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Creating Value in Hardwood Sawmills With the Help of AI

Presented by **Ryan Shear**

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Welcome

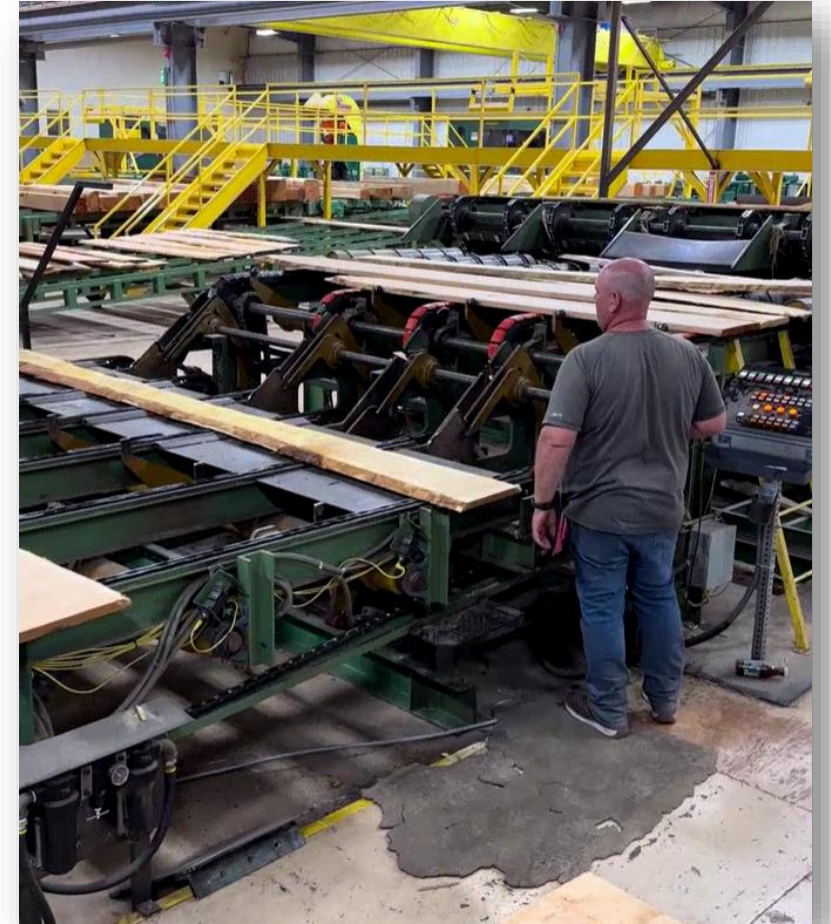
- Leader in AI-driven Auto-Grading and Optimization Platforms
- 25 years in the Lumber Industry, both as equipment producer and in mill production
- Multiple Patents for the use of AI in sawmill applications
- Advisory Board Member @ Oregon State Univieristy – Computer Science and Engineering



Why this matters now

Same variability. Less room for error.

- Uncertain markets and tighter margins
- Harder to recruit and retain skilled people
- Critical knowledge concentrated in a few employees
- Greater need for consistent decisions



The Knowledge Problem

What happens when experience can't be everywhere



- Experienced judgement takes years to develop
- Fewer people entering the Sawmill Ecosystem
- Decisions vary by person, shift, and production pressure
- Knowledge must be captured, supported, and shared

Value Is More Than Volume

The highest-volume decision is not always the highest-value decision

Board feet tell us how much we made.

Value depends on how well we used the log.

- Grade recovery
- Width and length
- Product mix
- Market fit
- Waste and rework

The same volume can produce very different financial results.



If We Want to Improve Value, We Have to Measure It

Small decisions x Production volume = Significant Value



Better visibility creates more opportunities to improve.

- Recover more value from each pieceImprove grade and product consistency
- Preserve valuable width and length
- Reduce unnecessary trim and rework
- Increase throughput and responsiveness
- Give operators better information

The value of better information grows every time we use it to make a better decision.

