Basics of REDCap Survey and Project Design

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Agenda

● What and Why REDCap?
● Getting started
● Quick tour around REDCap
● Creating a REDCap project
● Creating a data instrument
● Inviting participants to complete a survey
● Collecting the same data multiple times
● Creating reports and exporting data
● Other capabilities
● Training & Docs
What is REDCap?

- REDCap == Research Electronic Data Capture
- REDCap is an Electronic Data Capture (EDC) system
- EDC systems are used to capture data onto an electronic system (i.e., a database)
  - Survey systems are similar to EDCs but are primarily intended to directly survey a participant
  - EDCs, on the other hand, are generally used by study staff to enter data from paper forms or while interviewing a participant or perhaps abstracting their chart
  - REDCap is an EDC that also supports surveys
Where did REDCap come from?

- REDCap was developed at Vanderbilt University for the use of universities and non-profit institutions
- REDCap is maintained by the REDCap Consortium of which UW & CSDE are members
- REDCap is for non-profit use only
And where is REDCap going?

- REDCap is installed on more than 6,000 partner sites and is currently serving 1.6 million projects with 2.4 million users.
- REDCap has a vibrant & active community and is constantly being upgraded and improved.
Creating a Data Instrument

- You can design your instrument using...
  - Online designer
  - Spreadsheet
  - Some combination of the two
Quick Tour
Welcome to REDCap

REDCap is a secure web platform for building and managing online databases and surveys. REDCap's streamlined process for rapidly creating and designing projects offers a vast array of tools that can be tailored to virtually any data collection strategy.

REDCap provides automated export procedures for seamless data downloads to Excel and common statistical packages (SPSS, SAS, Stata, R) as well as a built-in project calendar, a scheduling module, ad hoc reporting tools, and advanced features, such as branching logic, file uploading, and calculated fields.

Learn more about REDCap by watching a brief summary video (4 min). If you would like to view other quick video tutorials of REDCap in action and an overview of its features, please see the Training Resources page.

NOTICE: If you are collecting data for the purposes of human subjects research, review and approval of the project is required by your institutional Review Board. If you require assistance or have any questions about REDCap, please contact REDCap Administrator (redcap@vanderbilt.edu).
Listed below are the REDCap projects to which you currently have access. Click the project title to open the project. Read more To review which users still have access to your projects, visit the User Access Dashboard.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>PID</th>
<th>Records</th>
<th>Fields</th>
<th>Instruments</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul's Demo Project</td>
<td>15</td>
<td>0</td>
<td>2</td>
<td>1 form</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Another Project</td>
<td>16</td>
<td>0</td>
<td>2</td>
<td>1 form</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Project Navbar

Access to most parts of REDCap, including:

- Other pages (My Projects, Project Home, etc.)
- Data collection
- Other Components (Applications)
- Reports
- Help

Your Navbar will vary depending on your security level & items in project.
Project Setup page

Provides access to:
- Online designer
- Data dictionary
- Project title
- Lots of project settings
- Optional modules and customizations
- User rights

Tabs across top, provide additional access to:
- Project Home
- Revision history

Your access to some features will be affected by security level.
# Record Status Dashboard

**Record Status Dashboard (all records)**

Displayed below is a table listing all existing records/responses and their status for every data collection instrument (and if longitudinal for every event). You may click any of the colored buttons in the table to open a new tab/window in your browser to view that record on that particular data collection instrument. Please note that if your form-level user privileges are restricted for certain data collection instruments, you will only be able to view those instruments, and if you belong to a Data Access Group, you will only be able to view records that belong to your group.

