

From Good to Great

USABILITY FOR SOFTWARE ENGINEERS

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What is Usability?



An aerial view of a park or urban walkway. A person in a dark jacket and light pants is walking away from the camera on a light-colored gravel path. To the right of the path is a green lawn with a young tree. Further right is a paved area with several wooden benches and a black lamppost. The scene is bright and sunny, with shadows cast on the ground.

User experience

Design

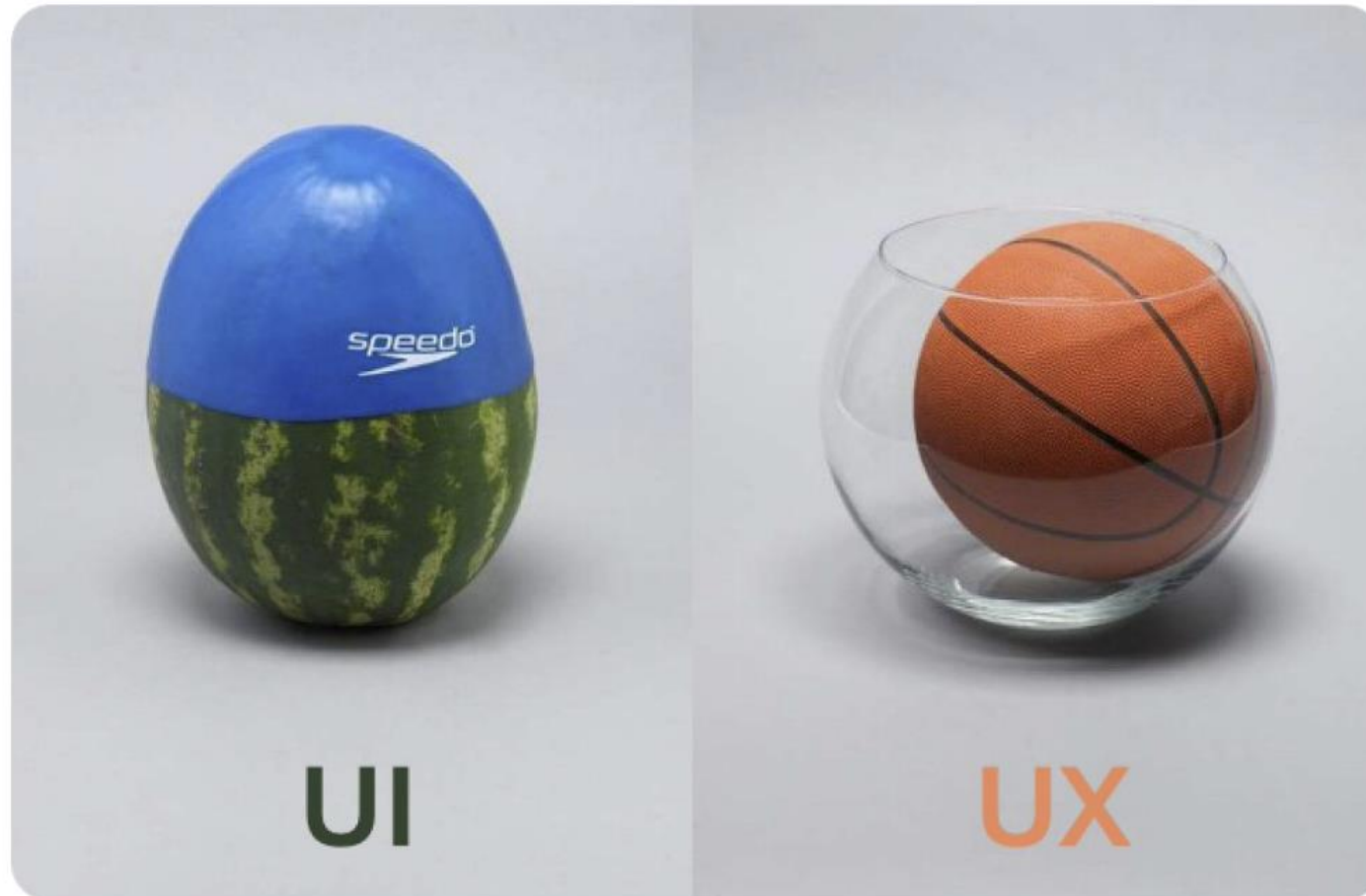


Sebastiaan de With

@sdw



I label increasingly nonsensical images with 'UI' and 'UX' and hope they get used in serious presentations



3:26 PM · Mar 15, 2016

How easy
a user
interface
is to use

- 5 quality components
 - Learnability
 - Efficiency
 - Memorability
 - Errors
 - Satisfaction

-
- Utility = features you need
 - Usability = Features are easy and pleasant to use

Useful = Usability + Utility



PC LOAD LETTER

PC LOAD LETTER?

