

# The Evolution of Software Testing

## What is Next?

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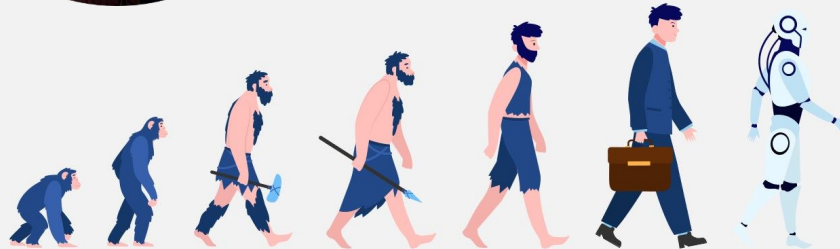
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# AGENDA



Yesterday



Today

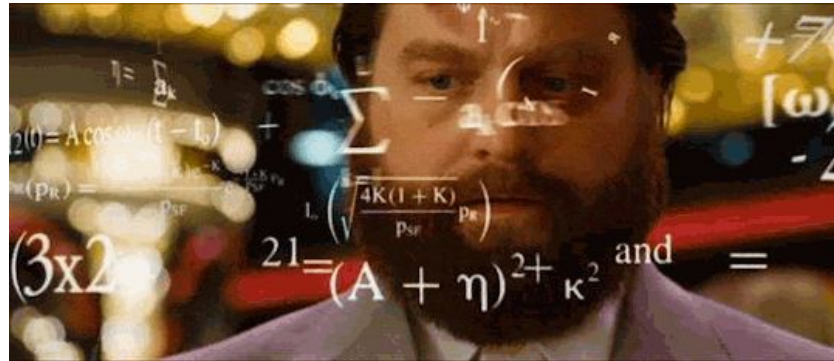


Tomorrow

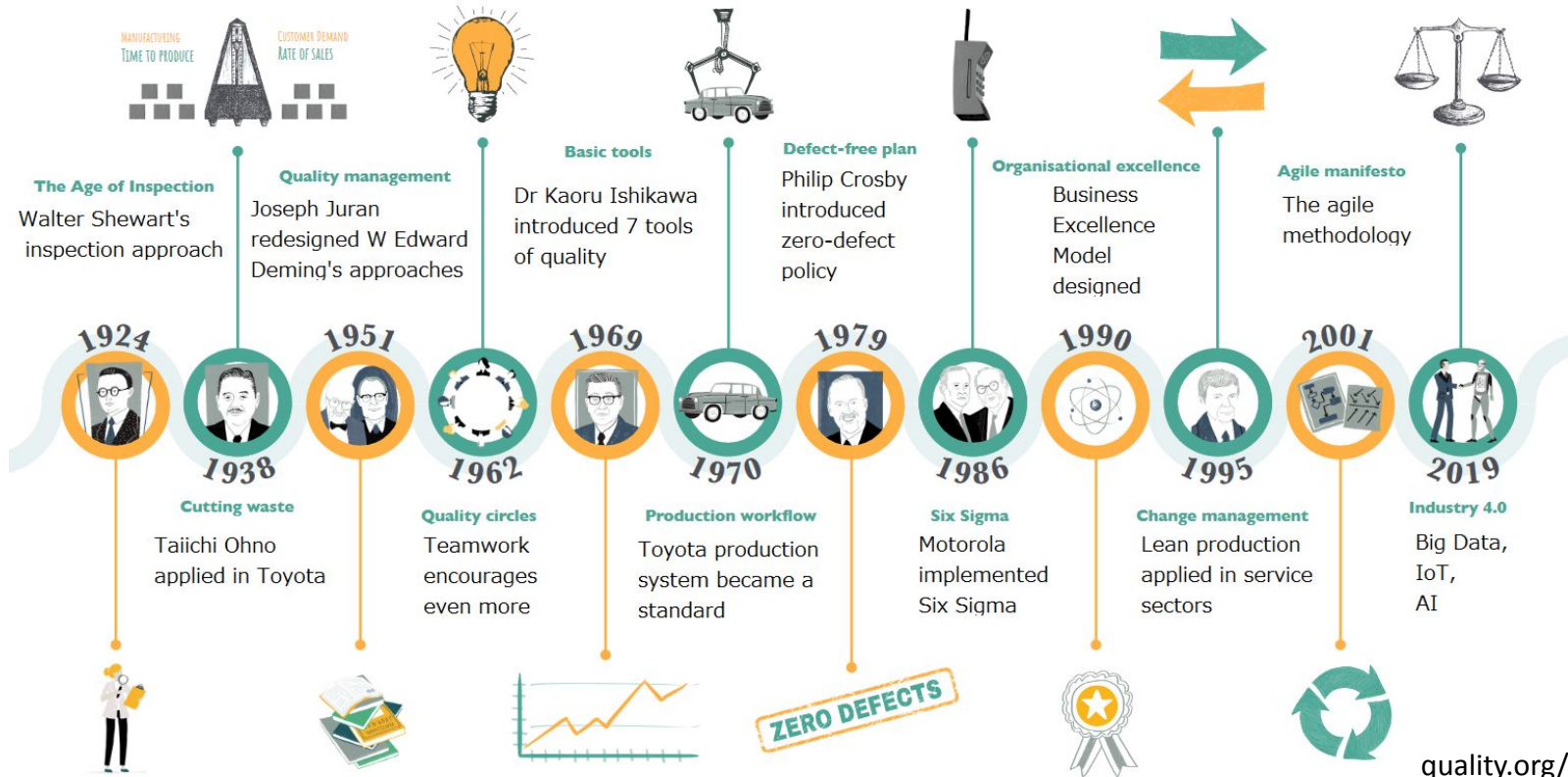
# Challenges



# Me vs. Challenges



# 100 years of Quality



# Evolution of Software Testing

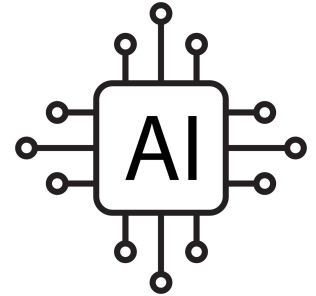
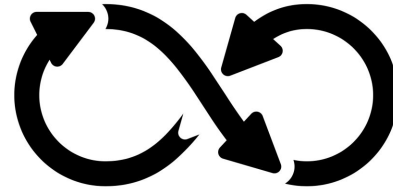
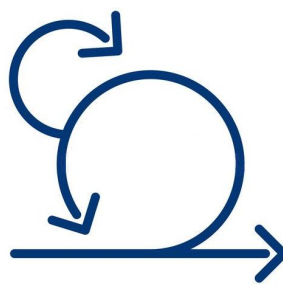
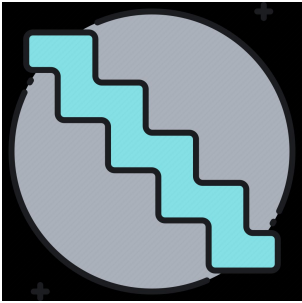
Manual Testing

Basic Automation  
Tools