Three Decisions Shape the Outcome

Where Decisions Create or Destroy Value

See It

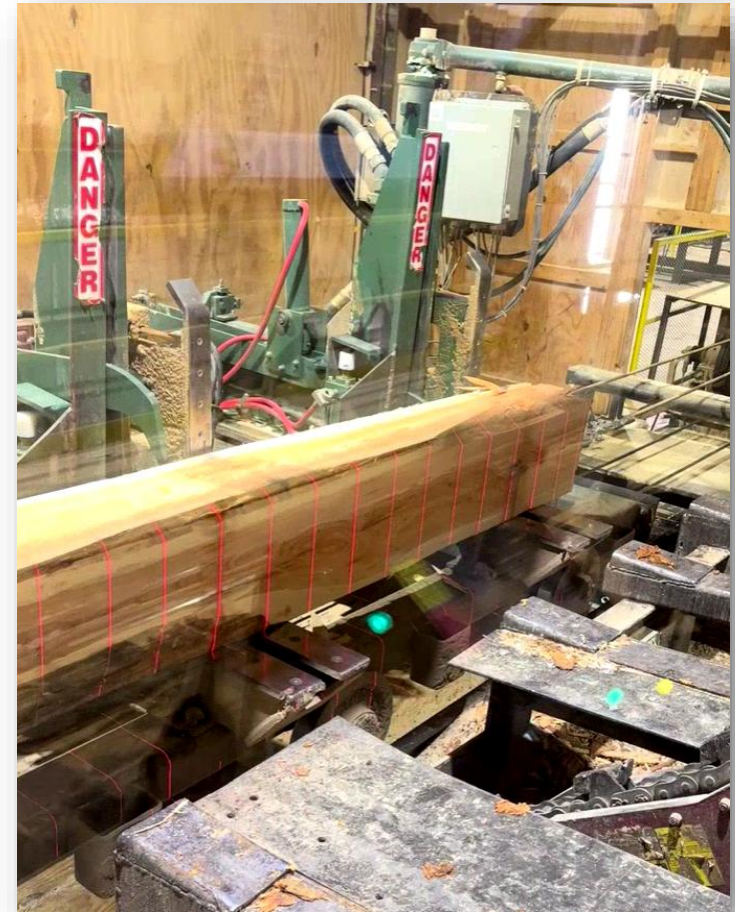
- Geometry and dimensions
- Defects and usable clear areas
- Species, color, moisture, and quality

Choose It

- Orientation and sawing pattern
- Edge, trim, divide, or leave intact
- Grade and product decision

Place It

- Sort and destination
- Customer or product match
- Rework, recovery, or downgrade



How Value Disappears

The largest loss may be a small mistake repeated all day.



Missed Opportunity

A higher-value solution was present but not recognized.

Excess Removal

More width or length was removed than necessary.

Inconsistency

The answer changes by person, shift, speed, or conditions.

Local Optimization

One machine improves its result while reducing total mill value.

