AAMC GIR Excellence Award: REDCap support during the COVID-19 pandemic

August 3, 2021, 9:00 a.m – 10 a.m.

Presenters
Adam Garrett, Director, Systems, Health Sciences Library
Bas de Veer, Data Services Manager, ITHS
Ashleigh Lewis, REDCap Manager, ITHS
Michael Moore, Grants and Special Project Librarian, Health Sciences Library
A brief history of REDCap at our institution

• 2009:
  • Evaluation project for an EDC between REDCap & OpenClinica at ITHS

• 2012: \textit{(Users: 400)}
  • Full time REDCap Administrator hired
  • New training curriculum (1 intro, 3 advanced classes)
  • OpenClinica sunsettled

• 2016: \textit{(Users: 4,000)}
  • Trail collaboration started
  • 5 Health Sciences Library staff trained

• 2017: \textit{(Users: 5,000)}
  • Ticketing system implemented
  • Training sessions moved to Health Science Library and expanded (1 intro, 4 200 level, 4 300 level)

• 2018: \textit{(Users: 8,000)}
  • New REDCap Administrator hired; Old administrator promoted

• 2020: \textit{(Users: 12,000)}
  • Rotation of 8 Health Sciences Library staff
  • Extra dedicated REDCap administrator hired

• 2021: \textit{(Users: 19,000)}
  • Infrastructure upgrades due to increased demand and usage
History of TRAIL
TRAIL SERVICES

Partner(s) responsible for each service

- UW Health Sciences Library (HSL)
- Biomedical Informatics and Medical Education (BIME)
- Institute of Translational Health Sciences (ITHS)
- National Network of Libraries of Medicine, Pacific Northwest Region (PNR)
- UW Medicine Information Technology Services (ITS)
IMLS-Funded Virtual Reality Project
Library Support for REDCap

• **Existing skillsets**
  • Research data management
  • Data wrangling
  • Data visualization
  • Database design
  • Assessment
  • Basic coding language

• **Experience providing support**

• **Capacity from larger staff**

• **Ability to incorporate into job workflows**
Level 1
Project creation
Project copy
Review changes
"Canned responses"

Level 2 / 3
Complex questions
Governance
Best practices
Everything else
HSL Agents

Amber Atkins          Sara Rind
Lynly Beard            Ruba Sadi
Paul Ludecke           Nancy Shin
Michael Moore          Frank Stieber
Training of REDCap level 1

Prior to 2021

• One-on-one training with REDCap admin

• Less consistent

• Time consuming especially with staff turnover and additions
2021+ Level 1 Ticket Workflow

- Thorough and adaptable
- Consistent training
- Walk through system

What type of request is this?
- Project Creation/Copy
- Change Request
- Delete Project
- NSA: / SA: / NP:
- Undeliverable: / Delivery Status Notification (Failure)
- Automatic reply:
- General Question or Unknown

Are there any records affected?
- Yes
- No

Please use the "CH - Fields to be deleted" canned response or copy and use the language below:

These variable deletions will cause you to lose the data in those variables.

Please let us know if you would like to proceed with these changes. If you do not want to proceed with your changes, we can reject your request and you can update your edits, or we can remove ALL edits and take your project out of draft mode.
UW Medicine IT Agents

Bas de Veer
Ashleigh Lewis
Fred Dowd
Courtney Howell
Tickets Closed, by Topic (Jan. 2020 - June 2021)

- Change Request: 8529
- General Question: 8192
- Project Creation: 4864
- Project Copy: 2029
- New Outside User: 1882
Tickets Closed, by TRAIL Partner (Jan. 2020 - June 2021)

- HSL (Atkins, Beard, Ludecke, Moore, Rind, Sadi Stieber): 13754
- ITHS / UW Med. IT (de Veer, Howell, Lewis): 9713
- NNLM PNR (Shin): 2029
REDCap Class Attendance, by Month
COVID-19 Impacts

• Effects of the COVID-19 Pandemic
  • Number of users
    • Users with logins
    • Survey participants
  • Number of survey invitations
    • Number of projects with surveys
    • Projects with large number of participants
  • Need for e-consent options
  • Need for more REDCap build consults
    • Quick turn around
    • More complex builds
Problem 1 – Response spikes

Issue:
Significant server slowdown due to participant response spikes

Cause:
Small number of projects sending large batches of invitations at the same time

Solution:
Ask users to “batch” invitations with 10-15 min intervals
Problem 2 – Increased usage

Issue:
Server slow downs and crashes due to increased peak load

Cause:
Research studies needing to move to remote
Everybody working remotely

Solution:
1) Increase the available resources for the server
2) Redo the entire server infrastructure
Problem 3 – Database Server Bottlenecks

**Issue:**
Database server crash due to increased volume of write commands

**Cause:**
Practical limit to number of writes a server can do per second
Increased usage frequently hit that limit

**Solution:**
1) Increase the available resources for the database server
2) Split out the server into a cluster with multiple nodes
Problem 4 – Email Server slowdowns

Issue: Emails (invitations, alerts) were delayed by hours or days

Cause: Increased email traffic per second hit the “spam limit” set by the university IT department

Solution:
1) Escalate through university leadership to set expectations
2) Ask users to batch their emails into smaller numbers
Problem 5 – Uneven utilization

Issue:
Small number of projects using most of the capacity for both the server infrastructure and support capacity

Cause:
Several COVID tracking projects with high number of participants with daily interactions

Solution:
1) Maintenance plans *(supplies funding for more people)*
2) Tailoring specialized REDCap servers for big projects
**Problem 6 – e-Consenting unclarity**

**Issue:**
Most studies needed to move online including the consent process. Very little guidance from legal, IRB, compliance if this is ok.

**Cause:**
E-Consenting module in REDCap is a relatively new feature. Laws regarding e-Consent are vague and differ per state.

**Solution:**
Custom workgroup dedicated to creating guidance for e-Consenting.
Problem 7 – Increased support burden

Issue:
More tickets submitted with tougher problems

Cause:
Users trying to do everything online are finding limitations of the software

Solution:
1) Have a solid ticketing system in place
2) Hire more people
Current State Challenges

- **Support Burden:**
  - Feb 2020: 1000 closed tickets
  - Feb 2021: 1658 closed tickets

- **Cluster infrastructure**
  - New concept for REDCap
  - Backup methods
  - File server

- **Scalability**
  - ~13.5K users
  - 18K+ projects

- **Funding**
  - Infrastructure
  - People

UW-ITHS REDCap infrastructure
March 2021