Mature Automation  
Tools

Automation  
Frameworks

AI in Test



1980-1990

1990-2000

2000-2010

2010-2018

2019-..

Waterfall

Improvement in  
Development Cycles

Agile

Devops and CI

Smart Testing

# Manual Testing -> Automated Testing



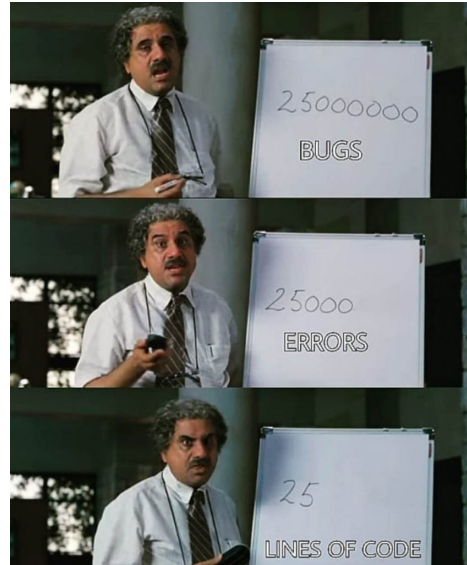
# Test Reliability

|             |      | Any Issues in the feature? |               |
|-------------|------|----------------------------|---------------|
|             |      | No                         | Yes           |
| Test Report | PASS | No Problem                 | Silent Horror |
|             | FAIL | False Alarm                | Real Bug      |