"WHAT THE !*#%
DOES THAT MEAN?"

OFFICE SPACE (1999)



Small decisions can have a big impact on user satisfaction



How do we improve Usability?

- User testing
 - Test old designs before starting new design
 - Test competitor's designs
 - Conduct field studies
 - Make paper / low fidelity prototypes of new design ideas and test them
 - Iterate


TikTok
@tired_actor





Discount Usability

WE CAN ALL CONTRIBUTE TO
IMPROVING THE USABILITY

10 Usability Heuristics

10 general principles for interaction design

Broad rules of thumb and not specific usability guidelines

Jakob Nielsen (1994) <https://www.nngroup.com/articles/ten-usability-heuristics/>

#1: Visibility of System Status

The design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.

e.g. You are Here indicators on mall maps



#1: Visibility of System Status

Breadcrumbs

mseng / AzureDevOps / Overview / Summary

AzureDevOps

mseng / AzureDevOps / **Boards** / **Boards**

Intersect Experiences ▾ ★

Board Analytics Feature Timeline Epic Roadmap

Pipeline Status

#20230508.13 • Updated TagInitiativeWorkItems.ps1
AzDev.InitiativeDashboard (WorkItemTagging)

Summary 1ES Test Dogfood Scans

Scheduled by 'Tagging items every 15 minutes.'

Repository and version ◆ AzDev.InitiativeDashboard
 8 master 85b34454
Time started and elapsed 📅 Today at 1:15 PM
 ⌚ 2m 40s
Related 📁 0 work items
 📦 0 artifacts
Tests and coverage 🔗 [Get started](#)

Jobs

Name	Status	Duration
Job	Running	⌚ 2m 38s

#1: Visibility of System Status

Response time (How users perceive delays)

- **< 0.1 second** - perceived as instantaneous
- **1 second** - user's flow of thought stays uninterrupted, but delay noticed
- **10 seconds** - limit for keeping user's attention focused on the dialog
- **> 10 seconds** - user will want to perform other tasks while waiting

#2: Match between system and the real world

- Speak the users' language
- Words, phrases, and concepts familiar to the user
- Follow real-world conventions, making information appear in a natural and logical order

e.g. When stovetop controls match the layout of heating elements, users can quickly understand which control maps to which heating element.



#2: Match between system and the real world

- Don't assume your understanding of words or concepts will match those of your users



Simon Cropp @SimonCropp · Dec 8, 2022
tasks under "boards". what is even a board?



#3: User control and freedom

- Users often perform actions by mistake.
- Clearly marked "*emergency exit*" to leave the unwanted action

e.g. Digital spaces need quick emergency exits, just like physical spaces do.



#3: User control and freedom

Users don't like to feel trapped by the computer!

Strategies

- Cancel (allow the user to quit a task or multi-step process)
- Undo/Redo (can get back to previous state)
- Close (allow the user to close a new view)
- Defaults (for restoring a settings)

#3: User control and freedom

The screenshot shows the 'Review' stage of a new pipeline in Azure DevOps. The breadcrumb navigation at the top reads 'misptest / SmartHotel360 / Pipelines'. A search bar and utility icons are on the right. The left sidebar contains navigation icons. The main area has a progress bar with 'Connect', 'Select', 'Configure', and 'Review' (the active stage). Below the progress bar, it says 'New pipeline' and 'Review your pipeline YAML'. On the right, there are 'Variables' and 'Save and run' buttons. The pipeline file is 'PublicWeb / azure-pipelines.yml'. The YAML content is as follows:

```
1 # ASP.NET Core
2 # Build and test ASP.NET Core projects targeting .NET Core.
3 # Add steps that run tests, create a NuGet package, deploy, and more:
4 # https://docs.microsoft.com/azure/devops/pipelines/languages/dotnet-core
5
6 trigger:
7   - master
8
```

