

# Building a Flexible, Scaleable Self-Serve Reporting System with Shiny

posit::conf(2023)

*Natalie O'Shea  
Analytics Consultant, People Insights*

**BetterUp**



# A common scenario...

A partner organization makes major, publicly-announced goals to advance equity

BetterUp digital coaching products are purchased to facilitate a ripple effect of empowered and inclusive leadership at their organization

They have unique objectives for each coaching cohort that they want aligned to their specific organizational competencies and culture transformation goals



# The problem...



You're a CSM responsible for this amazing, inspiring account which doesn't have the support of a dedicated behavioral science expert....

Alongside 15 other amazing, inspiring accounts



How do we enable our field team to tell compelling stories of organizational transformation at scale with limited subject matter expert support?

How do we then productize those insights and enable our partners to have real time insight into their own organizational transformation?

# The current patchwork of approaches fails to our needs

Tool	Pros	Cons
In-product analytics	Accessible to clients themselves; Professional-quality data visualizations; Clear alignment on metric definitions	Often doesn't address unique client goals and concerns; Limited ability to tell a compelling story in the language of the client
BI Tools	Self-serve and accessible to less technical users; Easy to scale with strong data protections	Effective enablement is difficult; Dashboards beget more dashboards beget more metrics (info overload); Data visualizations lack visual polish
Parameterized reporting	More customizable and scalable end-product with professional-quality data visualizations	Lacks ability to customize in final stages and tailor to specific client goals and concerns
Custom Reporting	Question-specific and tailored to client goals and concerns; Highly customizable end-product	Time-consuming and difficult to scale effectively; Unclear problem scope/definition

↑ Less Customizability  
↓ More Customizability



manually  
loading and taking  
screenshots from  
10 dashboards to  
build a single  
report or presentation



automatically  
populating  
reports and  
presentations with  
data in a few clicks

# Introducing... betterupinsights



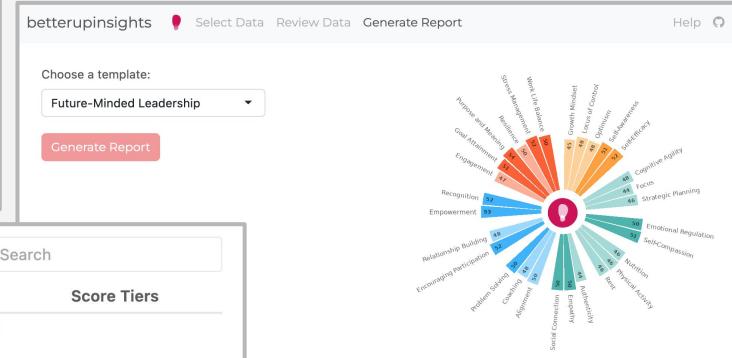
## 1 Select partner-specific or industry-level filters

The screenshot shows the 'betterupinsights' interface with a navigation bar at the top: 'Select Data', 'Review Data', 'Generate Report'. Below it are sections for 'Population Filters', 'Deployment Group' (set to 'B2B / Gov Paid Contract'), 'Industry' (set to 'Select Industry'), 'Benchmark Filters', and 'Member Filters'. A large central graphic features a megaphone pointing upwards, surrounded by colored dots. A pink button at the bottom says 'Load Data'. A message at the bottom states: 'You haven't selected enough filters yet.'



