

Challenges of DIP for automated visual inspection

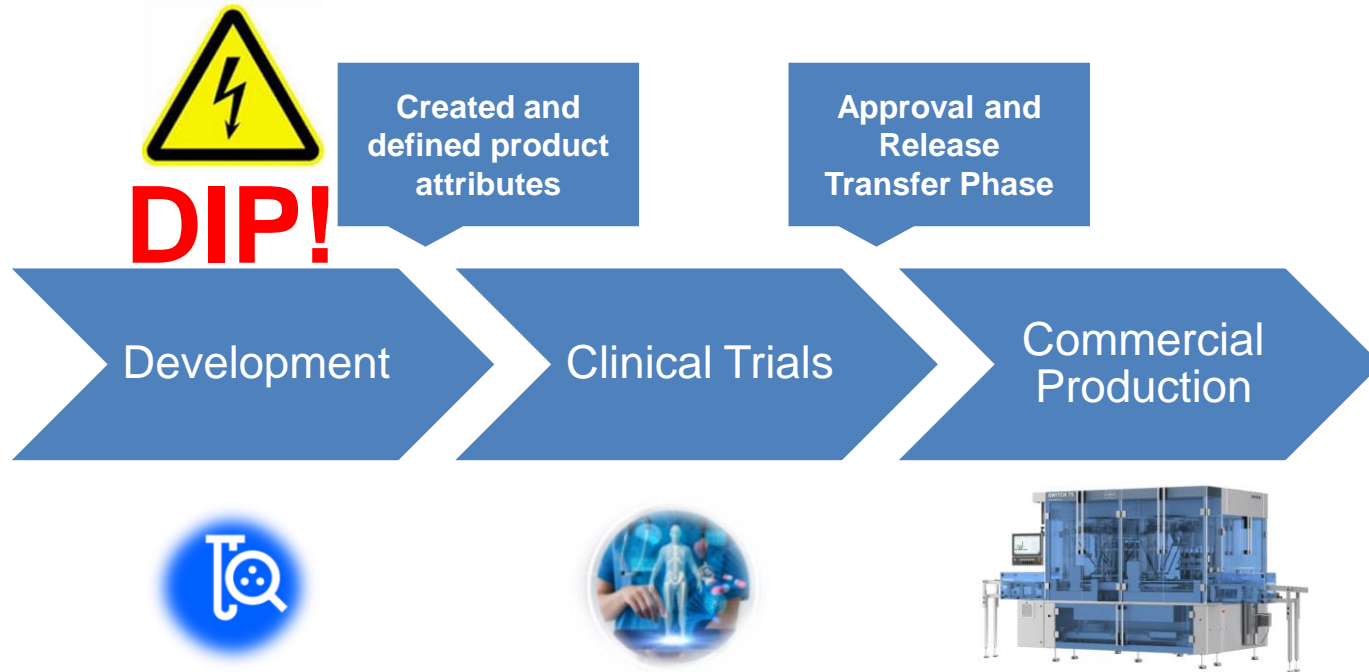
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Körber Pharma Inspection GmbH

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The challenge in the Pharma Industry



DIP (Difficult to Inspect Product)

- **Product Attributes**

- Inhomogeneous product shape
- Product color
- Product stability
- Bubbles and Foam
- ...

