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REDCap is a tool for building online surveys and databases. No technical knowledge or prior experience is needed. Instructional text and prompts provide guidance at every step. REDCap is designed to be a quick and easy way to collect and manage almost any type of data.

This video illustrates REDCap's basic features and functionality. Jump to any topic, or watch the entire video to explore the lifecycle of a simple REDCap database project.

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REDCap projects are webpages built within the software and used to enter data. They can be used from anywhere, at any time, and on any device having internet access. REDCap is designed to be neutral. It can capture almost any type of data, and for any purpose.

REDCap was created in 2004 at Vanderbilt University. The software is now supported by a global consortium of non-profit organizations, and used for a wide range of data collection needs. You can learn more about the consortium at www.projectredcap.org. The consortium works actively to develop new features and functionality, based on feedback from users around the world. But each REDCap system is independent. Every consortium partner site personalizes their system to their local security policies and user needs. So always consult your organization's REDCap administrator for guidance about your system.

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Project creation begins by defining fundamental features, including the project title and purpose. Let's create a simple database project for an imaginary research study. There are two design options. These define the initial content of the data collection instruments. Those instruments are the data entry webpages. They reflect your work – whether it's a research study, a quality improvement project, a registration survey for a national conference, or any other type of work.

Starting from scratch is usually best if you have a good idea of what data you want to collect. For example, if you have a questionnaire or case report form already developed. Otherwise, consider using a template. This option is also good for new users. It creates your project with certain settings already enabled and some example questions already built on your project's data collection instruments.

No matter which design option you choose, REDCap is incredibly flexible. It allows changes to most settings at any time.

After creating the project, it opens immediately. This is the typical layout. Notice the project menu, title, and the main workspace.

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By default, the Project Setup tab is displayed immediately after project creation. This is a checklist of steps to help build and test your project. It's the homepage during project development. Steps can be completed in any order, and not all steps are required.

Notice the project status is "development". This means exactly what it sounds like. The project is being built and tested. It is critical to test everything, including data entry, imports and exports, and running searches or analyses. Development mode is the best time to test because all changes take effect immediately.

When ready to begin collecting real data, the project should be moved from development to production. This is the final step on the Project Setup tab.

The biggest difference between development and production is that production has additional data protections. In production, a couple of extra steps are required for certain changes. These steps allow REDCap to double-check if the changes might affect saved data. This prevents accidental data loss. Consult your local REDCap administrator for more detailed guidance about production mode.

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The Project Setup tab guides the project development process. REDCap is very powerful software. It can support a wide variety of data collection needs. So explore this tab thoroughly to determine which features apply to your work and which steps to complete.

Project development usually focuses on building data collection instruments. These instruments are the data entry webpages. They reflect your particular study or work. Customizing these instruments is central to project development.

Instruments are built using the Online Designer and Data Dictionary. Other videos explore these tools in more detail. Let's use the Online Designer to build this project for an imaginary research study.

One default instrument is here. Notice that The Online Designer defines what appears in the project menu's Data Collection section. The Designer creates the structure of these instruments. This is where to define what data to capture and how it will be stored and displayed.

Let's customize this instrument by creating questions about an imaginary research study. First, let's capture the study participant's name and contact information. Remember, the questions built here will be used later for data entry. REDCap calls these questions fields.

When adding fields, the Online Designer requires only two things - the field label and variable name. The field label is the actual question or descriptive text. It is displayed on the data collection instrument during data entry. The variable name is the key word from the field label. This name is used to store and analyze data, so keep it short and descriptive. Variable names are used in advanced features. They are not seen during data entry.

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Everything else in the popup is optional and can customize the appearance and use of this field. Explore all these extras to determine which features may benefit your work. For example, validation on text boxes ensures that a specific data format must be entered. This is a great way to control the quality of data, right at the point of data entry.

Let's add another question, to capture our study participant's gender. Notice that when using a multiple choice field, the software automatically applies numeric coding to the answer choices. For multiple choice questions, the text is displayed during data entry, but the data is saved as a number behind the scenes.

Next, let's add some fields to capture our study data, including our consent documentation and the results of a blood test.

Although I could put those questions on this instrument, let's instead create an entirely new instrument for the study data. This creates flexibility, especially for large study teams. Building separate instruments allows different people to access each one, more tightly controlling what people see and do in the project.

Almost any type of data can be collected in REDCap. The challenge is to explore which field types and other options work best for your needs. Test different types of questions in development mode. This is the best time to refine and finalize your instruments. So to test them, let's practice the data entry process.

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Project development focuses on building data collection instruments through the Online Designer and Data Dictionary. Those instruments appear in the menu's Data Collection section. This is where data is entered. Build and refine the instruments until you are ready to practice using them by entering some fake data.

Let's create a new record, and enter an imaginary study participant. At the top, the record number is displayed. The questions and data entry fields appear below. These fields look exactly as they were built in the Online Designer. Let's enter some fake data to practice the data entry process.

Project development is an iterative process. After building a few fields on your instruments, enter some practice data to test them out. Continue refining and testing the instruments until they work as needed.

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At the bottom of every data collection instrument is the default "form status" question. This defines how this record will be opened later. You can mark a record as "complete" even if some questions haven't been answered. Completed records can be edited at any time. This form status defines only that this saved record will appear in the "complete" dropdown box.

Let's open the record again, and test the instruments some more. We can move to the next data collection instrument to continue practicing. Notice that we are still entering data about this same record, but on a new instrument. As the instruments evolve, consider adding advanced features like validation and branching logic to enhance the data entry process. Development mode is the best time to test and refine your data collection strategy.

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Thorough testing is an important part of project development. Practicing data entry usually leads to changes on the data collection instruments. Exploring other features and applications can lead to similar changes. The Project Setup tab is a great place to begin exploring and testing the many optional extras and built-in applications.

For example, the User Rights tool is accessible through the Project Setup tab. It is also listed in the Applications section of the menu. These tools help manage project data. Testing the applications is just as important as practicing data entry.

The User Rights page controls project access. This tool is how to grant other people permission to use your project. Your study team and even colleagues at other institutions can help build and test your project. You have complete control over which features and data each user can see. This example database project illustrates the benefit of using multiple data collection instruments. Different permissions can be assigned to each instrument. This is often useful for tightly controlling user access.

REDCap enables you to define exactly what each user can do. It also has a complete audit trail, so you can track every user's activity. The Logging tool automatically documents every action by every user. It's another good application to explore during testing.

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REDCap is primarily a data collection tool. It focuses on ensuring quality data entry, fully customized to your needs. The Data Exports, Reports, and Stats tool performs simple searches and basic analysis on your dataset. It can also be used to save a copy of your data at any time.

Reports are searches. They are repeatable, real-time queries of your dataset. Reports can be run at any time. The export option saves any report in a format of your choosing. Complex analyses are often best run outside of REDCap, by exporting the data of interest and using a true statistical program. The analyses you plan to do should define how data is collected. Testing reports and exports while in development mode is critical.

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Testing a project lasts however long you wish. Ensure that your study team is comfortable with the data entry process and familiar with the features and applications used in management of your study data. Once ready to begin collecting real data, the project should be moved to production mode. This locks certain high-level settings and protects against data loss. The project still looks and functions as it did in development mode. Changes can still be made to the instruments through the usual methods. The project can continue to grow as your needs change. But notice that in production mode, changes no longer take effect immediately. There are a couple of extra button clicks, which ensure that no data is accidentally lost or modified.

Your local REDCap administrator may have additional guidelines for making production changes. As always, consult your local REDCap support team for additional guidance.