## 2 Review data via in-depth interactive data visualizations

## 3 Generate customizable reports with pre-formatted with data insights



rhino  
framework



R6 + gargoyle  
triggers

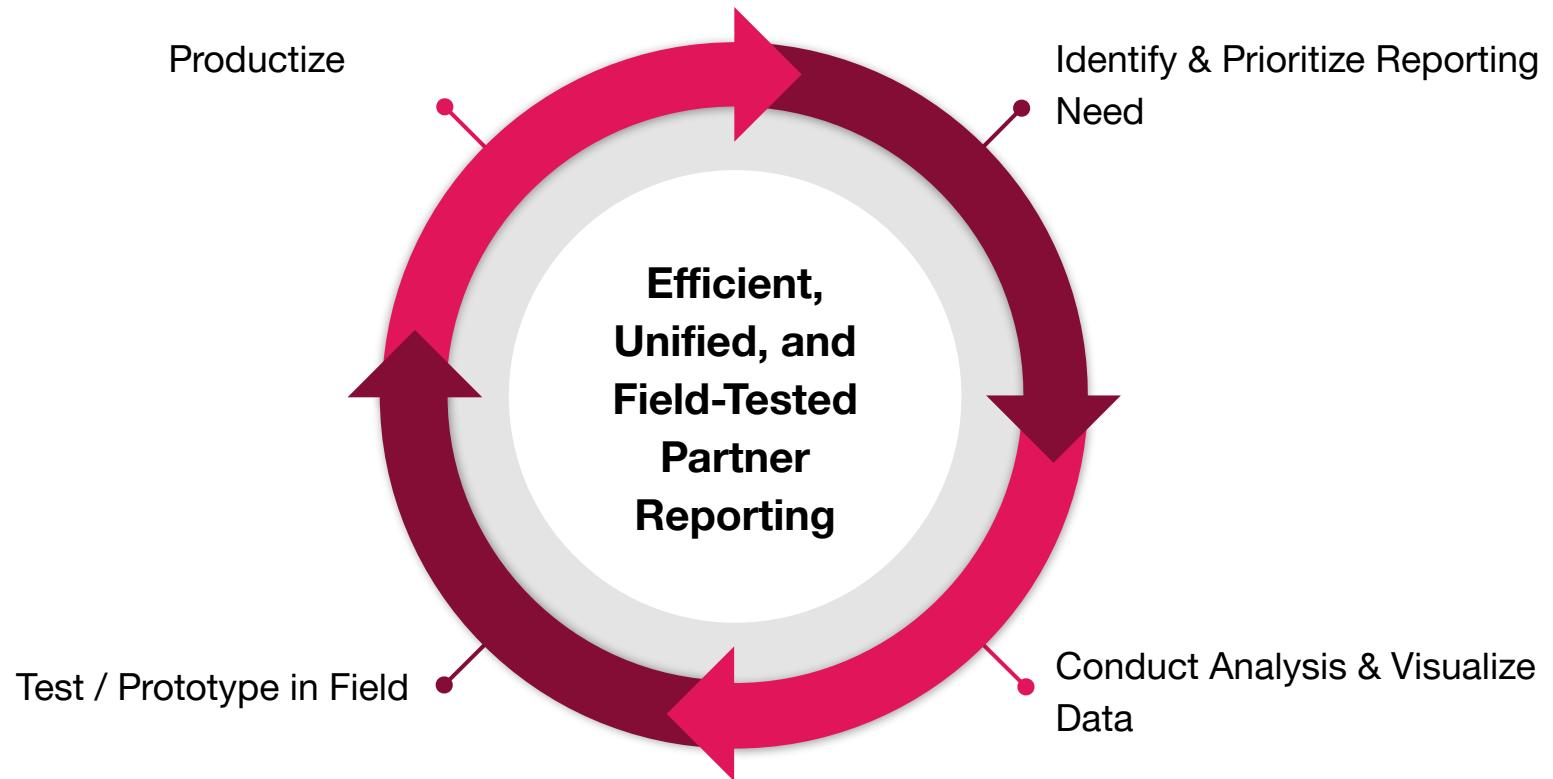


googleapi via  
reticulate



Source: [Pass around data between Shiny modules with R6](#) (Jiwan Heo)

BetterUp



Building the  
business case for  
Posit at your  
organization



# Identify a **core capability**

*What capability can you provide that is not already present in existing tools?*



# Build your team

## The lead developer

Main developer of the flagship project you've identified

## The customer representative

Your primary stakeholder, the folks you are developing the project for

## The business person

Someone who knows how to navigate the business and obtain resources

## The product manager

The Marie Kondo archetype, pro project management and communicator

## The DevOps engineer

Another technical lead to nerd out with, but someone who loves the things you hate and makes sure the system doesn't fall apart



**TIMESCANNER**

@timescanner

Be a Kermit the Frog. Have a creative vision and no ego. Recognize the unique talents of those around you. Attract weirdos. Manage chaos. Show kindness. Be sincere.