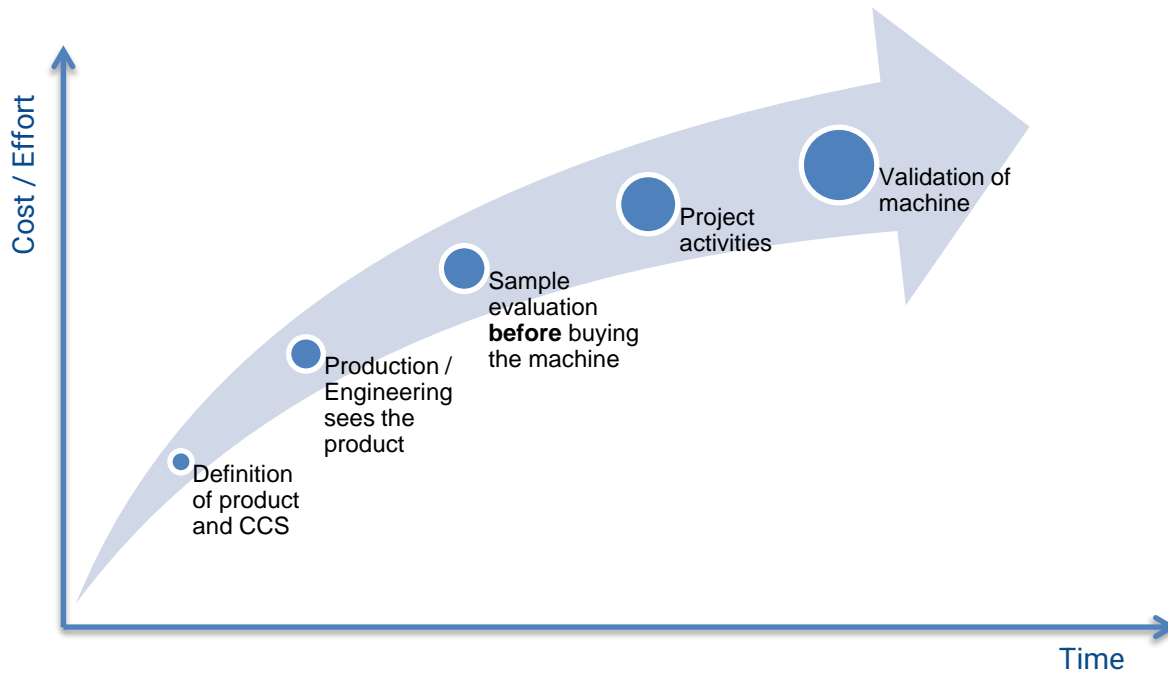


- **CCS (Container Closure System)**

- Glass quality
- Glass color
- Stopper-, plunger or closure shape and color
- ...



When to discover DIPs

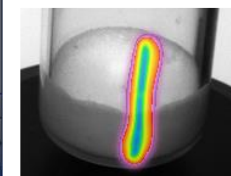
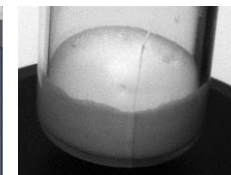
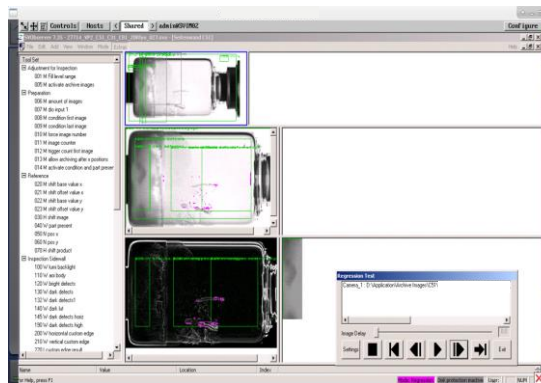
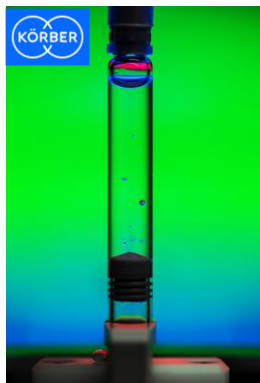
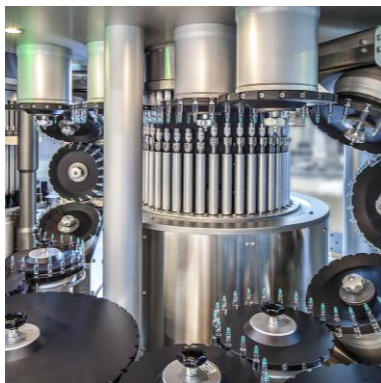


