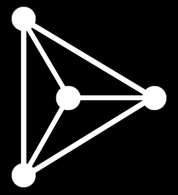


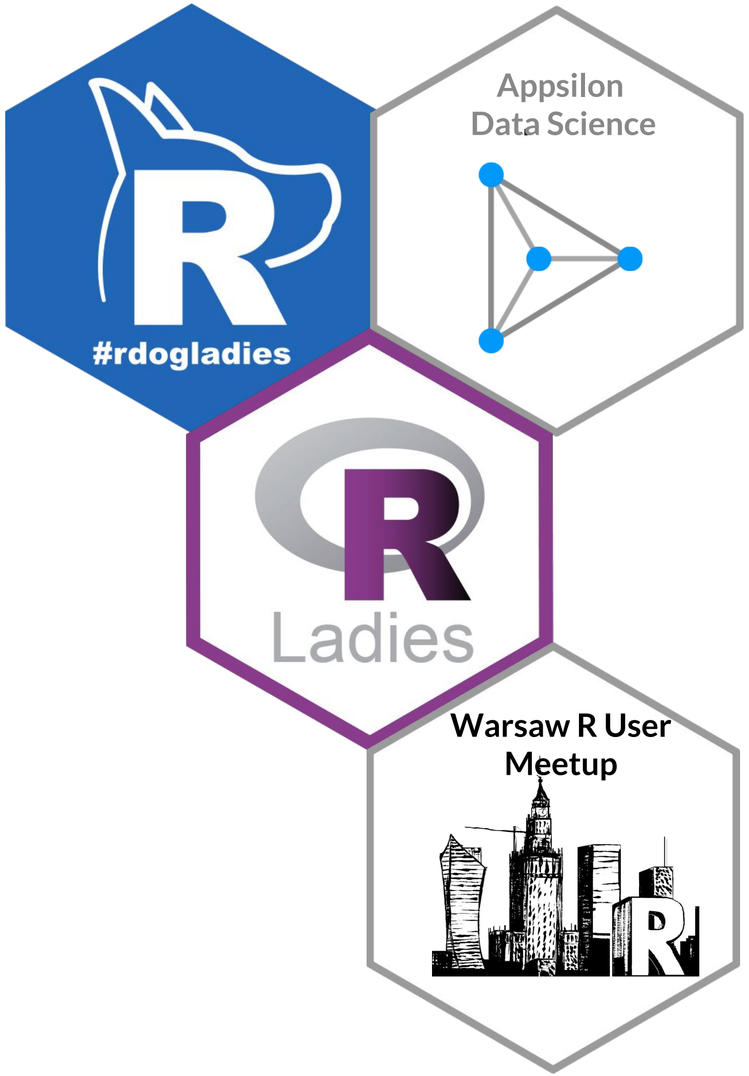
Appsilon
Data Science

How we built a Shiny App used by 700 users?

Data Science team story

WhyR Warsaw 2017

@olga_mie



HELLO!

