

State and
Future of UI
Testing

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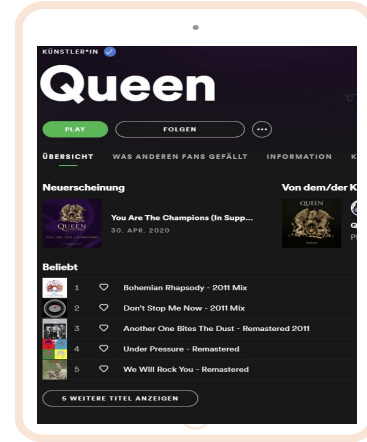
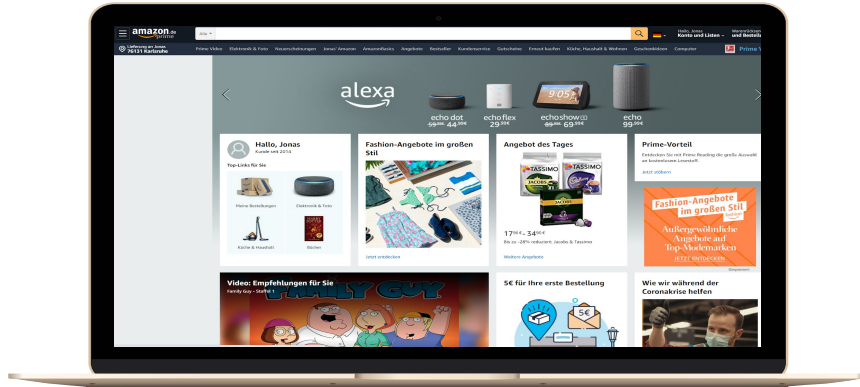
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UI Interfaces



“In the industrial design field of human–computer interaction, a **user interface (UI)** is the space where interactions between **humans** and **machines** occur.” -
Wikipedia





