



# Programming for Accessibility

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Microsoft Developer Advocate



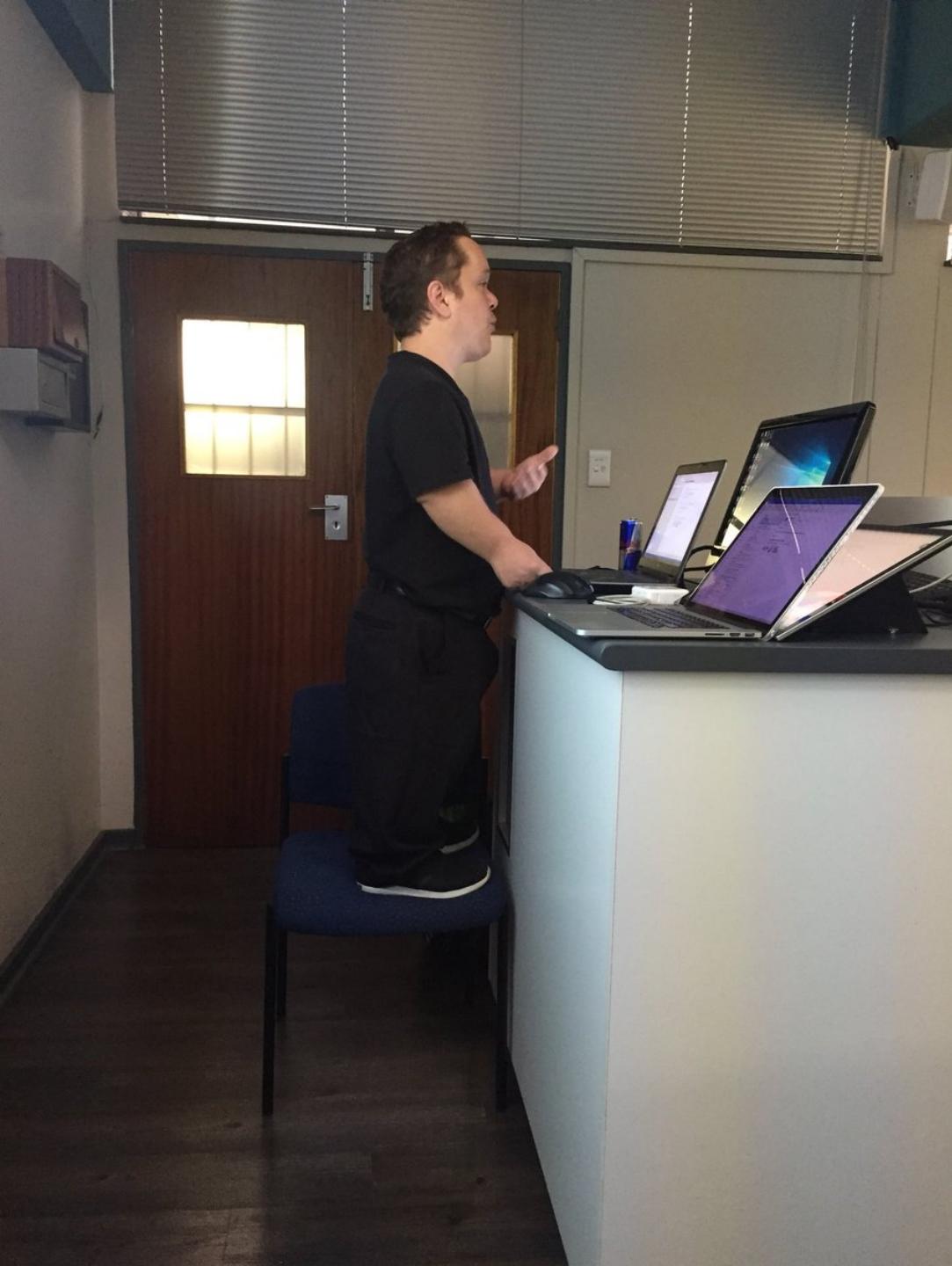
@rorypreddy



## My Car Pedals



Bolt on



## The Hydra



## Empathy Bubble



Fail

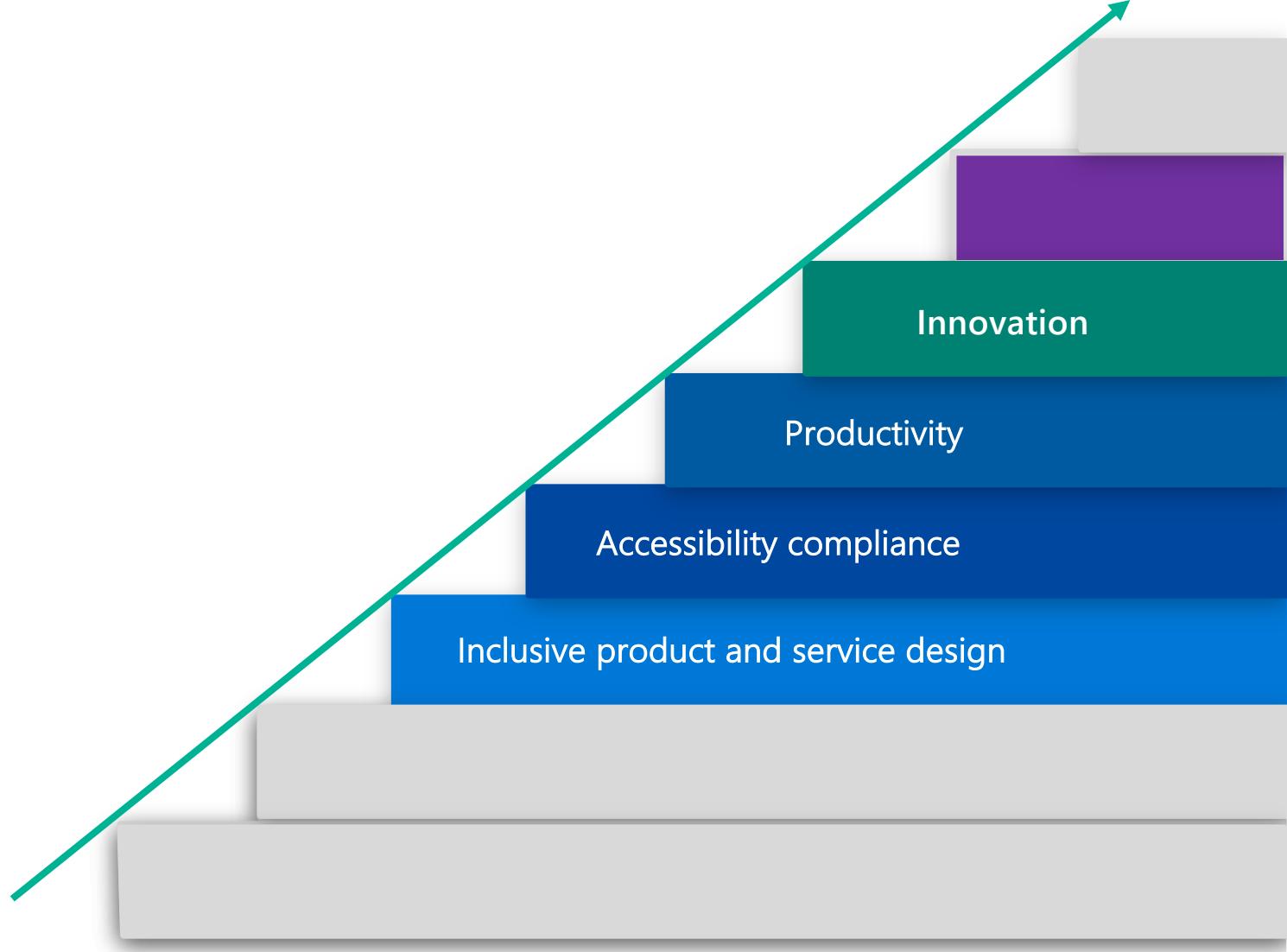
FAIL

# The plan

- Define Accessibility
- Understanding Your Organization's Unique Accessibility Motivators
- Set Achievable Interim Milestones
- Implement Tools
- Measure, Improve and Automate