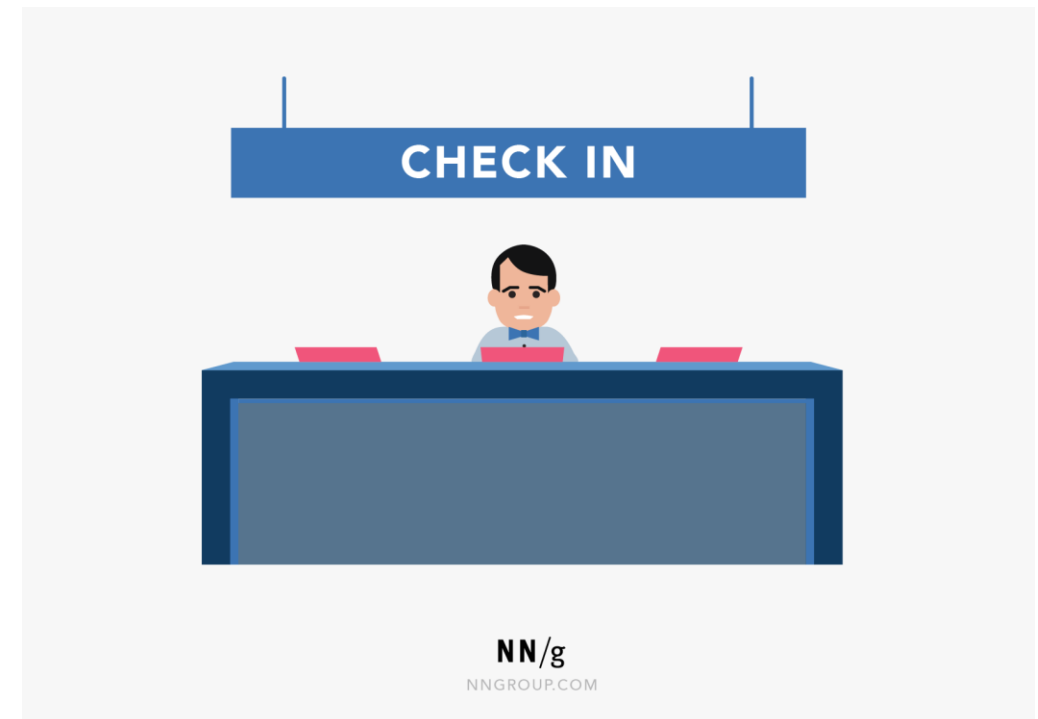
A 'Show assistant' button is located in the top right corner of the editor area.

#4: Consistency and standards

- Users should not have to wonder whether different words, situations, or actions mean the same thing
- Follow platform and industry conventions



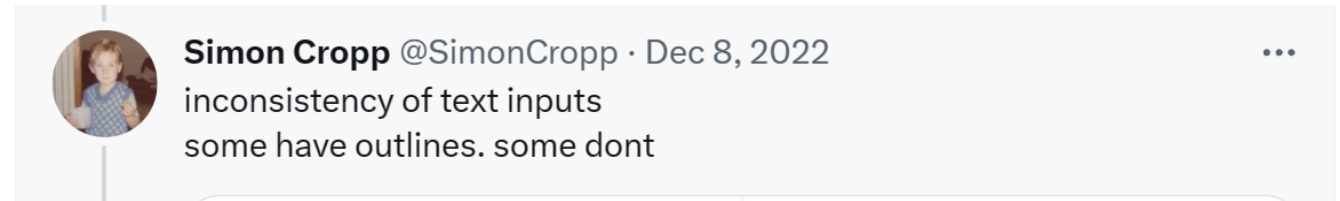
e.g. Checkin counters are usually located at the front of hotels. This consistency meets customers' expectations.