Hören



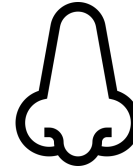
Sehen



Tasten



Geschmack



Geruch

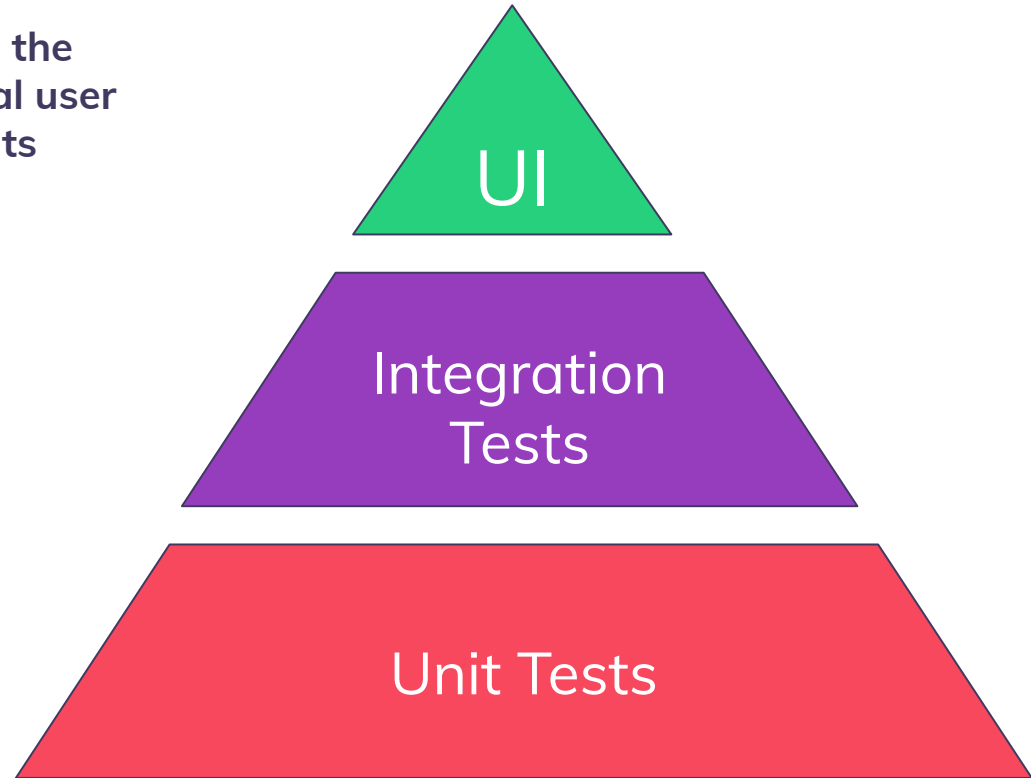


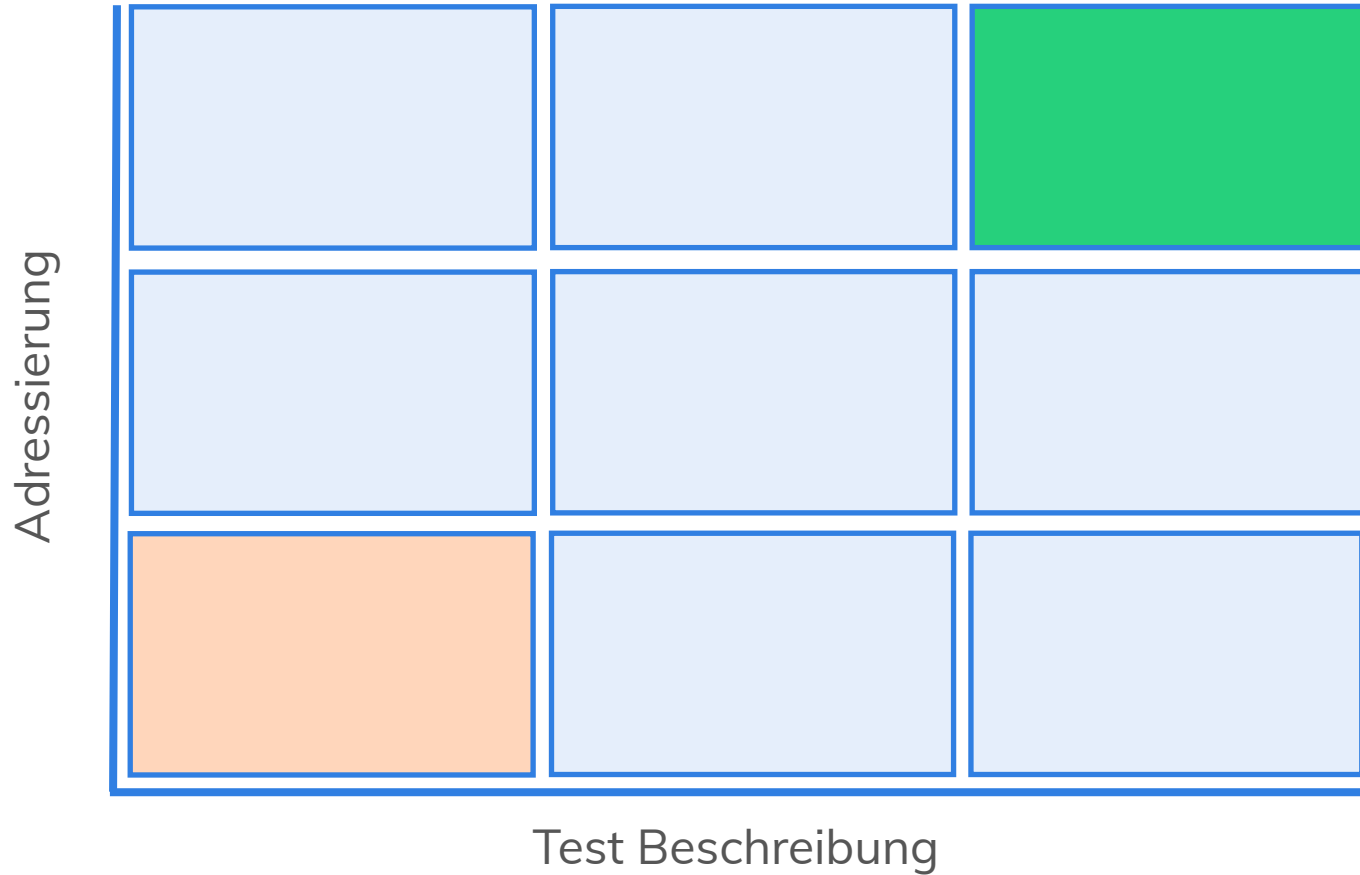
Typen

1. Attentive user interfaces
2. Batch interfaces
3. Command line interfaces (CLIs)
4. **Conversational interfaces**
5. **Conversational interface agents**
6. Crossing-based interfaces are graphical user interfaces
7. Direct manipulation interface
8. **Gesture interfaces**
9. **Graphical user interfaces (GUI)**
10. Hardware interfaces
11. **Holographic user interfaces**
12. Intelligent user interfaces
13. Motion tracking interfaces
14. Multi-screen interfaces
15. **Natural-language interfaces**
16. Non-command user interfaces
17. Object-oriented user interfaces
18. Permission-driven user interfaces
19. Reflexive user interfaces
20. Search interface
21. Tangible user interfaces
22. Task-focused interfaces
23. Text-based user interfaces
24. **Touchscreens**
25. Touch user interface
26. **Voice user interfaces**
27. Web-based user interfaces
28. Zero-input interfaces
29. Zooming user interfaces