## Accessibility is...

...the design of products, services, and environments so that everyone, including people with disabilities, can fully experience them.



Disability



Personal  
health  
condition

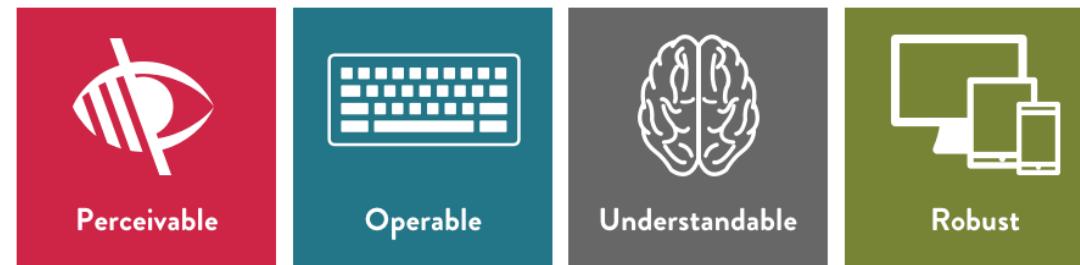
**Disability**



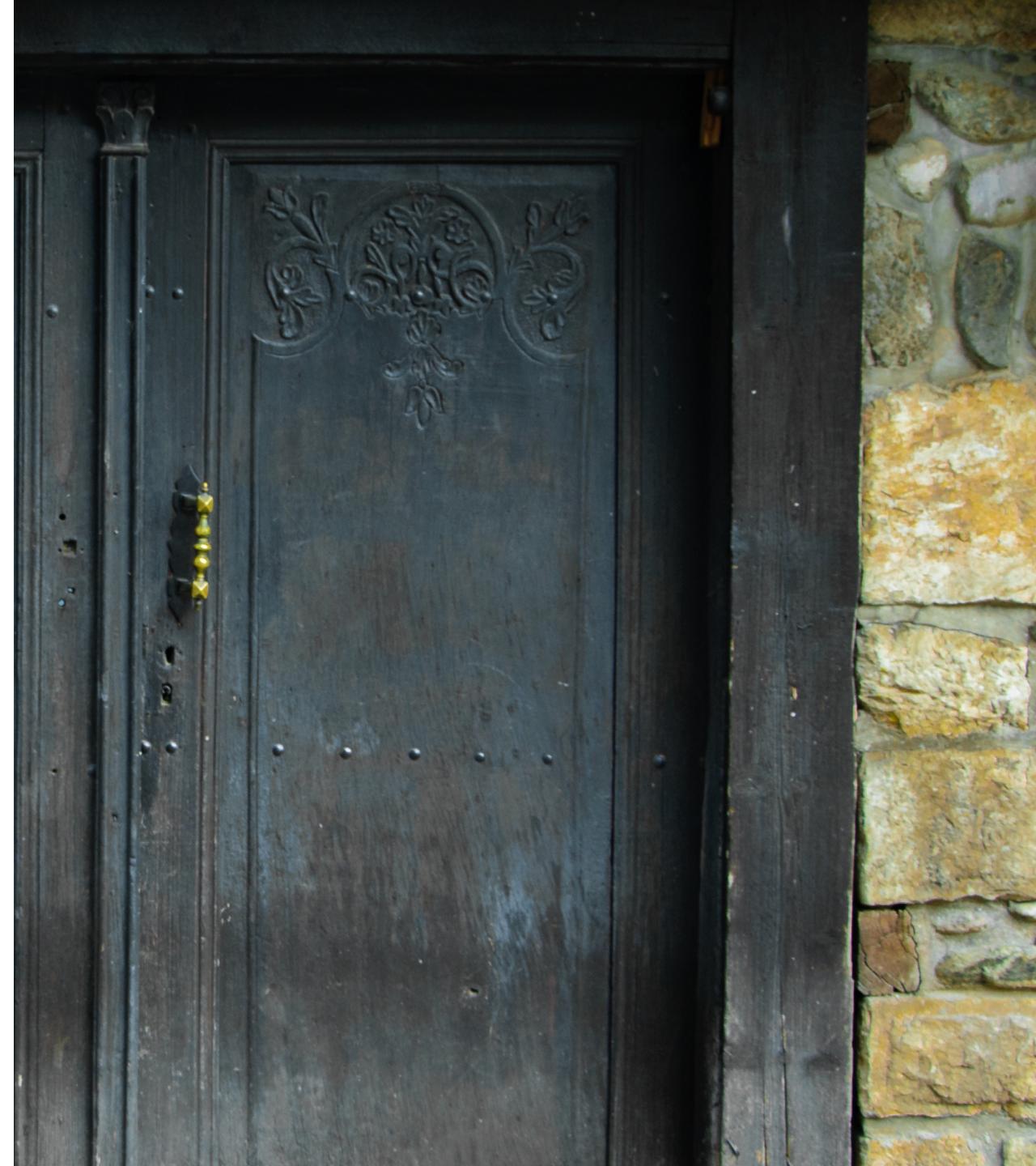
Mismatched  
human  
interactions

# WCAG Accessibility Design principles

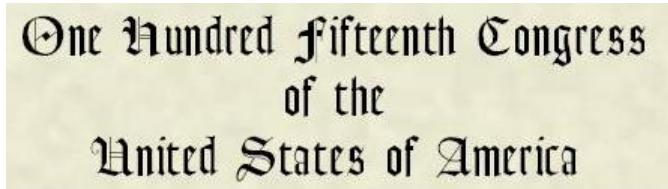
- Perceivable – *can you see it*
- Operable – *can you use it*
- Understandable – *can you understand it*
- Robust – *it won't break future technologies*



