A man with a beard and long hair, wearing large black headphones, is shown in profile, looking towards the right. He is wearing a blue t-shirt. The background is a blurred office environment with a window showing a sunset or sunrise. The overall lighting is warm and soft.

Automation Best Practices for CI/CD

Leo Laskin, Sr. Solutions Architect



Topic 1
CI/CD



Topic 2
Best Practice Testing



Topic 3
Selenium Testing



Topic 4
Other tips



THE PATH TO CI/CD



Waterfall



Fast Waterfall



Continuous Integration



Continuous Delivery



Process

Traditional sequential design model

Initial adoption of Agile

Agile Practice Embraced

Fully automated Development process



Tools

Manual testing dominates

Automated testing begins

***Automated testing dominates;
manual only for debugging***

Continuous Testing



People

Dev. & QA completely separate

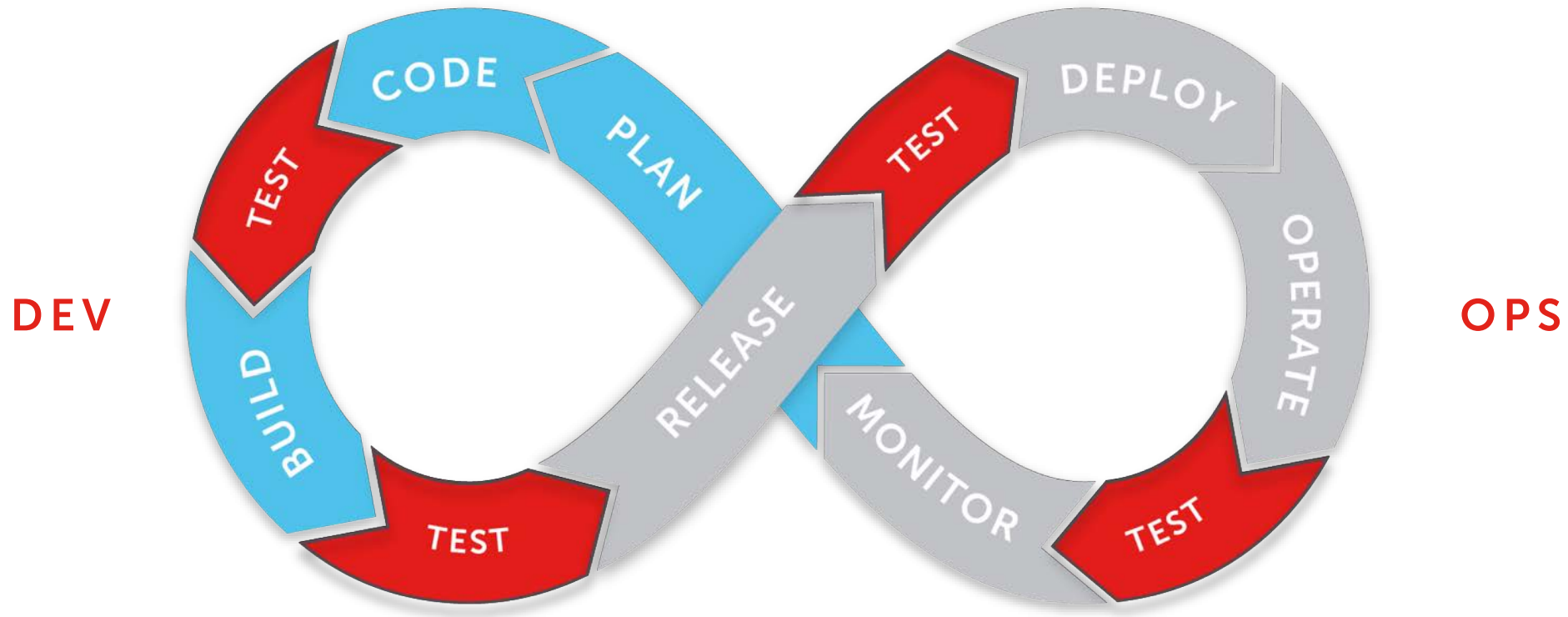
Dev. & QA start communicate

Dev. and QA collaborate closely

Dev. and QA functions merge



THE MODERN DEVELOPMENT TOOL CHAIN



CONTINUOUS TESTING



Topic 1
CI/CD



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Topic 3
Selenium/Appium Testing



Topic 4
Organizational Advice



Manual Tests Improve Automation

- Automation as Test Case Management
- Automate your bugs



Start with a Clean System

- Having a clean system every time is paramount for reproducible results
- SaaS grid based systems can be setup to be fresh with no system cache, browser cache, cookies, etc.