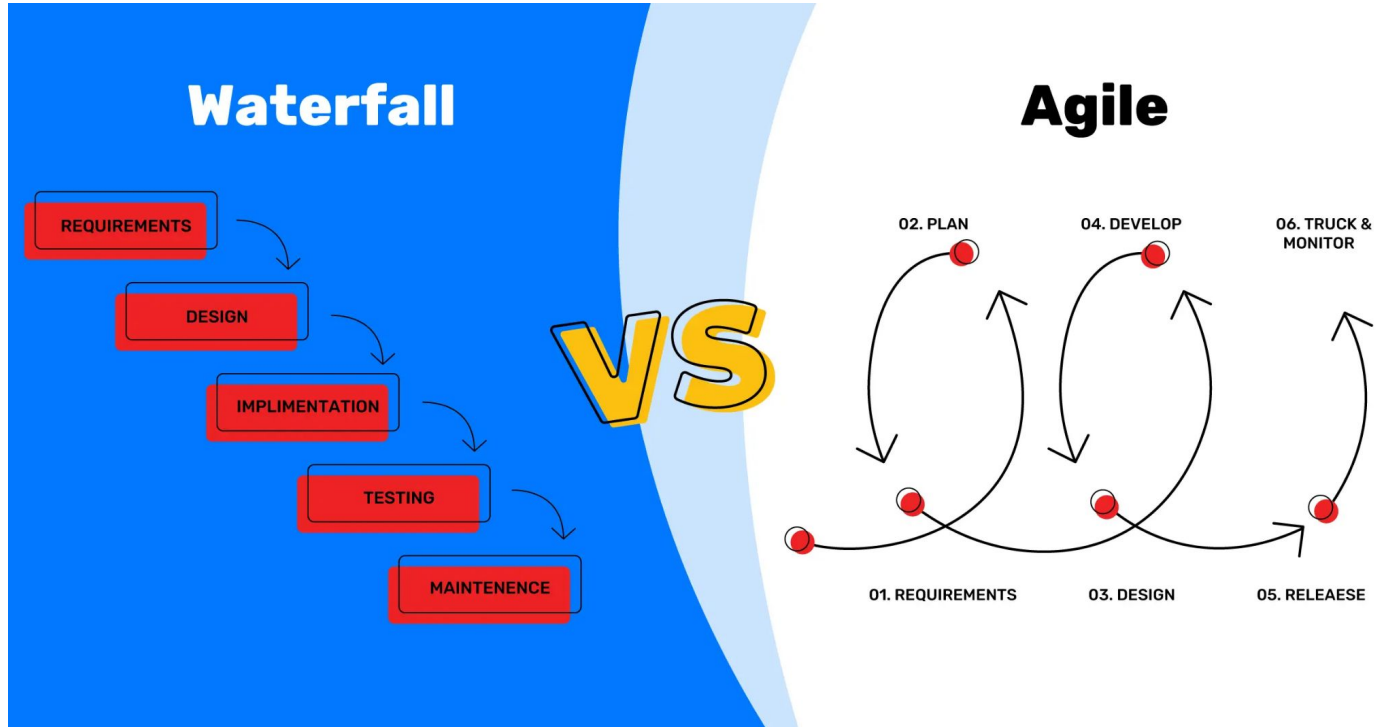
# Test Smells



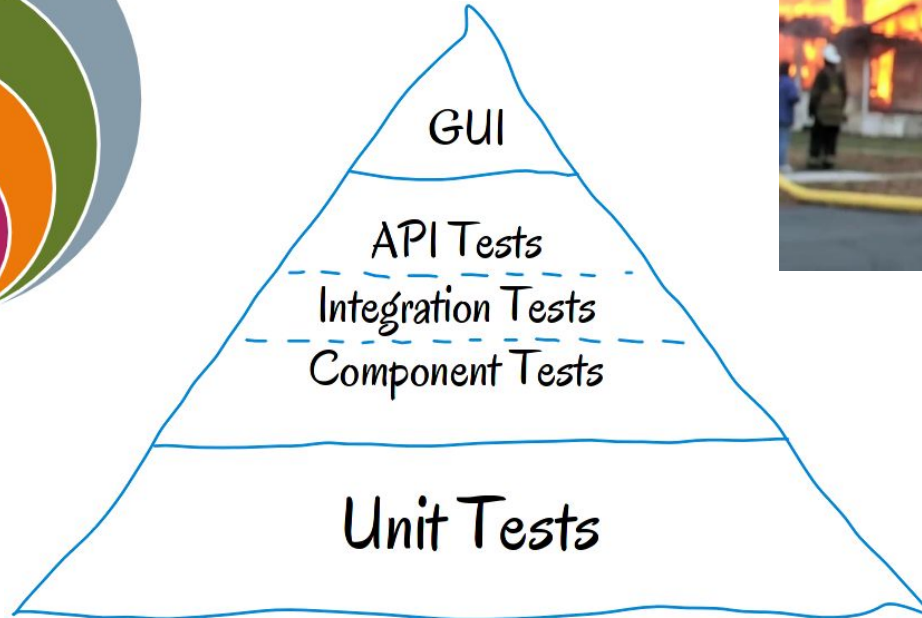
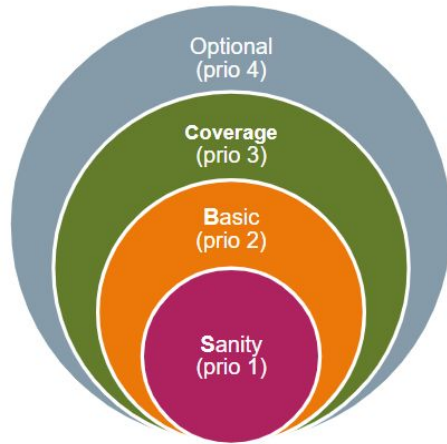
# Code Quality