# Motivators



# Legislation



US 21st Century Integrated Digital Experience Act



EU parliament directive on digital accessibility



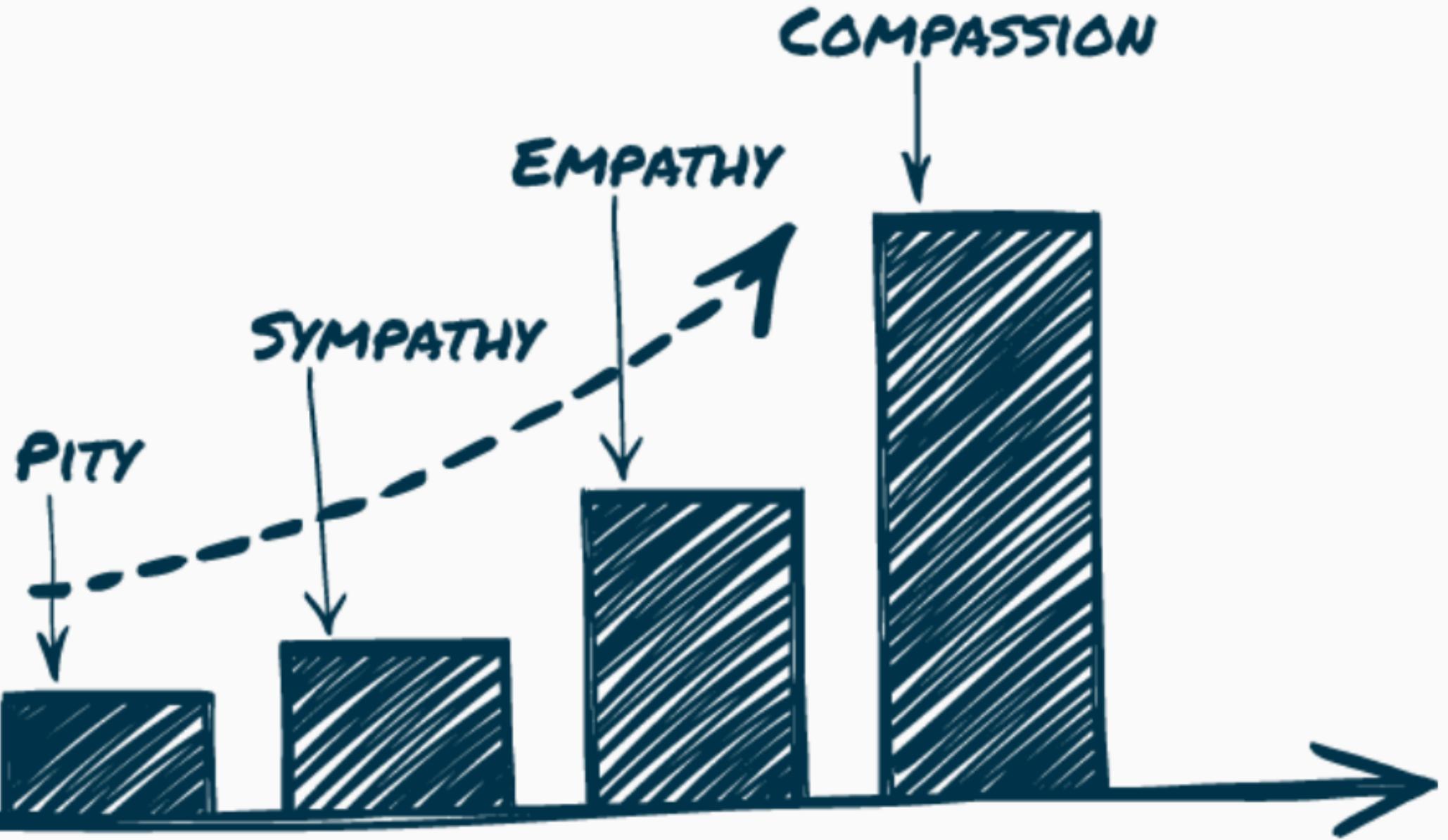
# Quality of life

For most of human history, we've put our innovative capacity into improving the quantity of life. Because we're living longer, our focus is starting to shift toward improving our quality of life

--Bill Gates



Emotional Engagement



## Claudia



54 years old social worker

Sight impaired (partially sighted)

Uses a screen magnifier and changes colours to increase contrast

---

### Chromebook help

If you're lost, go back to the first tab to re-orientate yourself!

## Ashleigh



24 years old arts graduate and administrative assistant

Severely sight impaired (blind)

Uses a screen reader

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### Chromebook help

Screen reader quick guide:

Use Tab to move from links and form elements to the next. Shift + Tab to go back. Search + Arrow Right/Left to read text in between those.

## Ron



82 years old, retired

Multiple conditions: arthritis, losing his hearing, cataracts, hip replacements

Doesn't use any assistive technology

---

### Chromebook help

As Ron is not very technical, don't use anything which might help. For example, don't zoom into the page and don't use the keyboard to navigate.