Parallelization

- Serialized tests take more time and cost more money
- 300 minute long tests can take either 5 hours or as little as 1 minute.
- Using a Selenium Grid like Sauce Labs, parallelized tests can spin up multiple browsers for you or multiple tests simultaneously

Test Constantly

- Don't ever stop testing
- Having tests run on every commit is going to provide significantly higher confidence in your software
- You have unlimited amounts of time to test. Use it!



Speed things up

- The average attention span of an adult is less than 5 minutes
- Try to provide results before context is switched
- Make the devs work for you not against you



Start Small

- Don't rush to automate every test case
- Identify test case priority then automate



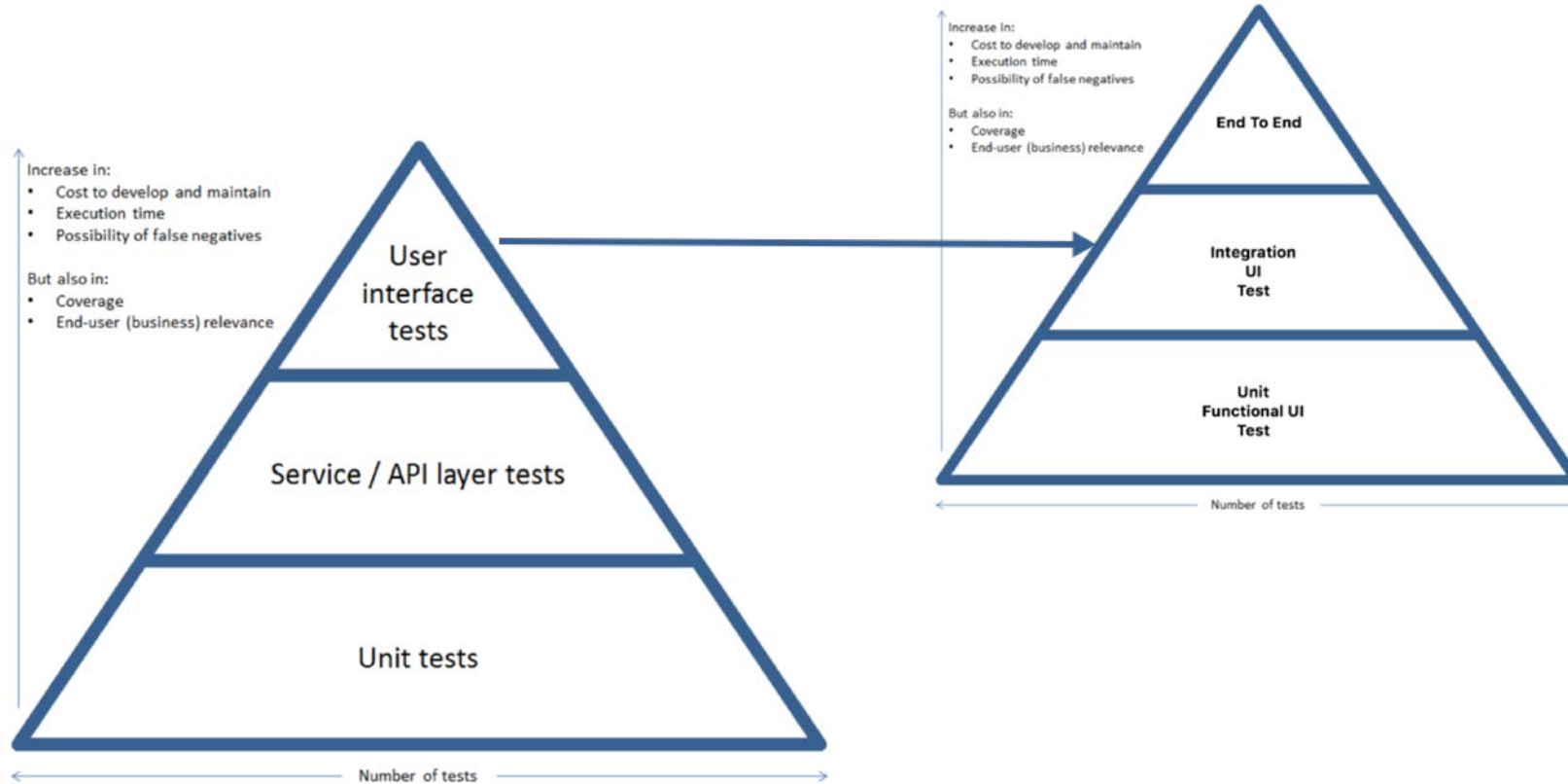


Avoid Dependencies

- Don't allow tests to be dependent on each other
- One test's actions should not drive another tests assertion criteria
- Dependent tests run slower because of a need to wait for a prior test



