Robb Kohn

Automation & Robotics

Blind

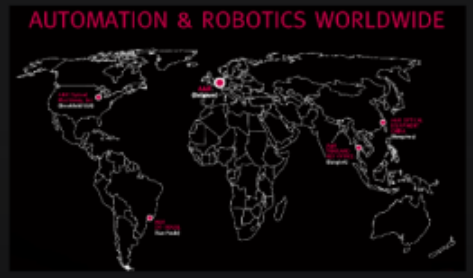
Industry 4.0

Our industry is moving towards Industry 4.0. Solutions like the MES from Satisloh and the Control Center from Schneider are coming to the market. At A&R, we have developed both hardware and software solutions in order to make the important inspection data available.

Solutions for the optical industry
30 years

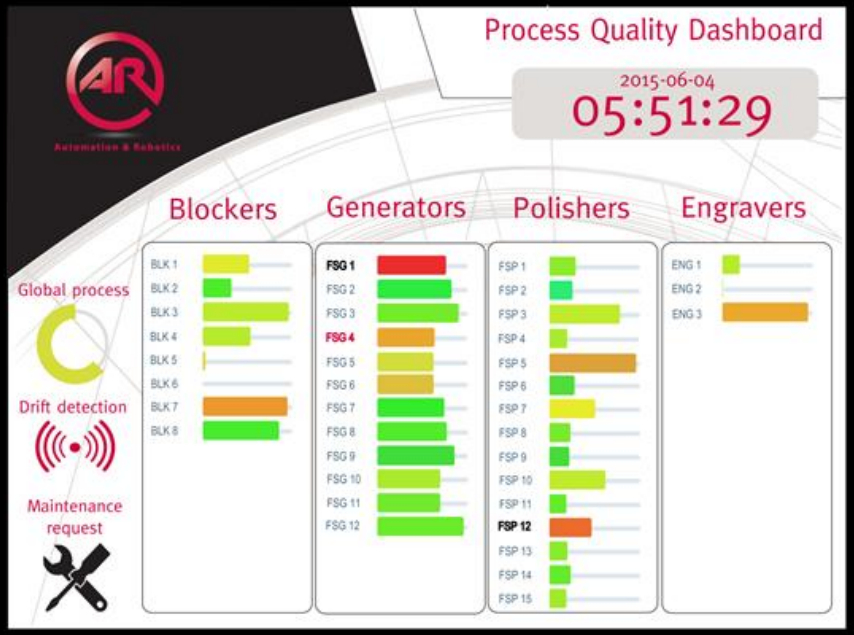
Leader


essilor
HOYA
ZEISS
RODENSTOCK
LUXOTTICA
Transitions
Specsavers
Opticians
And many more...

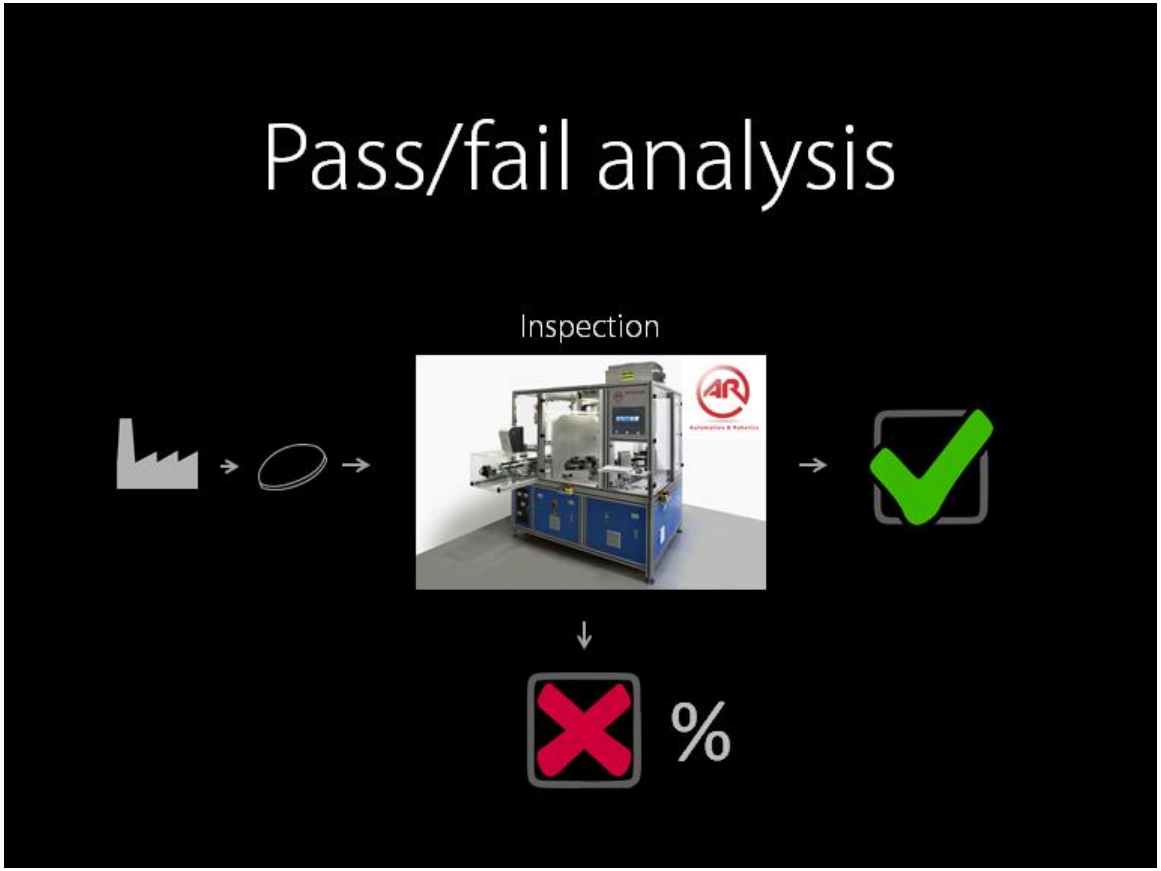

AUTOMATION & ROBOTICS WORLDWIDE

In 2008 A&R introduced the Dual LensMapper, which revolutionized the way freeform lenses are inspected.