#4: Constistency and standards

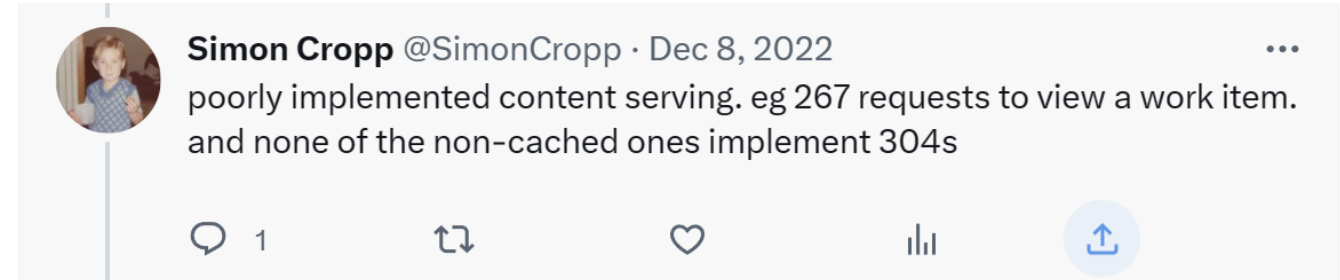
- Internal Consistency

- Use design system
- Beware of naming consistency



- External Consistency

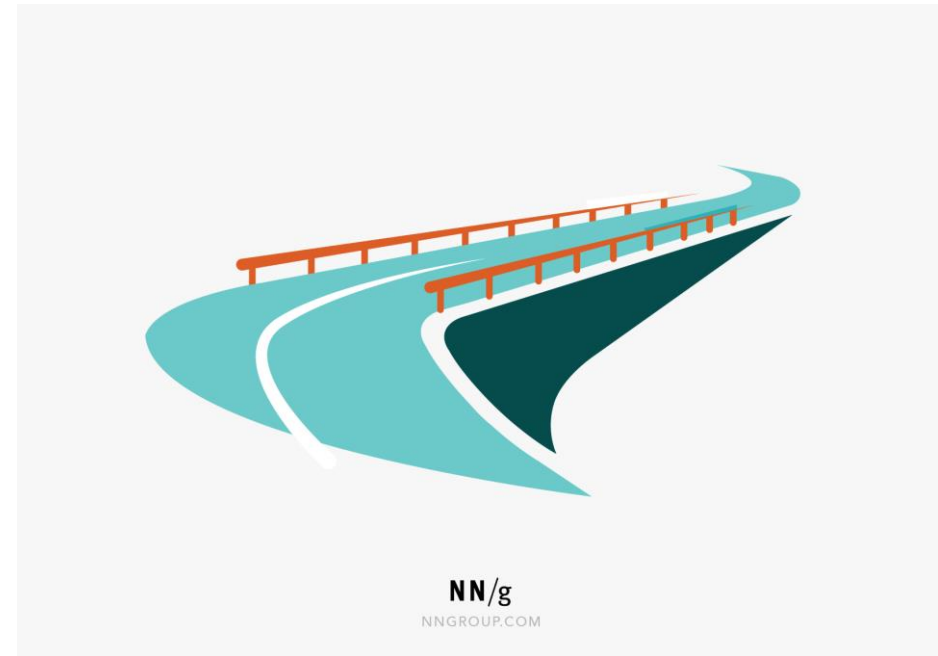
- Recognizable icons
- Don't reinvent standards



#5: Error Prevention

- The best designs **prevent problems from occurring** in the first place
- Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action

e.g. Guard rails on curvy mountain roads prevent drivers from falling off cliffs.



#5: Error Prevention

New pipeline

Review your pipeline YAML

Variables

Save and run



PublicWeb / azure-pipelines.yml *

Show assistant

```
1  # ASP.NET Core
2  # Build and test ASP.NET Core projects targeting .NET Core.
3  # Add steps that run tests, create a NuGet package, deploy, and more:
4  # https://docs.microsoft.com/azure/devops/pipelines/languages/dotnet-core
5
6  trigger:
7  - master
8
9  pool:
10   - vmImage: ubuntu-latest
11   - blah: test
12
13  variables:
14   - buildConfiguration: 'Release'
15
16  steps:
17   - script: dotnet build --configuration $(buildConfiguration)
18     displayName: 'dotnet build $(buildConfiguration)'
19
20
```

#2 • Set up CI with Azure Pipelines

PublicWeb

Rerun failed jobs

Run new



This run will be cleaned up after 1 month based on your project settings.

Summary

Triggered by david.paquette

View 49 changes

Repository and version	PublicWeb master 25a2598c
Time started and elapsed	Just now <1s
Related	1 work items 0 artifacts
Tests and coverage	Get started

Errors 1

/azure-pipelines.yml (Line: 18, Col: 1): Unexpected value 'displayName'
2

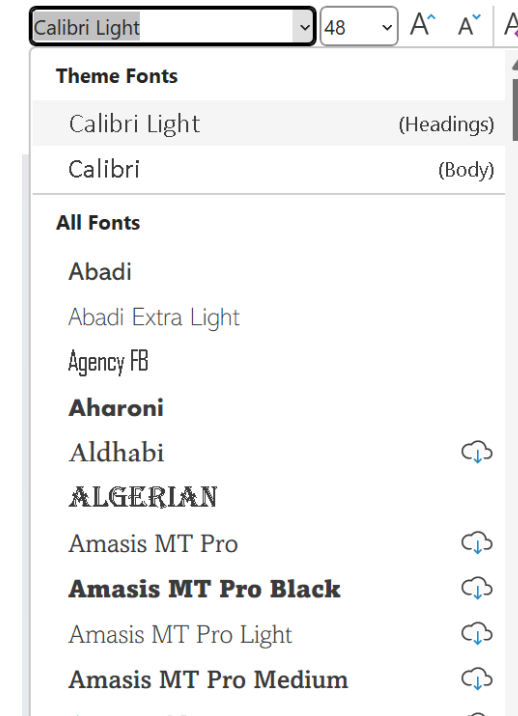
Troubleshooting failed runs

#6: Recognition rather than recall

- Minimize user's memory load by making elements, actions, and options visible
- User should not have to remember information from one part of the interface to another
- Information required to use the design (e.g. field labels or menu items) should be visible or easily retrievable when needed