<https://alphagov.github.io/accessibility-personas/>

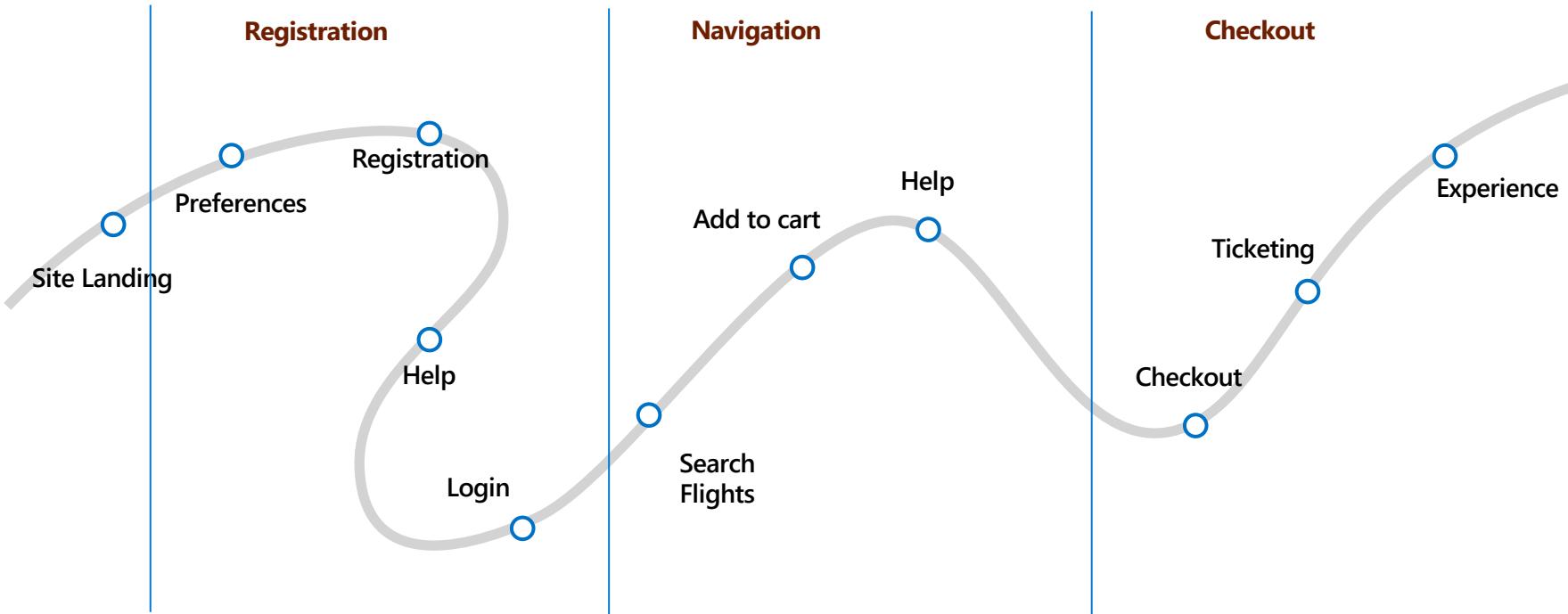
# Inclusive design steps

1. Recognise exclusion
2. Solve for one, extend to many
3. Learn from diversity

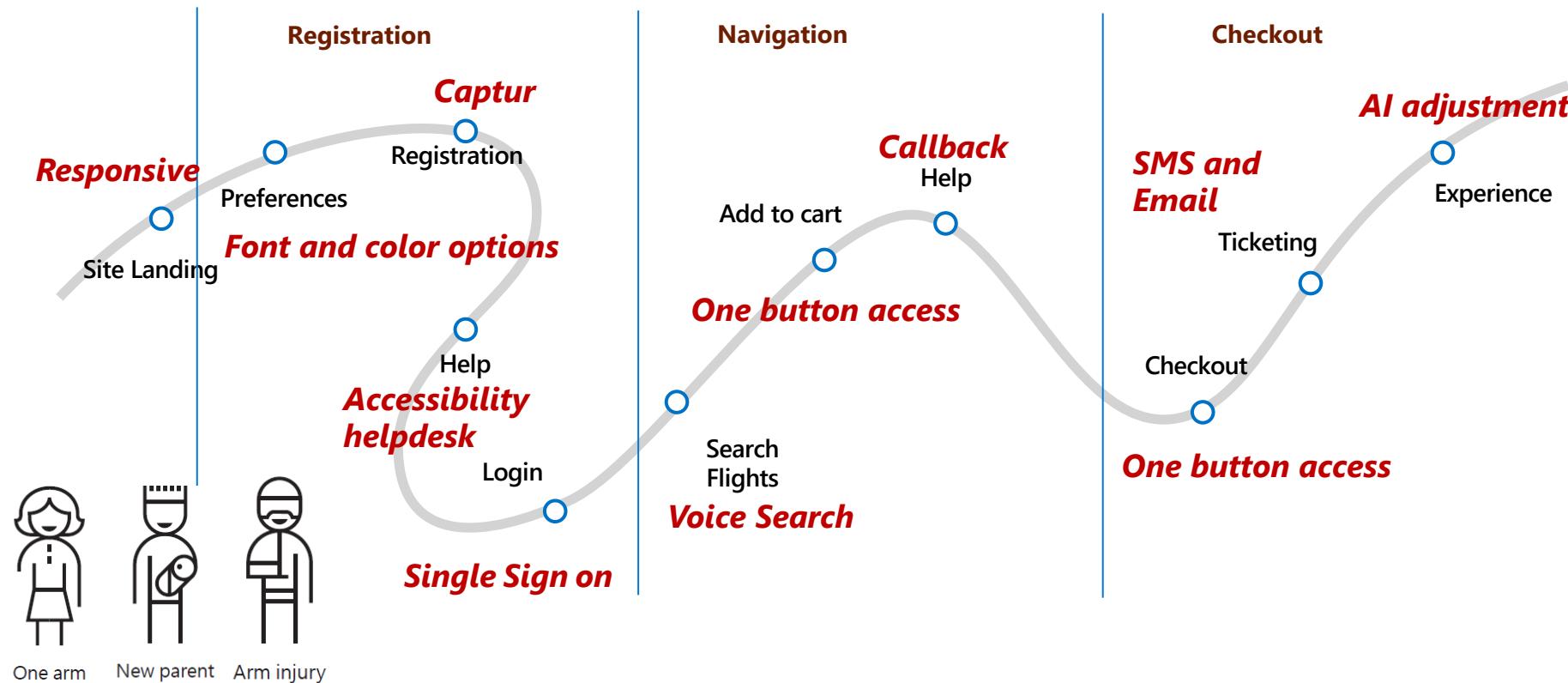
# Persona Spectrum



# Ticketing scenario

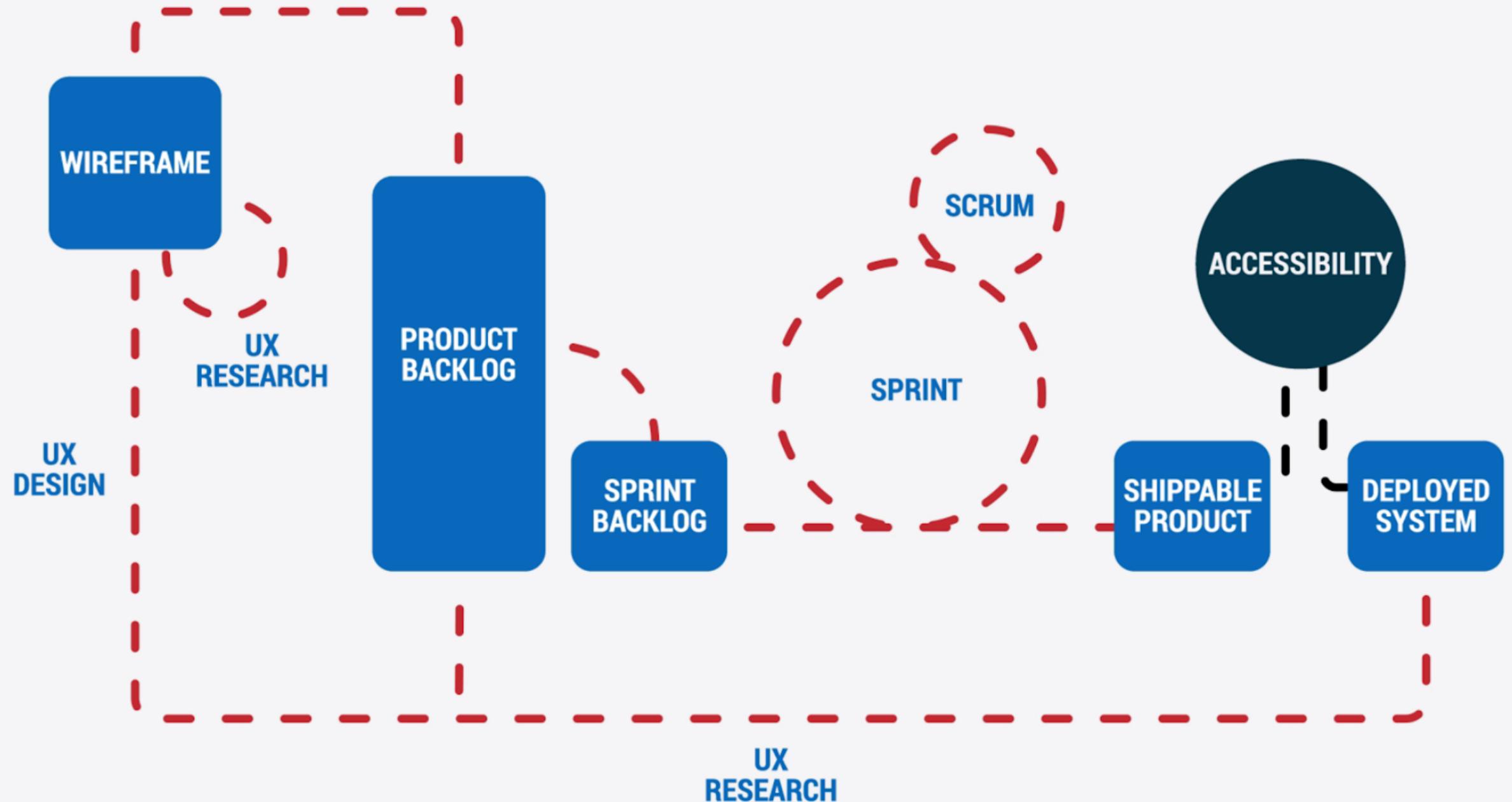


# Apply Personas



# Milestones





**Backlog**

**Design**

**Coding**

**Testing**

**Release**



**Small Investment**

**Small Investment**

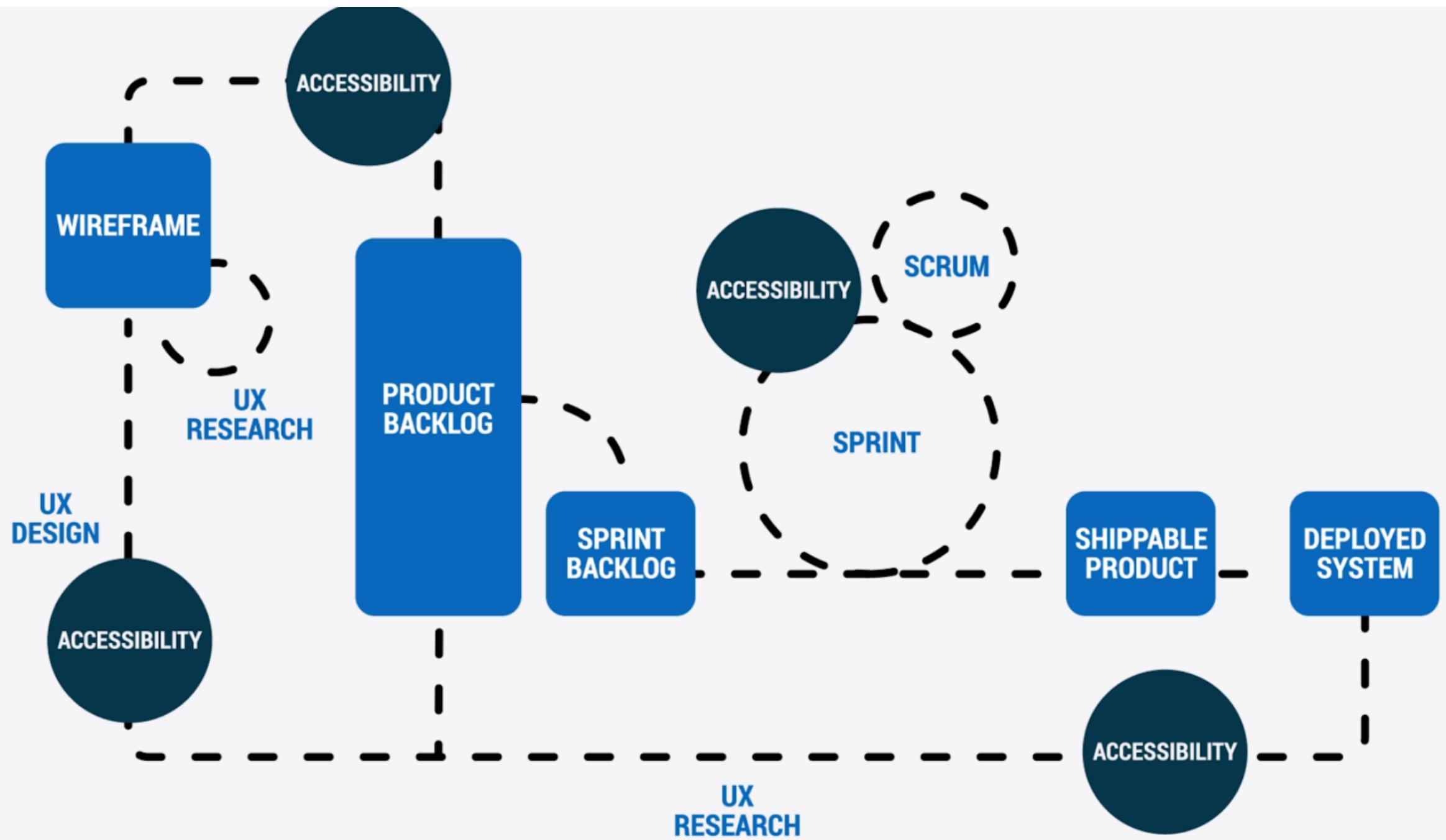
**Small Investment**

**Small Investment**

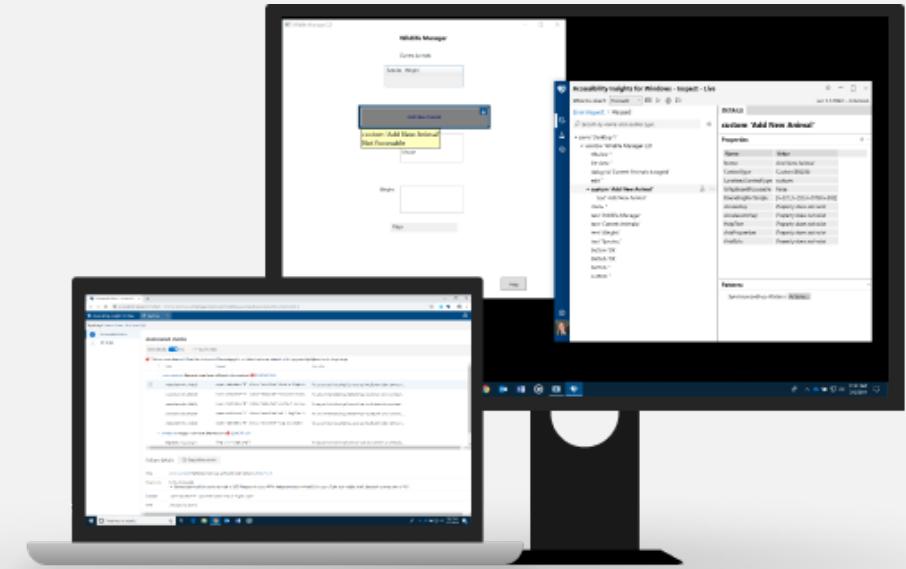
**Large Investment**

**⚠ Traditional**





# Tools





# Accessibility Insights

Find and fix accessibility issues before they reach your customers

## Accessibility Insights for Web

Chrome & New Edge Extension to test web apps and websites

## Accessibility Insights for Windows

Test accessibility in Windows applications

## Accessibility Insights for Android

Automated accessibility checks for Android apps

NEW