# Waterfall -> Agile

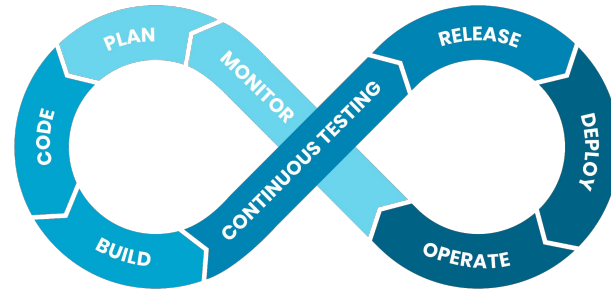


# Efficiency

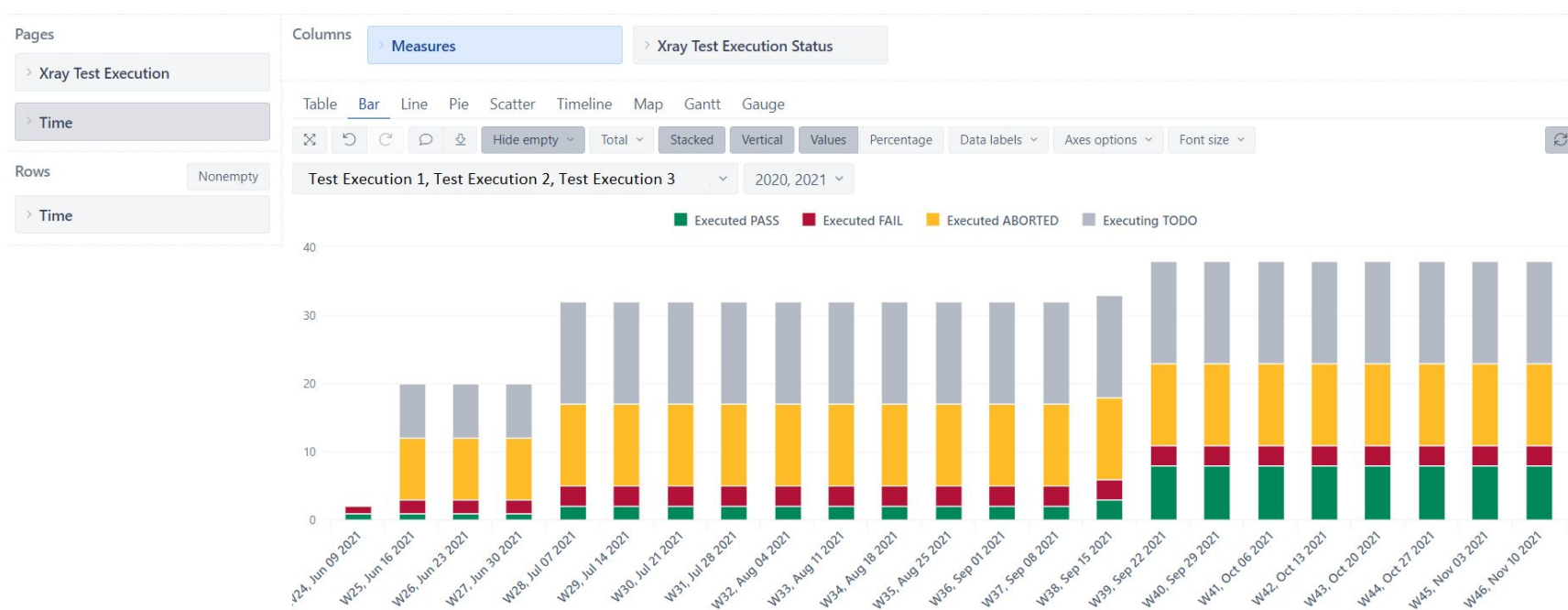


# Shift Left? Right?

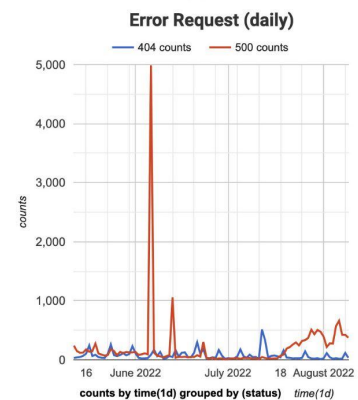
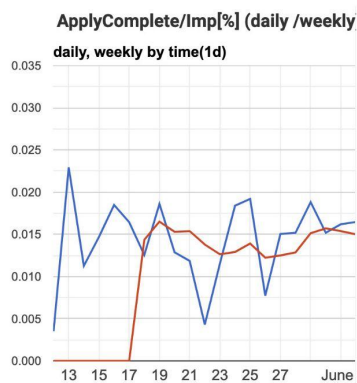
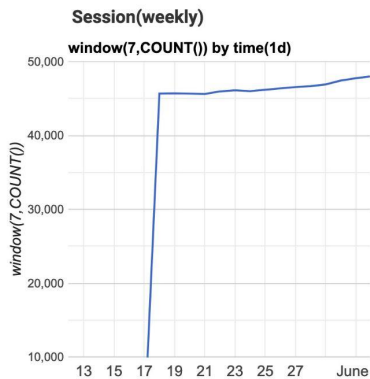
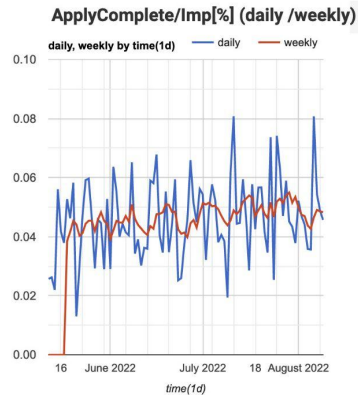
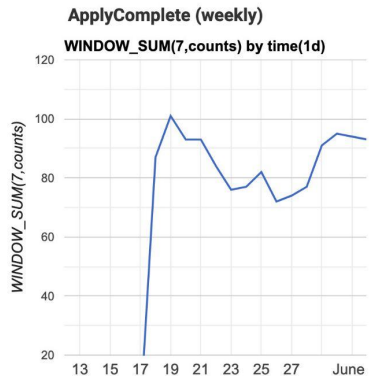
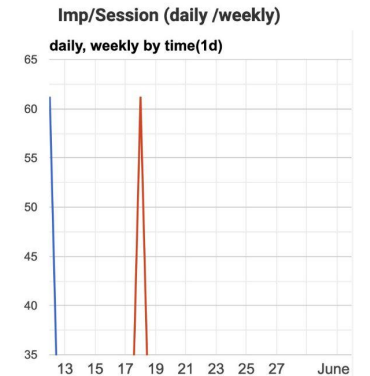
## Shift everywhere... Continuous Testing