<https://www.nngroup.com/articles/recognition-and-recall/>

Computers are good at remember thing,
people are not



#6: Recognition rather than recall


- Most recently used (MRU) list
- Auto Complete
- Offer help in-context

New pipeline

Review your pipeline YAML


Variables

Save and run

PublicWeb / azure-pipelines-1.yml * 


```
1 # ASP.NET Core
2 # Build and test ASP.NET Core projects targeting .NET Core.
3 # Add steps that run tests, create a NuGet package, deploy, and more:
4 # https://docs.microsoft.com/azure/devops/pipelines/languages/dotnet-core
5
6 trigger:
7   - master
8
9 pool:
10  vmImage: ubuntu-latest
11
12 variables:
13   buildConfiguration: 'Release'
14
15 steps:
16   - script: dotnet build --configuration $(buildConfiguration)
17     displayName: 'dotnet build $(buildConfiguration)'
18
19 Settings
20 - task: DownloadPipelineArtifact@2
21   inputs:
22     buildType: 'current'
23     artifactName: 'test'
24     targetPath: '$(Pipeline.Workspace)'
```

Download Pipeline Artifacts


Download artifacts produced by * 

☒ Current run


☐ Specific run

Artifact name 

test

Matching patterns 

**

Destination directory * 

\$(Pipeline.Workspace)

#7: Flexibility and efficiency of use

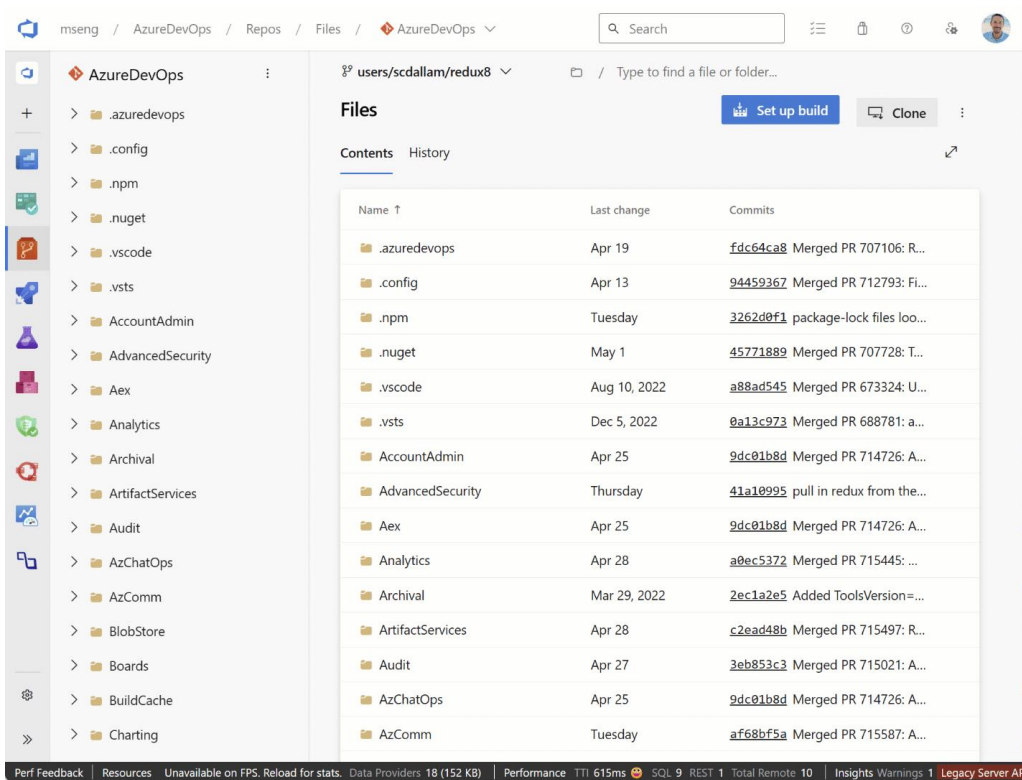
- **Shortcuts** — hidden from novice users — may speed up the interaction for the expert user so that the design can cater to both inexperienced and experienced users
- Allow users to **tailor frequent actions**

e.g. Regular routes are listed on maps, but locals with knowledge of the area can take shortcuts.



