

# Did we just make a web app?

*Using R Shiny in Production: Lessons, Battle Stories, and Encouragement*



# Hello!

- Current graduate student at University of Chicago: MS Computational Analysis and Public Policy (MSCAPP)
- Previously Deloitte Federal analytics practice
- Started programming in R for work a few years ago, thrown straight into R Shiny development!

# Why Shiny and not Django/Ruby on Rails/etc.:

***Shiny is easy to stand up!***

## You are:

- Working with a team with diverse backgrounds
- Working with R as a primary or default language
- Making something beyond ad-hoc data viz, but your team wasn't hired/formed with the intention of building a large-scale web app

## You are not:

- Building a super high-traffic web application and/or accustomed to building custom web apps or websites
- Building something with very strong authentication/encryption needs
- Managing a team of pure CS-background software engineers

## Important but not covered in this talk:

- Performance optimization (making it run faster)
- Scaling operations with many users
- Deployment strategies and server hosting

# Journey to production Shiny:



Hey, this data is helpful—  
maybe it would be even  
more useful in an  
interactive format?

Building the app and  
getting new cool ideas  
from users!

Ongoing new feature  
upgrades, data updates,  
infrastructure changes

# Three case studies:



Infrastructure

Can you reproduce a past version of the application and show me what results I got back then? Maybe by tomorrow?



Design

Sometimes critical information doesn't appear and users are confused-- how can we find these issues before our users do?

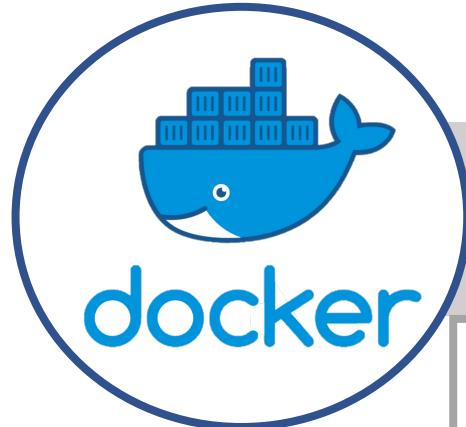


QA & Testing

I refreshed the data and there's a new column– **it broke everything!**



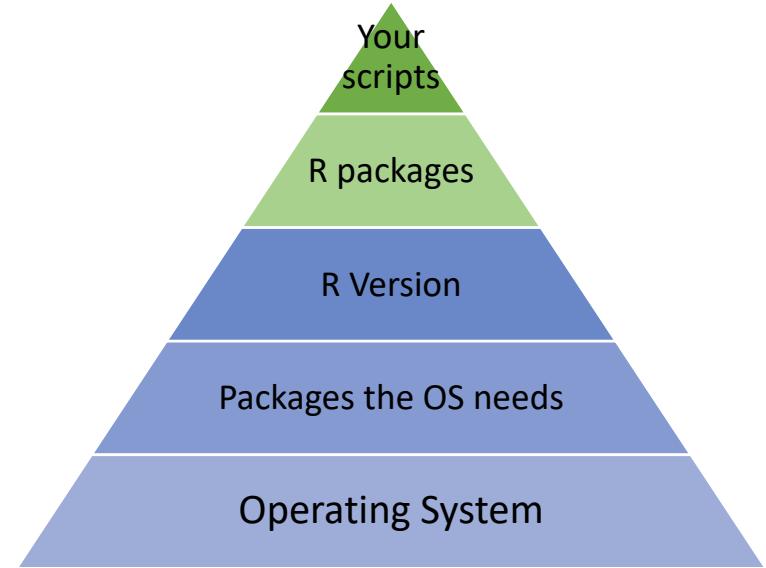
Can you reproduce a past version of the application and show me what results I got back then? Maybe by tomorrow?



Docker lets you create a ‘container’ you can start and stop with all your dependencies— operating system, version of R, packages, everything!

***Challenges:***

- Needed to get the organization infrastructure team on-board with giving us admin-like rights
- Depending on your organization’s level of mediating your internet access, can be challenging.



**Solution:** Containers for each legacy application— everything needed to reboot a legacy version exists in a tidy bundle



## Design

Sometimes critical information doesn't appear and users are confused (and so are we!) How can we find these issues before our users do?