<table>
<thead>
<tr>
<th>Subject Id</th>
<th>Reversal task - REDCap test/practice</th>
<th>Radial Array Setup</th>
<th>Radial Array Warmups</th>
<th>Radial Array Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
<td>2</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
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<td><img src="icon1.png" alt="Icon" /></td>
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<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
<td>4</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
<td>5</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
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<td>6</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
<td>7</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
<td>8</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
<td>9</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
<td>10</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
<td>11</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
<tr>
<td>12</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
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<tr>
<td>13</td>
<td><img src="icon1.png" alt="Icon" /></td>
<td><img src="icon2.png" alt="Icon" /></td>
<td><img src="icon3.png" alt="Icon" /></td>
<td><img src="icon4.png" alt="Icon" /></td>
</tr>
</tbody>
</table>

**Legend for status icons:**
- ![Icon](icon1.png) - Incomplete
- ![Icon](icon2.png) - Incomplete (no data saved)
- ![Icon](icon3.png) - Unverified
- ![Icon](icon4.png) - Partial Survey Response
- ![Icon](icon5.png) - Complete
- ![Icon](icon6.png) - Completed Survey Response

**Provides**
- overview of all your records
- Access to custom dashboards
- Ability to add new records
Add/Edit Records

Add / Edit Records
You may view an existing record/response by selecting it from the drop-down lists below. To create a new record/response, click the button below.

- Total records: 363

Choose an existing Subject id
- select record --

+ Add new record

Data Search
Choose a field to search
(excludes multiple choice fields)
- All fields

Search query

Allows you to
- Select a record by subject/record id
- Add a new record
- Search for a record by most fields in project
Creating a REDCap Project
Creating a REDCap Project

Are you hosting at CSDE?

Yes

Request access by emailing csde_help@uw.edu

Login with your UW NetID at https://surveys.csde.washington.edu/

Follow instructions in email to verify account & log back in

Click **New Project** along top bar

No (ITHS, etc.)

Talk to your host about account/project creation
Lab 1: Creating Your Account and a Project

- In this lab you will create an account on the CSDE REDCap server
- CSDE has already authorized your UW NET ID
- You will:
  - Create your account/login
  - Verify your login
  - Create a new project
Creating an Instrument
Creating an instrument using the designer

Design your data collection instruments

Add or edit fields on your data collection instruments. This may be done by either using the Online Designer (online method) or by uploading a Data Dictionary (offline method). Quick links: [Download PDF of all instruments](#) OR [Download the current Data Dictionary](#)

Go to [Online Designer](#) or [Data Dictionary](#)

Have you checked the [Check For Identifiers](#) page to ensure all identifier fields have been tagged?

Learn how to use [Smart Variables](#), [Piping](#), [Action Tags](#), [Field Embedding](#), [Special Functions](#)
Starting with a new project

- For new projects, you will start with a single data collection instrument, **Form 1**
- **Do not delete** this instrument; **rename** it instead
Your first instrument (form)

- The first form in the project will always have the `record_id` field as first and only field
- **Don’t delete this field; it is the primary key of your project; but you can rename it.**
- Click on **Add Field** button at bottom to add additional fields
Adding a field

- Clicking the Add Field button brings up the **Add New Field** dialog
- This dialog will vary based on the chosen **Field Type**
Field Types

- Standard fields

- Plus Matrix fields
Other form features

• You can also use the **data dictionary** (spreadsheet) to create forms instead of or in addition to using the **designer**

• **Branching** (skip logic)

• **Validation** of fields
  ○ Email address, date, time, number with min and max

• **Calculated** fields

• **Piping** of data
  ○ Customize labels or display previously-entered data

• **Action Tags** (field modifiers)
  ○ Use to make fields read only, set a default value, hide fields, retire no longer used choices, etc.
Designing an instrument using the data dictionary