Influence

Customization of fully automated inspection machine

- Special handling solutions
- Special camera and light design
- Put a lot of work into vision configuration design
- Deep Learning using AI in visual inspection

Reduce the influence




Influence

Check product attributes in the product development phase:

Build up **knowledge** about production in PD

Build up **vision expertise** in PD

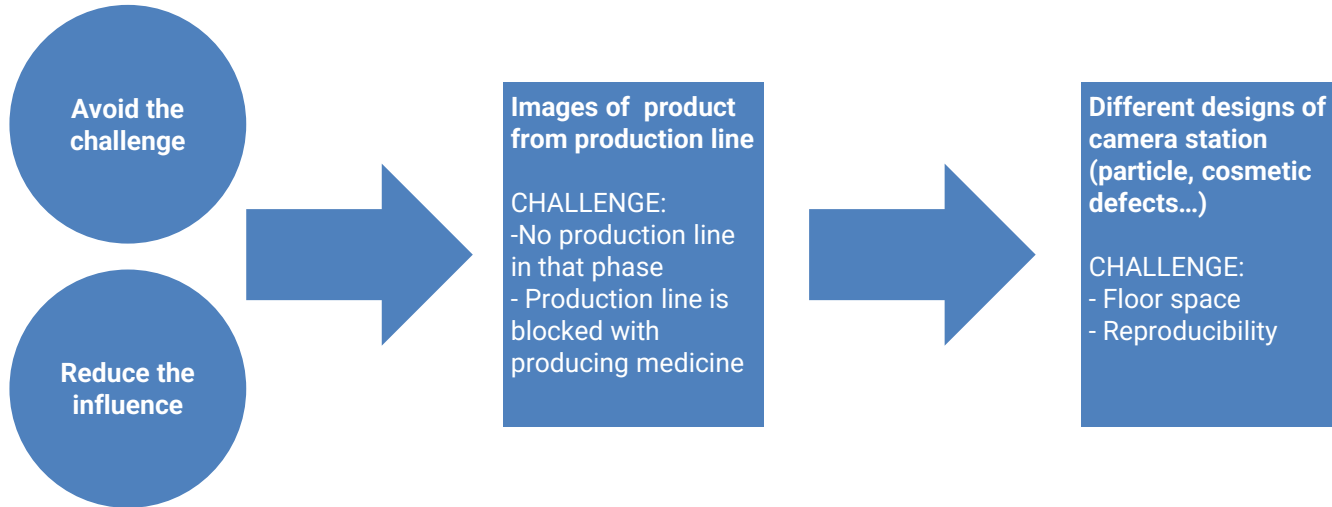
- **Check** the Container Closure System
 - Container size
 - Glass quality
 - Stopper color
 - Crimp / Cap / Needleshield / RNS...
- **Check** product attributes
 - Appearance (Bubbles, Foam, Splashes, Lyo cake stability...)



Control the
challenge

→ **Adjust the product if possible and necessary OR prepare for special design**

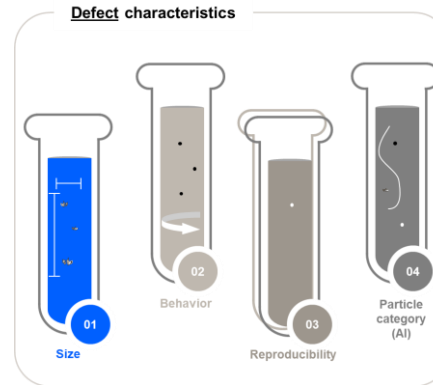
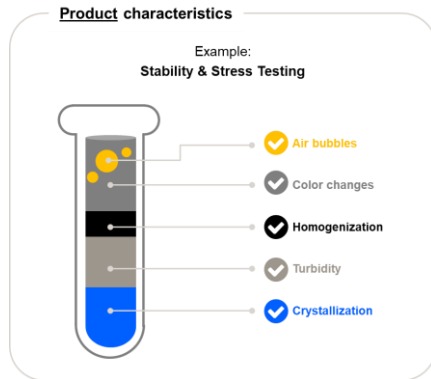
Influence