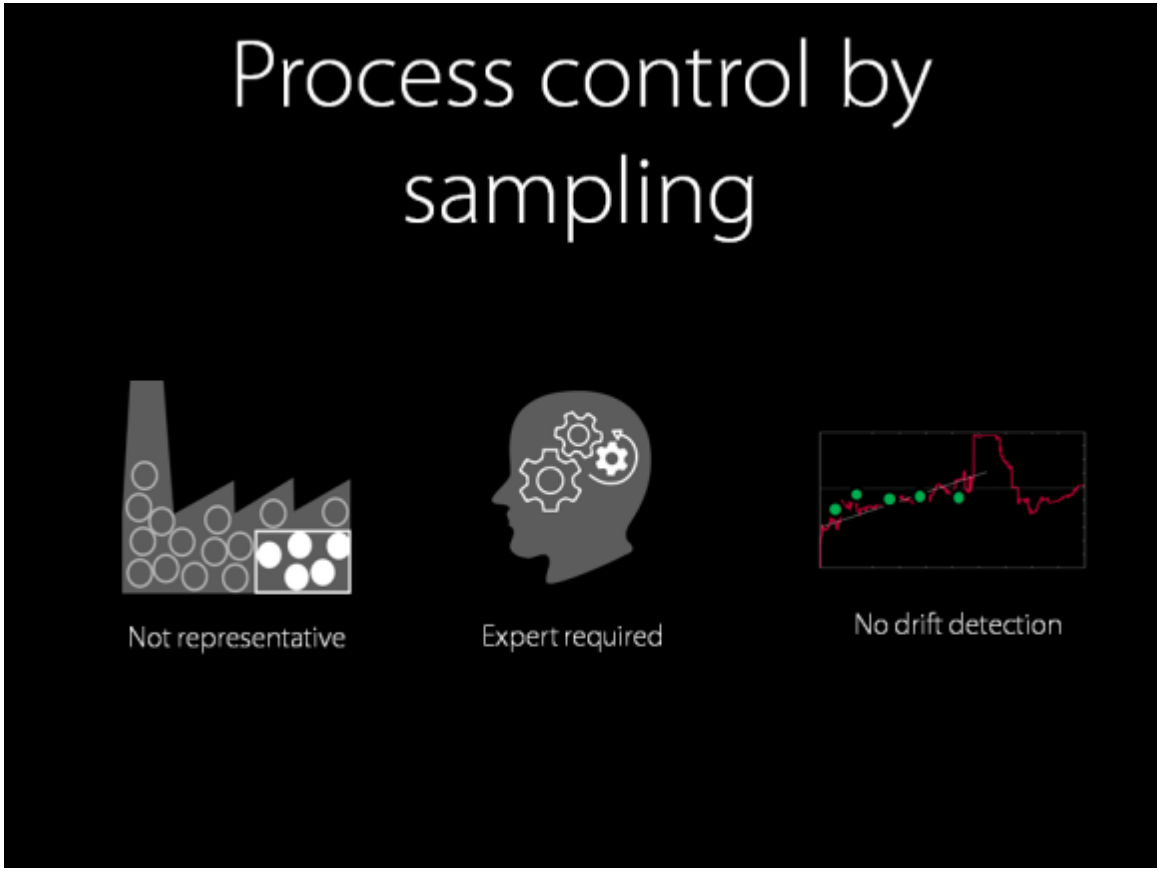
Process quality score



We are proud to say that for the first time, A&R provides teal-time process quality schore based on in-line mapping inspection. We believe this process quality score will be the cornerstone of many quality optimization systems within Optical Industry 4.0. It opens up new opportunities like real-time monitoring of the manufacturing machine quality.

