# 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 current 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

# Home page

**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 (mbw@uw.edu).

## REDCap Features

**Build online surveys and databases quickly and securely in your browser** - Create and design your project using a secure login from any device. No extra software required. Access from anywhere, at any time.

**Fast and flexible** - Go from project creation to starting data collection in less than one day. Customizations and changes are possible any time, even after data collection has begun.

**Advanced instrument design features** - Auto-validation, calculated fields, file uploading, branching/skip logic, and survey stop actions.

**e-Consent** - Perform informed consent electronically for participants via survey.

**Diverse and flexible survey distribution options** - Use a list of email addresses or phone numbers for your survey respondents and automatically contact them with personalized messages, and track who has responded. Or create a simple link for an anonymous survey for mass email mailings, to post on a website, or print on a flyer.

**REDCap Mobile App** - Collect data offline using an app on a mobile device when there is no WiFi or cellular connection, and then later sync data back to the server.

**Data quality** - Use field validation, branching/skip logic, and Missing Data Codes to improve and protect data quality during data entry. Open data queries to automatically identify and resolve discrepancies and other issues real-time.

**Custom reporting** - Create custom searches for generating reports to view aggregate data. Identify trends with built-in basic statistics and charts.

**Export data to common analysis packages** - Export your data as a PDF or as CSV data for easy analysis in SAS, Stata, R, SPSS, or Microsoft Excel.

**Secure file storage and sharing** - Upload and share any type of file with anyone in the world through the File Repository feature or Send-It tool. Also works with exports and other built-in file uploading features.

**Data-based triggers and alerts** - Send real-time alerts and notifications to your team or other stakeholders via email, text, or phone based on certain data being entered or specific questions having a particular answer.
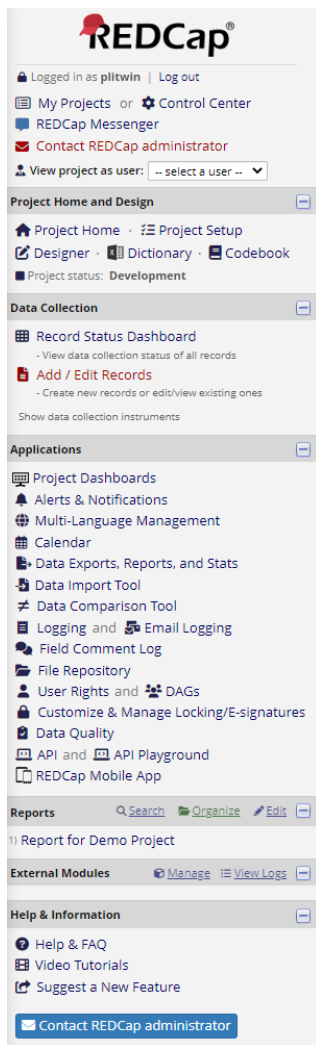
**Connect to other resources** - Use built-in features (API) to move data to/from your project. Build your own custom software development features to connect your project to other systems.

# My Projects Page

# 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 addtnl 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.

**Legend for status icons:**
- 🔴 Incomplete  ⚪ Incomplete (no data saved) ?
- 🟡 Unverified  🟠 Partial Survey Response
- 🟢 Complete  ✅ Completed Survey Response

Dashboard displayed: [Default dashboard] ▾        ✏ Create custom dashboard

Displaying record  Page 1 of 1: "1" through "test" ▾  of **68** records        ALL (68) ▾  records per page

➕ Add new record

Table not displaying properly ?

**Displaying:** Instrument status only  |  Lock status only  |  All status types

| Subject Id | Reversal task - REDCap test/practice | RadialArraySetup | Radialarraywarmups | Radialarraytrials |
|---|---|---|---|---|
| 1 | ⚪ | ⚪ | 🔴 | 🟢 |
| 2 | ⚪ | ⚪ | ⚪ | 🔴 |
| 3 | ⚪ | ⚪ | ⚪ | 🟢 |
| 4 | ⚪ | ⚪ | ⚪ | 🟢 |
| 5 | ⚪ | ⚪ | ⚪ | 🔴 |
| 6 | ⚪ | ⚪ | ⚪ | 🔴 |
| 7 | ⚪ | ⚪ | ⚪ | 🔴 |
| 8 | ⚪ | ⚪ | ⚪ | 🔴 |
| 9 | ⚪ | ⚪ | ⚪ | 🔴 |
| 10 | ⚪ | ⚪ | ⚪ | 🔴 |
| 11 | ⚪ | ⚪ | ⚪ | 🔴 |
| 12 | ⚪ | ⚪ | ⚪ | 🔴 |
| 13 | ⚪ | ⚪ | ⚪ | 🔴 |

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: **303** | |
| --- | --- |
| **Choose an existing Subject Id** | -- select record -- ⌄ |
| | **+ Add new record** |

| Data Search | |
| --- | --- |
| **Choose a field to search**<br>(excludes multiple choice fields) | All fields ⌄ |
| **Search query**<br>Begin typing to search the project data, then click an item in the list to navigate to that record. | |

