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Automating flat glass tempering process

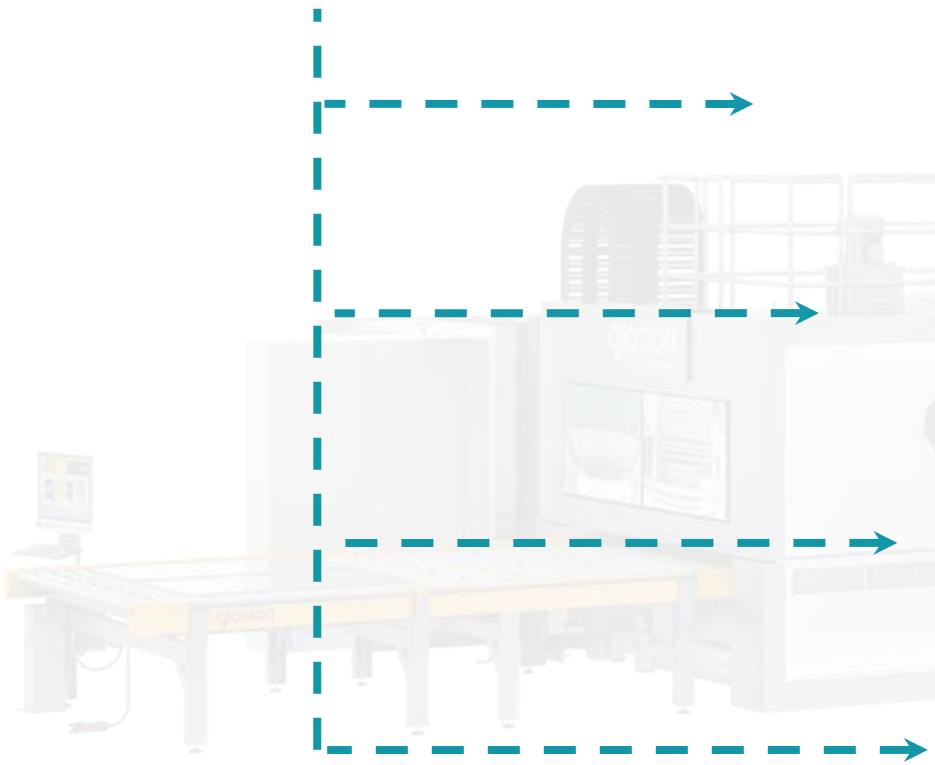
Riku Färm
Glaston Finland Oy



The purpose of automation and digitalization is to facilitate removal of non-value add activity from the course of daily life, whether at work or in private



CONTENT



Drivers For Automation

The Roadmap Steps For Full Automation

Required Technology Development

The Business Model Change

How shall we get there?

TEMPERING LINE VS. CARS



Main drivers for automation

Cars vs. tempering line

PASSENGER CARS

- Time
- Safety
- Cost
- Fluency
 - (e.g. less parking problems)

