REVIEW ARTICLE

Epicollect5: A Free, Fully Customizable Mobile-based Application for Data Collection in Clinical Research

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Abstract

Meticulous data collection is indispensable for clinical research. Traditionally, data collection involves pen and paper materials, wherein the researcher enters data onto prespecified data collection forms. This method is cumbersome, time-consuming, and fraught with errors. With the advent of smartphone technology, it is now possible to use data collection applications for this purpose. In this review, we look at EpiCollect5, a free-to-use application that allows creation of fully customizable databases for use in clinical research.

Keywords: Applications, Data collection, Epicollect5, Mobile phone, Research, Smartphones.

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Introduction

We live in the era of smartphones; these fast-selling gadgets have entered all aspects of our lives. The mobile phone is no longer a device for communication alone; it is being used for entertainment, navigation, education as well as to access various social media platforms.[1] The dramatic advancement in mobile technology has also opened up new opportunities in the field of research and healthcare. Nowadays, a slew of mobile applications are available to provide up-to-date information to healthcare professionals. These include applications for drug dosages, drug interactions, calculators for various medical formulae, and data collection applications.

Perhaps the cornerstone of clinical research is meticulous data collection.[2] Traditionally, data collection has been confined to pen and paper methods; data is manually entered in prespecified data collection sheets and is then imported into computer-based spreadsheet software such as Microsoft Excel. Needless to say, this is time consuming, cumbersome, and fraught with errors. To overcome these problems, mobile-based platforms for data collection have gained popularity. Epicollect5 is one such application that is available free of cost. This application is both mobile and web based and was developed by Imperial College, London, and funded by Wellcome Trust.[3] It allows users to create customized forms and questionnaires for data collection. The data can be secured by means of password protection and is available to researchers in real time, on their smartphones or computers. Also, since the data storage is centralized on the Epicollect server, multiple users can work simultaneously on the same project. This application can be used for a wide variety of studies, including clinical trials, biodiversity surveys, and population and health studies.[4] In this review, we will briefly describe how Epicollect can be used to create fully customizable data collection forms.

Step 1: Getting Started

The Epicollect5 website can be found at http://five.epicollect.net. The mobile app named Epicollect5 can be downloaded from Apple or Android app stores . For logging into the web application of Epicollect5, one must sign in with a Google account. To begin with, a new project can be created by clicking on the CREATE PROJECT option (Fig. 1). The newly created project can have public or private access. The private access option allows only the creator and other specified users to have the access. Once the project is created, the project hyperlink (URL) can be found at top left corner (Fig. 2).

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Step 2: Designing Forms for the Project

The FORMBUILDER option is the heart of Epicollect, wherein the databases or questionnaire can be created from scratch and customized. Clicking on the FORMBUILDER option under the dashboard takes the user to a screen with 3 layouts that pop up. To the left are the inputs, in the middle column inputs are dragged and dropped, and in right column are the selected input settings (Fig. 3).

Epicollect5 provides an easy to use drag and drop form builder. To add questions, one can drag from the left column (Inputs) and drop it into the middle one. In settings panel on the right side, one can see the Properties, Advanced, and Jump options. To enter the question text, the user clicks on PROPERTIES and types in the desired text. This is what will be visible to the users on mobile or laptop screens.

Epicollect5 gives the user the versatility to add database questions in the form of dropdown lists, checkboxes, or radio buttons. Dropdown lists are easy to use if there are multiple options from which a correct response can be selected, check boxes are used in case multiple responses are to be allowed, and radio buttons

