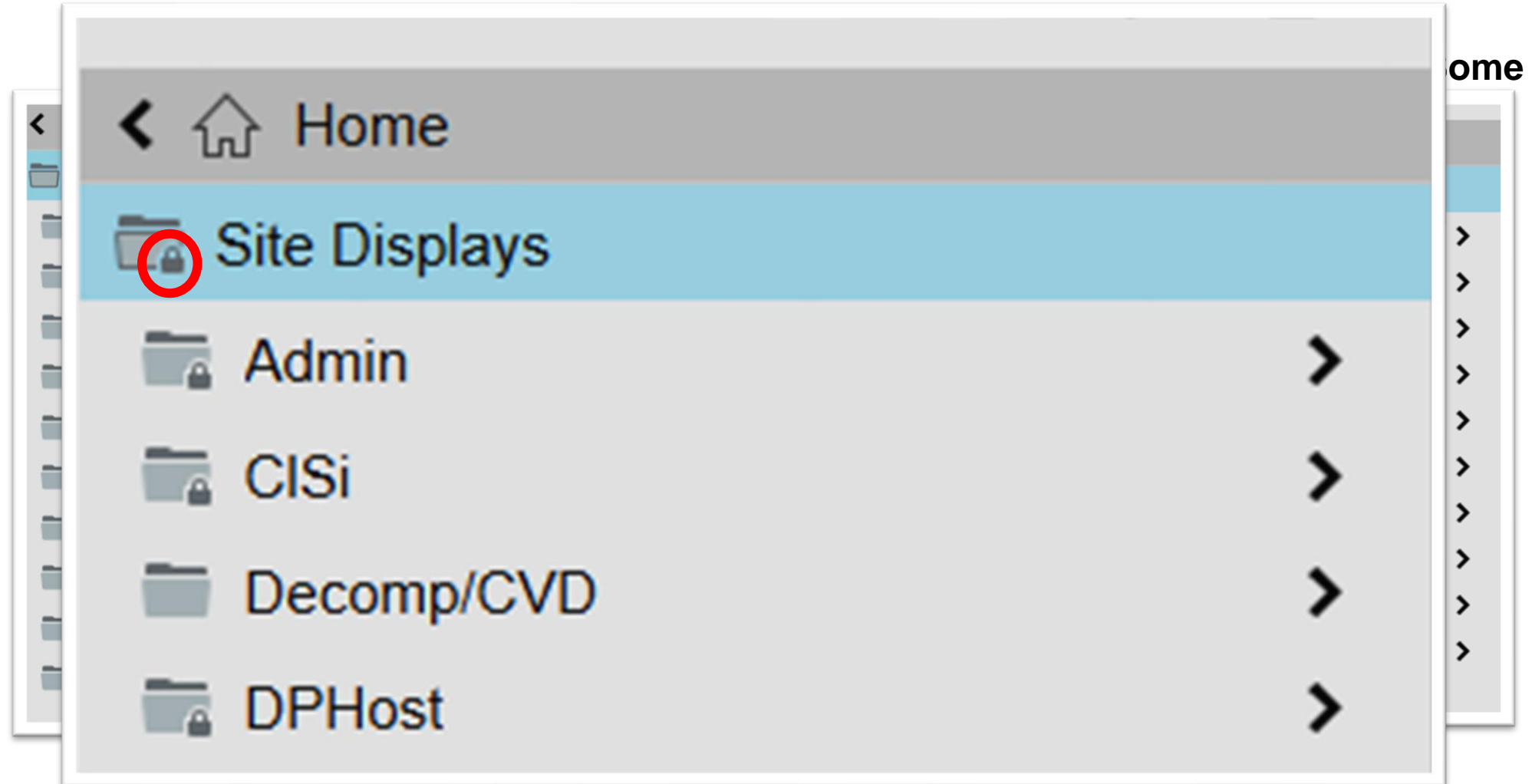
Overall Positives

- User reception has been extremely positive. People would leave training excited to use the tool.
- Training has been streamlined.
  - Former training model on site involved a full-day class of ProcessBook and Datalink
    - Additional half day for advanced training class for deeper topics (datasets / expressions, multi-states, etc.)
  - Now With Vision, we can cover all material in a single day(Vision, DataLink and Advanced Topics.
- PI use among non-standard PI users (supply chain, finance, etc.) is up.
- Collaboration has increased with the ease of display sharing.
- Leveraging Vision displays in iFrames for other applications
- Beginning to leverage templatization capabilities of Vision displays with AF assets.