Focus On Automation Pyramid

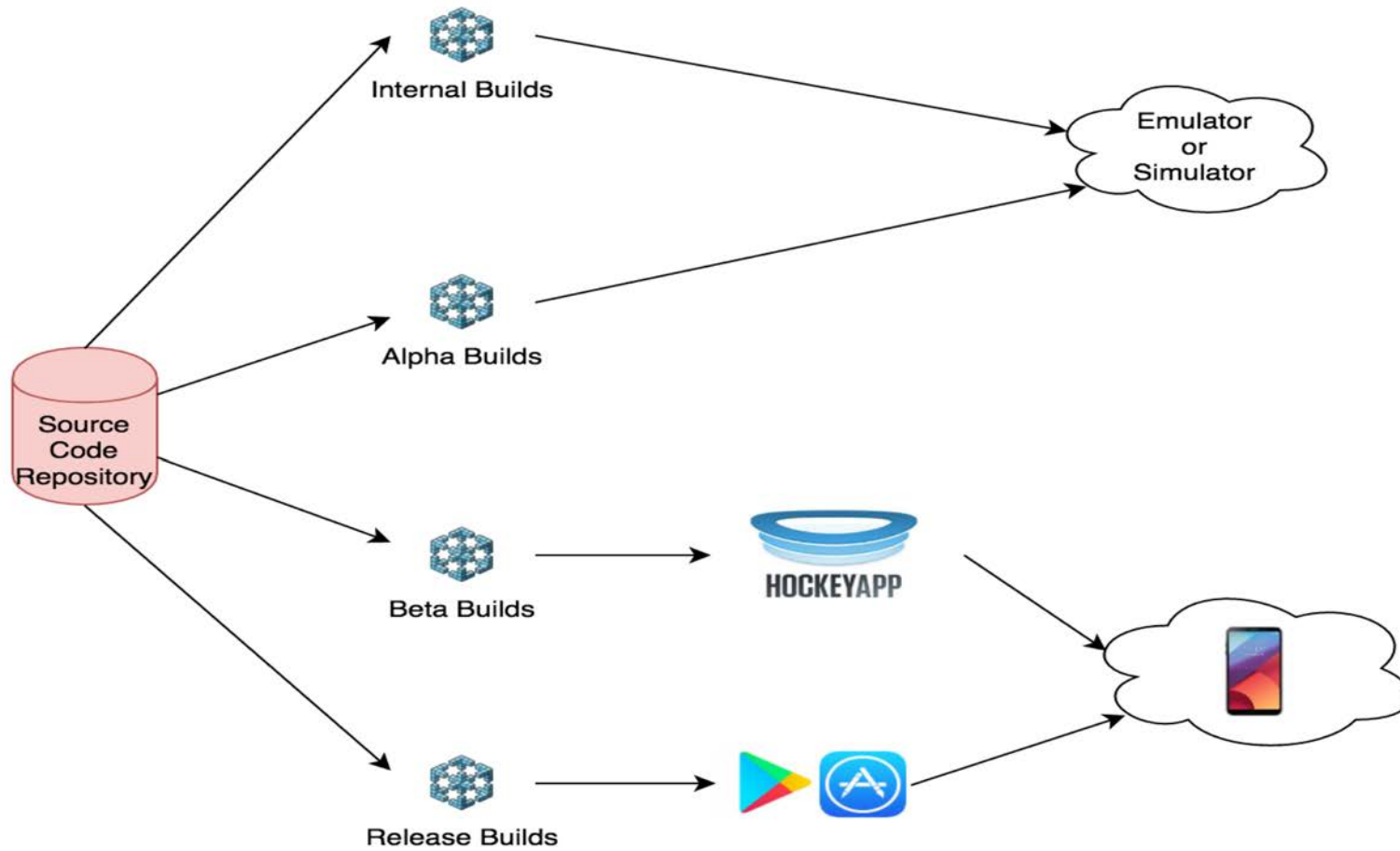




Automation = Development Activity

- Automation is a real development endeavor, treat it as such
- Beware of Cowboy Coding / Parachute Drop Coding
- Copy/Pasting inside your code can be replaced by reusable methods
- Source control is cheap insurance
- Bad coding practices = bad testing practices (and vice versa)