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** →

**No**
(ITHS, etc.)
↓

Talk to your host about account/project creation

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

**REDCap**  Home  My Projects  + New Project  Help & FAQ  Training Videos  Send-It  Messenger
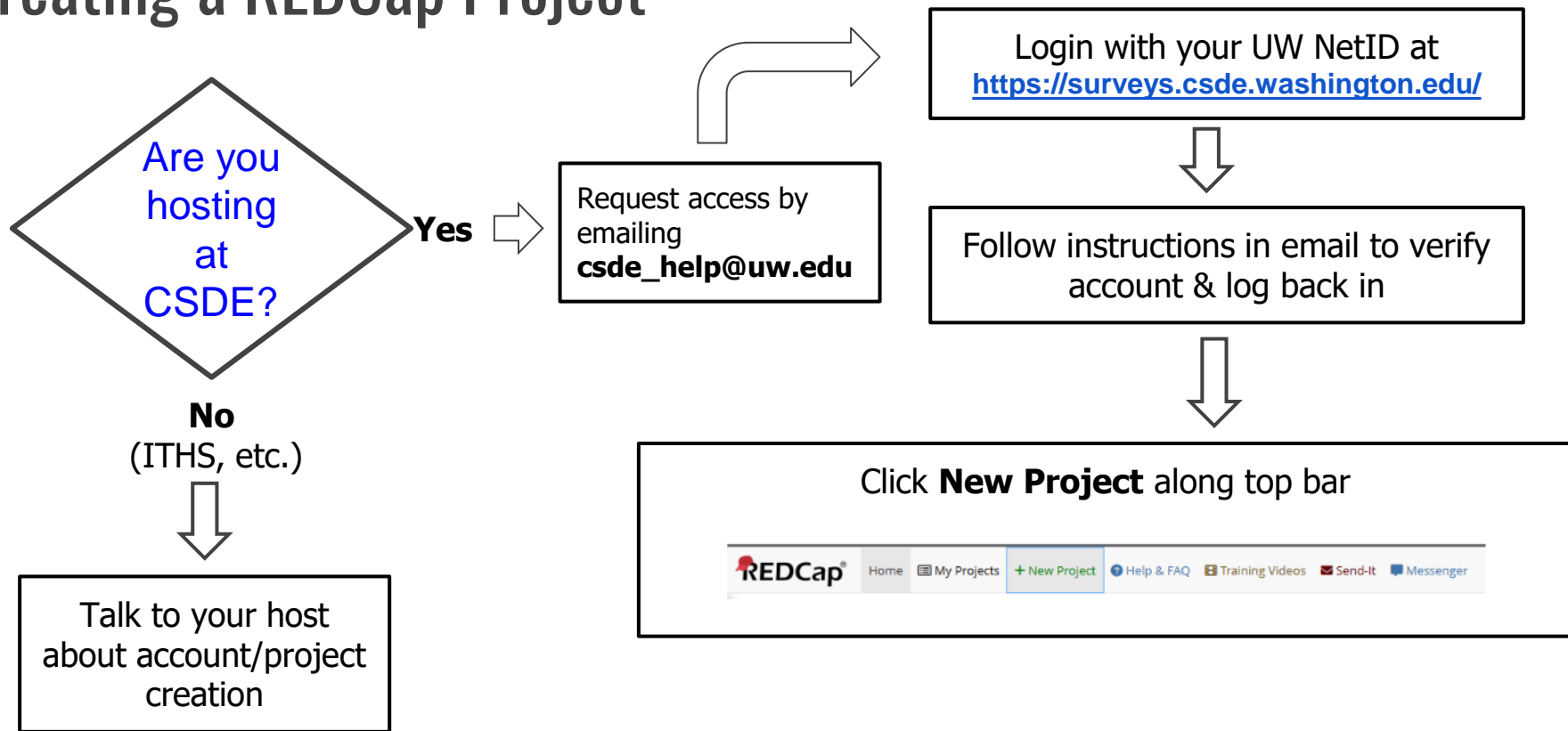
# Lab 1: Creating Your Account and a Project

- 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
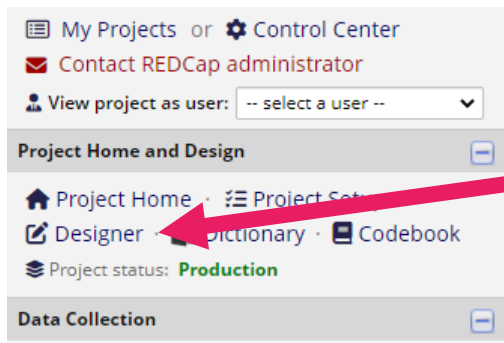
My Projects  or  ⚙ Control Center
✉ Contact REDCap administrator
👤 View project as user: ⌄ -- select a user --

**Project Home and Design** ⊟

🏠 Project Home · ⌸ Project Set
✏ Designer · ⌂ Dictionary · 📘 Codebook
📑 Project status: **Production**

**Data Collection** ⊟

🔧 **Design your data collection instruments**

✕ Not started

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

I'm done!