# Robustness



# Metrics

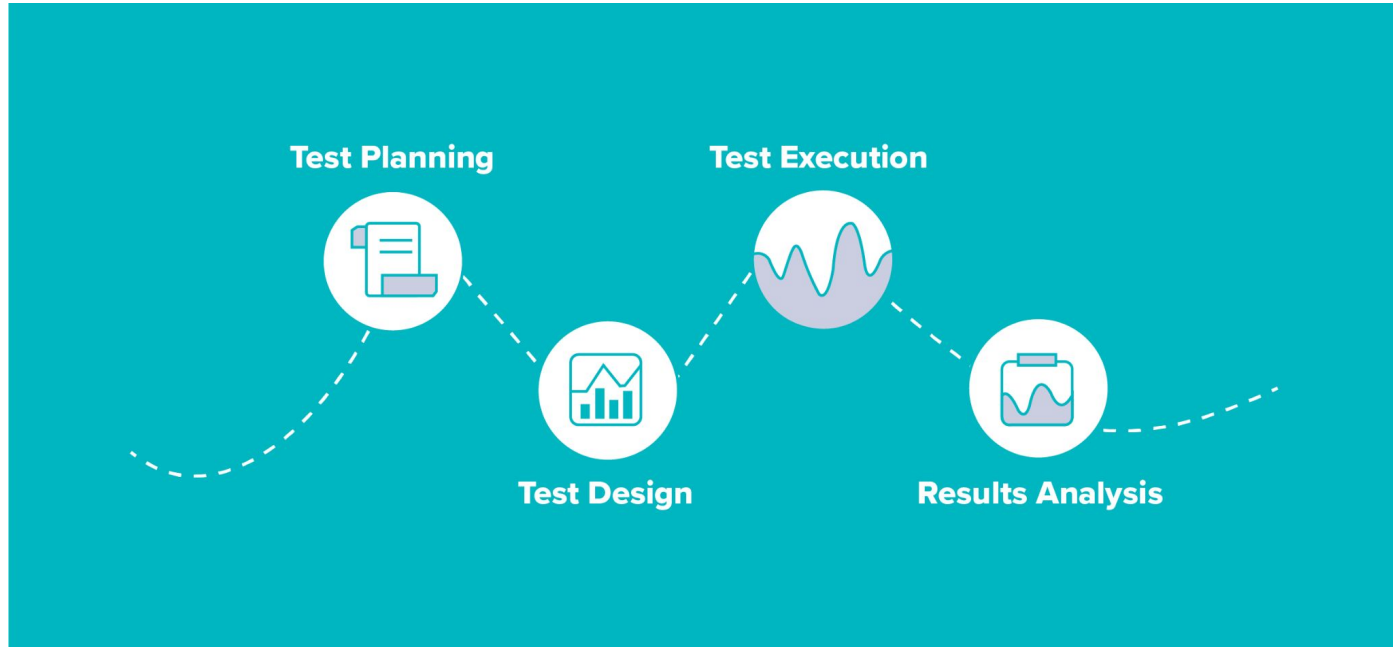


# Thanks for the help:

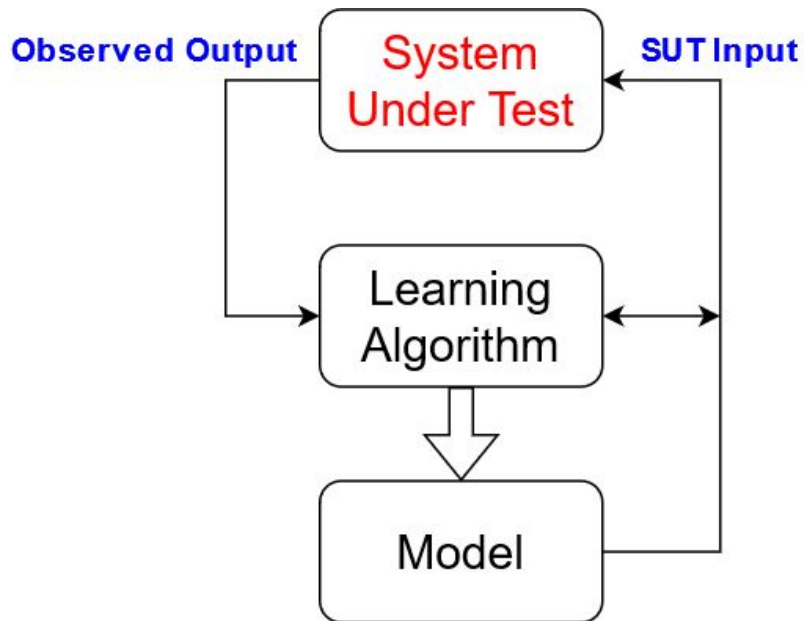
## Machine Learning Assistance



# Software Testing Stages

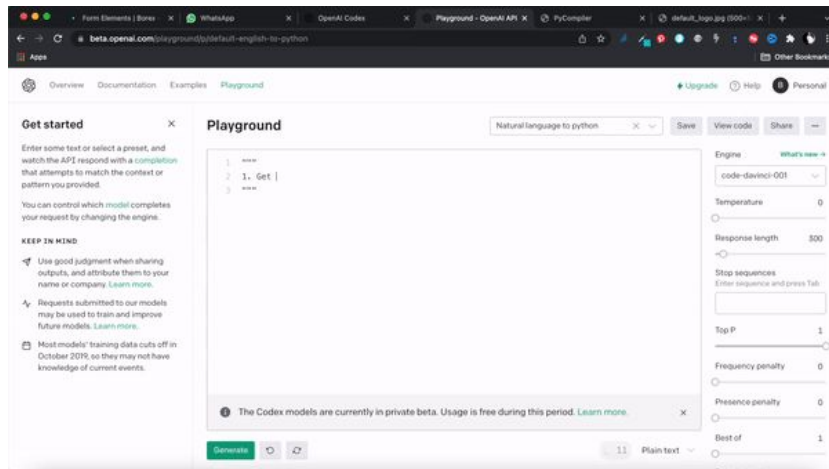


# Test Case Generation



```
<books>
  <book>
    <ISBN>0-672-32374-5</ISBN>
    <price>59.99</price>
    <year>2002</year>
  </book>
  <book>
    <ISBN>0-781-44371-2</ISBN>
    <price>69.99</price>
    <year>2003</year>
  </book>
</books>
```

