SW Test Workshop

Semiconductor Wafer Test Workshop

Optical Character Recognition (OCR) Automation

New Functionality Added to Existing Hardware

Hector H. Moreno

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Overview

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Introduction

- Optical Character Recognition (OCR) is a process that gets done by almost every machine in wafer test and is critical to the material being tested. Uses range from data integrity to the correct wafer map for good die.
- The machines with OCR cameras will likely store settings locally causing problems with settings get overwritten and varied across a test floor. This leads to never ending OCR read errors.

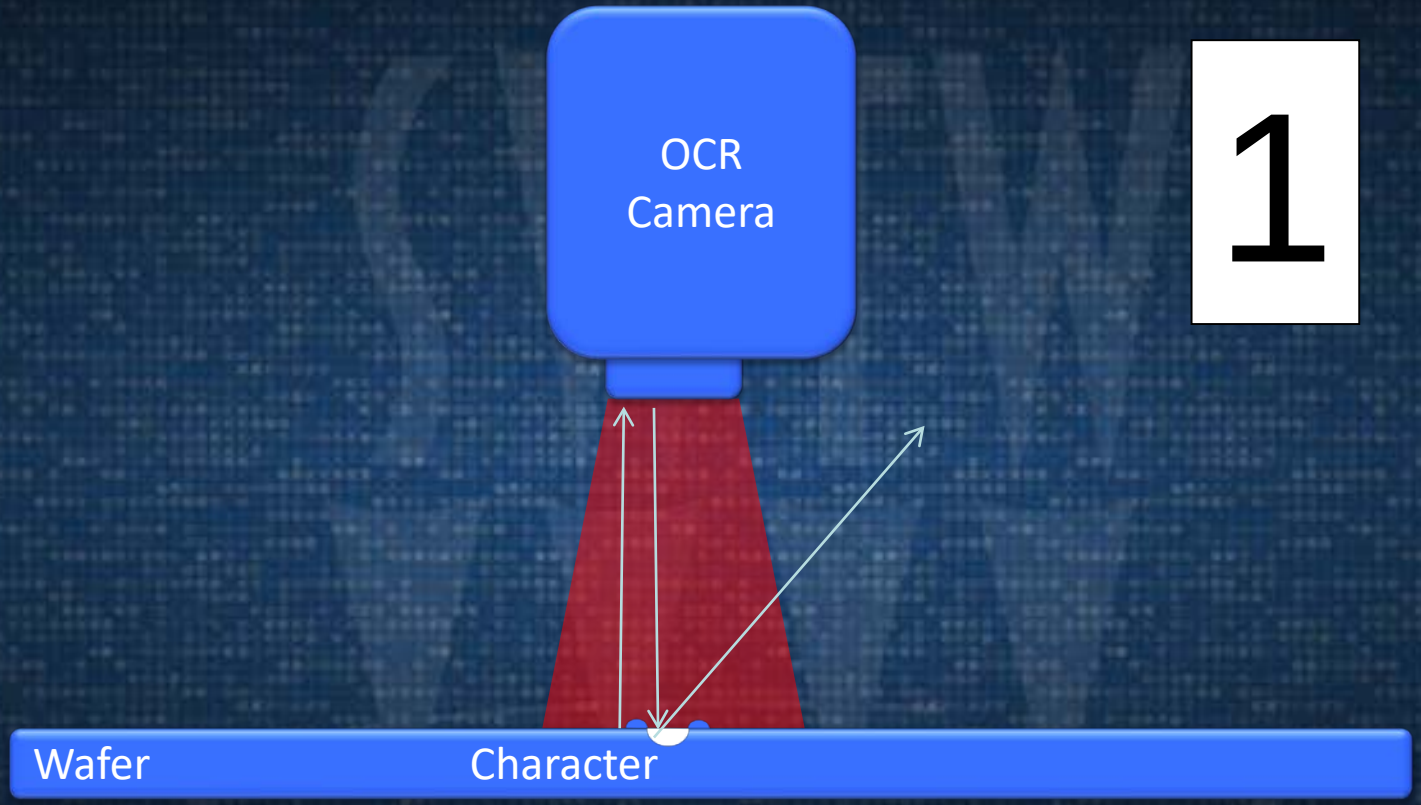
Objectives

- Tuned lighting settings
- Standardize character settings
- Improve OCR read rates
- Decrease machine down time
- Stop overwriting other OCR fab settings.
- Reduce hardware fails by removing unnecessary hardware for OCR.