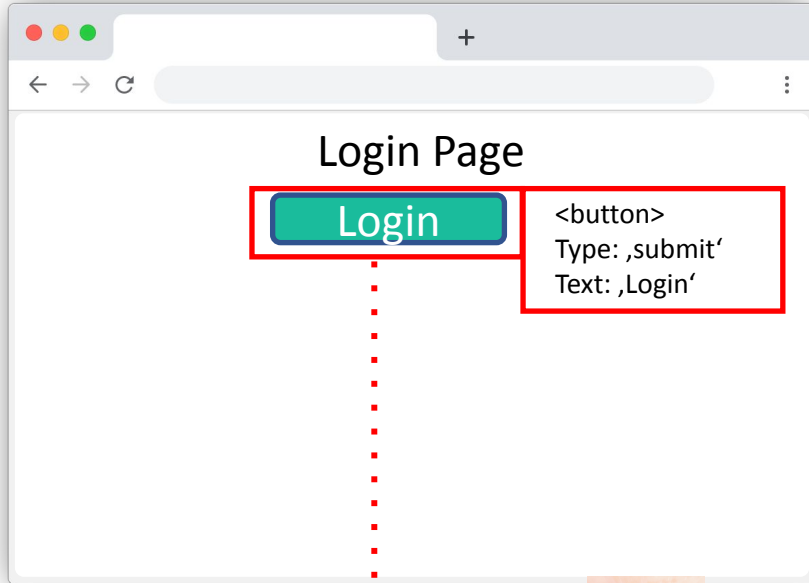
‘... graphical user interface testing is the process of testing a product's graphical user interface (GUI) to ensure it meets its specifications.’ - Wikipedia







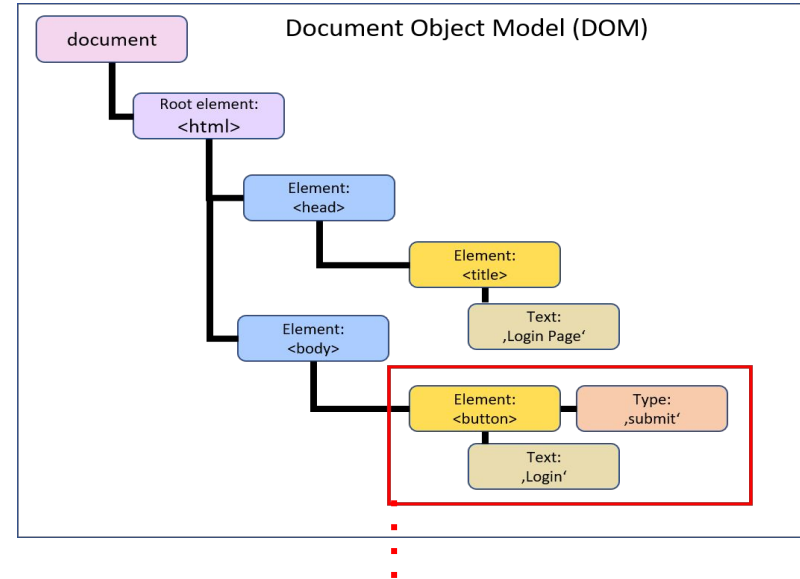
Visuell



Visuelle Selektierung



Formal



Dynamischer Selektor



Code

```
it('Successfull Login', () => {  
  cy.visit('https://testshop-615f6  
  
  cy.get('#loginEmailId')  
    .type(username);  
  cy.get('#loginPassword')  
    .type(password);  
  cy.get('#loginButton')  
    .click();  
  
  cy.contains('Our Best Products')  
    .should('be.visible');  
})
```

Grafisch



No-Code






1. Öffne Webseite
2. Tippe "demo@test.de" in das E-Mail Textfeld
3. Tippe "secret" in das Passwort Textfeld
4. Klick auf login
5. Erwarte eine Weiterleitung auf die Produktübersichtsw Webseite

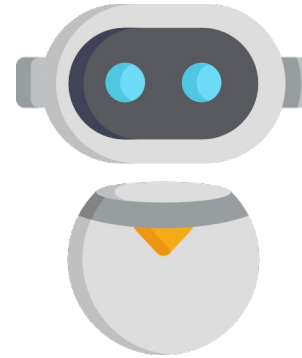


Visuell			
Smarte Selektoren			
Formal (DOM)			
	Code	Grafische Programmierung	No-Code