Test in the right place





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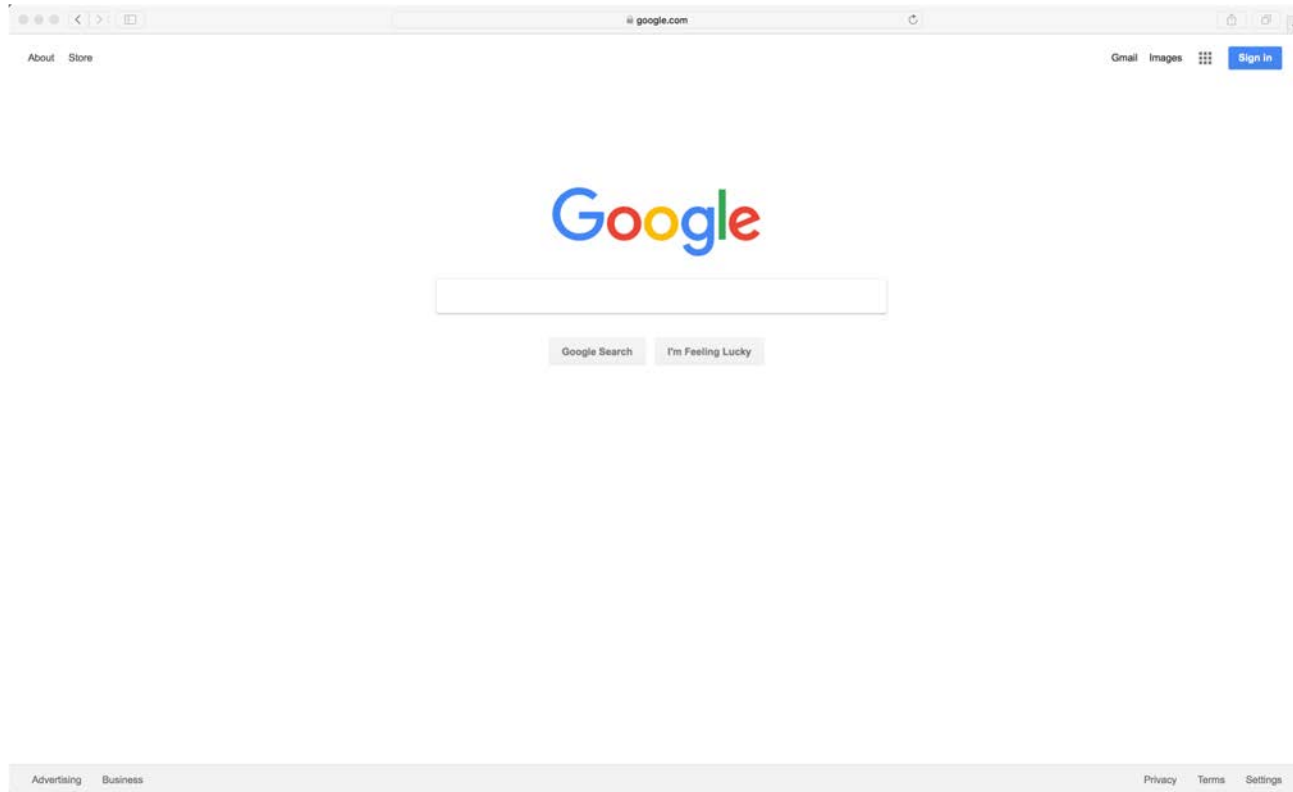


Selector Strategy

- What selectors do you use?
- XPath vs the rest
- Ideal Ordering
 - ID }
 - Name }
 - CSS Selector*
 - Xpath

*<https://code.tutsplus.com/tutorials/the-30-css-selectors-you-must-memorize--net-16048>

Selector Strategy



Xpath: `//div[@id='searchform']/div/form//input[@id='gbqfbb']`
CSS: `#gbqfbb`





Page Object Pattern

- Encourage reusable code throughout your test app
- Test code more organized for update if test parameters like selectors change
- Tests are more readable with natural feeling definition and variable naming



Waiting

- Thread.sleep

```
Thread.sleep(5000);
```

- Implicit Waits

```
driver.manage().timeouts().implicitlyWait(10, TimeUnit.SECONDS);
```

- Explicit and Fluent Waits

```
WebElement myElement = (new WebDriverWait(driver, 10))  
    .until(ExpectedConditions.presenceOfElementLocated(By.cssSelector("#myIDelement")));
```



End Your Test

```
public void verifyCommentInputTest() throws InvalidElementStateException {  
    String commentInputText = UUID.randomUUID().toString();  
  
    GuineaPigPage page = GuineaPigPage.visitPage(driver);  
    page.visitPage();  
    page.submitComment(commentInputText);  
    assertThat(page.getSubmittedCommentText(), containsString(commentInputText));  
    assert(page.getSubmittedCommentText(), containsString(commentInputText2));  
    assert(page.getSubmittedCommentText(), containsString(commentInputText3));  
}
```

- End the Test
- Don't perform actions after Assertion
- Multiple simultaneous assertions are OK



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Prep Your Environment

- Make sure your CI rig can handle the number of jobs running on it simultaneously
- Make sure your SUT can handle the number of tests running on it simultaneously



Collect Metrics

- Green or Red Build
- How many tests were run in the last 24 hours?
- How many bugs do automated tests identify per release?

test.allTheThings()