Methods

- **OCR recipe tuning and best practices**
  - Bright Field
  - Dark Field
  - Recipe Settings
- **Fab character settings**
- **Analyzed existing OCR hardware**
  - Looked for possible options of improvement.
- **Found OCR camera had more capabilities**

OCR Bright Field



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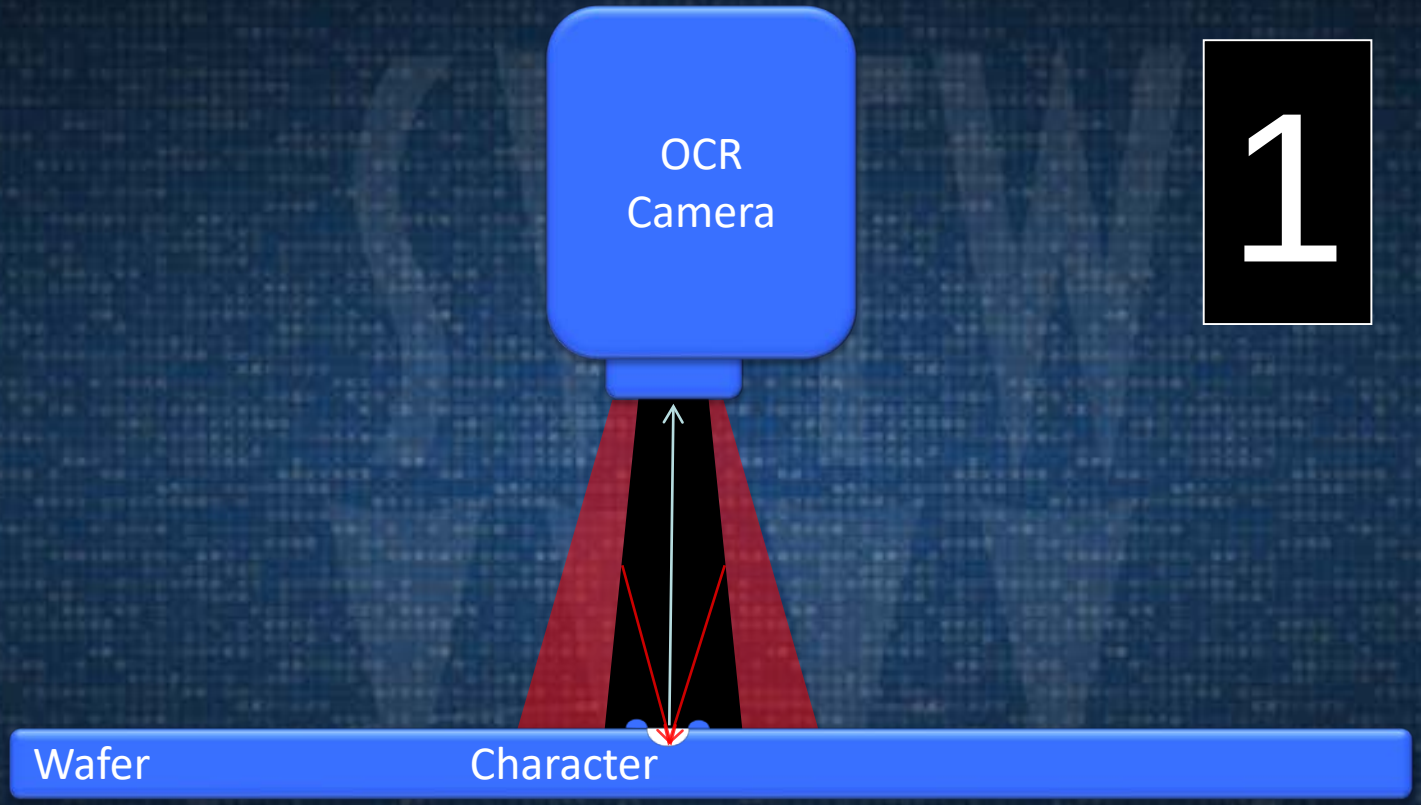
OCR Dark Field