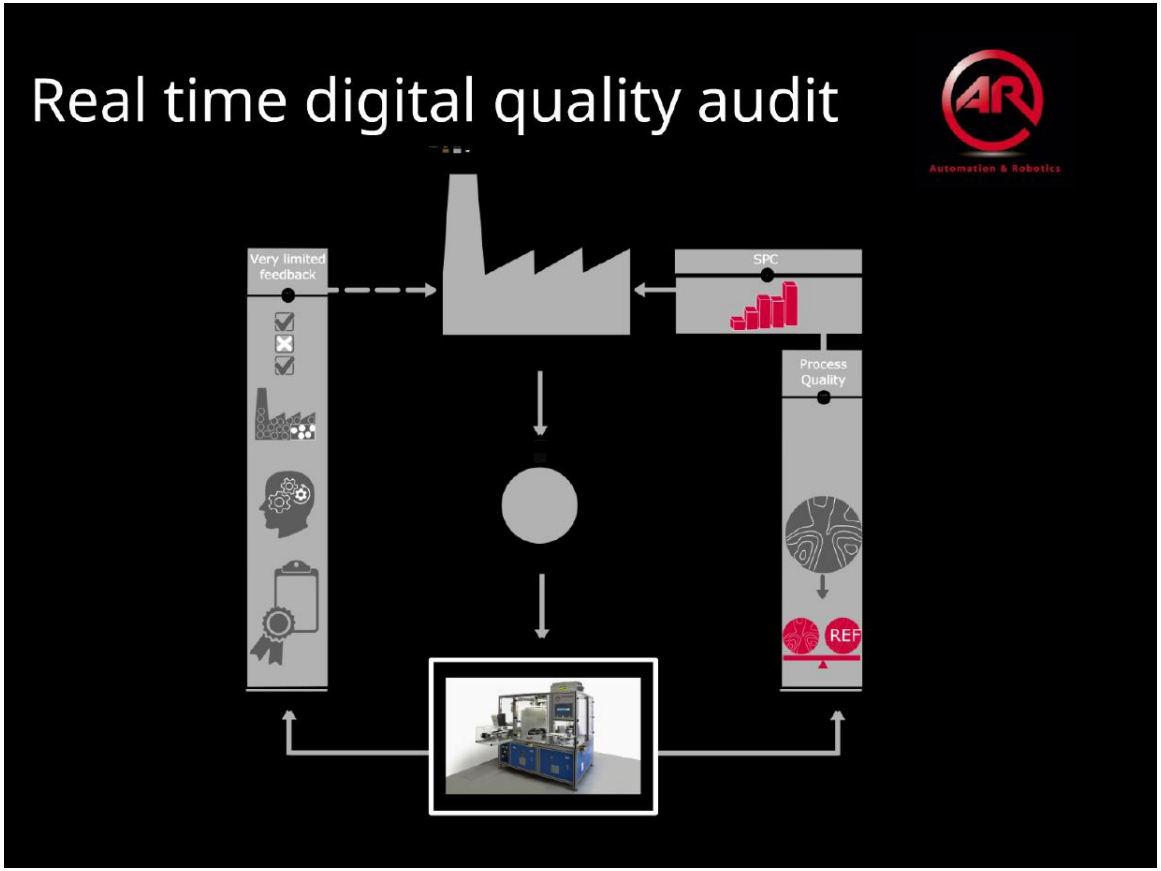


Current Situation, analysis on the reject rate

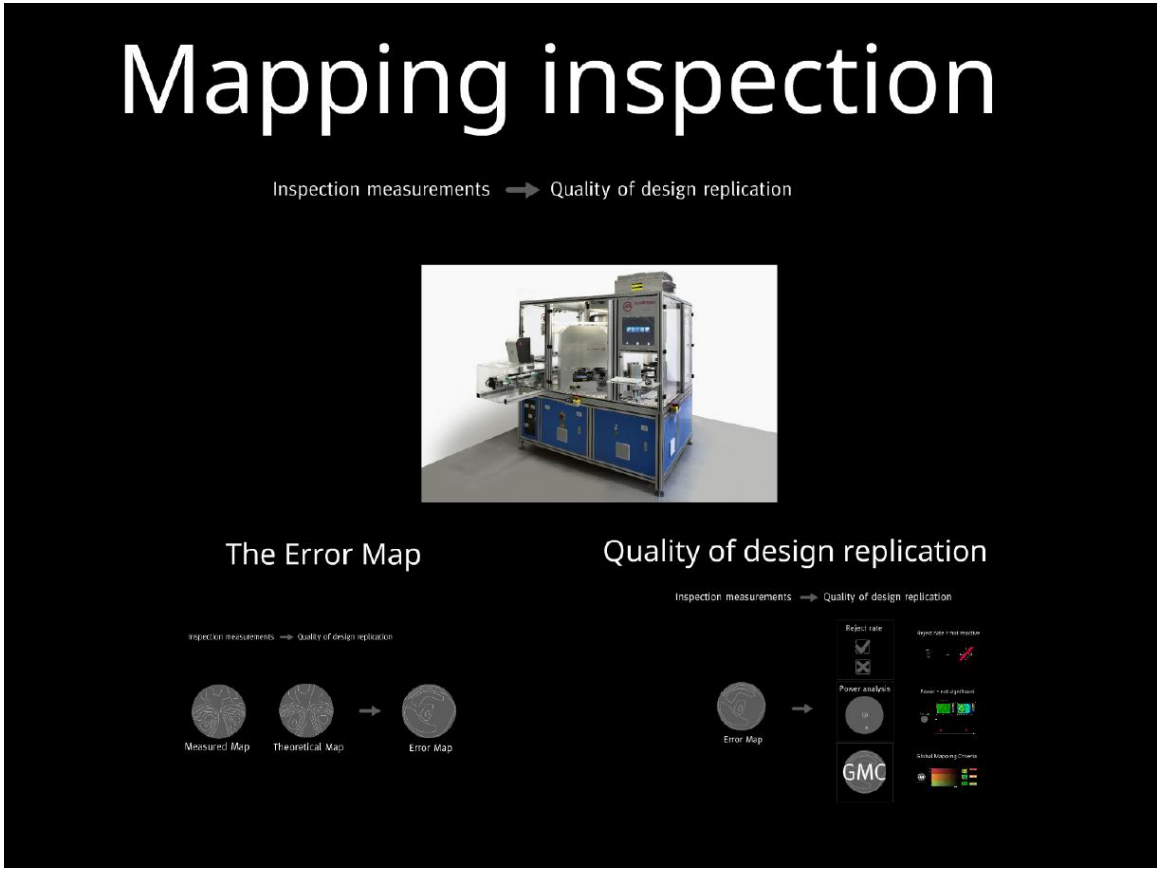


Manual evaluation of a few lenses, limited data, difficult to detect drift

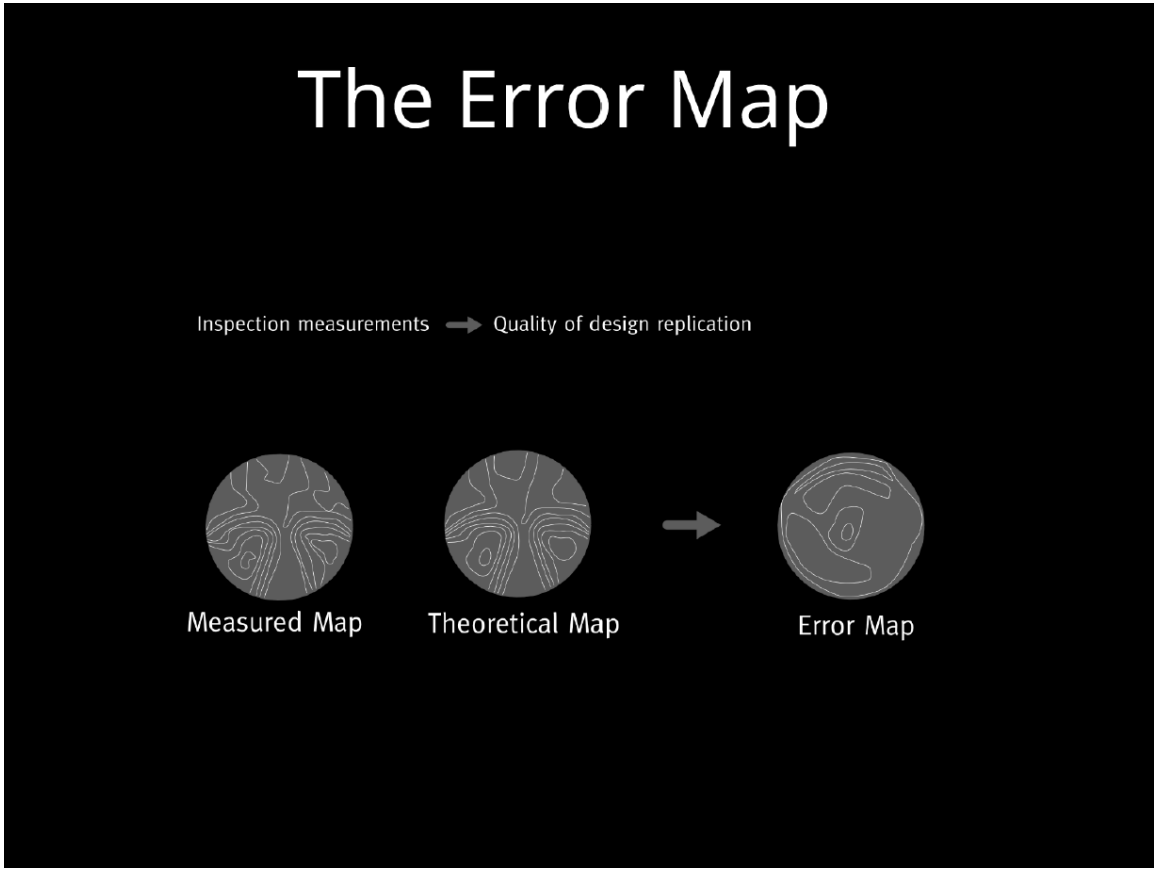
Some Design Vendor's Require lab's to send back lenses, no real-time process or quality control. No chance for direct action by the lab.



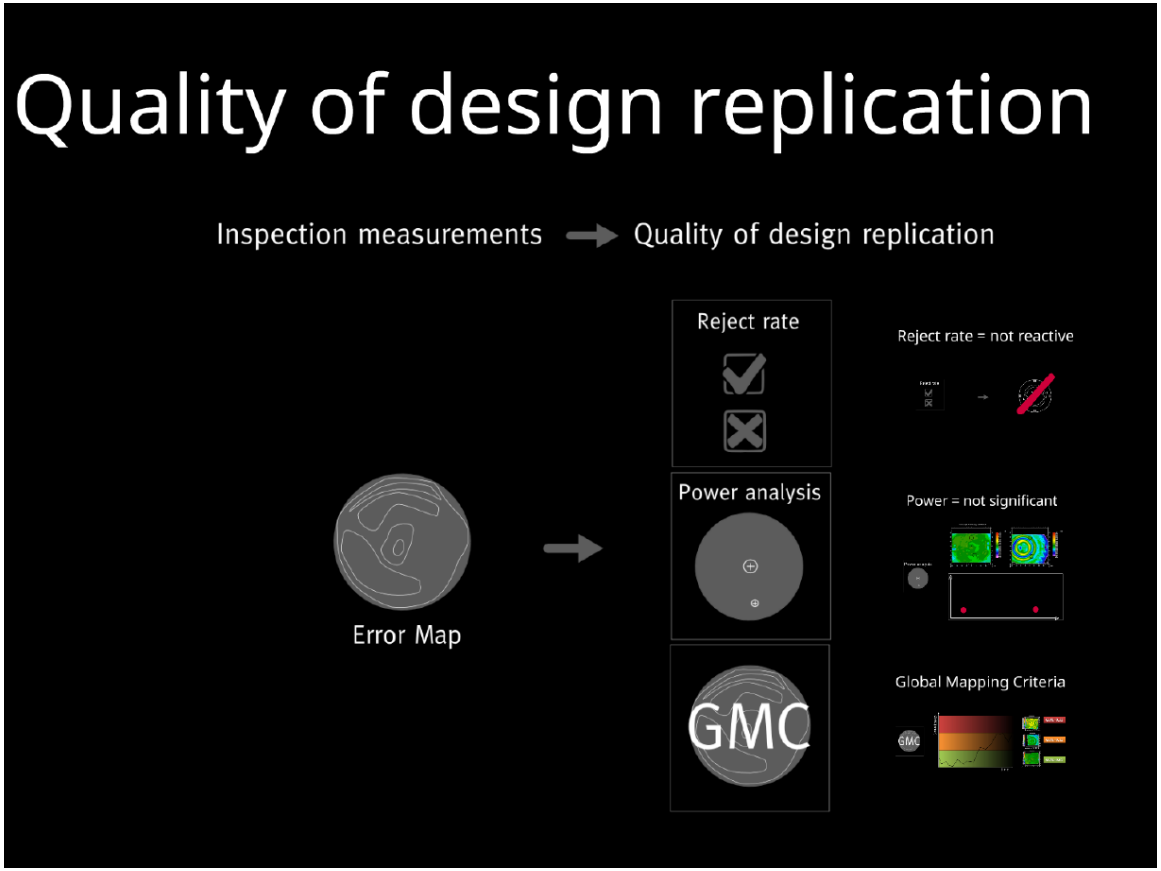
The idea is to use the powerful mapping inspection to build a reactive and significand feedback mechanism in the process