Go to  ✏ Online Designer  or  📊 Data Dictionary    Explore the  🧩 REDCap Instrument Library

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  √x 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

**Field Type** ✓ ---- Select a Type of Field ----
Text Box (Short Text)
Notes Box (Paragraph Text)
Calculated Field
Multiple Choice - Drop-down List (Single Answer)
Multiple Choice - Radio Buttons (Single Answer)
Checkboxes (Multiple Answers)
Yes - No
True - False
Signature (draw signature with mouse or finger)
File Upload (for users to upload files)
Slider / Visual Analog Scale
Descriptive Text (with optional Image/File Attachment)
Begin New Section (with optional text)
Dynamic Query (SQL)

| | Never | Rarely | Seasonally | Several times a month | At least once a week up to daily |
|---|---|---|---|---|---|
| Meat and/or seafood protein (beef, pork, lamb, poultry, fish, organ meats, processed deli meat, etc.) | ○ | ○ | ○ | ○ | ○ |
| | | | | | reset |
| Non-meat protein (tofu, other soy products, egg, beans, peas, etc.) | ○ | ○ | ○ | ○ | ○ |
| | | | | | reset |
| Grains, starches, and/or cereals (rice, potato, yam, corn, bread, pasta, grains, chips, crackers, etc.) | ○ | ○ | ○ | ○ | ○ |
| | | | | | reset |

- Plus Matrix fields

# Other form features

- You an 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

File   Home   Insert   Draw   Page Layout   Formulas   Data   Review   View   Automate   Help

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Variable / | Form Nam | Section He | Field Type | Field Label | Choices, Calculations, OR Slider Labels | Field Note | Text Valida | Text Valida | Text Valida | Identifi |
| 2 | record_id | demographics | | text | Record ID | | | | | | |
| 3 | dm_first_n | demographics | | text | First name | | | | | | |
| 4 | dm_last_n | demographics | | text | Last name | | | | | | |
| 5 | dm_dob | demographics | | text | Birthdate | | | date_mdy | | today | |
| 6 | dm_books | demographics | | checkbox | How do you read books? | 1, I read paper books \| 2, I read books on my phone/eReader/computer \| 3, I listen to audio books? \| 4, I don't read books | | | | | |
| 7 | dm_audio | demographics | | checkbox | When do you listen to audio books? | 1, In the car \| 2, On the bus or train \| 3, When walking or hiking \| 4, When running \| 5, In my home \| 6, At other times/places (explain below) | | | | | |
| 8 | dm_audio | demographics | | notes | Please elaborate on the other times/places you listen to audio books? | | | | | | |
| 9 | dm_tv | demographics | | yesno | Do you own a television? | | | | | | |
| 10 | lv_date | lab_values | | text | Today's date | | | date_mdy | | | |
| 11 | lv_sbp | lab_values | | text | Systolic blood pressure | | | integer | | | |
| 12 | lv_dbp | lab_values | | text | Diastolic blood pressure | | | integer | | | |
| 13 | lv_hrate | lab_values | | text | Heart rate | | per minute | number | | | |
| 14 | | | | | | | | | | | |

PaulsDemoProject_DataDictionary

Ready   Accessibility: Unavailable   Display Settings   100%

# 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 it's 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**

| Data Collection Instrument | Baseline | Week 1 | Week 2 | Week 3 |
|---|---|---|---|---|
| Demographics | ● | | | |
| Lab Values | ● | ○ | ● | ○ |
| Delete all data on event: | ✕ | | ✕ | |

# Repeating Instruments

- ❏ Using Project Setup page
  - ❏ Enable **Repeating Instruments and Events**
  - ❏ Decide which instruments are to repeat



Record ID **1**

| Data Collection Instrument | Status |
|---|---|
| Demographics | 🟢 |
| Lab Values | 🟢 + |

Repeating Instruments

| Lab Values (2) | | |
|---|---|---|
| 1 | 🟢 | 01-03-2023 |
| 2 | 🟢 | 02-03-2023 |
| | + Add new | |

# 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
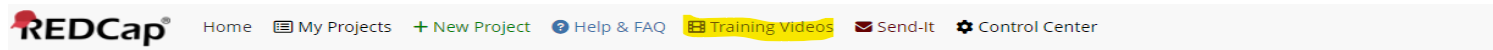
# Security

- 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…

# Training & Docs (2 of 2)

## 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 | Project Setup/Design | Data Collection Instrument Design | Data Entry/Collection | Communicating from REDCap | Applications |

| Making Production Changes | Optional Modules and Services |

Jump to a sub-section:   General   |   Licensing   |   Mobile Devices   |   Language Modules

## General

| How much experience with programming, networking and/or database construction is required to use REDCap? | ⌄ |
|---|---|
| Where can I suggest a new REDCap feature? | ⌄ |
| Can I still maintain a paper trail for my study, even if I use REDCap? | ⌄ |
| Can I transition data collected in other applications (ex: MS Access or Excel) into REDCap? | ⌄ |
| Is it possible to transfer a project to a different person? | ⌄ |

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