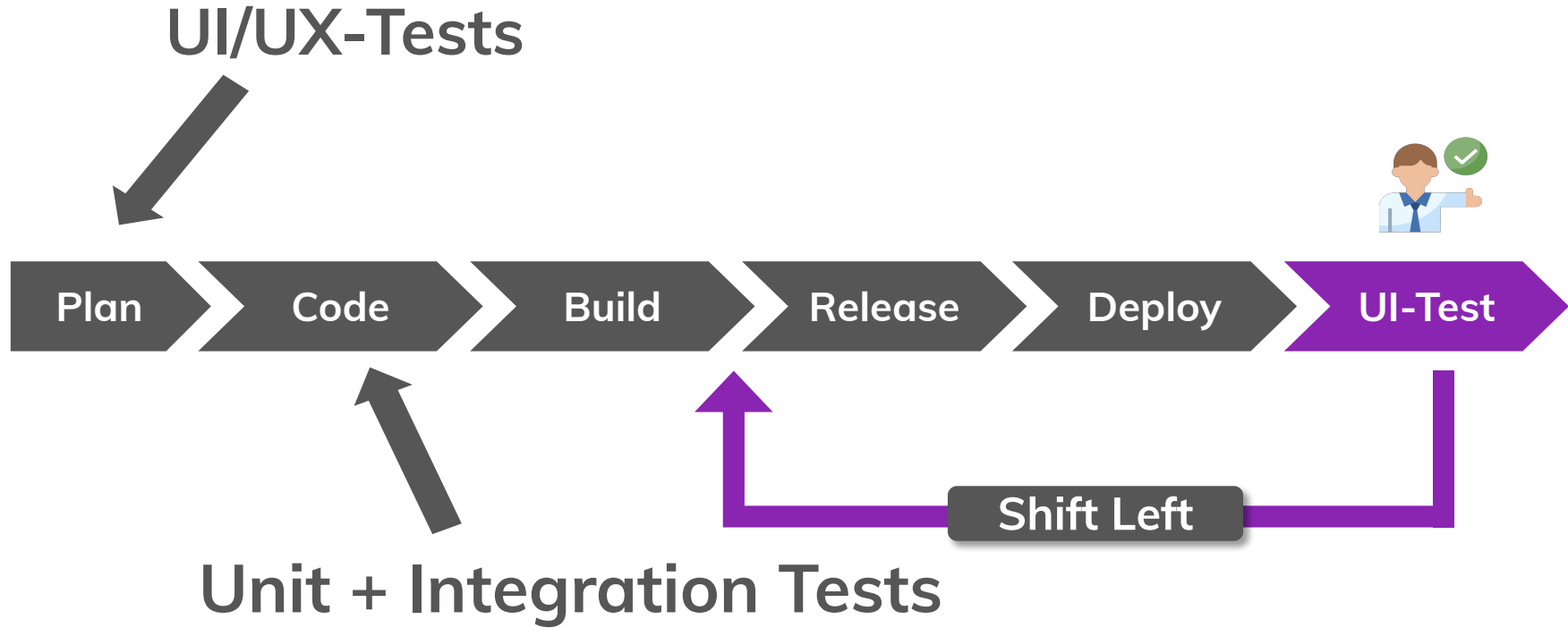
manuel

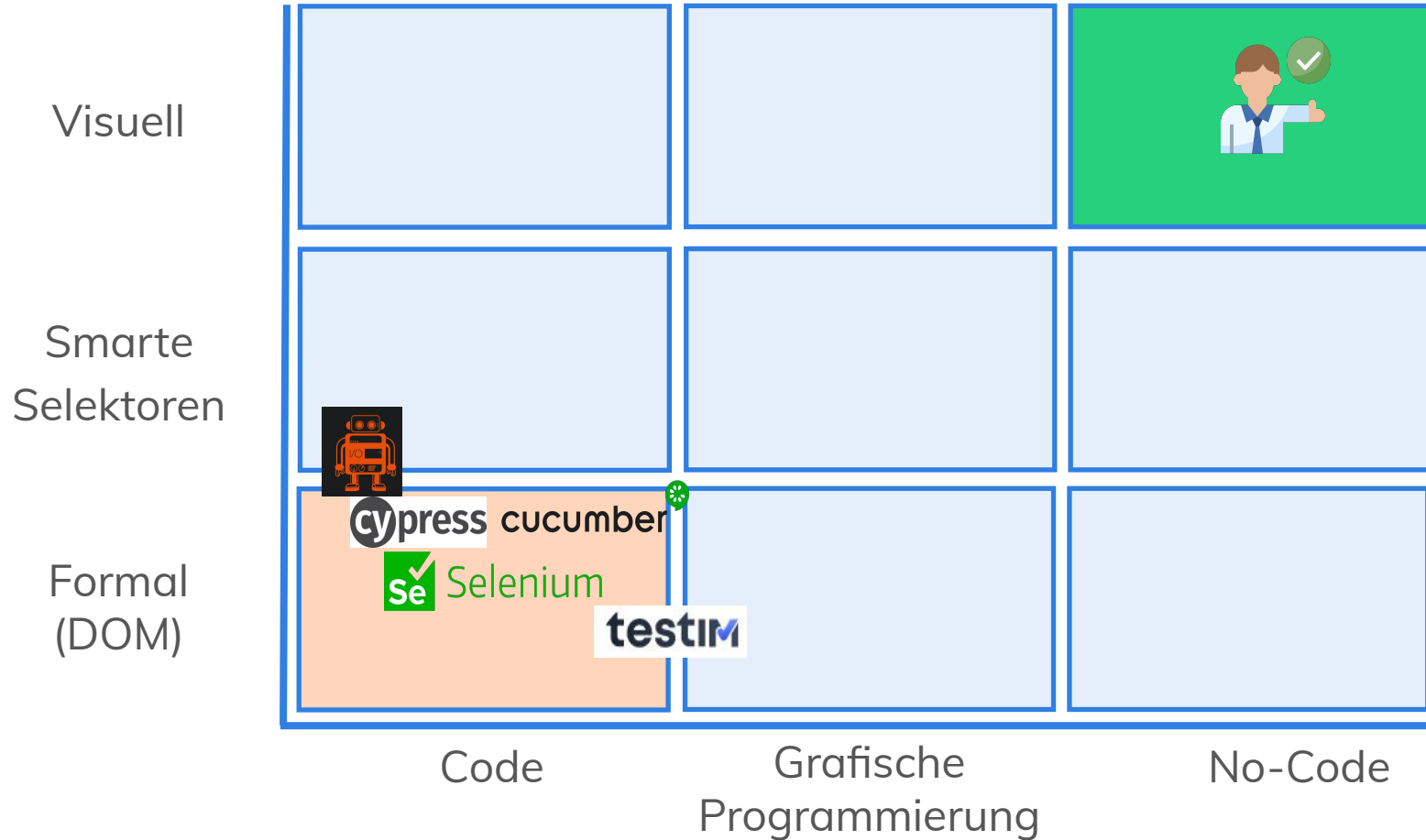
-  Ausführungszeit
-  Fehlertoleranz
-  Skalierbarkeit
-  Plattformunabhängig
-  Kosten



automatisiert

-  Ausführungszeit
-  Fehlertoleranz
-  Skalierbarkeit
-  Plattformunabhängig
-  Kosten