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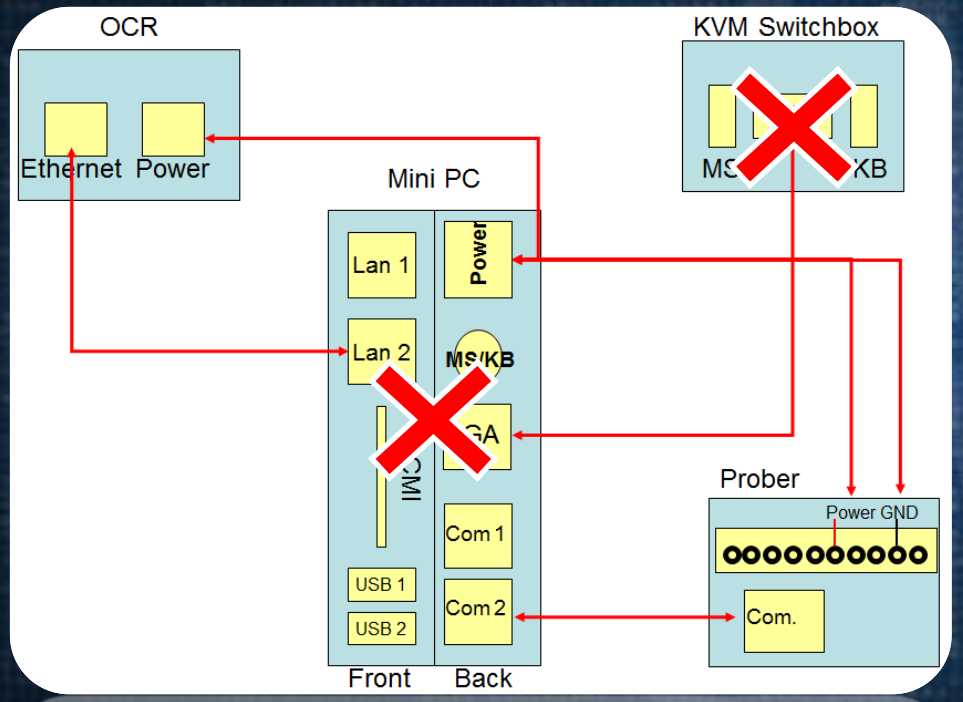
Recipe Settings

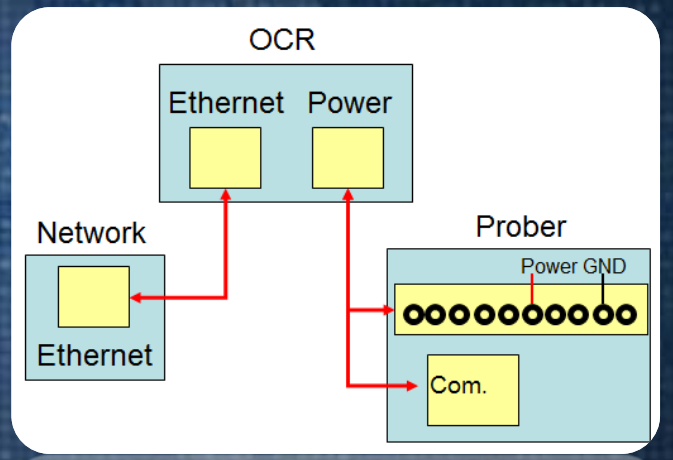
- **Character Settings:**
  - Alphabetic = A
  - Numeric = N
  - Any = *
  - Example: *-NNNNNNN-NN-AN
- **Lighting Settings:**
  - Bright or Dark Field Modes
  - Brightness Range from 0 to 100%

