

Data dashboards with R and Shiny

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Stuff you should download

<https://github.com/dhenderson/shinyheinz>

Make sure you have the following R packages

- shiny
- dplyr
- ggplot2
- tidy
- leaflet
- plotly

What is Shiny?

- Shiny is an **R** package that makes it **easy** to build interactive web applications (apps) straight from R.
- Shiny apps are **single-page-apps**.
- Shiny apps are built using a **reactive** programming paradigm.

Why should you care?

- Get R into the **browser!**
- Build web apps with R only (no need to know HTML, CSS, Javascript, etc.)
- Empower people to apply your analysis and **explore data on their own.**
- One-click deployment with shinyapps.io

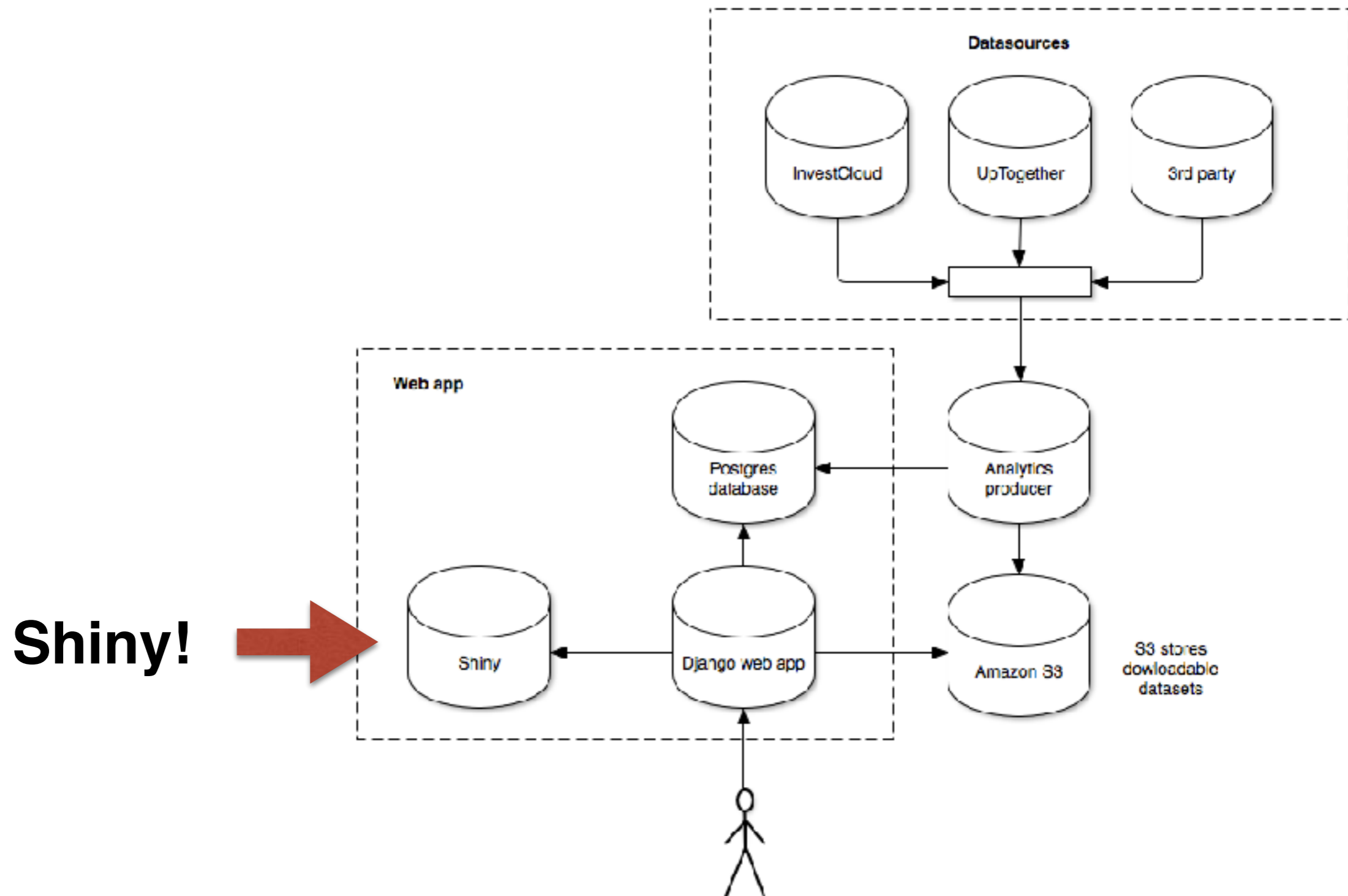
About the Family Independence Initiative