@olga_mie
@AppsilonDS

700 users Shiny App

PROJECT STORY

1. Shiny Application for 700 end users supporting their decision making

2. Team only Data Scientists

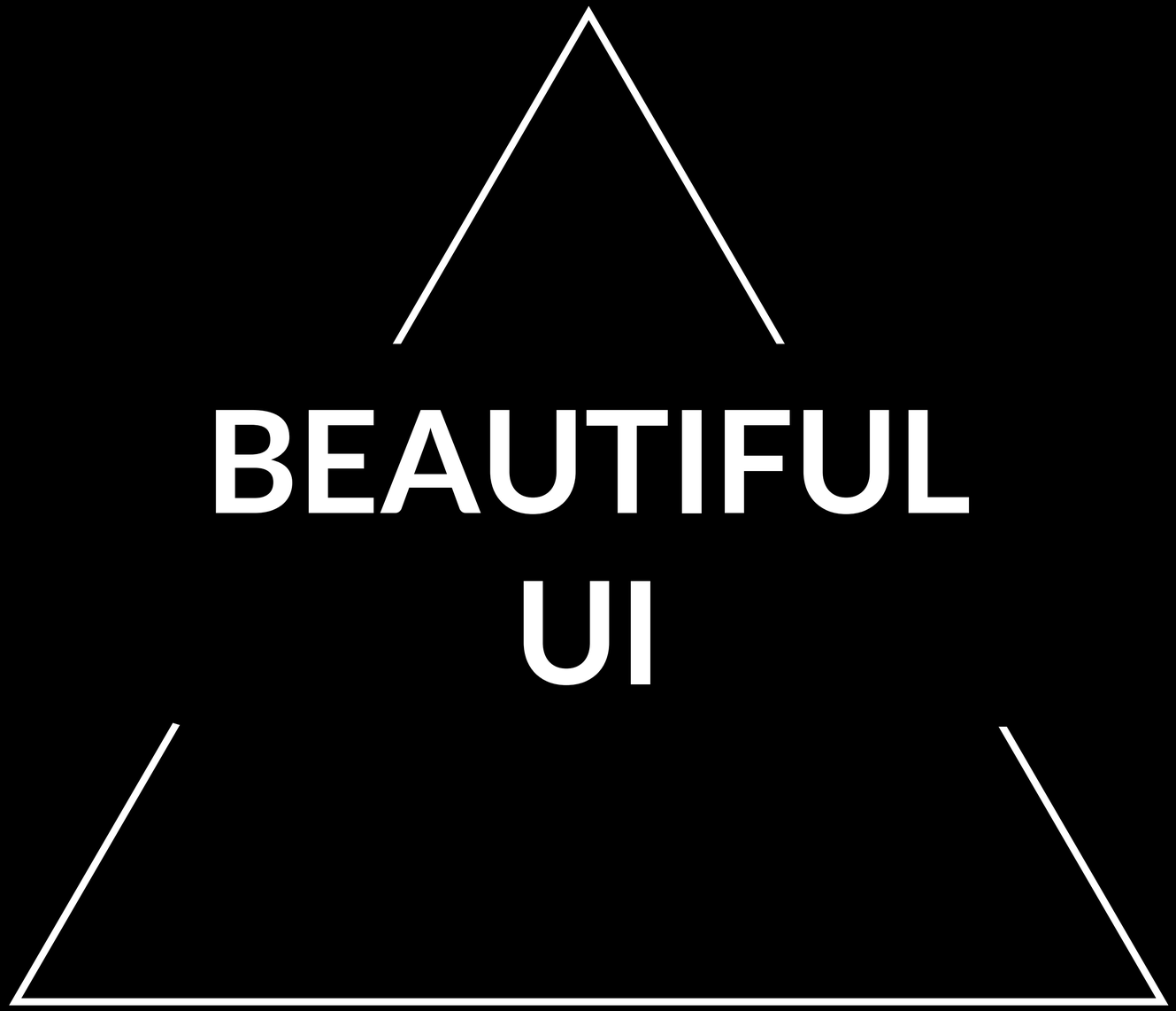
3. Prototype the next day, working demo after 2 weeks

“...during the first week [of UAT], we got **overwhelmingly positive** feedback and **good results...**”.

John Dannberg, The Boston Consulting Group

700 users Shiny App

CHALLANGES


BEAUTIFUL
UI

Appsilon Data Science

Pending actions | Settings | Log out

Client's info

Name	John Smiths
City	Warsaw, Poland
Client since	07/2014
Our rating	★★★★☆
Monthly spendings	$2500 aprox.

Calls history

Show 10 entries Search:

	Date	Topic	Consultant
1	2016-12-08	Connection problem	Kate Lees
2	2016-12-22	New plan	You
3	2016-12-23	Resume services	Mike Bradley
4	2017-01-01	Suspension of service	Kate Lees

Showing 1 to 4 of 4 entries Previous 1 Next

Convert to 'Pay as you go' plan

Estimated reduction

33% cost reduction based on historical data

+ Proceed

Offer health insurance

Upselling opportunity

Clients of following profile are 2 times more likely to accept our health insurance plan

+ Proceed

Sell credit card for spouse

Upselling opportunity

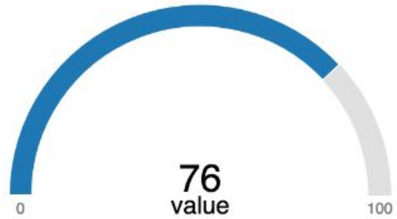
Accounts used by familiy members are likely to accept additional card and increase number of transactions.

+ Proceed

Current call

05:37

EMOTIONS



Voice analysis: Interested

FEEDBACK

Score client:

☆☆☆☆☆

Churn risk - your feelings:

☆☆☆☆☆

using shiny.semantic

USER INTERFACE

Package: shiny.semantic - http://appsilon.github.io/shiny.semantic

What is it?