Laboratory Case



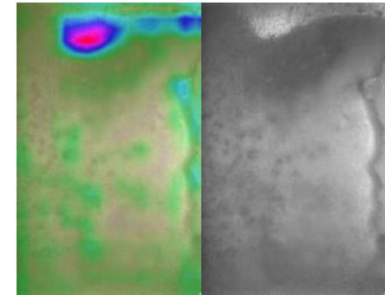
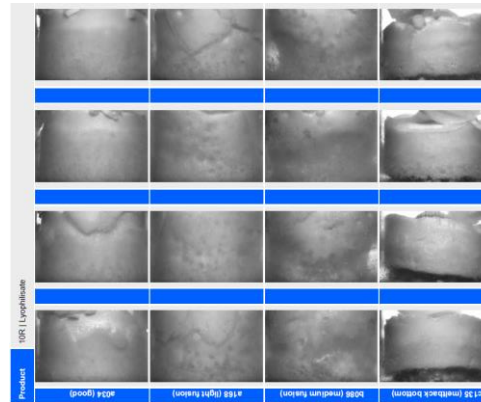
- Acquire product knowledge
- Document product appearance over time
- Identify special characteristics to control them



Deep Learning Case



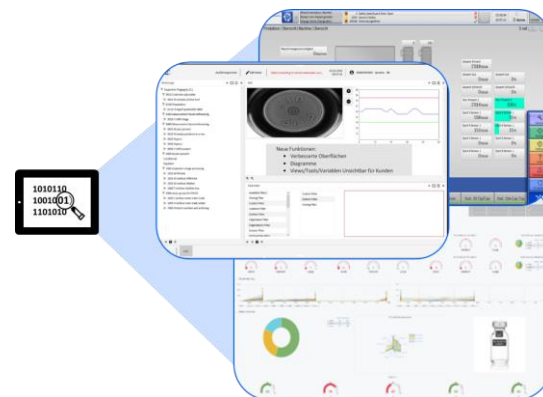
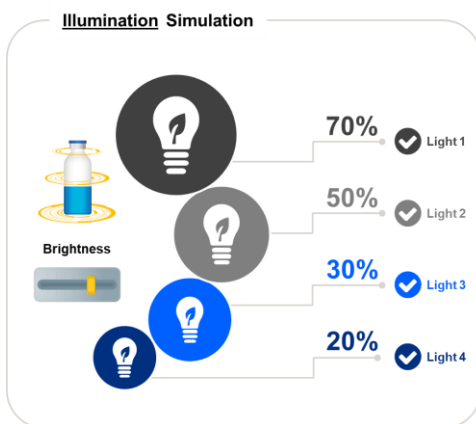
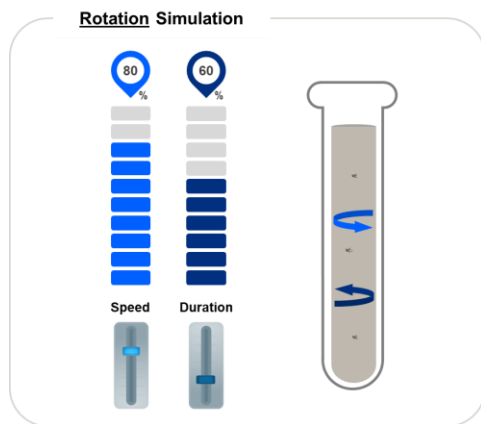
- Acquire lots of images