Rollout Strategies

- Import maintain trust and confidence during the roll out.
  - PI is one of the most stable platforms on any site
  - PI users tend to be very attached to their tools
- Involve power users very early on. Their enthusiasm for the tool will help the rollout succeed.
- Develop a folder structure for controlled displays and build AD groups and identities
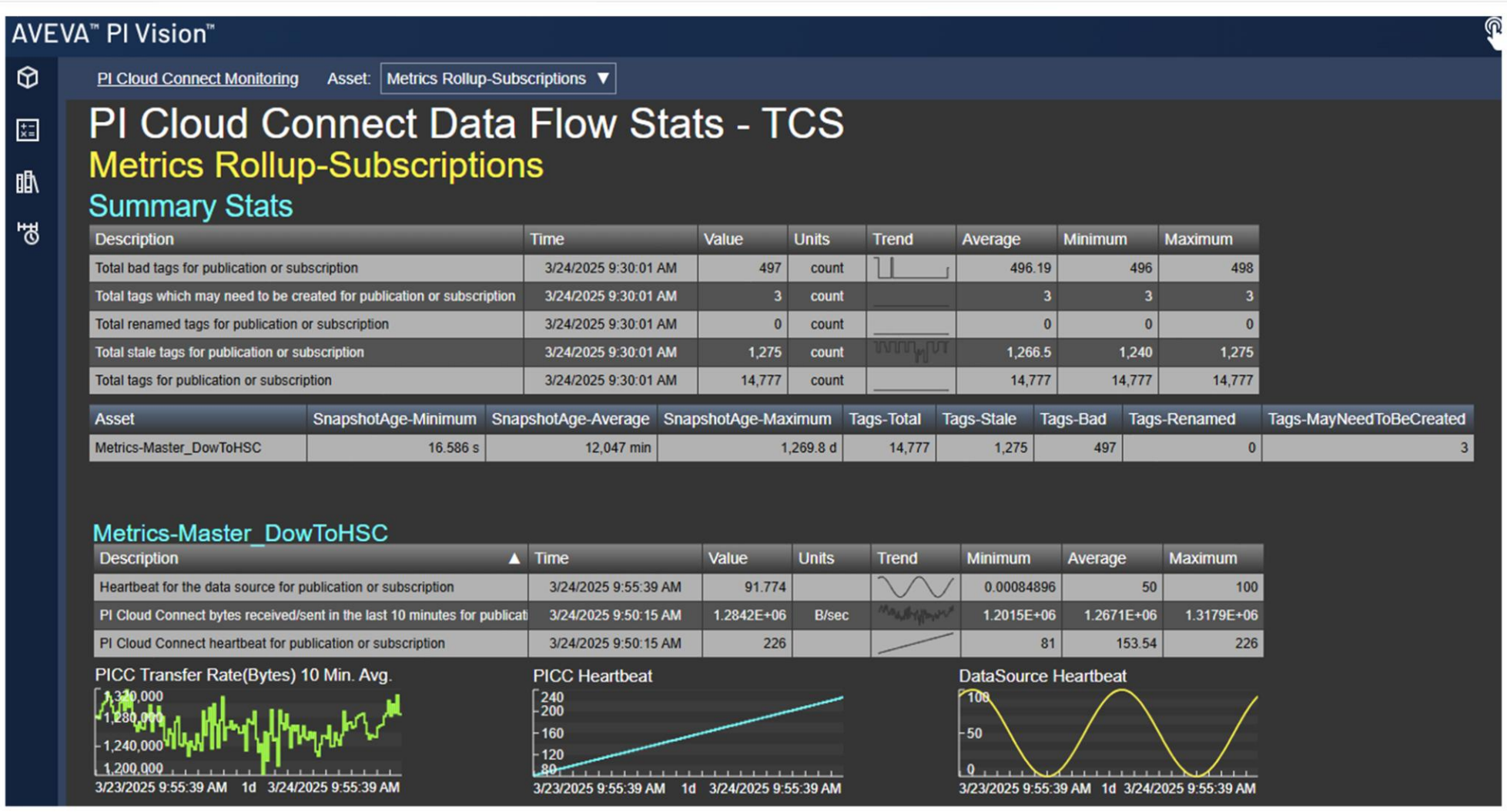- Cull unused ProcessBook displays BEFORE conversion if you can.

Element Relative Display Example 2

AVEVA™ PI Vision™

PI Cloud Connect Monitoring   Asset: [Metrics Rollup-Subscriptions ▼]

PI Cloud Connect Data Flow Stats - TCS
Metrics Rollup-Subscriptions
Summary Stats

Description	Time	Value	Units	Trend	Average	Minimum	Maximum
Total bad tags for publication or subscription	3/24/2025 9:30:01 AM	497	count		496.19	496	498
Total tags which may need to be created for publication or subscription	3/24/2025 9:30:01 AM	3	count		3	3	3
Total renamed tags for publication or subscription	3/24/2025 9:30:01 AM	0	count		0	0	0
Total stale tags for publication or subscription	3/24/2025 9:30:01 AM	1,275	count		1,266.5	1,240	1,275
Total tags for publication or subscription	3/24/2025 9:30:01 AM	14,777	count		14,777	14,777	14,777

Asset	SnapshotAge-Minimum	SnapshotAge-Average	SnapshotAge-Maximum	Tags-Total	Tags-Stale	Tags-Bad	Tags-Renamed	Tags-MayNeedToBeCreated
Metrics-Master_DowToHSC	16.586 s	12,047 min	1,269.8 d	14,777	1,275	497	0	3

Metrics-Master_DowToHSC

Description	▲ Time	Value	Units	Trend	Minimum	Average	Maximum
Heartbeat for the data source for publication or subscription	3/24/2025 9:55:39 AM	91.774			0.00084896	50	100
PI Cloud Connect bytes received/sent in the last 10 minutes for publicati	3/24/2025 9:50:15 AM	1.2842E+06	B/sec		1.2015E+06	1.2671E+06	1.3179E+06
PI Cloud Connect heartbeat for publication or subscription	3/24/2025 9:50:15 AM	226			81	153.54	226

PICC Transfer Rate(Bytes) 10 Min. Avg.
1,320,000 / 1,280,000 / 1,240,000 / 1,200,000
3/23/2025 9:55:39 AM 1d 3/24/2025 9:55:39 AM

PICC Heartbeat
240 / 200 / 160 / 120 / 80
3/23/2025 9:55:39 AM 1d 3/24/2025 9:55:39 AM

DataSource Heartbeat
100 / 50 / 0
3/23/2025 9:55:39 AM 1d 3/24/2025 9:55:39 AM

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Future Steps

- We have evaluated and are about to purchase Werusys' PI Vision suite of controls.
  - This adds dozens of new controls to improve display data density and usability (note that Werusys is at the conference in the vendor fair)
- We are currently still very tag-focused. We are building out our AF structure in more detail starting in 2025.