## shinyTest to the rescue!

- shinyTest lets you automate your UI testing
  - Record the UI tests, including when you want the state of the app checked
  - A JSON file stores the state of all the input, output, and export values at the time of the snapshot
  - **Finally replicate a user's strange UI issue? Turn it into an automated test!**

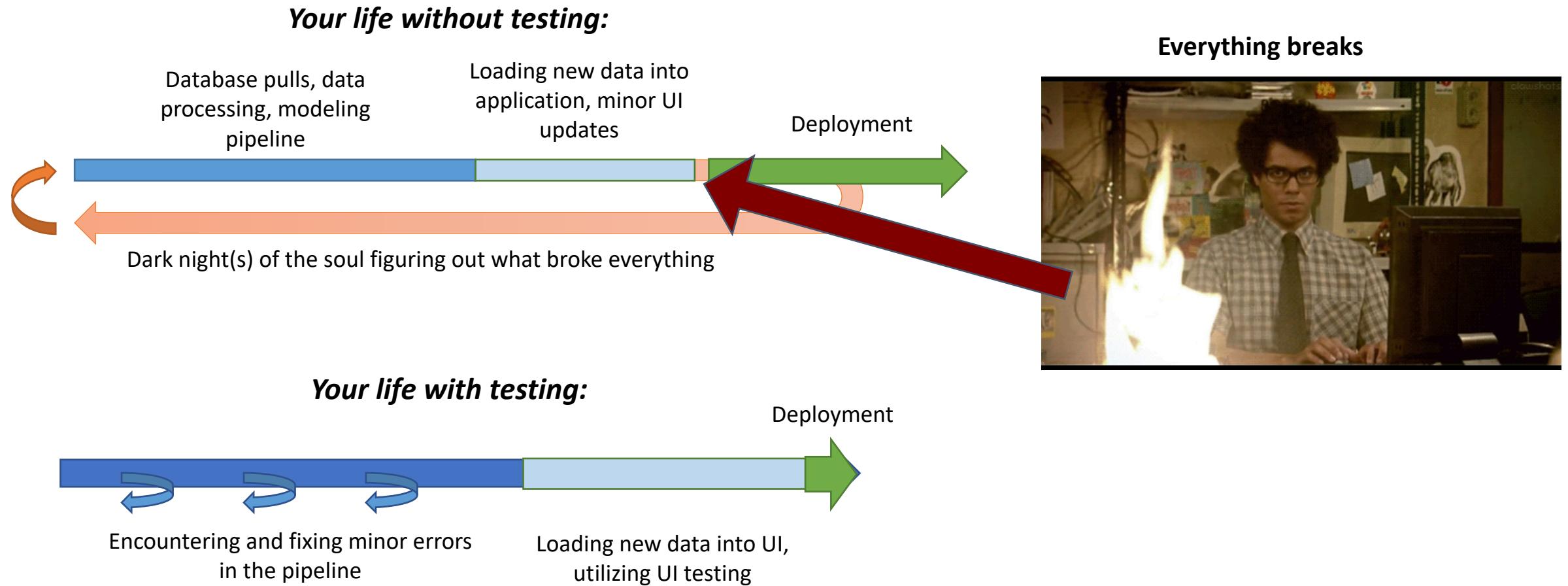
The screenshot shows a web browser window titled "Shiny Widgets Gallery" with the URL "http://127.0.0.1:3028". The page displays three widgets: "Action button", "Single checkbox", and "Checkbox group". Each widget has a "Current Value(s)" section and a "See Code" button. To the right, the "Test event recorder" sidebar shows options like "Take snapshot", "Save script and exit test event recorder", and "Quit without saving". It also lists "Recorded events" in a table:

Event type	Name
1 input	checkGroup
2 output-event	--
3 input	checkGroup
4 output-event	--
5 input	action
6 output-event	--



QA & Testing

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## Resources:

### Infrastructure & Docker

- **Tutorials on Docker for R:**  
<https://colinfay.me/docker-r-reproducibility/>
- <https://ropenscilabs.github.io/r-docker-tutorial/>
- **Ready-made Docker files for R:**  
<https://www.rocker-project.org/>

### Design & UI

- **Packages for UI Testing:**
- <https://rstudio.github.io/shinytest/>
- <https://rstudio.github.io/reactlog/>
- **Use modules! If you're not already...**
- <https://www.blog.cultureofinsight.com/2018/01/reproducible-shiny-app-development-with-modules/>

### QA & Testing

- **Packages for Testing:**
- <https://testthat.r-lib.org/>
- <https://github.com/ropensci/drake>
- **Tutorials:**
- <https://r-pkgs.org/tests.html>

### General Shiny in Production Resources

#### Packages:

<https://thinkr-open.github.io/golem/>

#### Tutorials:

<https://rtask.thinkr.fr/building-big-shiny-apps-a-workflow-1/>

<https://kellobri.github.io/shiny-prod-book/>

<https://rstudio.com/resources/rstudioconf-2019/shiny-in-production-principles-practices-and-tools/>

<https://medium.com/inlocotech/r-shiny-in-production-e2fb6a577fe0>

# *Thank you!*



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