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Variable / Form</td>
<td>Nam</td>
<td>Section</td>
<td>He Field</td>
<td>Type</td>
<td>Field Label</td>
<td>Field</td>
<td>Note</td>
<td>Text Valid</td>
<td>Text Valid</td>
</tr>
<tr>
<td>record_id</td>
<td>record ID</td>
<td>text</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>date_mdy</td>
<td>today</td>
<td></td>
</tr>
<tr>
<td>dm_first_r</td>
<td>First name</td>
<td>text</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>date_mdy</td>
<td>today</td>
<td></td>
</tr>
<tr>
<td>dm_last_r</td>
<td>Last name</td>
<td>text</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>date_mdy</td>
<td>today</td>
<td></td>
</tr>
<tr>
<td>dm_dob</td>
<td>Birthdate</td>
<td>text</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>date_mdy</td>
<td>today</td>
<td></td>
</tr>
<tr>
<td>dm_books</td>
<td>How do you</td>
<td>checkbox</td>
<td></td>
<td>choices,</td>
<td>calculations,</td>
<td>OR slider labels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>read books?</td>
<td></td>
<td></td>
<td>choices</td>
<td>calculations</td>
<td>OR slider labels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dm_audio</td>
<td>When do you</td>
<td>checkbox</td>
<td></td>
<td>choices</td>
<td>calculations</td>
<td>OR slider labels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>listen to audio</td>
<td></td>
<td></td>
<td>choices</td>
<td>calculations</td>
<td>OR slider labels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lst_books</td>
<td>books?</td>
<td></td>
<td></td>
<td>notes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lst_audio</td>
<td>When do you</td>
<td>checkbox</td>
<td></td>
<td>choices</td>
<td>calculations</td>
<td>OR slider labels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>listen to audio</td>
<td></td>
<td></td>
<td>choices</td>
<td>calculations</td>
<td>OR slider labels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lst_tv</td>
<td>Do you own a</td>
<td>yesno</td>
<td></td>
<td>choices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>television?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lst_date</td>
<td>Today’s date</td>
<td>text</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lst_sbp</td>
<td>Systolic blood</td>
<td>text</td>
<td></td>
<td>integer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lst_dbp</td>
<td>Diastolic blood</td>
<td>text</td>
<td></td>
<td>integer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lst_hr</td>
<td>Heart rate</td>
<td>text</td>
<td></td>
<td>per minute</td>
<td>number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lab 2: Creating an Instrument

- In this lab you will create an instrument using the online designer
- Extra credit: After creating the instrument, download the data dictionary and make a modification and upload the data dictionary to see your change
Inviting Participants to Take a Survey
Understanding surveys

- A survey is just an instrument that is enabled to be taken by a participant
- Surveys settings control how the survey looks and behaves
Anonymous vs Non-anonymous Surveys

- Surveys can be anonymous or non-anonymous
  - **Anonymous surveys** are surveys that can be accessed from a public survey link and don’t require you pre-identify the participant; there can only be one anonymous survey per REDCap project
  - **Non-anonymous surveys** require you to send an invite to a participant you have already identified
Anonymous Surveys

- Once you have enabled surveys for the project, **Survey Distribution Tools** appears under Data Collection in the left-hand nav bar.
- Click on Survey Distribution Tools to get to the **Public Survey Link** tab and the **Public Survey URL** box.
Non-anonymous surveys require an email address

1. The email address can come from a Participant List (found under **Survey Distribution Tools: Participant List** tab)

2. Or the email can come from a **field on a previously completed instrument** in the same project
Three ways to invite participants to a survey

1. In batches via **Compose Survey Invitations** (found under Survey Distribution Tools)

2. Automatically based on the completion of another instrument using **Automated Survey Invites (ASIs)**

3. Similar to using ASIs, you can also use the more flexible/powerful **Alerts & Notifications**
Lab 3: Working with Surveys and Participants

- In this lab you will enable the instrument you created in the last lab to be a survey, you will modify its design slightly and configure the survey.
- Then you will take the survey two different ways.
Collecting the Same Data Multiple Times
Needing to collect the same data multiple times

Several ways to accomplish this in REDCap

1. You can make copies of instruments. *Usually not the best approach*
2. You can create **events** (e.g., baseline, follow-up year 1, follow-up year 2) w/in a longitudinal project to collect data at scheduled time points. Events are created at *design time*
3. You can configure an instrument to **repeat without using events**. Repeating instruments repeat at *data collection time*
4. You can also use a **hybrid** of the two so that an instrument repeats within an event container; or the entire event and all of its containing instruments repeats
Longitudinal Projects and Events

- Using Project Setup page
  - Enable **Use Longitudinal data collection with defined events**
  - Click **Define My Events**
  - Click **Designate Instruments for Events**

---

**Record ID 1**

<table>
<thead>
<tr>
<th>Data Collection Instrument</th>
<th>Baseline</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>[ ]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lab Values</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Delete all data on event:</td>
<td>[x]</td>
<td>[x]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Repeating Instruments