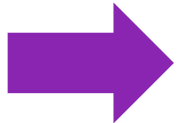




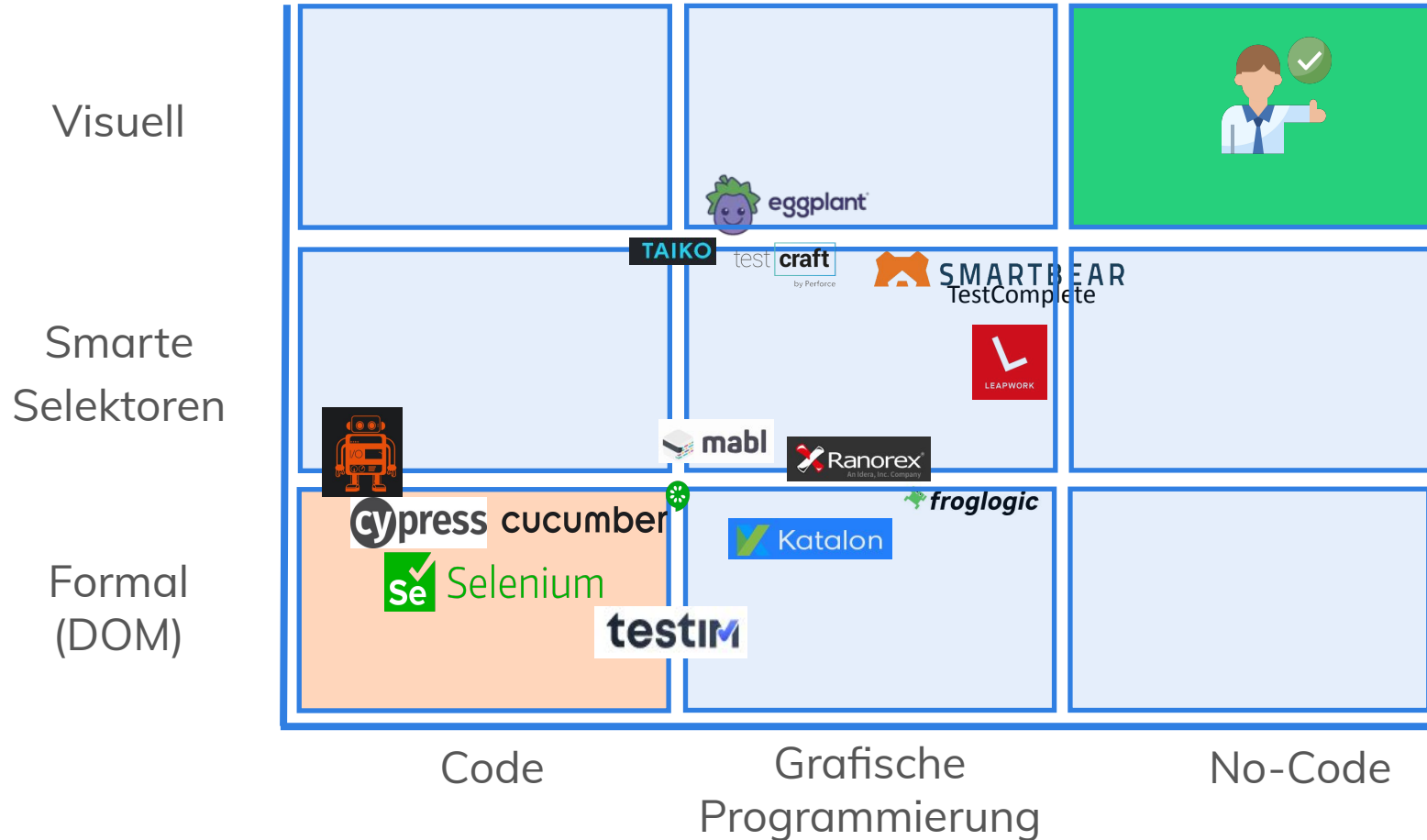


Cypress

- seit 2014
- end2end Testing Framework
- Javascript
- Eigene Architektur (Unabhängigkeit von Selenium)



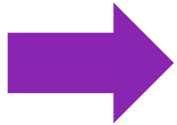
DEMO





Taiko

- Version 1.0 seit Juli 2019
- node.js-Library für moderne Web Applikationen
- Javascript
- Implizites Warten auf erscheinen von Elementen



DEMO



Optical Character Recognition (OCR)

- Texterkennung mit Fuzzy Matching

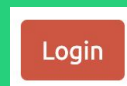
“Äpfe” == “Apfel” = true

“Apfel” == “Apfel” = true

“Apfl” == “Apfel” = true

Pixelabgleiche

- Ausgeschnittene Elemente werden über Pixelabgleiche im Bild gesucht



Sign in

Email address
Enter email

Password
Password

Login Sign in with Google

New User? Register here!