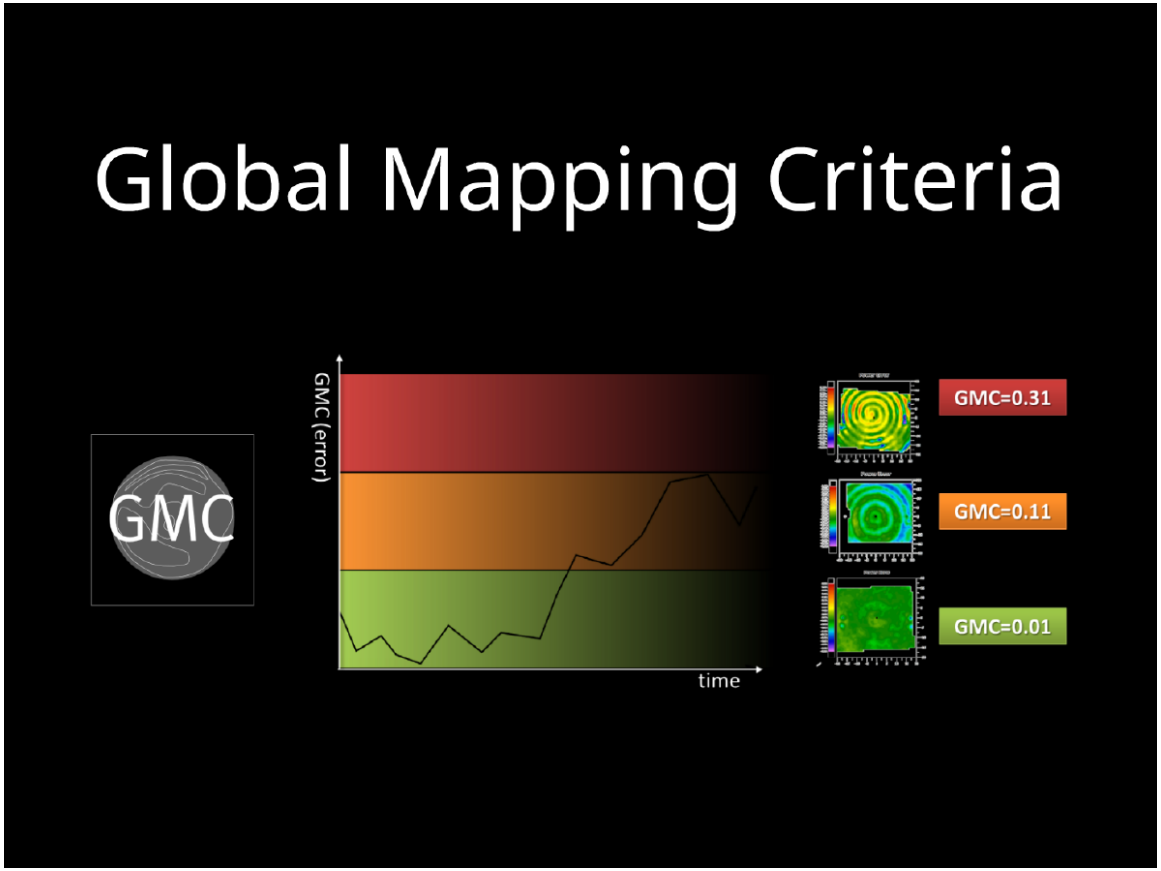
The aim of the inspection is to assess the quality of the design replication