Production Case



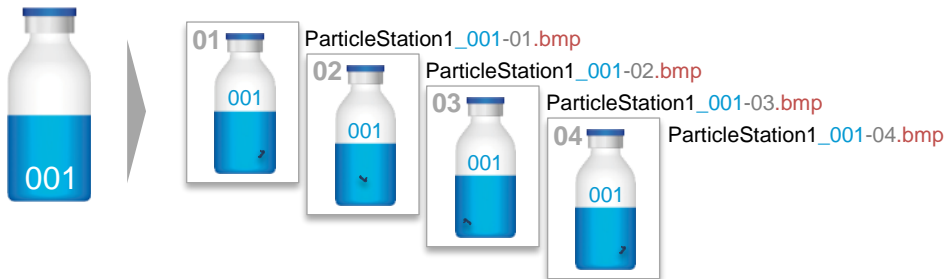
- Set up and fine-tune vision configuration (physical and SW)
- Training (Training before the machines is at site)



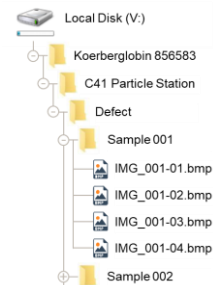
Production Case



- Create and maintain Knapp- and other defect sets (physical)
- Create and maintain the image defect library

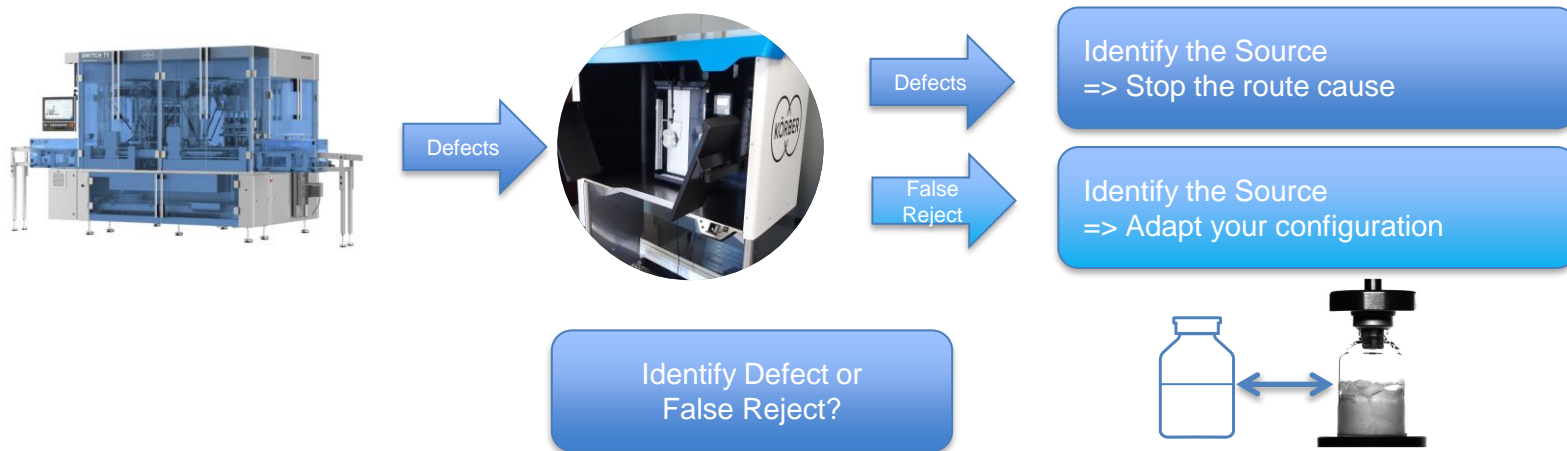


Folder Structure Sequence archiving



Production Case

- Analyze defects and machine reaction (Defect or False Reject)



Conclusion

- ▶ • Product Knowledge
- ▶ • Know Dos and Don'ts
- ▶ • Be independent of the fully automated inspection machine
- ▶ • It's all about images, images, images...

Thank you!



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