#7: Flexibility and efficiency of use

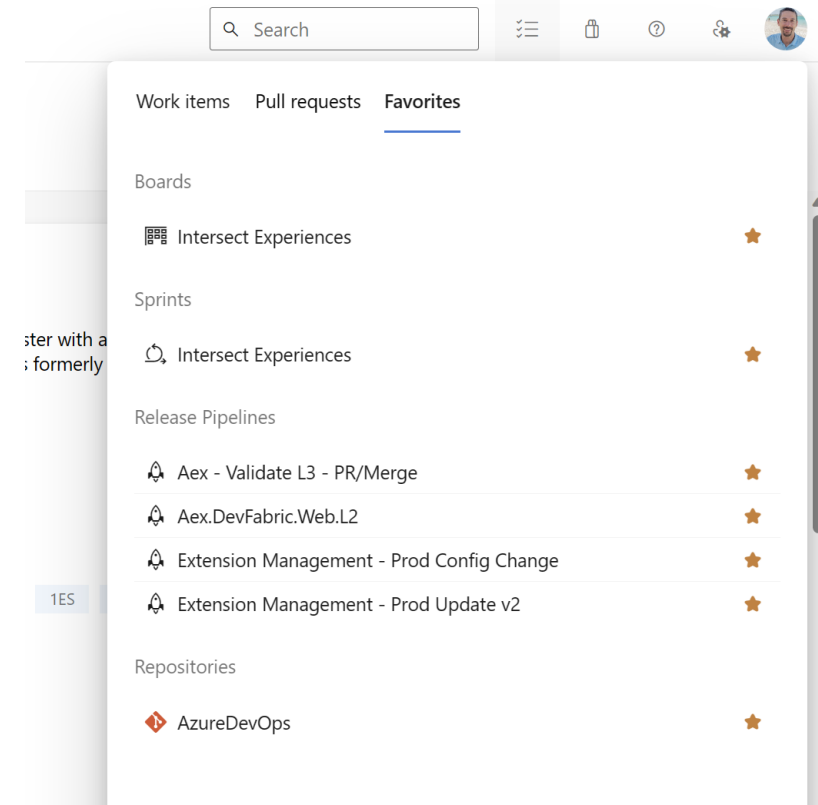
Press . on any repository page



The screenshot shows the Azure DevOps web interface. The left sidebar lists repositories under 'mseng / AzureDevOps / Repos / Files / AzureDevOps'. The main area displays the 'Files' section for the repository 'users/scdallam/redux8'. A table lists files with their names, last change dates, and commit hashes. The table has columns for Name, Last change, and Commits.

Name ↑	Last change	Commits
.azuredevops	Apr 19	fd64ca8 Merged PR 707106: R...
.config	Apr 13	94459367 Merged PR 712793: Fi...
.npm	Tuesday	3262d0f1 package-lock files loo...
.nuget	May 1	45771889 Merged PR 707728: T...
.vscode	Aug 10, 2022	a88ad545 Merged PR 673324: U...
.vsts	Dec 5, 2022	0a13c973 Merged PR 688781: a...
AccountAdmin	Apr 25	9dc01b8d Merged PR 714726: A...
AdvancedSecurity	Thursday	41a10995 pull in redux from the...
Aex	Apr 25	9dc01b8d Merged PR 714726: A...
Analytics	Apr 28	a0ec5372 Merged PR 715445: ...
Archival	Mar 29, 2022	2ec1a2e5 Added ToolsVersion=...
ArtifactServices	Apr 28	c2ead48b Merged PR 715497: R...
Audit	Apr 27	3eb853c3 Merged PR 715021: A...
AzChatOps	Apr 25	9dc01b8d Merged PR 714726: A...
AzComm	Tuesday	af68bf5a Merged PR 715587: A...

Favourites



The screenshot shows the 'Favourites' sidebar in the Azure DevOps web interface. The sidebar is titled 'Favourites' and contains a list of items categorized under 'Boards', 'Sprints', 'Release Pipelines', and 'Repositories'. Each item has a star icon next to it, indicating it is a favorite.

- Boards
 - Intersect Experiences
- Sprints
 - Intersect Experiences
- Release Pipelines
 - Aex - Validate L3 - PR/Merge
 - Aex.DevFabric.Web.L2
 - Extension Management - Prod Config Change
 - Extension Management - Prod Update v2
- Repositories
 - AzureDevOps

#8: Aesthetic and minimalist design

- Interfaces should not contain information that is irrelevant or rarely needed
- Every extra unit of information in an interface competes with the relevant units of information and diminishes their relative visibility

e.g. An ornate teapot may have excessive decorative elements, like an uncomfortable handle or hard-to-wash nozzle, that can interfere with usability.





Simon Cropp @SimonCropp · Dec 8, 2022

all this information for a broken build. and all i really want is to see the broken tests, which is a tiny link for a different tab

#1.1.67-unstable • ToAestDateAndTimeString

Rerun failed jobs

Run new

This run will be cleaned up after 1 month based on your project settings.