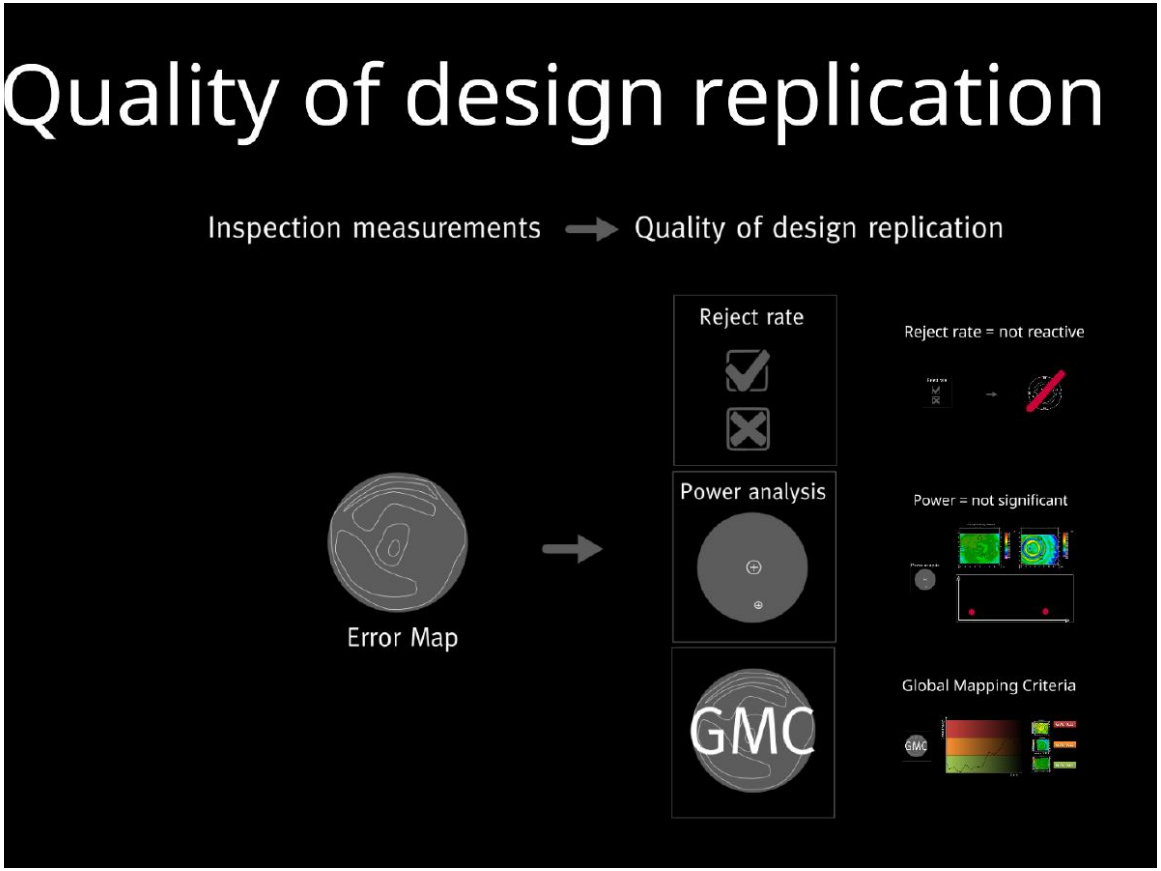
Inspection by Reflection & Transmission



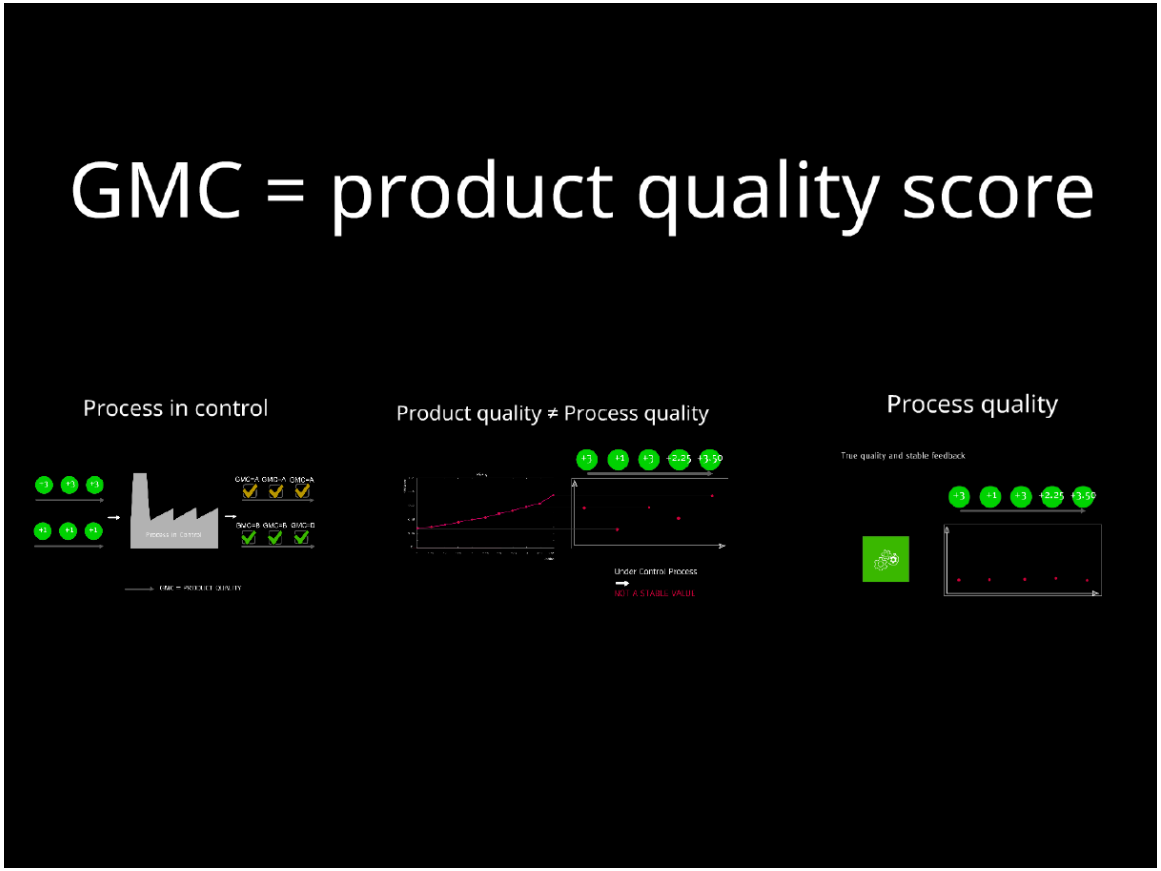
To build an appropriate feedback mechanism in the process, based on mapping inspection, the information from the error map has to be used automatically. To do so, a single number carrying the information from the error map has to be established, which we call the Global Mapping Criteria – GMC.



For example, the value of the GMC increases when the importance of the defect increases, and has been adjusted to fit the score given by an expert.

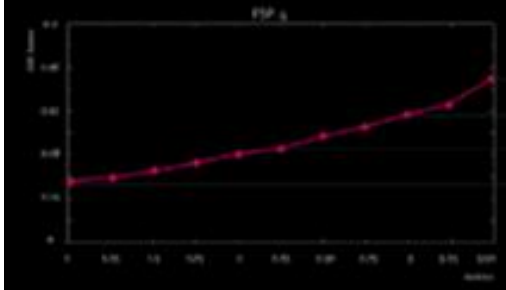


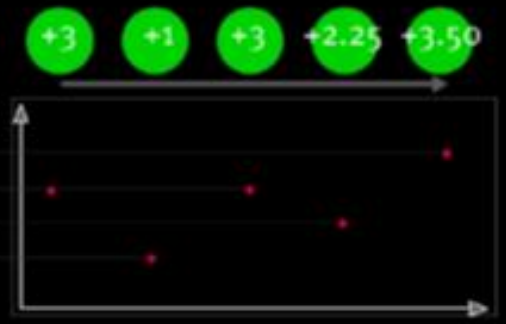
This reactive and significant value, based on powerful mapping inspection results, is chosen to create our feedback signal on the process.



The GMC value corresponds to the quality of the product but not to the quality of the process.