- 1,500 low-income households submit monthly journals online
- ~300 data points in various domains
- We invest in families' initiative



Family Independence Initiative

Shiny is the last mile of our data pipeline



Life before Shiny

- Data requests were handled **one at a time**.
- Manually processing each request means your team is **treading water**, not focusing on higher order problems.

Life after Shiny

- Staff and partners **answer their own** questions through Shiny apps.
- As we answer new types of questions, we build **new Shiny apps**.
- For any type of analysis, we **write once** and **run forever**.

We have multiple Shiny apps

[Apps](#)[Documents](#)[Datasets](#)[Surveys](#)

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Family Independence Initiative / **Analytics Apps**

Audit Assessment

This application provides tools to help assess the effectiveness of monthly journal audits and maintain data integrity.

[Launch app](#)

Business

This report includes counts of the number of households reporting business income, what percentage of those businesses are new, and changes in business income for households with businesses.

[Launch app](#)

Demographics

The demographics report provides counts for the number of individuals and families and breakdowns of FI members by sex, race, and ethnicity.

[Launch app](#)

Education

This report covers changes in grades and attendance for family members attending school.

[Launch app](#)

Enrollment

This report contains data on total and monthly household enrollment.

[Launch app](#)

Financials

This report covers every income, asset, and liability type collected in InvestCloud. Data is presented graphically and as summary statistics, with average amounts grouped by month in FI.

[Launch app](#)

Goals

Text mining tool to explore goals and progress toward goals.

[Launch app](#)

Health

This report summarizes how often families access medical care and how satisfied they are with the care they receive.

[Launch app](#)