- R package available on CRAN and GH

```
install.packages('shiny.semantic')
devtools::install_github('Appsilon/shiny.semantic')
```

- Package for Semantic UI components
- **alternative to** currently available **Bootstrap**
- **domain specific language** wrapping HTML tags

using shiny.semantic

USER INTERFACE

Package: shiny.semantic - http://appsilon.github.io/shiny.semantic

What it does?

- downloads and imports **Semantic UI CSS** classes
- creates the abstraction enabling the user to

define Shiny (text) inputs

- contains ready to use **pre-defined more complex**

elements as R functions

USER EXPERIENCE

Filtering in the backend

FAST DATA LOOKUPS

Fast Lookups: Indexing using *data.table* **25x faster** than *dplyr::filter*

```
library(dplyr)

benchmark({
  key_to_lookup <- select_random_key()
  time(data %>% filter(col1 == key_to_lookup))
})

##    min    max   mean
## 0.0960 0.2440 0.1124
```

```
library(data.table)

 time(setkey(data_table, col1)) ## 5.645

benchmark({
  key_to_lookup <- select_random_key()
  time(data_table[.(key_to_lookup), nomatch = 0L])
})

##     min     max    mean
## 0.00200 0.01200 0.00455
```

*data has 10 M rows.

Filtering in the frontend

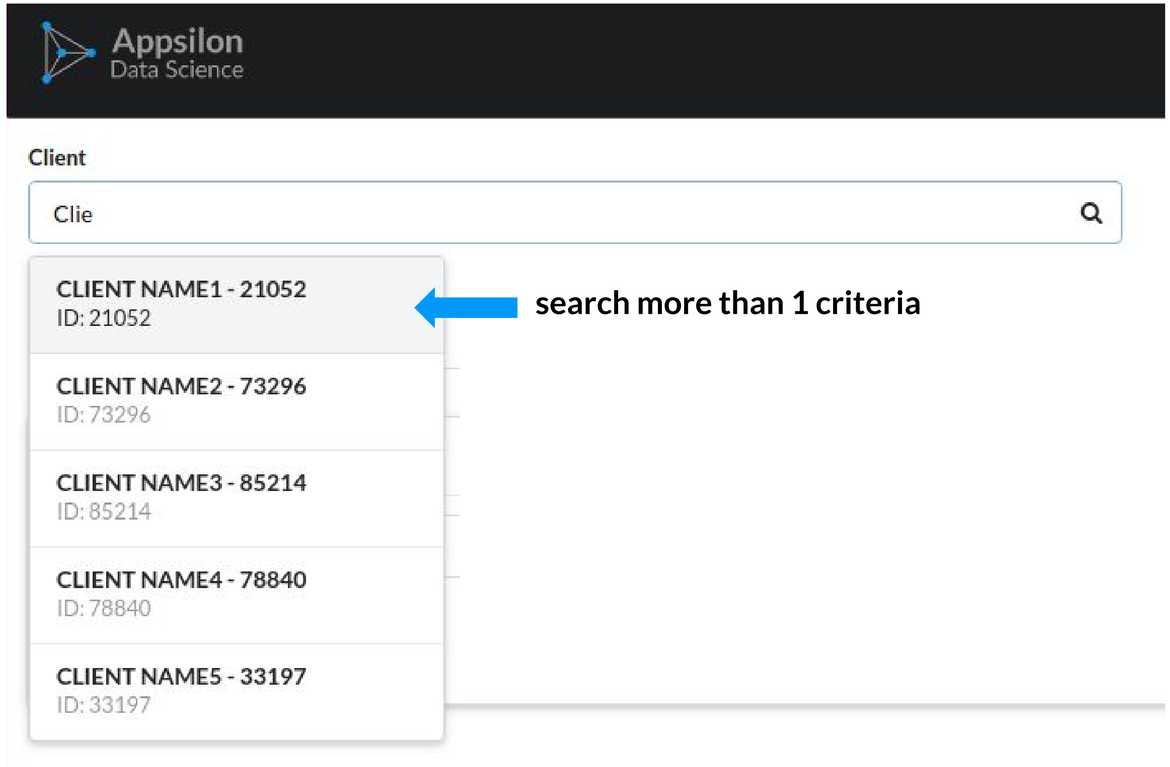
OWN API

Fast custom search with server side API

- Server-side solution sends only matching results

Why not use shiny selectize?