Relationen

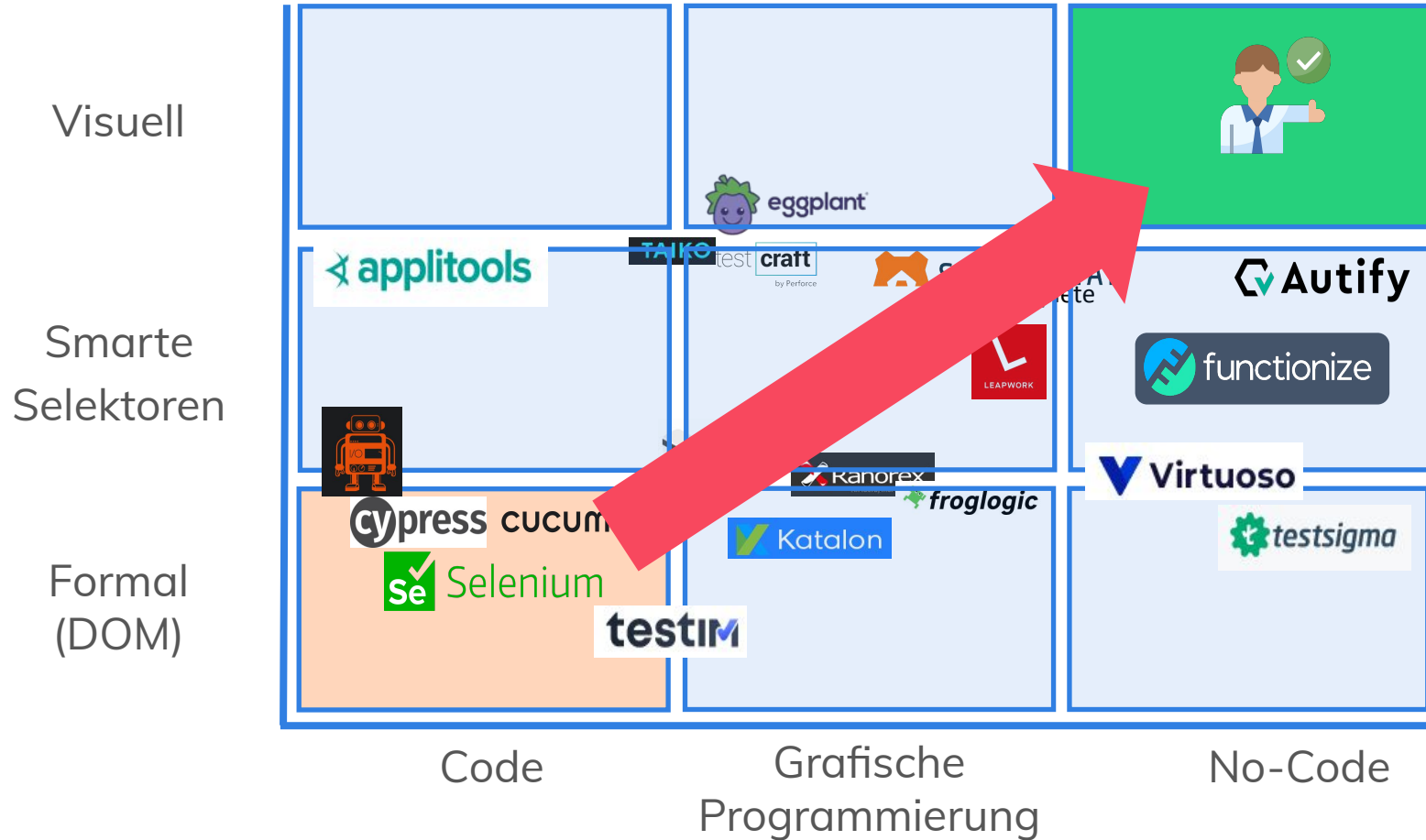
- Elemente werden über Relationen zu anderen Elementen selektiere

Type "Test" in textfield below of "Email"

Self-Healing Tests

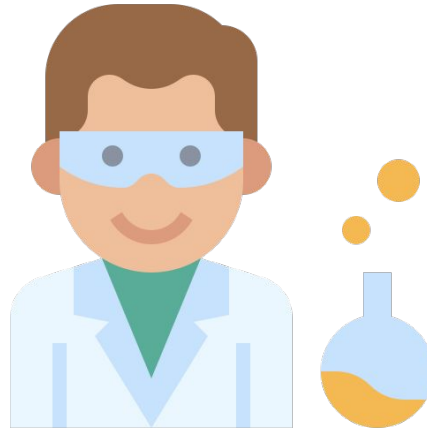
- Änderung der Position werden über Eigenschaften der Elemente wiedergefunden







Ausblick in die KI Forschung





Generative Pretrained Transformer 3 (GPT-3)

- trainiert auf 100 mrd. Wörtern
- 175 mil. parameter = 700 GB memory

Quelle: <https://lambdadb.com/blog/demystifying-gpt-3/>

Natural Language to SQL

Instruction: Given an input question, respond with syntactically correct PostgreSQL. Be creative but the SQL must be correct.

Input: how many users signed up in the past month?

GPT-3 Response: SELECT COUNT(*) FROM users WHERE signup_time > now() - interval '1 month'

Quelle: <https://blog.seekwell.io/gpt3>

Natural Language to Code

a button that looks like a watermelon

Generate

```
<button style={{backgroundColor: 'pink', border: '2px solid green', borderRadius: '50%', padding: 20, width: 100, height: 100}}>Watermelon</button>
```



Quelle: <https://analyticsindiamag.com/open-ai-gpt-3-code-generator-app-building/>