Product quality ≠ Process quality





Under Control Process

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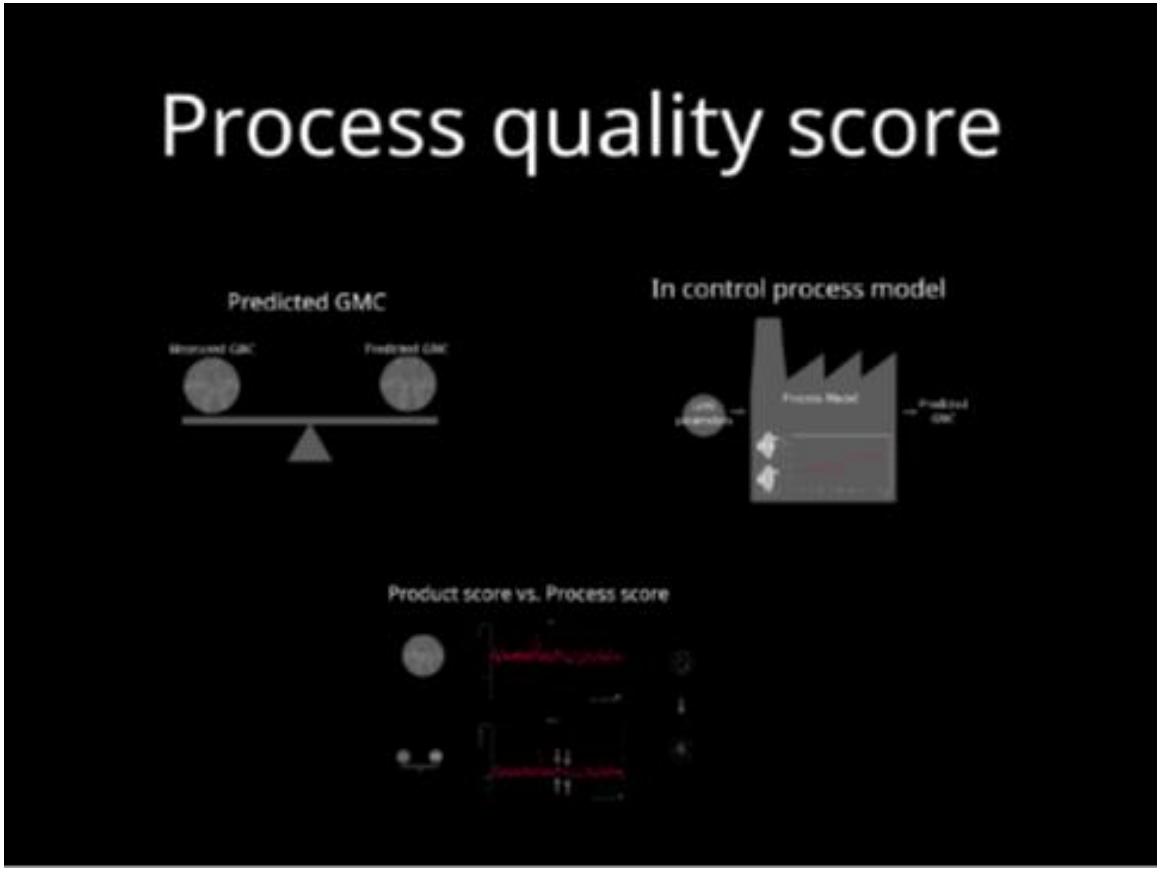
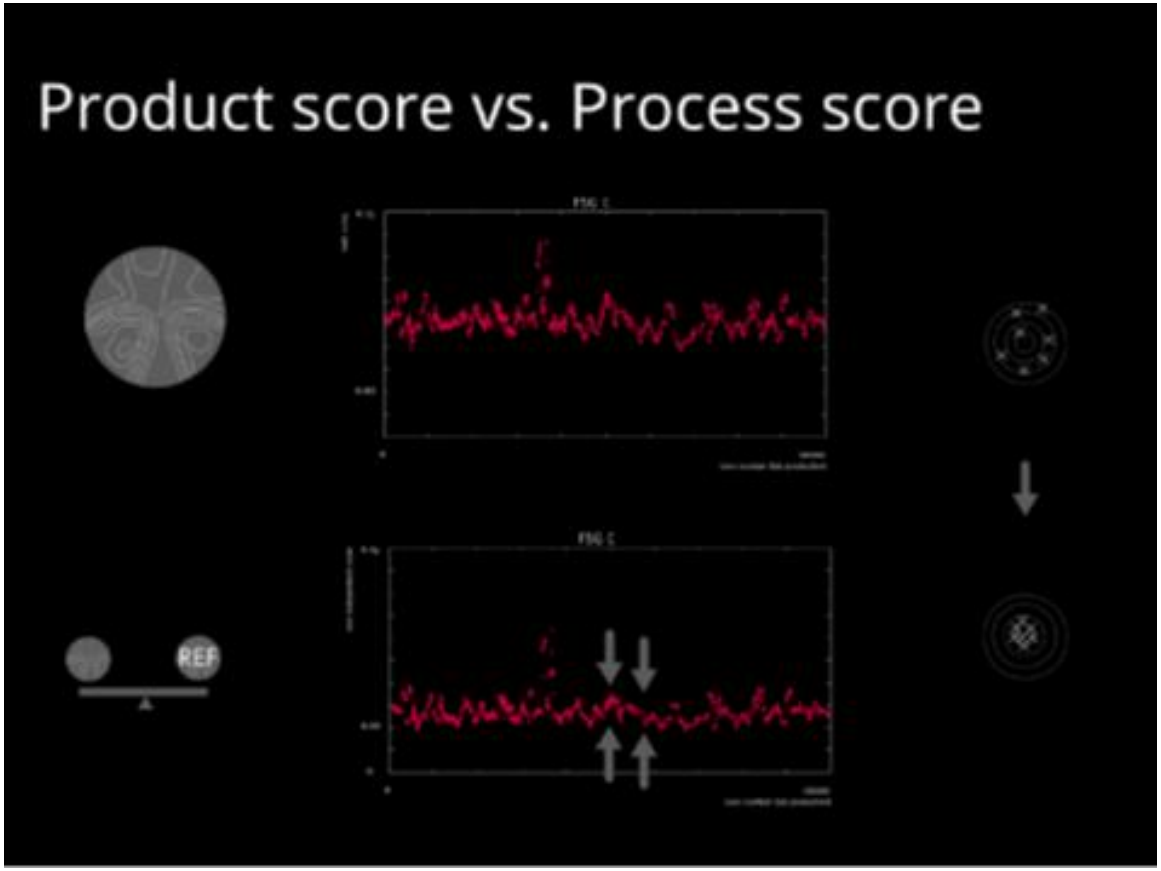
NOT A STABLE VALUE

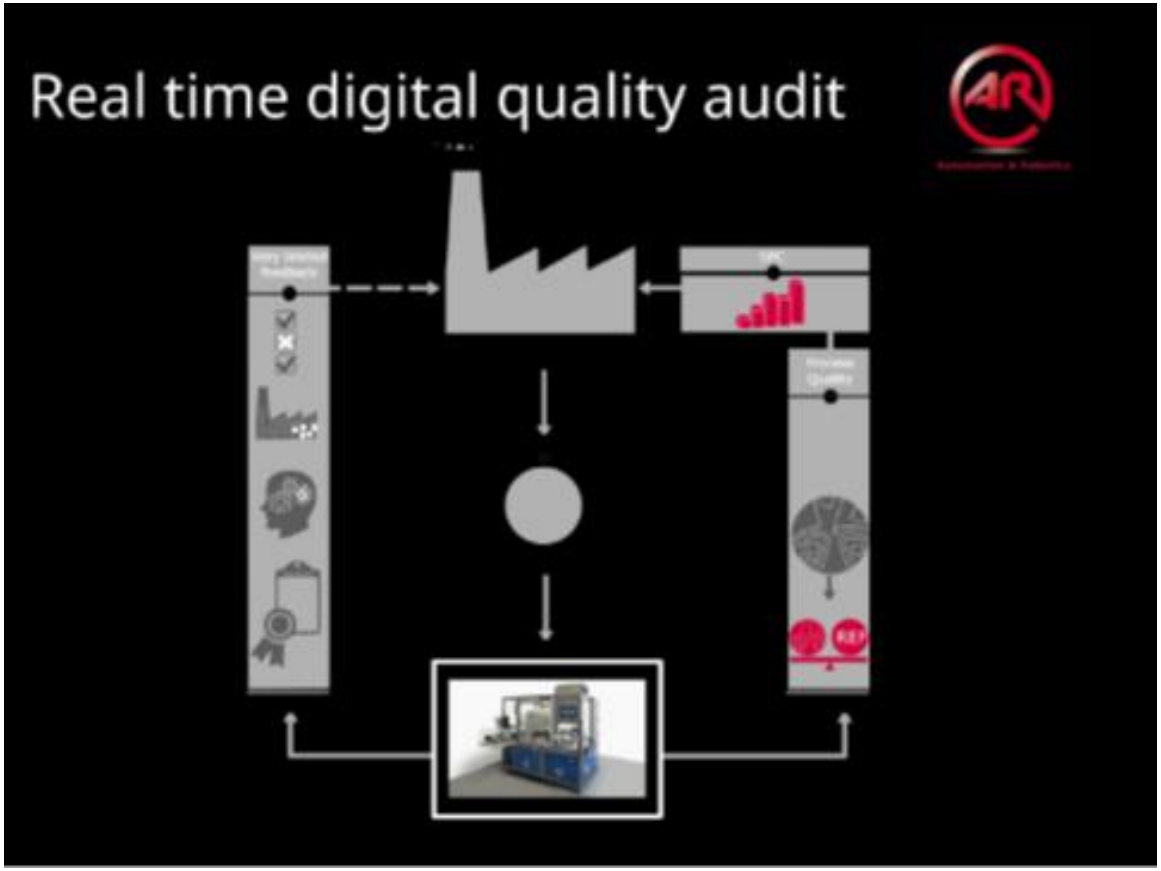


Instead of using the GMC signal, we use the difference between the measured GMC and the one expected if the process was in control. This way, if the GMC is equal to the one expected in control, the process is considered in control. But if the GMC is higher than the expected GMC in control, it means the process is out of control.

