Institute for Aging Research
Hebrew SeniorLife

HARVARD MEDICAL SCHOOL AFFILIATE

Automated Clinical Research Tracking And Assessment Using R-Shiny

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Clinical Research?

- What do people think we do?

  - Doctors?

  - Building Data Models Everyday?

  - In fact, we spent a lot of time on making sure study is running alright

    - Tracking and Continuous Assessment

Challenges (1)

- How can I pass the story I found in data to team decision makers?

  - ~~Weekly Reports?~~

Challenges (2)

- Can I reuse my codes in the analysis phase?

    - ~~Built-in tools in Data Collection Tools~~

      (Also, in most cases, these tools are not that useful…)

Our Solution

- We use R-Shiny to "automate all the boring things"

- Shiny can

  - Fetch data from database (REDCap)

  - Perform data manipulation
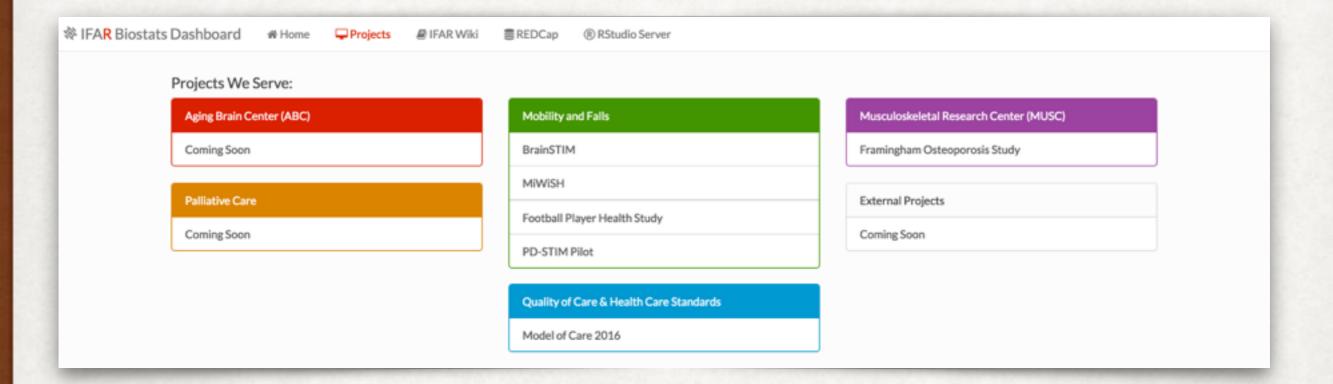
  - Generate results

  - Display results

Software Design Pattern

- Perform data manipulation [model]

- Generate results [view-model]

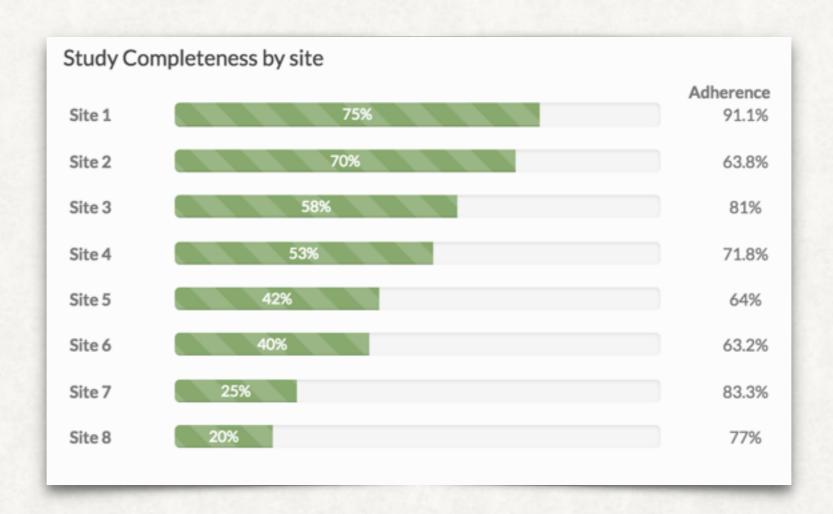- Display results [view]

MVVM Architecture

Projects We Have Helped

Demos (1)

Table 1a. Phone Screening Summary

Title	2016-04-21	2016-04-27	Difference
Total Contacts	192	197	+ 5
Phone Screening Completed	192	196	+ 4
• Eligible towards Visit 1	88	90	+ 2
• Not Eligible towards Visit 1	104	106	+ 2
Didn't want to participate	34	34	-
Participant Unresponsive	26	27	+ 1
Ineligible for MRI/tDCS Checklist	2	2	-
Failed to meet study criteria	42	43	+ 1

Demos (2)

Table 3. Post-Visit-1 Adherence Status

Study ID	1^{Test}	2^{MRI}	3	4	5	6	7	8	9	10	11	12	13^{Test}	14^{MRI}	15^{Test}	Adherence (Visit 3-12)
PC	+	+	+	+	+	o	+	+	+	o	o	o	+	o	+	60%
PC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	100%
PC	+	o	+	+	+	+	+	+	+	+	+	+	+	o	+	100%
PC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	100%
PC	+	o	+	o	+	+	+	+	+	+	+	+	+	o	+	90%
PC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	100%
PC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	100%
PC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	100%
PC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	100%

Demos (3)

Study Completeness by site

Site	Completeness	Adherence
Site 1	75%	91.1%
Site 2	70%	63.8%
Site 3	58%	81%
Site 4	53%	71.8%
Site 5	42%	64%
Site 6	40%	63.2%
Site 7	25%	83.3%
Site 8	20%	77%

Demos (4)

Demos (5)

Help Your Team Build The Habit Of Using Shiny

- Start with a proof-of-concept project to demonstrate the idea

- Work with small teams first

- Pilot Shiny with new study projects

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    - Football Players Health Study

    - MIWISH Study

    - Michael J Fox Foundation

- REDCapR developer team

- R community

Thank You!