GLASS TEMPERING PROCESS

Increase production capacity and flexibility to meet fluctuating demand

Improve service levels (e.g. delivery time) while reducing production costs

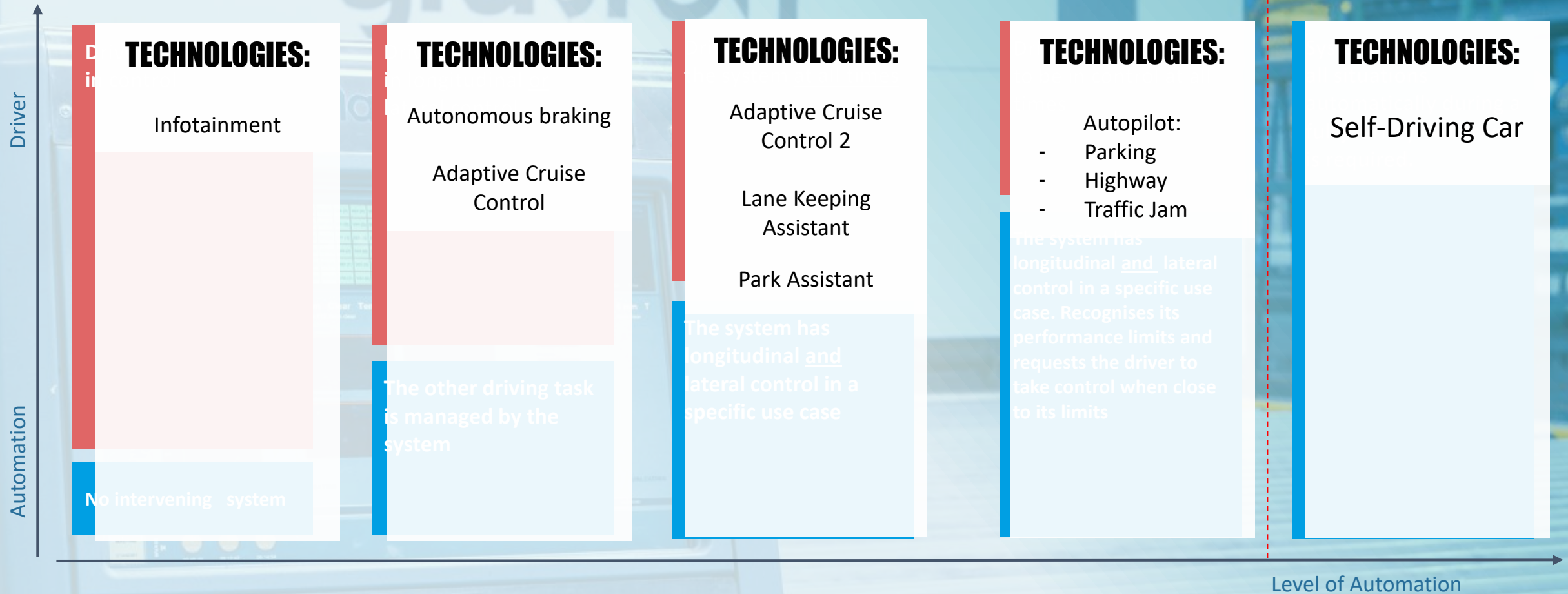
Improve competitiveness through improved product quality

Optimize efficiency, cost control and manufacturing agility through automation and digitalization.

A person is walking across a bridge with a railing, silhouetted against a bright, hazy background. The image is framed by the spiral binding of a notebook on both sides. The text is overlaid on the image.