2:24 AM · 8/16/22 · Twitter for iPhone

# Create a data product

Dashboards answer  
questions, data products  
perform a *valuable service*

Data products must be built  
with *Maintainability* and  
*robusticity* in mind



# Measure impact

## Baseline ROI Analysis

**\$750k-\$1.9M in time cost savings**

*Time cost = [Avg time to build a BR] \* [Number of BRs supported] \* [Avg hourly rate]*

## Usage Tracking

Manage and track viewership in Connect via groups

*(To be implemented) Extend Connect with the connectapi package*

## User Feedback

Prioritize new developments

Demonstrate your impact on colleagues workflows,  
Bring joy on a rainy day

Chinazom Nwabueze to Everyone 11:42 AM

CN

This is amazing



Nadia Waheed to Everyone 11:43 AM

Very cool visual

贯通 ☀️ ...



Ronit Levy 🌴 3 days ago

I've just watched this and I am SO impressed and SO grateful for all this incredible work @Natalie O'Shea and @Mike Litano!! Thank you for this - it's going to make the world of difference 😍🙏

贯通 1 THINK 1 ❤️ 1 贯通



Leila Comerford 3 days ago

This is AMAZING!!!! @Natalie O'Shea @Mike Litano

贯通 1 THINK 1 ❤️ 1 贯通

Alissa Manolescu to Everyone 11:35 AM



This is absolutely amazing, Natalie.

贯通 4



Kyla Holcombe, PhD (she/her) to Everyone 11:

Bar was set appropriately high - SUPER excited to drill into this!

贯通 5 😊 1



Raven Worthy to Everyone 11:35 AM

😍😍😍



Danielle Douglas to Everyone 11:36 AM

I change my answer: I would tell myself 2 years ago that we would have this awesome app!

贯通 3 贯通 3 😊 5

Leila Comerford to Everyone 11:42 AM



wow 😍

贯通 ☀️ ...

Shubh Jagani to Everyone 11:42 AM

S

This is so cool



Laura Lomeli 😊 5:03 PM

Hi team!

I may be spiking your posit #s @Mike Litano 🧑

I am loving the ability to see the score distribution and score tiers by subdimension 🦸

❓ Is there a way to download all of that data at one time (the reports have a higher level view of this but not the details)?

Thank you in advance,

Posit Obsessed

Thank you in advance,  
*Posit Obsessed*

# Thank you!

Mike Litano

Em Reit

Harsh Sheth

And many others!

# Let's connect!

 natalie-oshea

 @\_natalie\_oshea

 natalieoshea



# Appendix (Lessons Learned)

# Prototype first and iterate repeatedly (show, don't tell)

Shiny UI Editor

Choose App Template

Hover over a template to see a description and what elements are used. Select the desired template and click next to edit.

Show templates based on selected layouts:

Grid     Tabs

Generate app in:

Single file mode     Multi file mode

The Shiny UI Editor interface displays four different app templates. Each template is shown in a card-like format with a preview image and a title below it. The titles are: 'Grid Geyser' (top left), 'Sidebar Plotly' (top right), 'Chick Weights navbar' (bottom left), and 'Chick Weights Grid' (bottom right). The 'Grid Geyser' and 'Sidebar Plotly' cards show bar charts, while the 'Chick Weights' cards show line graphs. The 'Chick Weights Grid' card has two line graphs stacked vertically. The 'Chick Weights navbar' card shows a single line graph. The 'Sidebar Plotly' card includes a note: 'Select the cut of the diamond you want to see the ratio size distribution for.' The overall interface is clean with a light blue header and a white background for the content area.

Grid Geyser

Sidebar Plotly

Chick Weights navbar

Chick Weights Grid

# Package your code in a way that aligns with existing data modeling practices

Greater extensibility | Faster iteration | More reliable data pipelines for ad-hoc analyses