Product score vs. Process score

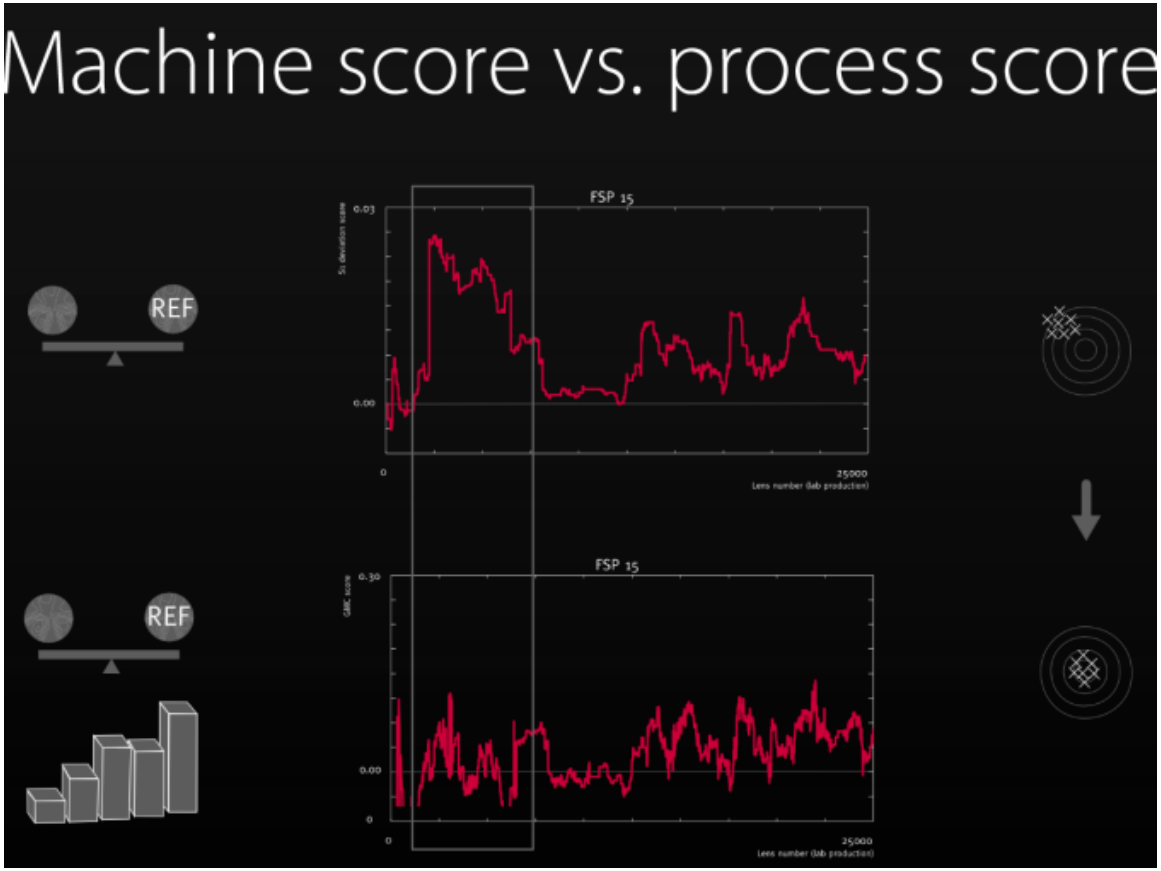


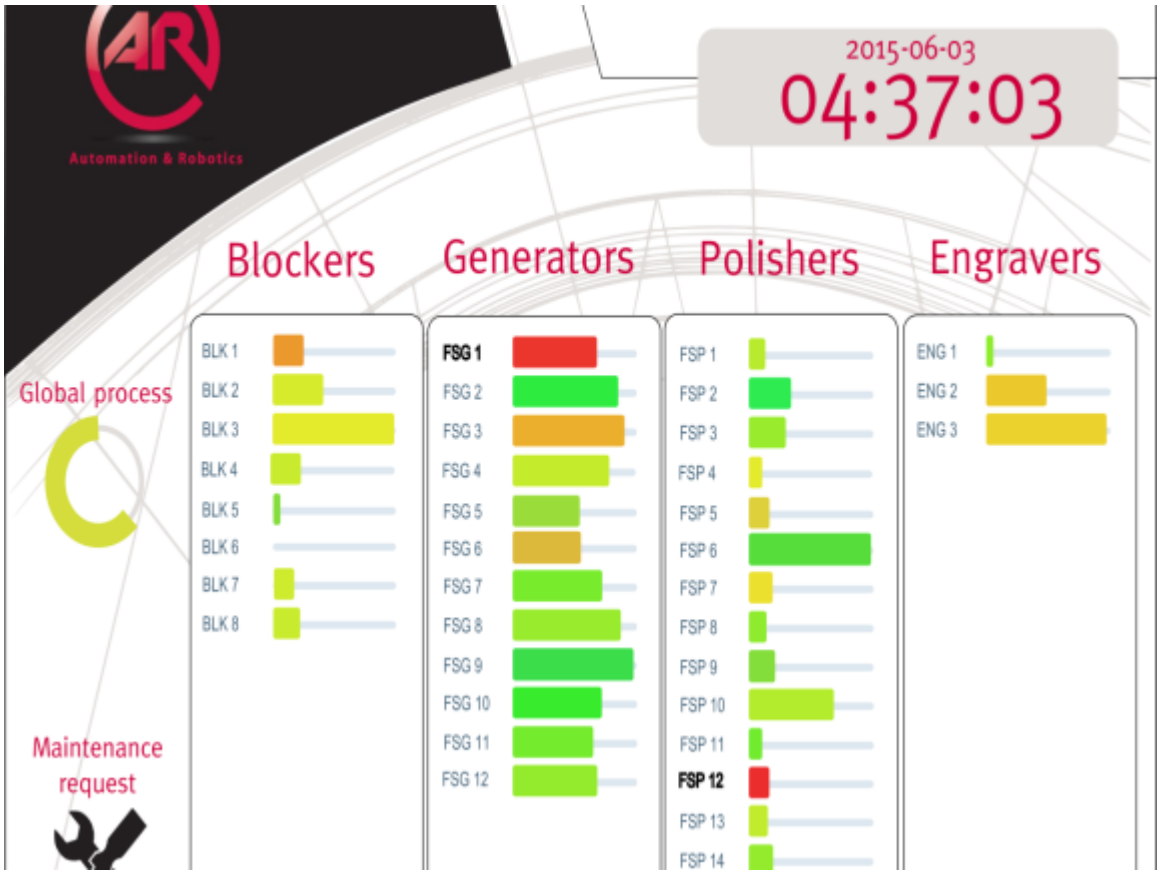
Real time digital quality audit



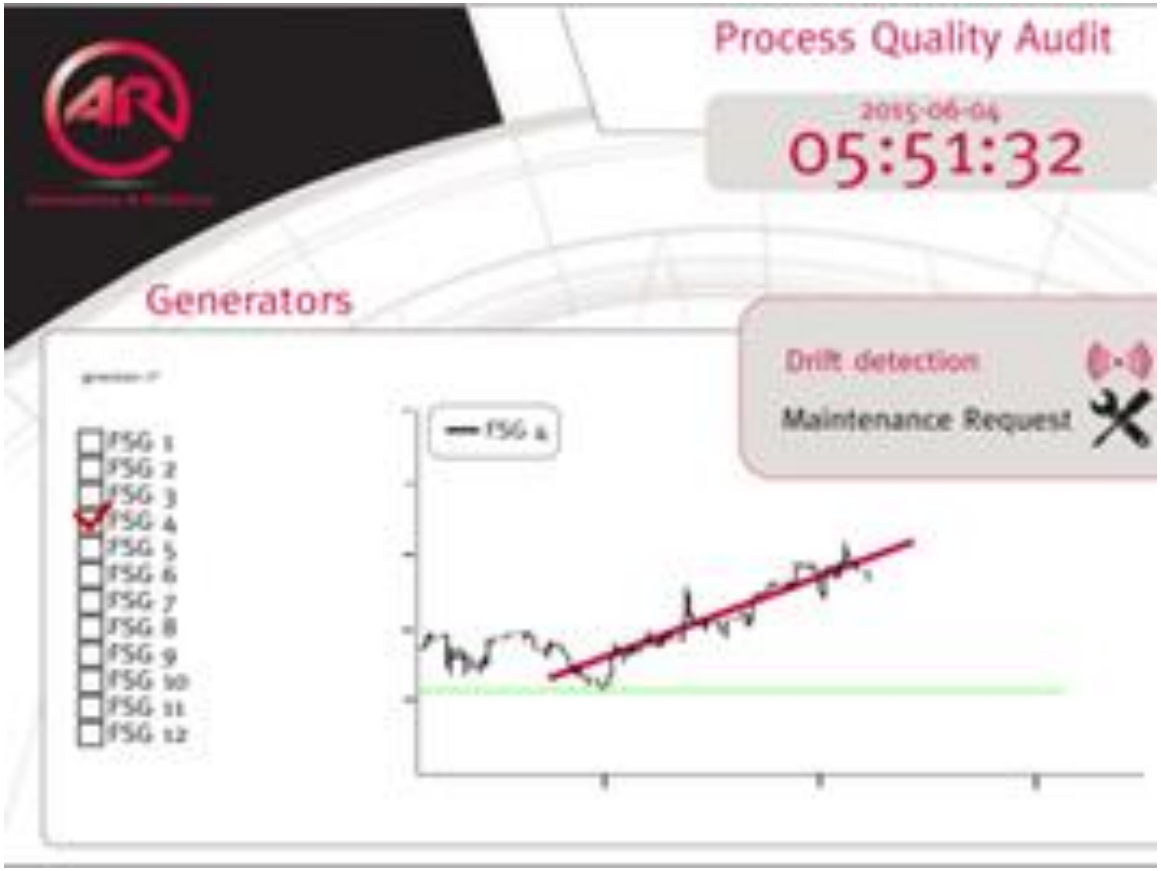
Quality scores have to be linked with the production data to provide real-time feedback on the production.

Machine score vs. process score

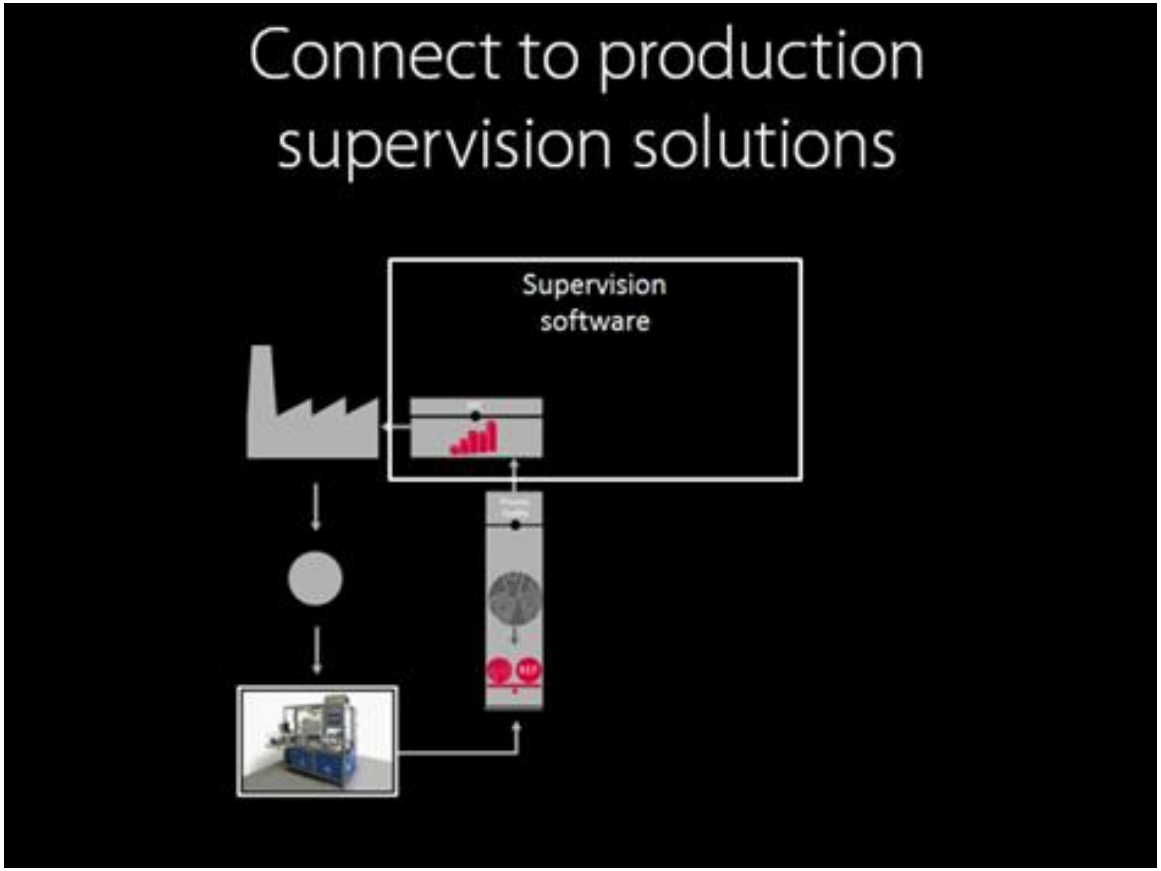




What you see is a dashboard representing the production machine quality at a certain time. For each machine, an error bar is given. The machine quality impacts its color, while the length of the bar represents the amount of lenses run though the machine. Example, one generator is underperforming.



If we look at the data, a drift in the values is clearly visible. A supervision software program could detect this drift, alert the lab manager, and suggest a course of action.



A&R will support any Industry 4.0 initiative to make this data available to the lab.