FULL AUTOMATION DOES NOT MAGICALLY APPEAR
IT'S A RESULT OF SYSTEMATIC DEVELOPMENT STEPS

ROAD TO AUTOMATION PASSENGER CARS



LEVEL 0
No Automation

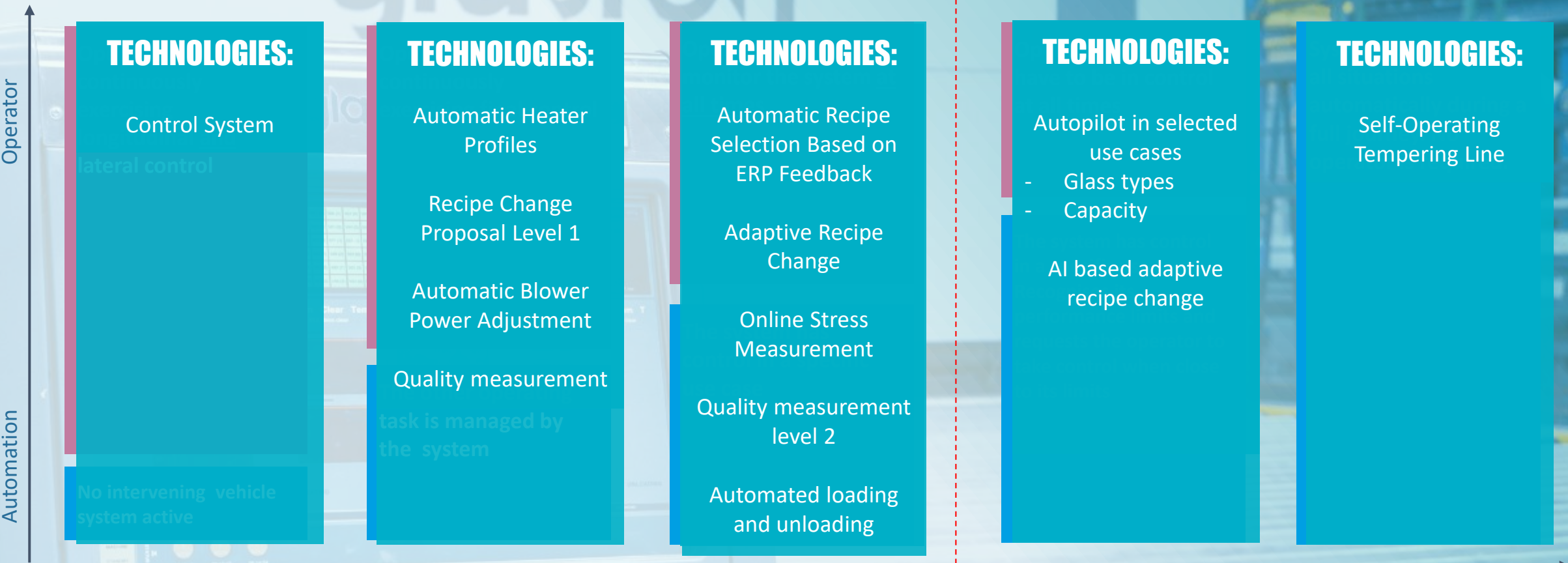
LEVEL 1
Driver Assistance

LEVEL 2
Partial Automation

LEVEL 3
Conditional
Automation

LEVEL 4
Full Automation

ROAD TO AUTOMATION TEMPERING LINES