Hardware Optimization

Before

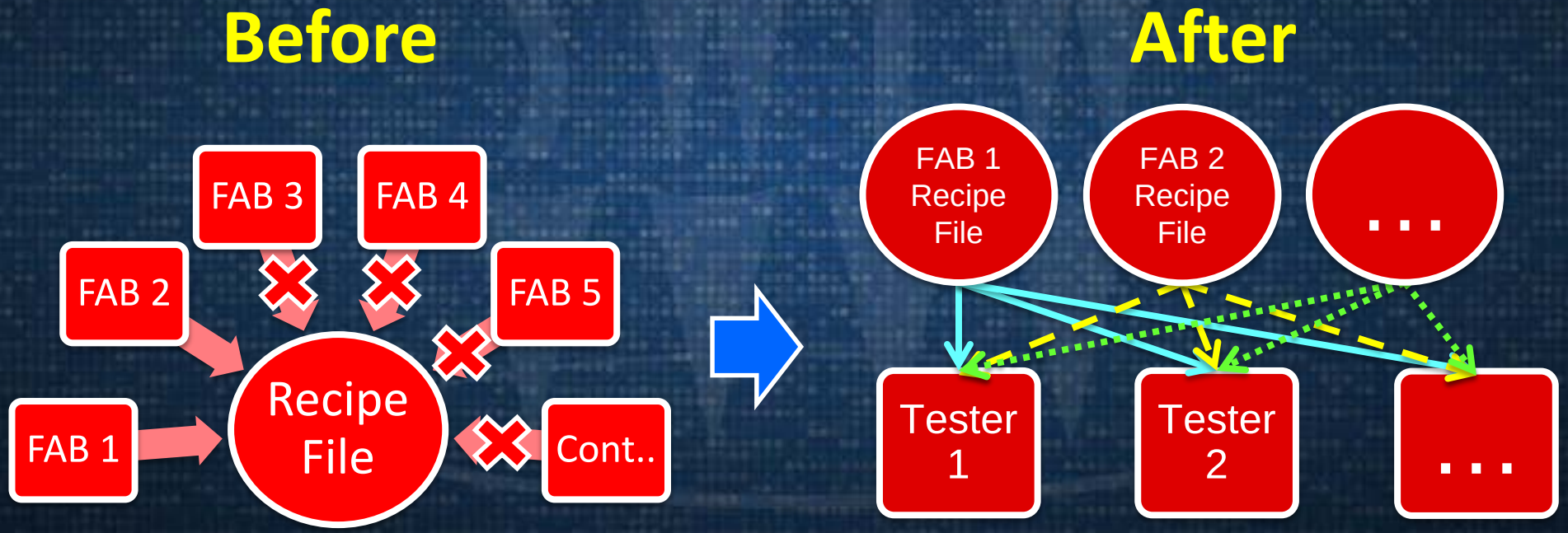


After

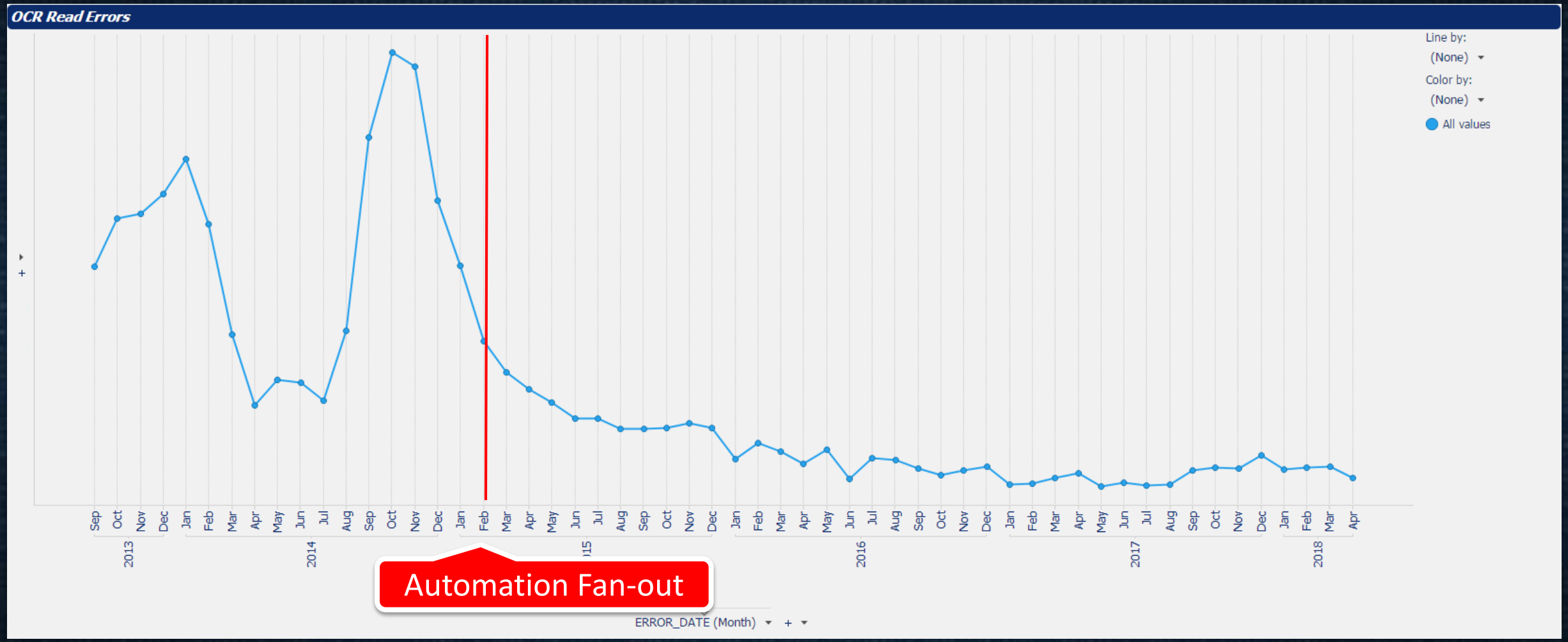


Software Automation

- Created Library with recipe files.
- Automation load recipe file from server.



Results: OCR Read Errors Per Month



Summary

Category	% Savings
Read Errors Per Day	63%
Hardware Repair Costs	55%
Error Repair Costs Per Year	38%

- **OCR Automation has greatly improved on OCR reading and cost savings with existing hardware.**

Follow-On Work

- **Look into integrating the automation into other TI Facilities and other machine types with similar OCR camera.**

Questions?

Special Thanks! ☺

- **Texas Instruments**
  - Vincent Ellis - Engineering
  - Thomas Vaughan - Applications
  - Lance Leonard - Engineering Tech
  - Evan McBride - Engineering Tech