Each app focuses on a particular set of questions

Financials

Financial variables

Total income

Join date range

2013-09-01

to

2016-03-15

Minimum number of months reporting

3

12

48

Organization

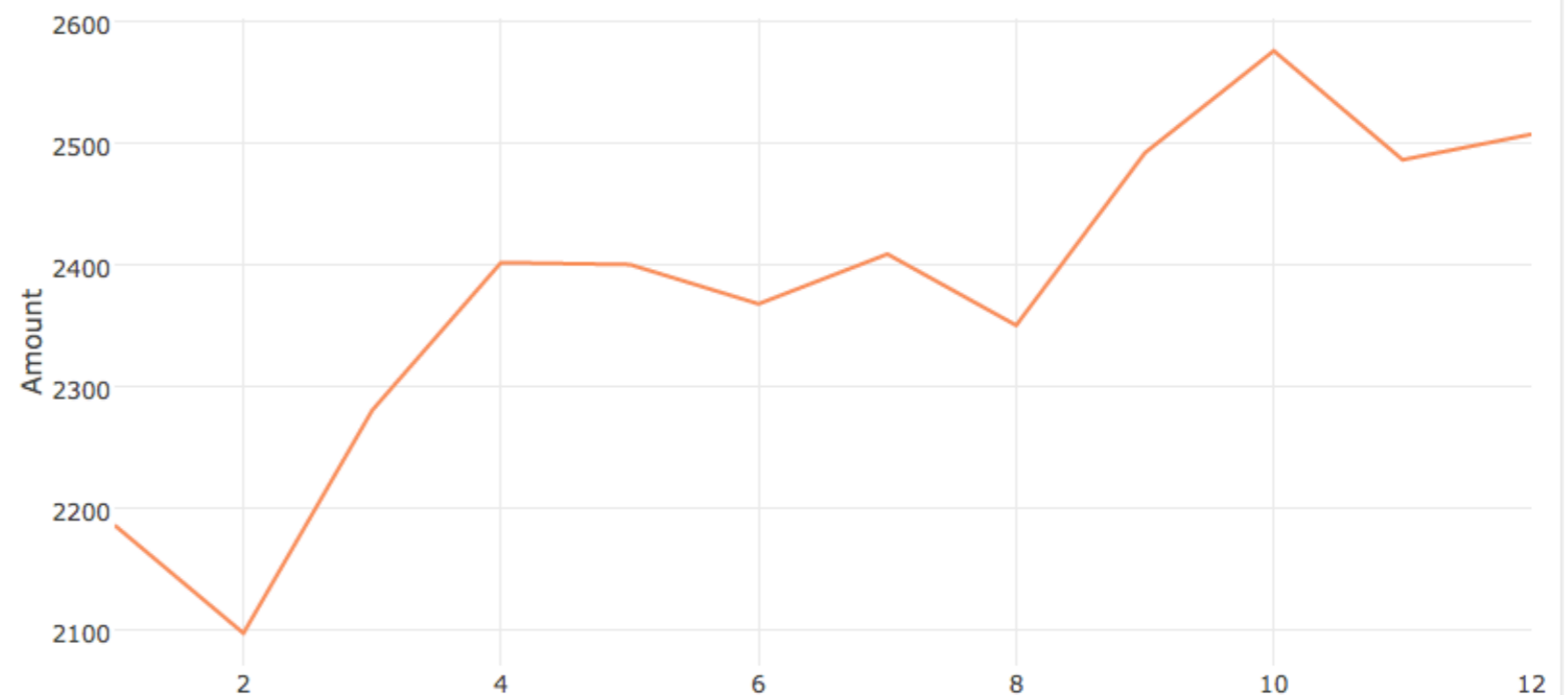
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Location

National

Summarized values

Individual values



How do you build a Shiny app?

- Download R Studio
- Install the “shiny” package

Shiny apps are made up of two R scripts

- **ui.R** - This script holds all the UI code
- **server.R** - This script holds all the “server” code
- That’s it! (although you can get fancier)

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- Reactivity means you just need to focus on the state of your app at any point in time without worrying about the client/server plumbing.
- **Shiny automagically handles updating your data, calculations, and charts for you.**

Let's take a look at the **ui.R** and **server.R** files

ui.R

```
library(shiny)

shinyUI(fluidPage
  # Your UI code goes here
))
```

server.R

```
library(shiny)

shinyServer(function(input, output){
  # Your server code goes here
})
```

The server takes an anonymous function with two arguments, **input** and **output**

```
shinyServer(function(input, output){  
  # Your server code goes here  
})
```

input - Access user inputs on the server side

Example: `input$some_user_input`

output - Assign output like charts, tables, calculated values, etc.

Example: `output$my_chart`

Shiny does its reactive magic by defining your data as a reactive expression

```
# define your data as a reactive expression
myData <- reactive({
  df %>%
    filter(some_var > input$some_threshold)
})
```

```
# your variable "myData" is now a reactive
# expression. Call your data by running the reactive
# function
myData()
```

Let's build a Shiny app

- I downloaded data on Allegheny County car crashes in 2015
- I built a simple Shiny app to explore the crash data which we will recreate together now

Resources

Shiny app we are building

<https://github.com/dhenderson/shinyheinz>

RStudio Shiny tutorial

<http://shiny.rstudio.com/tutorial/>

RStudio Shiny reference

<http://shiny.rstudio.com/reference/shiny/latest/>

Me

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