LEVEL 0
No Automation

LEVEL 1
Operator Assistance

LEVEL 2
Partial Automation

LEVEL 3
Conditional Automation

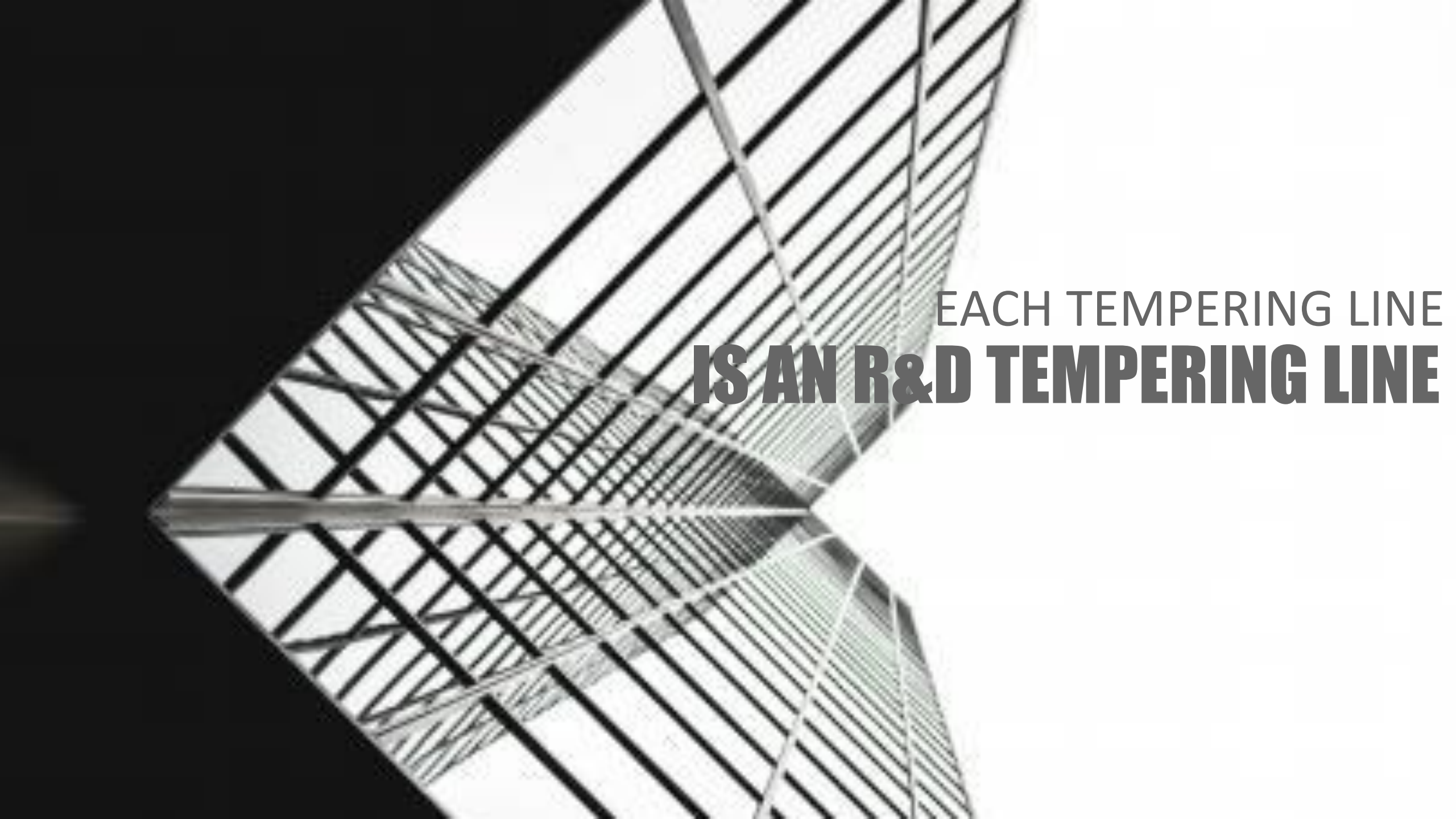
LEVEL 4
Full Automation

Level of Automation

iLook

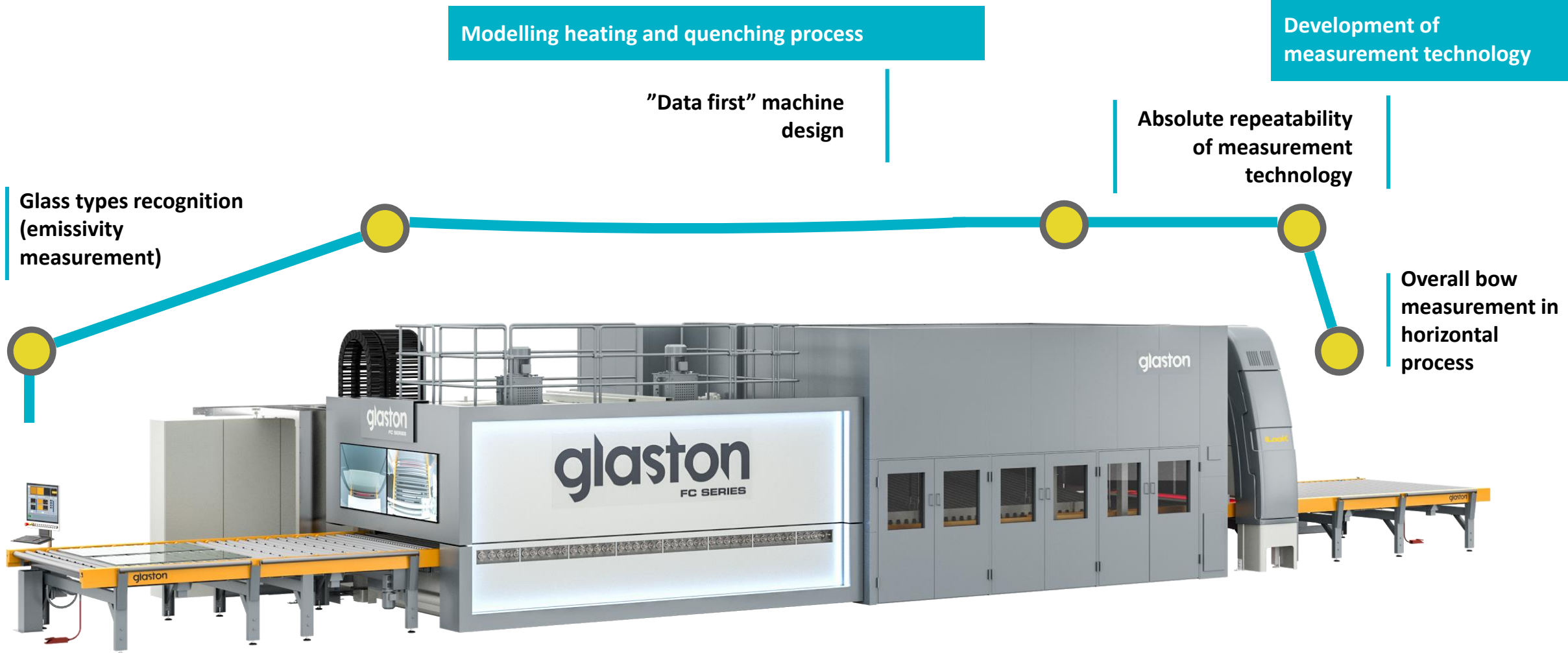
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How we move forward in the steps?