- Better UI element
- Flexible functionality of searching
- Custom search algorithm



Filtering in the frontend

OWN API

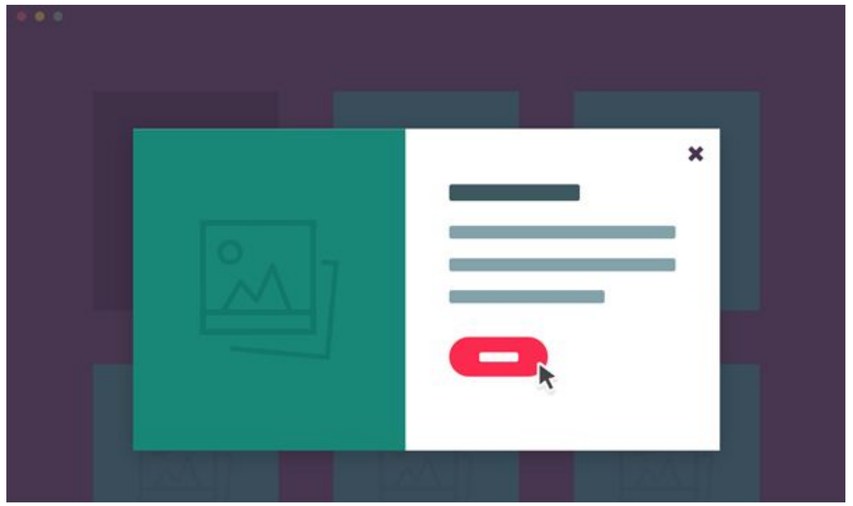
Use shiny::registerDataObj to create API from R

```
register_search <- function(session, data, search_query) {
  session$registerDataObj("search_api", data,
    function(data, request) {
      response <- jsonlite::toJSON(list(
        success = TRUE,
        results = search_query(data, request)
      ))
      shiny:::httpResponse(200, 'application/json',
        enc2utf8(response))
    }
)}
```

search_query our **own search algorithm function**

User Experience

RENDERING HIDDEN OUTPUT

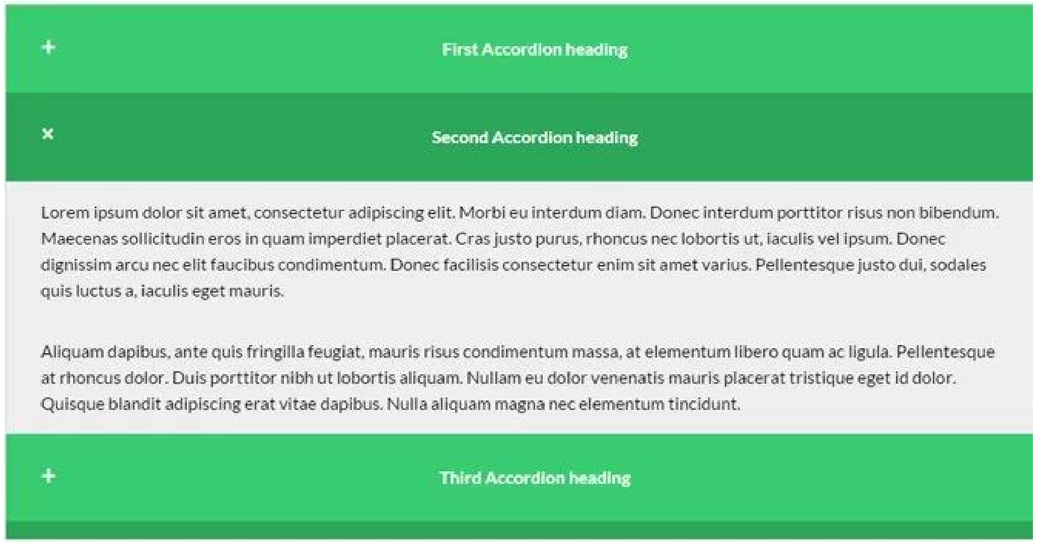


Rendering hidden output

- Output hidden in modal windows or accordions
- Default:

```
outputOptions(x, name, suspendWhenHidden = FALSE)
```

- Solution: *suspendWhenHidden* = **TRUE**



User Experience

COMPLEX REACTIVITY

Render on demand

- **reativeValue** breaks the reactivity chain if a value doesn’t update
- force the rendering of the component using **reactive trigger**
- concept introduced by Joe Cheng, the author of Shiny
- button that triggers reactivity, but programmatically

```
make_trigger <- function() {
 simple_value <- shiny::reactiveValues(a = FALSE)
 list(
   depend = function() {
     simple_value$a
     invisible()
   },
   trigger = function() {
     simple_value$a <-
       shiny::isolate(ifelse(simple_value$a, FALSE, TRUE))
   }
 )
}
```