# Test Code Generation



OpenAI,  
Skolo Online Learning

- `elementByXPath("//*[@id='Cart']")`

**Traditional XPath selector**

- `elementByCustom("ai:cart")`

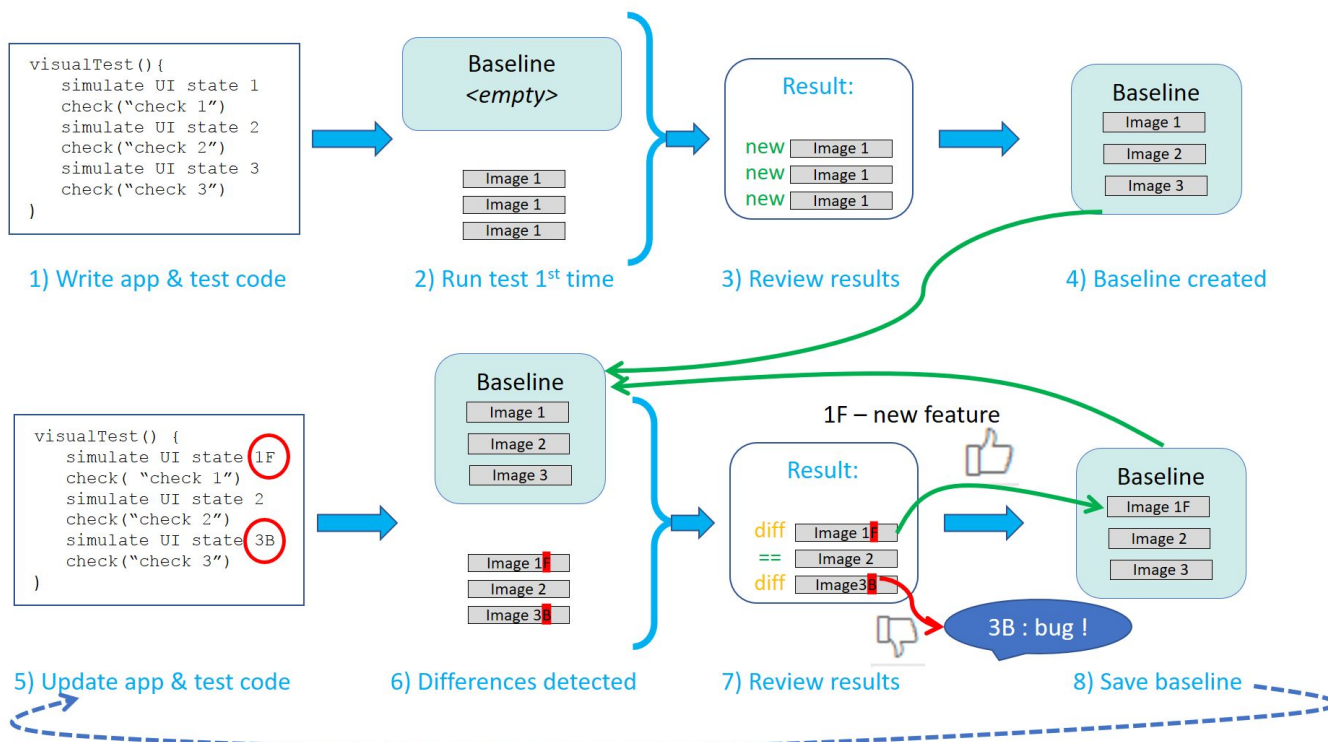
**New selector**

```
async function find (driver, logger, label, /* multiple */) {
  const curSetting = (await driver.getSettings())
    .elementResponseAttributes;
  const needToChangeSetting = !curSetting
    || curSetting.indexOf("react") === -1;