Summary

Tests

Releases

Triggered by simon.cropp

View 7 changes

Repositories 2

ElectorateReportingManager , +1

See Sources card for details

Time started and elapsed

23 Nov at 11:57 am

1m 34s

Related

0 work items

1 published; 1 consumed

Tests and coverage

97.4% passed

Setup code coverage

Errors 2

Warnings 1

Error: The process 'C:\Program Files\dotnet\dotnet.exe' failed with exit code 1

Tests

Dotnet command failed with non-zero exit code on the following projects : d:\agent_work\15\src\tests

Tests

Troubleshooting failed runs

Jobs

Name

Status

Duration

Job

Failed

1m 9s

Sources

Repository

Branch / tag

Version

Related

ElectorateReportingManager

develop

f9e65fe8

None

Azure Repos

Templates

Azure Repos

master

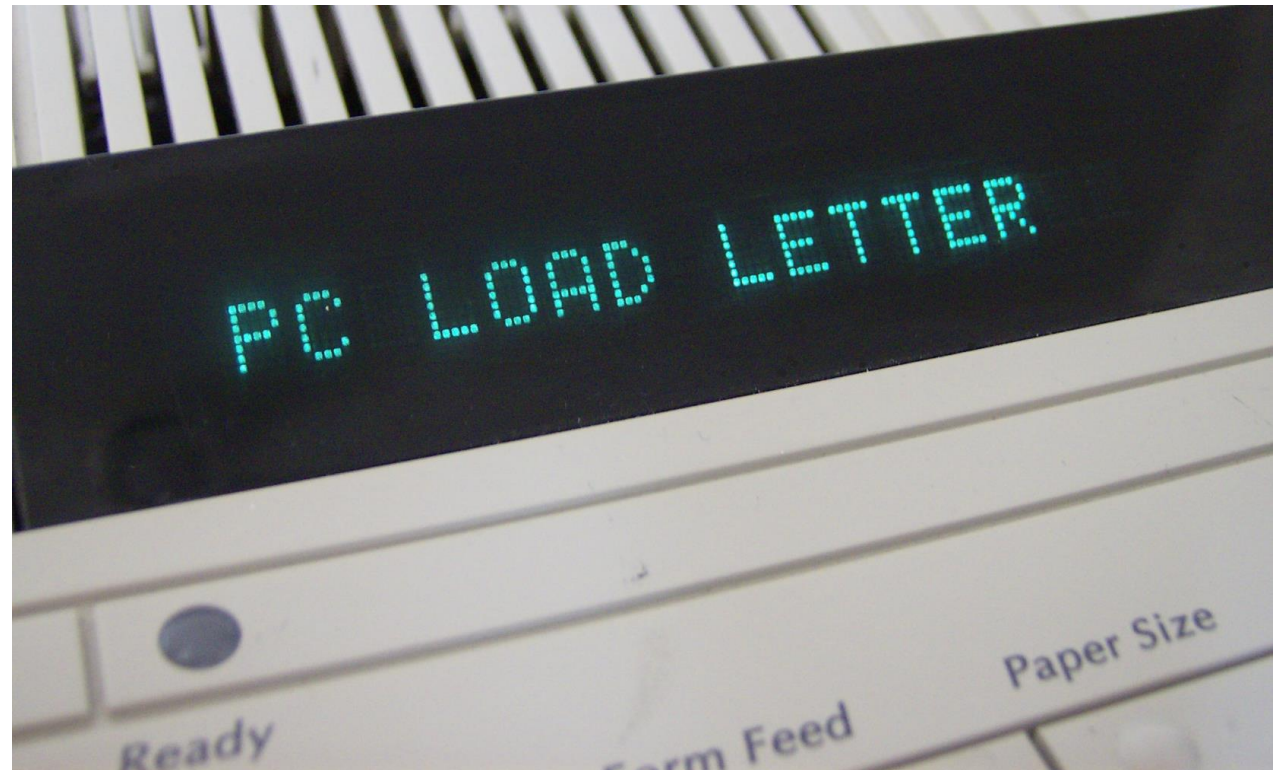
7dc2c175

1

#8: Aesthetic and minimalist design

#9: Help users recognize, diagnose, and recover from errors

- Error messages should be expressed in plain language (no error codes), precisely indicate the problem, and constructively suggest a solution.