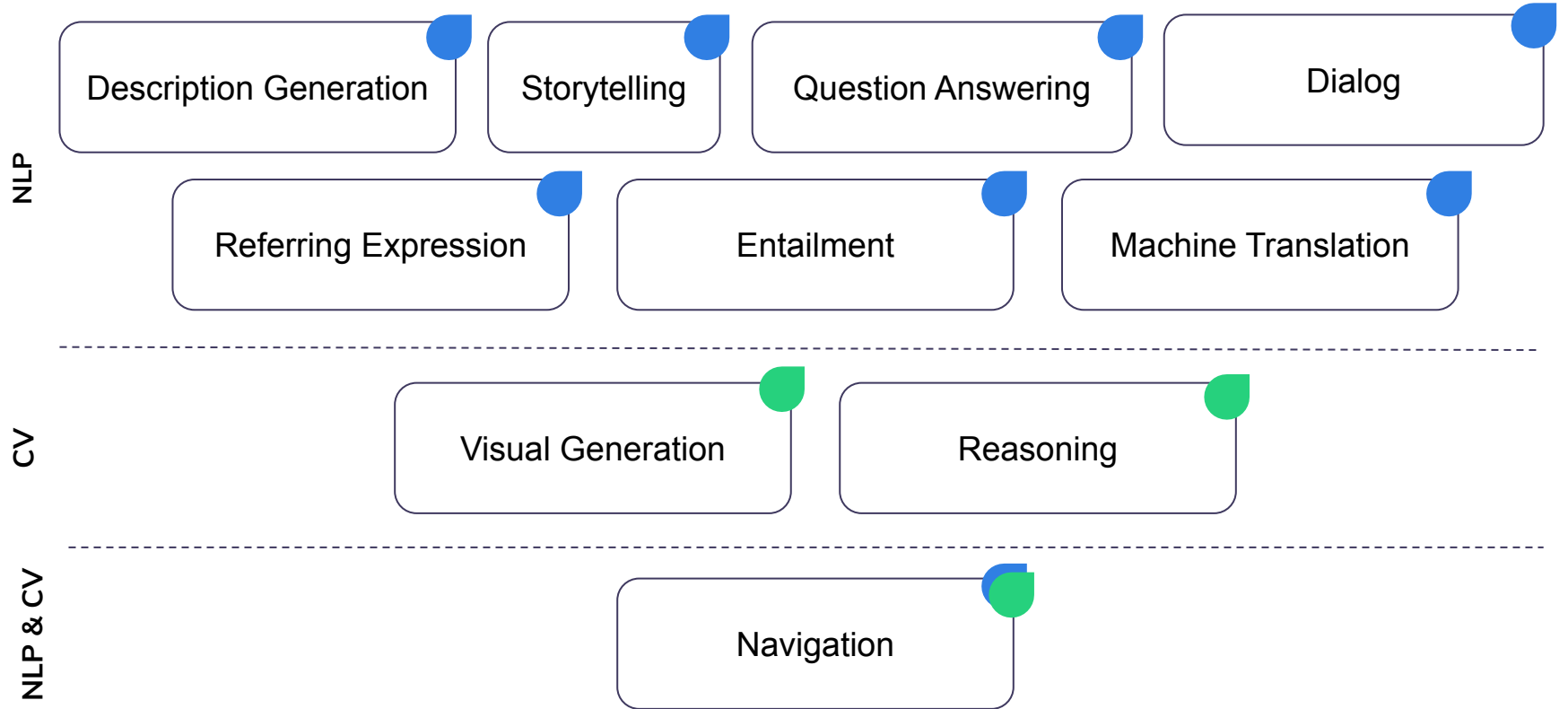
'A cat is standing on the ground'



Natural Language



Computer Vision





Visual Description
Generation



'A cat is standing on the
ground'

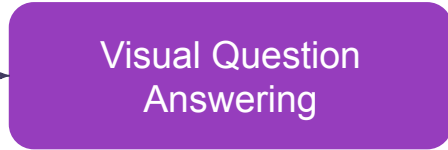


'A cat is standing on the ground'





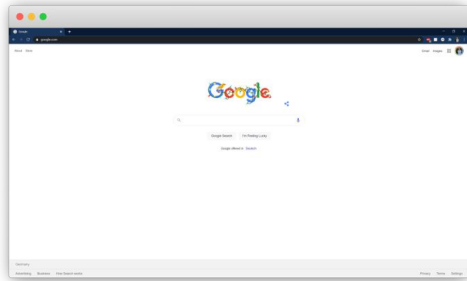
'Is a cat in the picture?'



'Yes'



Visuell			
Smarte Selektoren			
Formal (DOM)			
	Code	Grafische Programmierung	No-Code



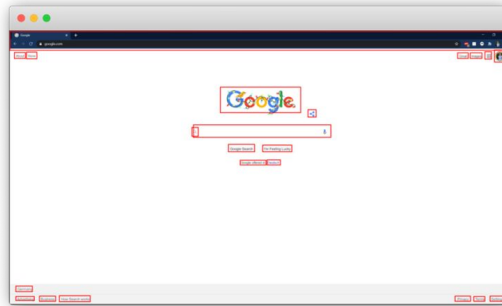
Your application

Enter 'Batman' in the textfield

Click on 'Google Search' button



James



Your test cases

Test execution and validation



- **Entwicklung von User Interfaces**
- **Aktuelle Tools kennen gelernt**
- **Ausblick in die Forschung**
- **Lernende System**



Fragen?



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