## Axe-Windows

Automated accessibility tests engine for Windows applications

## Accessibility Insights for CI/CD

Automated checks integration in the build pipeline

## Accessibility Insights for GitHub Actions

Automated checks integrated in the PR pipeline for GitHub

NEW

Azure DevOps :: / Pipelines / [failing example] csharp-sel... / 20200115.8

Search

axe-pipelines-samples

Overview

Pipelines

Pipelines

Releases

Jobs

← Jobs in run #202...

[failing example] csharp-selenium-webdriver-sample

Job win-chrom 1m 30s

- Initialize job 3s
- Checkout 4s
- install .NET Core 13s
- dotnet restore 34s
- dotnet test 33s
- Component Det <1s
- Post-job: Check <1s
- Finalize Job <1s

dotnet test

Results File: d:\a\\_temp\VssAdministrator\_fv-az130\_2020-01-15\_21\_50\_38.trx

Test Run Failed.

Total tests: 4

Passed: 3

Failed: 1

Total time: 22.5409 Seconds

##[error]Error: The process 'C:\hostedtoolcache\windows\dotnet\dotnet.exe' failed with exit code 1

Info: Azure Pipelines hosted agents have been updated to contain .Net Core 3.x SDK/Runtime along with .NET Framework 4.7.2

Some commonly encountered changes are:

If you're using `Publish` command with -o or --Output argument, you will see that the output folder

##[error]Dotnet command failed with non-zero exit code on the following projects : d:\a\1\s\csharp-

Async Command Start: Publish test results

Publishing test results to test run '16690'.

TestResults To Publish 4, Test run id:16690

Test results publishing 4, remaining: 0. Test run id: 16690

Published Test Run : https://dev.azure.com/accessibility-insights/axe-pipelines-samples/\_TestManagement

Async Command End: Publish test results

Finishing: dotnet test

View raw log

...

<https://github.com/microsoft/axe-pipelines-samples>

## A axe-pipelines-samples +

Overview

Pipelines

Builds

Releases

Library

Task groups

Deployment groups

Compliance

## ✓ #20190802.1: Bump lodash in /typescript-selenium-webdriver-sample (#49)

Triggered aug 1 at 6:00 pm for dependabot[bot] ⚡ microsoft/axe-pipelines-samples ➔ master ⚡ 1ffaaba