#9: Help users recognize, diagnose, and recover from errors

Errors 1

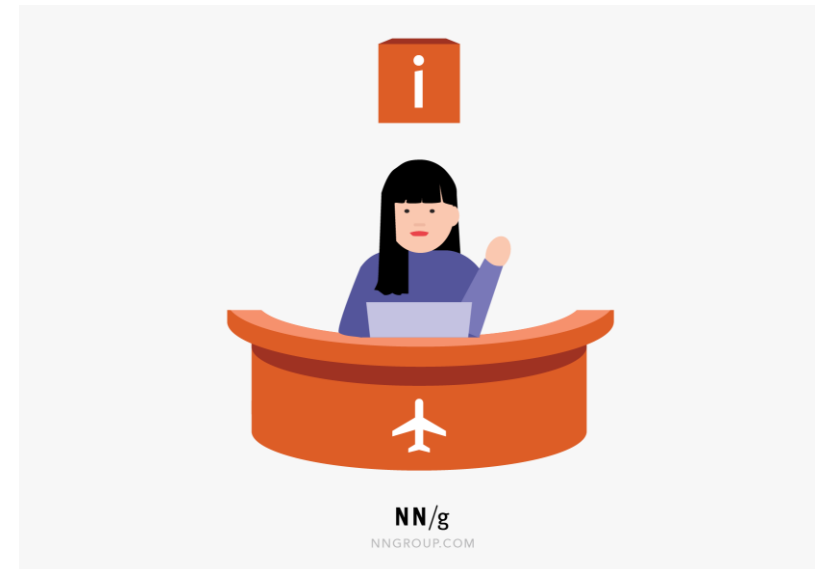
✖ /azuredevops/pipelines/builds/tfs_l2_a11y.selfhost.yml (Line: 3, Col: 17): Pipeline Resource source-pipeline Input Must be Valid.
\$(BuildDefinitionName)_\$(Build.SourceBranchName)_\$(Date:yyyyMMdd)\$(Rev:.r)

```
1 resources:
2   pipelines:
3     - pipeline: source-pipeline # Name of the pipeline resource.
4       source: AzureDevOps # The name of the pipeline referenced by this pipeline
5       trigger: # Run this pipeline when any run of AzureDevOps completes
6         branches:
7           exclude:
8             - releases/*
9             - master
10          include:
11            - users/dpaquette/ado-a11y-shift-left-spike
12
```

#10: Help and documentation

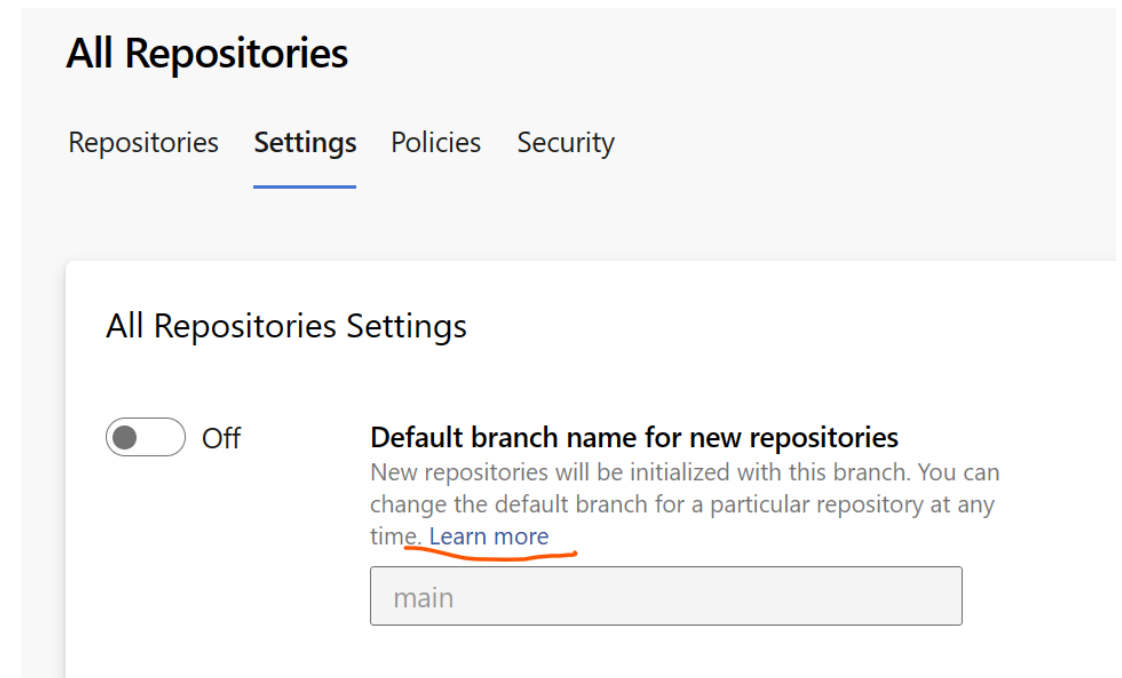
- It's best if the system doesn't need any additional explanation. However, it may be necessary to provide documentation to help users understand how to complete their tasks.

e.g. Information kiosks at airports are easily recognizable and solve customers' problems in context and immediately.



#10: Help and documentation

- Ensure that the help documentation is easy to search
- Whenever possible, present the documentation in context right at the moment that the user requires it.
- List concrete steps to be carried out.



Key Points

- Speak the user's language
- Be consistent
- Keep it simple
- Talk to users if you can

It's not the user's fault!!!!

References

<https://www.nngroup.com/articles/ten-usability-heuristics/>

<https://www.nngroup.com/>

The Design of Everyday Things – Donald Norman