Poor Product Matching

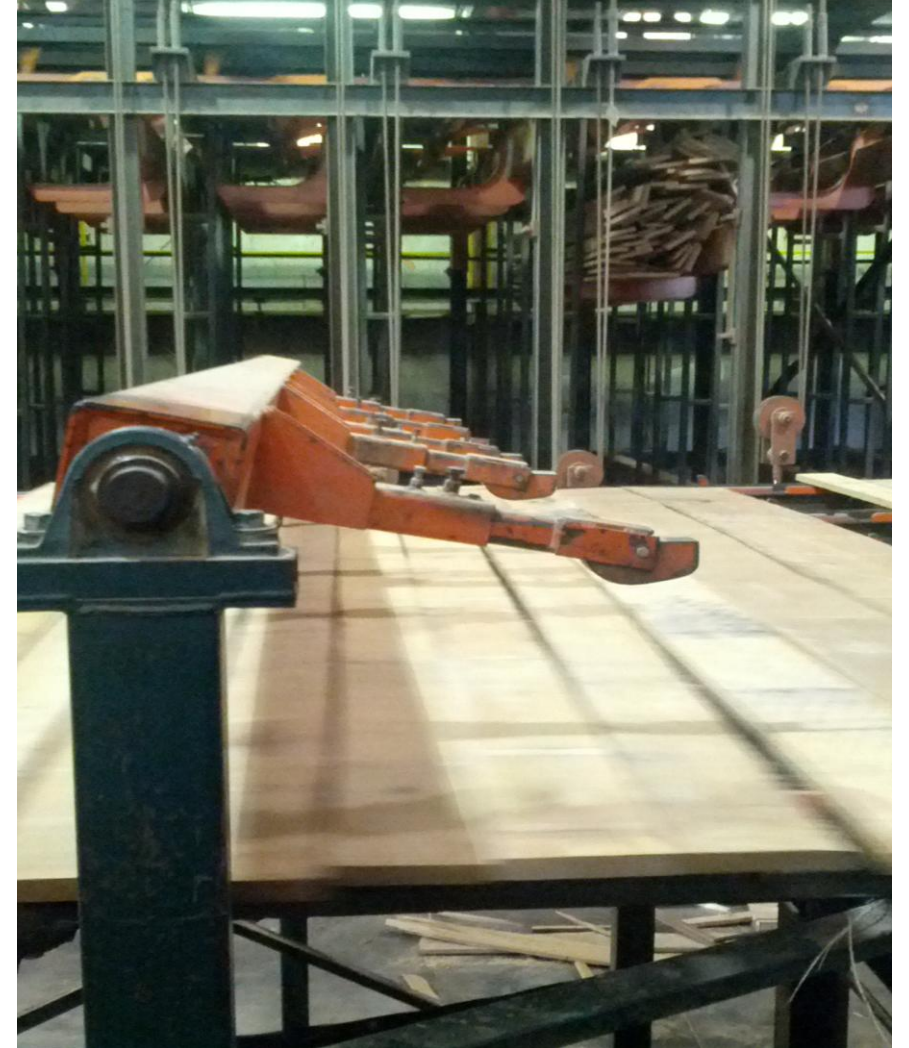
Good material is made into – or sent to – the wrong product.

Where AI Earns Its Place

Start with the decision – not the technology.

AI is a good fit when a decision is:

- Repeated many times
- Difficult to make at production speed
- Based on complex or variable information
- Affected by inconsistency
- Connected to a measurable outcome



See Better, Choose Better, Place Better

AI turns observations into decision support.



See Better

- Locate and classify defects
- Measure geometry, wane, warp, and dimensions
- Recognize species, color, or surface conditions
- Identify material that requires human review

Choose Better

- Compare edge and trim solutions
- Support grading decisions
- Balance grade, dimensions, price, and recovery
- Respond to changing product requirements

Place Better

- Improve sorting and product matching
- Direct boards to the best available process
- Identify recovery or rework opportunities
- Track consistency and process performance

AI Recognizes Patterns; It Does Not Understand the Mill

AI still struggles with:

- Material it has not seen before
- Changes in species, surface, moisture, or lighting
- Rare defects and unusual combinations
- Decisions that depend on market or customer context
- Recognizing when its own answer is wrong



A Good Average Can Hide Expensive Mistakes

Accuracy alone is not enough.

- Not every error has the same cost
- Rare mistakes may matter the most
- Performance can drift without an obvious failure
- Confidence does not guarantee correctness
- Some decisions still require human judgment



Why Hardwood Is a Harder Problem

Variability Is Built Into the Material



Every board can vary by:

- Species and growing conditions
- Color, grain, and natural character
- Shape, width, thickness, and length
- Moisture and surface condition
- Defect type, appearance, and location