Release

Artifacts

⋮

Logs Summary Tests Scans

## Summary

1 Run(s) Completed ( 1 Passed, 0 Failed )

4

Total tests  
+44 ● Passed  
0 ● Failed  
0 ● Others

100%

Pass percentage  
↑ 100%

14s 240ms

Run duration ⓘ  
↑ +14s 240ms

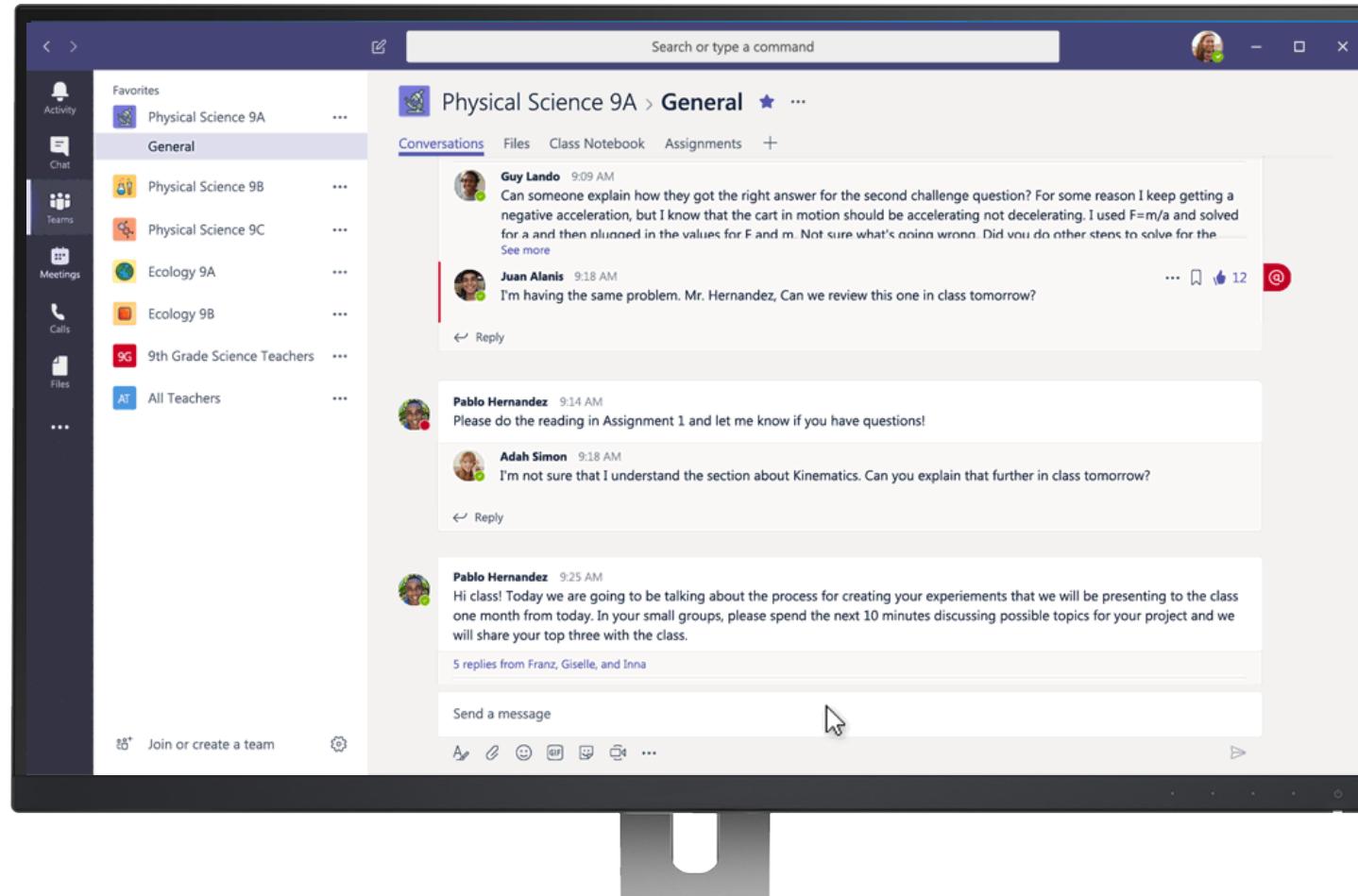
Test run Column Options

Filter by test or run name

Tags Test file Owner Outcome

Test	Duration	Failing since	Failing build	Tags
✓ ✓ typescript-selenium-webdriver-sample (4/4)	0:00:14.240			
✓ index.html has no accessibility violations in the h1 element	0:00:08.657			
✓ index.html has no accessibility violations outside of the known example violations	0:00:00.290			
✓ index.html has only those accessibility violations present in snapshot	0:00:00.290			
✓ index.html has only accessibility issues stored in our snapshot corresponding to only wcag2a and w	0:00:00.276			

# Immersive Reader



# What can it do?

n.  
Learning Tools Immersive Reader  
adj.