  const confidence = getConfidenceThreshold(driver,logger);

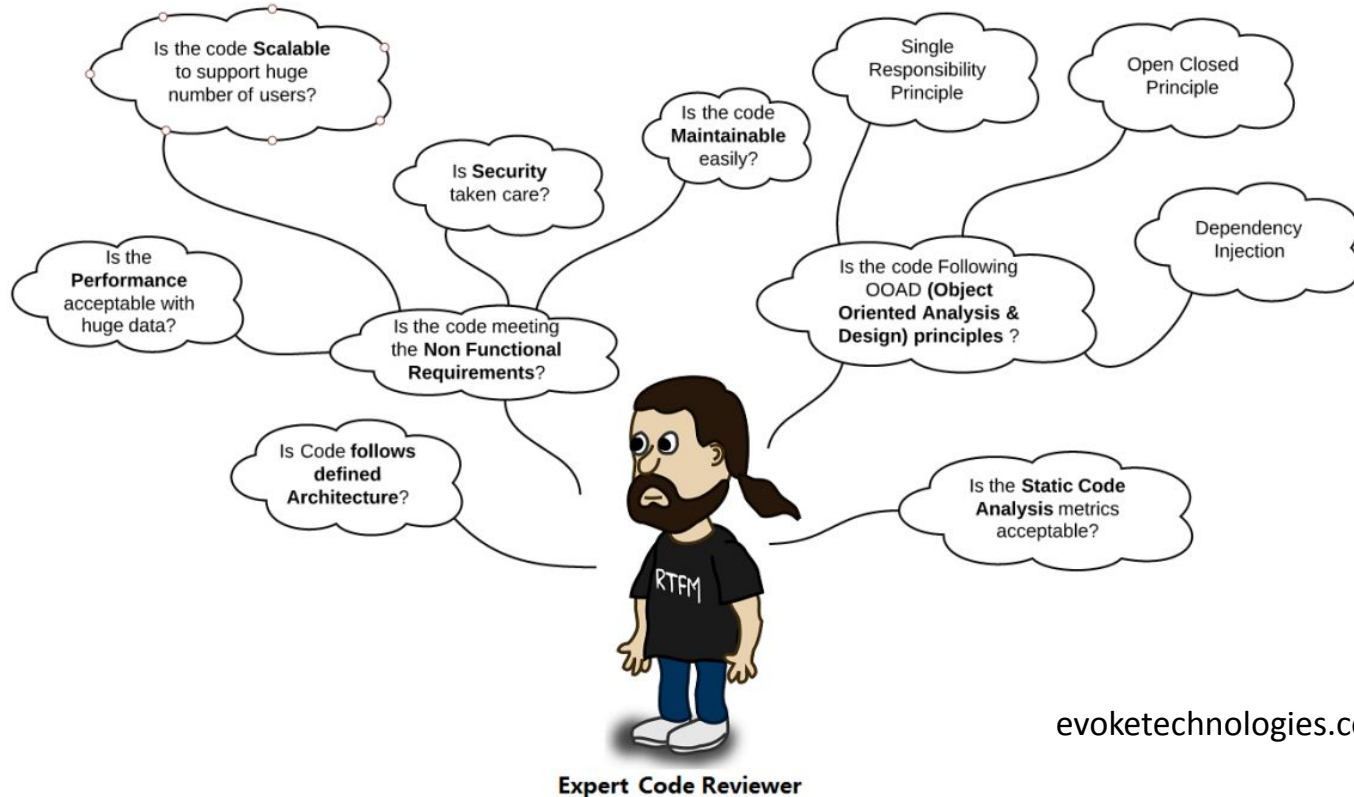
  try{
    const els = await getAllElements(driver,logger);
    const screenshotImg = await getScreenshot(driver,logger);
    const elsAndImages = await getElementImages(els,screenshotImg,logger)
    return await getMatchingElements(elsAndImages,label,confidence,logger);
  }
  finally{
    // ....
  }
}
```