EACH TEMPERING LINE
IS AN R&D TEMPERING LINE

Obstacles of automation





"Construction industry will be like Open Source within the next 5-10 years and the construction of a building will be as easy as building Lego"

Stefan Engeseth in Business Insider

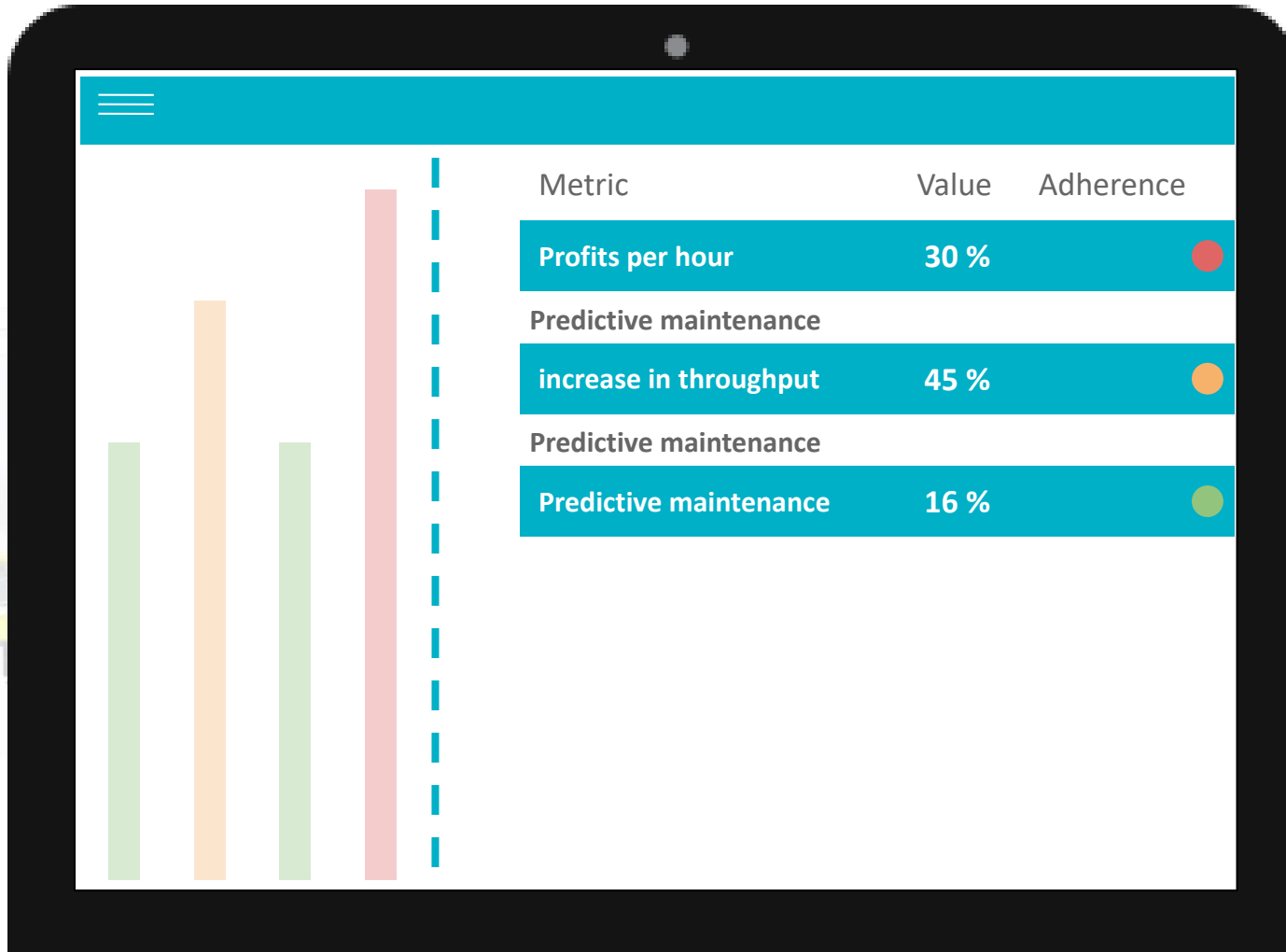
DIGITALISATION HAPPENS IN
FULL SUPPLY CHAIN

A dark, industrial hallway with a central white line on the floor and a closed metal door at the end. The hallway is dimly lit, with light coming from the ceiling and the door area. The walls are dark and textured. The floor has a central white line and some markings. The door at the end is closed and has a yellow and black striped top section.