The Role of People

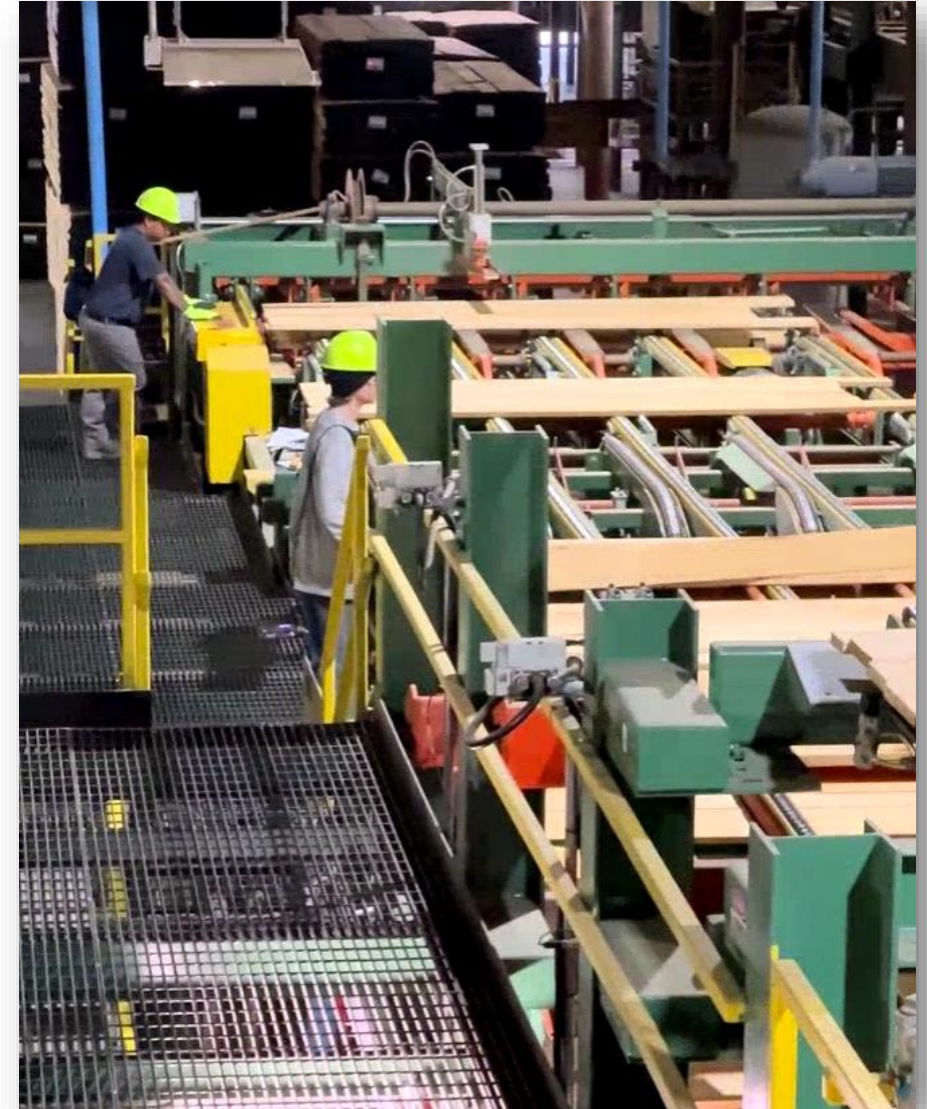
People Teach the System What Value Means

People provide the knowledge

- What a defect means
- Which decisions are practical
- Which exceptions matter
- What customers will accept
- How success should be measured

AI provides the scale

- Examines every piece
- Applies learned patterns consistently
- Compares more possible solutions
- Records decisions and results



The Role of People

People Remain Responsible for the Outcome

People should:

- Define the goal and acceptable risk
- Review uncertain or unusual material
- Approve high-consequence decisions
- Monitor accuracy and process changes
- Explain and record overrides
- Maintain a safe manual fallback

AI should:

- Handle repeatable, well-understood cases
- Flag uncertainty and exceptions
- Provide evidence for its recommendation
- Learn from reviewed outcomes





The goal is not a sawmill without people.

The goal is to give good people better tools.

- Recover more value
- Make decisions more consistently
- Preserve hard-earned knowledge
- Improve the mill one decision at a time

Technology has to earn its place.



“Strive not to
be a success,
but rather to be
of value.”

- Albert Einstein



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Thank You.

Q&A