Test.AI

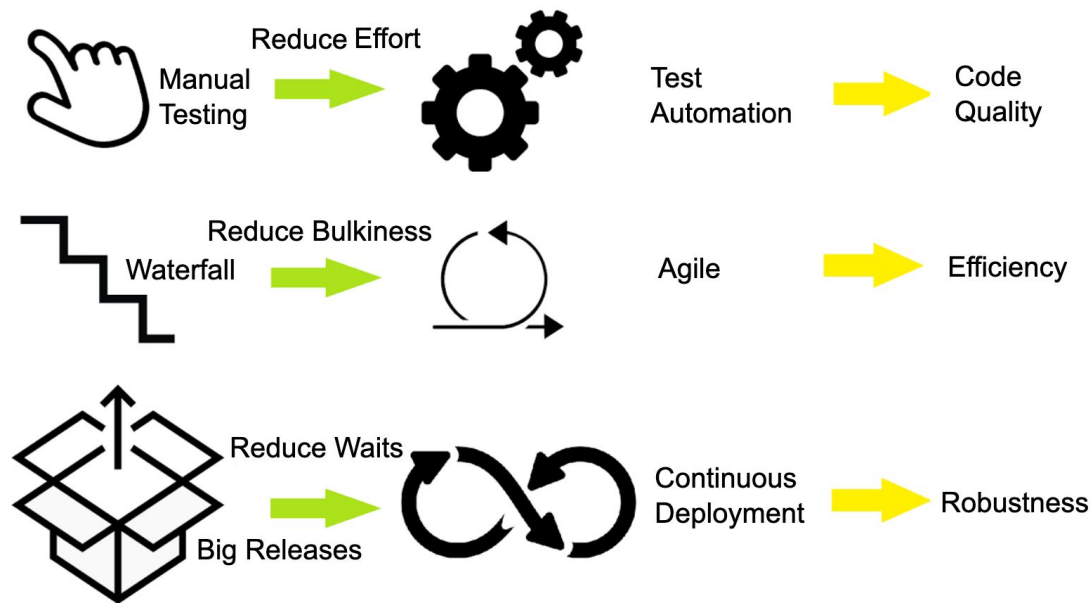
# Execution



# Maintenance



# SUMMARY



## AI Assistance

- Case Generation
- Code Generation
- Execution
- Maintenance
  - Review
  - Self healing
  - Triage
  - Classification
  - Clustering