THE RESULT CAN CREATE AND CHANGE
BUSINESS LOGIC

Real time data changing the business logic

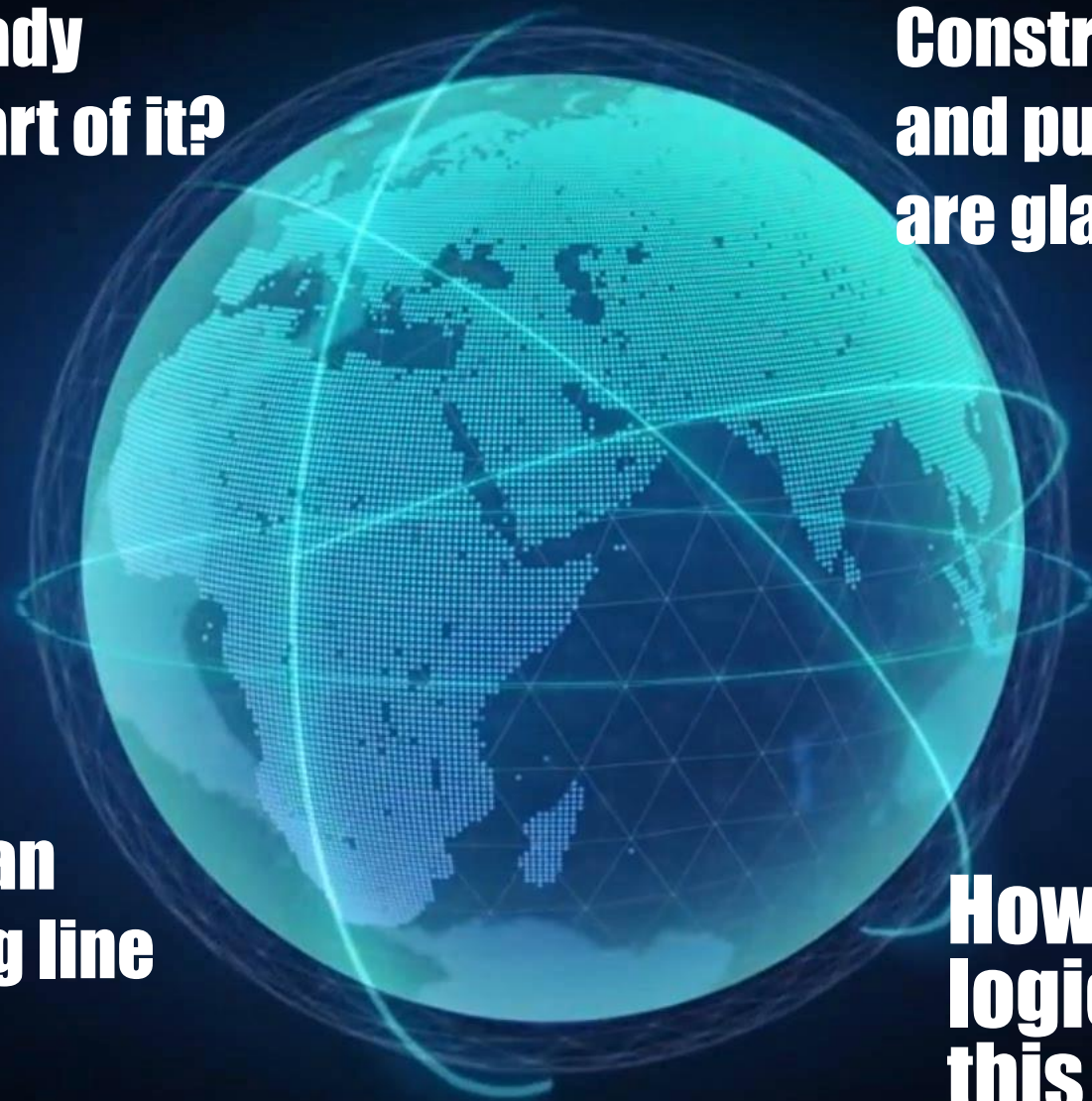
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- Automated tools for **Selling and pricing quality**
- **Pricing** also based on production availability
- **Production availability** and predictive maintenance
- **Profits per hour –management**
- Skilled operator
- Artificial Intelligence

Automation has already happened, are you part of it?

Construction industry design and purchasing will change - are glass processors ready?



Our vision is to have an automated tempering line 2020

How your business logic could change with this change?