v. n. n.  
creates a reading experience that

v. n.  
adds accessibility and

## Language

Immersive Reader

Original | Spanish

A   

n.  
Learning Tools inmersiva Reader

crea una experiencia de lectura que  
añade accesibilidad y comprensión

## Translate to 60 languages

Learning Tools Immersive Reader

 Immersive

creates a reading experience that

adds accessibility and

## Pronunciation

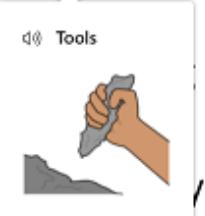
n.  
Learning Tools Im·mer·sive Reader

cre·ates a read·ing ex·pe·ri·ence

that adds ac·ces·si·bil·i·ty and

## Syllables

n.  
Learning Tools Immersive Reader

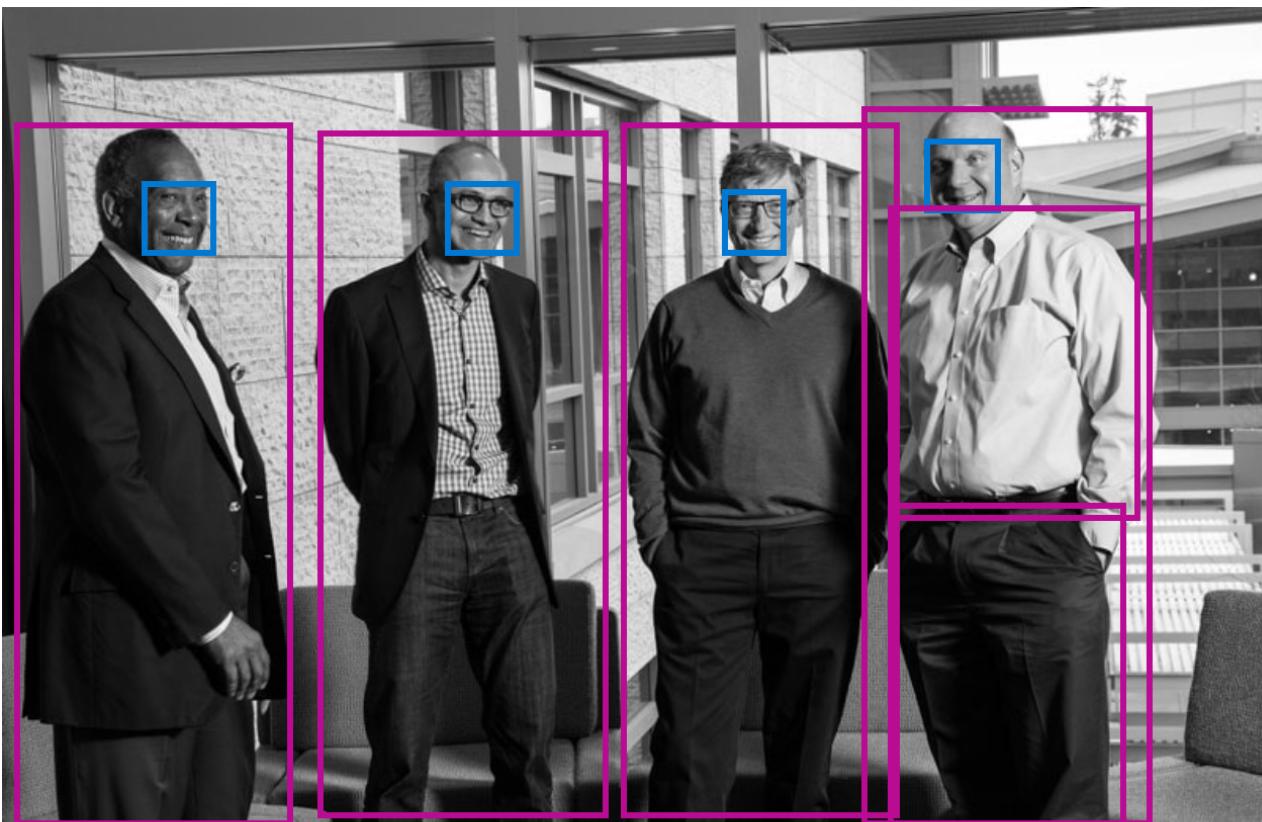


creates a experience that

adds acce / and

## Pictures

# Azure Computer Vision



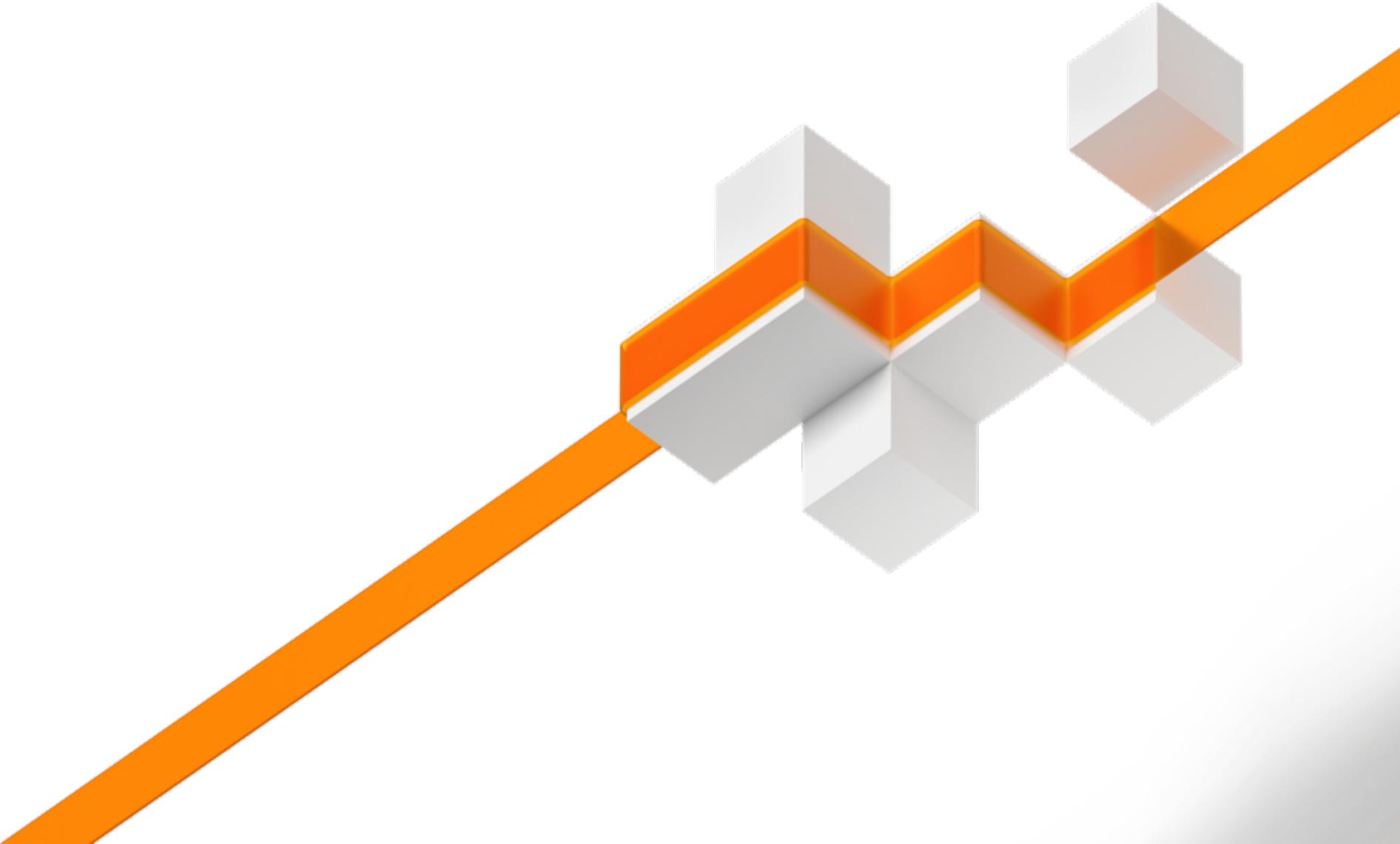
```
[{"name": "smile", "confidence": 0.967977047}, {"name": "black and white", "confidence": 0.9477451}, {"name": "man", "confidence": 0.9309614}, {"name": "outdoor", "confidence": 0.926383138}, {"name": "posing", "confidence": 0.8966964}, {"name": "human face", "confidence": 0.834066331}, {"name": "group", "confidence": 0.7781277}, {"name": "suit", "confidence": 0.7551476}, {"name": "clothes", "confidence": 0.7084104}, {"name": "old", "confidence": 0.172121257}]
```

Description { "tags": [ "person", "building", "standing", "photo", "man", "outdoor", "posing", "group", "suit", "wearing", "player", "front", "people", "old", "court", "woman", "holding", "dressed", "room", "baseball", "field" ], "captions": [ { "text": "Satya Nadella, Bill Gates, Steve Ballmer posing for a photo", "confidence": 0.9753075 } ] }

Image format "Jpeg"

Image 516 x 800

# Demo



# Conclusion

1. Empathy
2. Shift Left
3. Automate + AI

<https://microsoft.com/accessibility>



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