SCALE UP

Scale

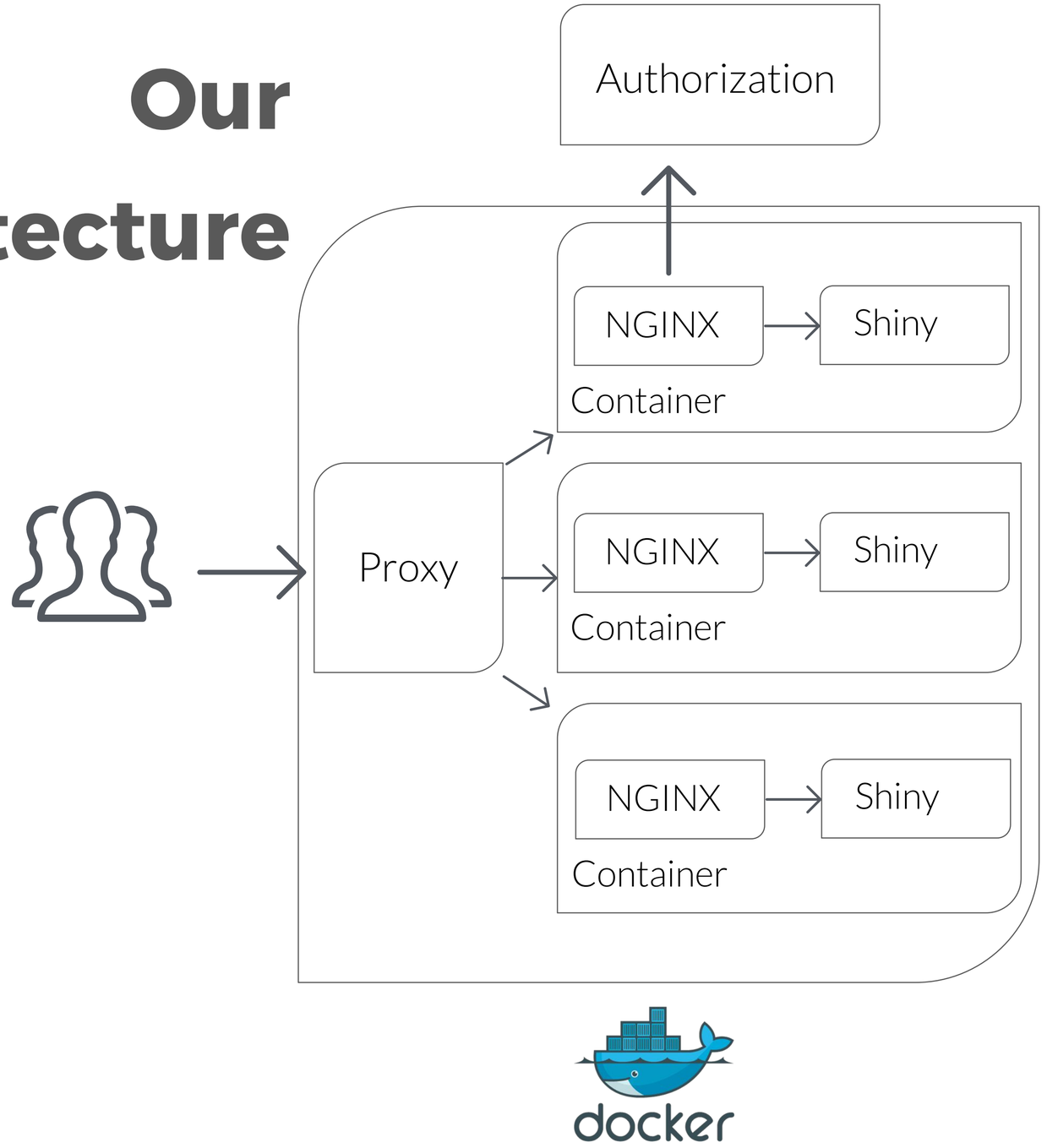
SCALE-UP

Improves the distribution of workloads across multiple servers

Each Shiny Server has the same configuration, and we run the same app in each container

We move authorization to a separate layer of our stack

Our Architecture

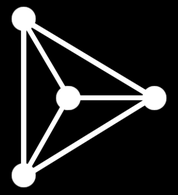


COMPATIBLE WITH:

amazon web services™ EC2

Microsoft Azure

On-Premise



Appsilon
Data Science

Data Science teams can efficiently scale production ready Shiny Apps with a UI/UX focus, quickly and aesthetically

QUESTIONS?

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WE ARE HIRING!