- Using Project Setup page
  - Enable **Repeating Instruments and Events**
  - Decide which instruments are to repeat
Creating Reports & Exporting Data
Reporting and Exporting Data

- REDCap allows you to create reports which can be viewed or be used to export data
- Data can be exported to...
  - CSV/Excel
  - SPSS
  - SAS
  - R
  - STATA
Creating a Report

- Click **Data Exports, Reports, and Stats** under Applications
- Click **Create New Report** and give your report a name
- Then complete four report steps:
  1. Set user access (optional)
  2. Add fields to the report using dropdowns or **Quick Add** button
     - optionally set additional report options (e.g., included survey timestamp, decide how to handle event/repeating data, etc.)
  3. Set an optional filter using dropdowns or advanced logic.
     - optionally add live filters
  4. Optionally order the results with sort fields

Any report can also be used to export data
Lab 4: Creating Reports and Exporting Data

- In this lab you will create a report for the Transportation Questionnaire, view it, and export the data into a CSV file.
Other REDCap Features
Project Status

- All projects start out in the **Development status**
  - Development projects can be freely edited
  - Use this status prior to collecting real data
- Production status
  - From the Project Setup page, scroll to the bottom to **Move your project to production status**
  - Once in production status, extra safeguards are put in place
    - Updates to design, require entering draft mode where you can safely draft your changes while existing users/participants still see the old design until those changes are submitted (finalized)
    - REDCap automatically keeps copies of your data dictionary and prevents you from making destructive changes
Security

- REDCap allows you to grant security at a very fine grain per user or role (groups of users)
- Can also use Data Access Groups (DAGs) to segment data per sites
Other Capabilities

- Randomization support
- Auto-numbering for records
- Rich automated logging of all data entry, schema changes, etc
- Support for field comments (to note special circumstances or something to come back to)
- Data Quality Rules
- Data Import
- Rich expression language you can use for branching logic, report filtering, calculations, logic to control alert and automated survey emails
- And lots more...
Training & Docs (1 of 2)

- Right within REDCap...

### REDCap Training Videos

**Just Getting Started?**
Explore these overviews of fundamental concepts and features.

<table>
<thead>
<tr>
<th>Title</th>
<th>Description</th>
<th>Watch Video</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brief Overview</strong></td>
<td>A quick summary of what REDCap is and what it can do.</td>
<td>4 minutes</td>
</tr>
<tr>
<td><strong>Detailed Overview</strong></td>
<td>This video provides an overview of basic functions and features within a REDCap project. It will serve as a starting point for learning about the basic concepts of REDCap, what REDCap projects are, how to create them, and how to use them.</td>
<td>14 minutes</td>
</tr>
<tr>
<td><strong>Data Entry Overview</strong></td>
<td>A focused exploration of basic data entry workflow. Suitable for training data entry staff.</td>
<td>19 minutes</td>
</tr>
</tbody>
</table>
## REDCap Help & FAQ

Click the tabs below to navigate to a specific topic. When performing a keyword search, each tab will list the number of keyword matches in that section.

**Search for a Question**

Enter a keyword or phrase

No filter applied.

### General

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much experience with programming, networking and/or database construction is required to use REDCap?</td>
</tr>
<tr>
<td>Where can I suggest a new REDCap feature?</td>
</tr>
<tr>
<td>Can I still maintain a paper trail for my study, even if I use REDCap?</td>
</tr>
<tr>
<td>Can I transition data collected in other applications (e.g. MS Access or Excel) into REDCap?</td>
</tr>
<tr>
<td>Is it possible to transfer a project to a different person?</td>
</tr>
</tbody>
</table>

There is no project user right in REDCap called "Owner." You could create a role called "Owner" - which would clearly designate which user is the project owner in the User Rights section (with appropriate permissions). Usually the owner is the user with the right to grant project access to other users.
Summary

● REDCap is a rich web-based and research-oriented electronic data capture program
● REDCap is a vibrant product with a bright future
● REDCap is easy to get started with but will also grow with you as you get more comfortable with it