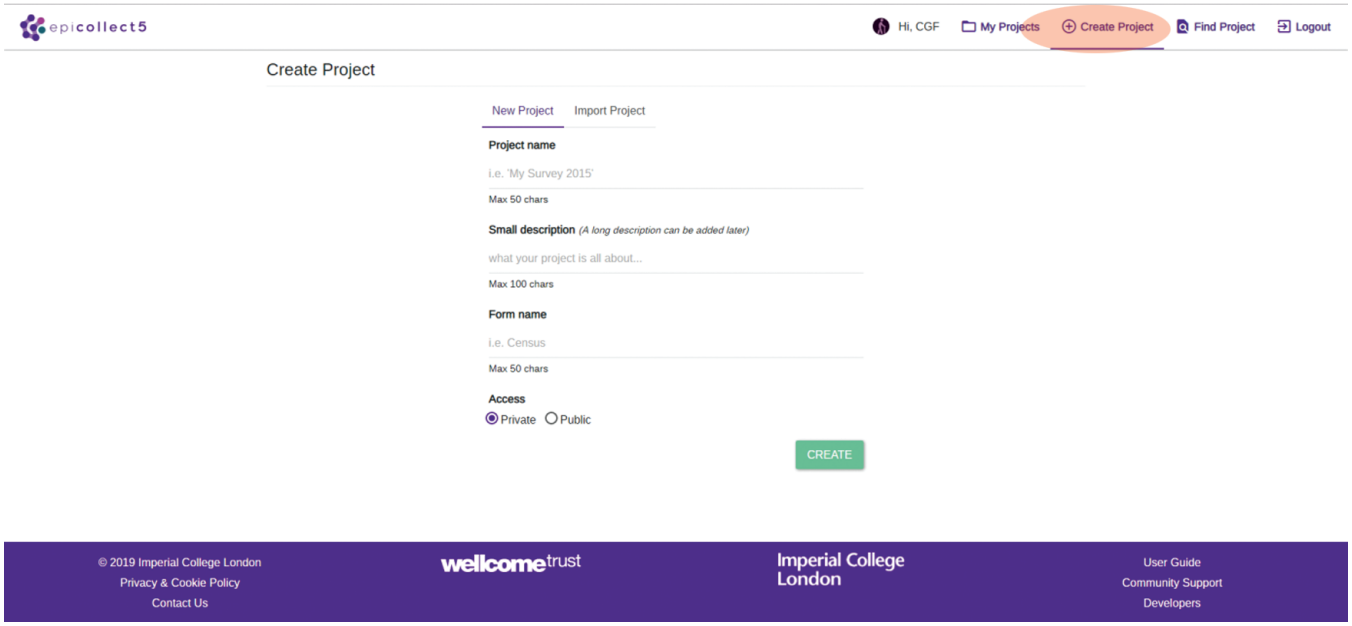

Fig. 1: Creating a new project in Epicollect5

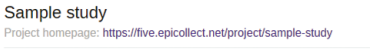

Fig. 2: The new project URL

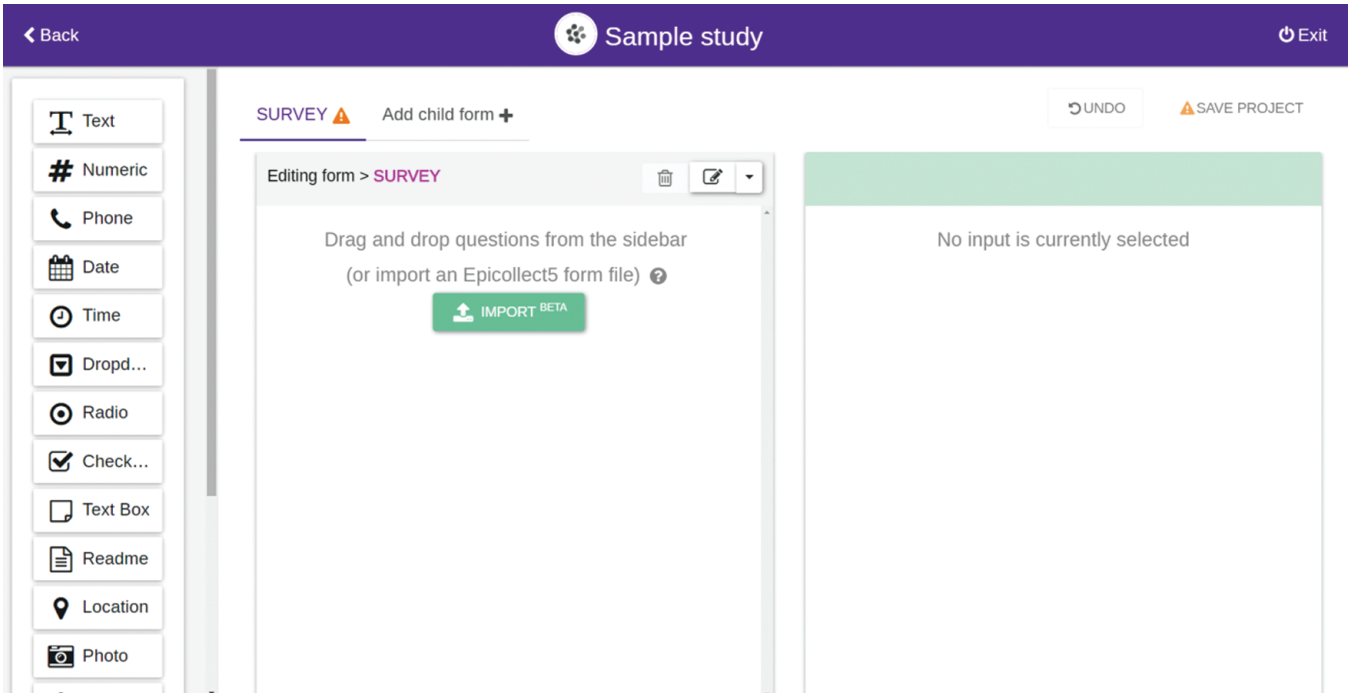

Fig. 3: The Epicollect5 Formbuilder

can be used for "yes/no" or other similar questions. Clicking on the "Add Answer" allows the user to modify the placeholder text with any desired text.

Questions are added to the form depending on the need of the study database and can be modified at any point of time. There is no limit on the amount of questions that can be added, and the application allows full customization.

Step 3: Sharing the Project with Others

Once all aspects of the database have been entered into the form, the project is ready for sharing. The project creator can decide who to share the project with, thereby permitting access. There are two levels of access, namely, the "creator" and the "collector" (Fig. 4). The creator has full access to the project details and can also make

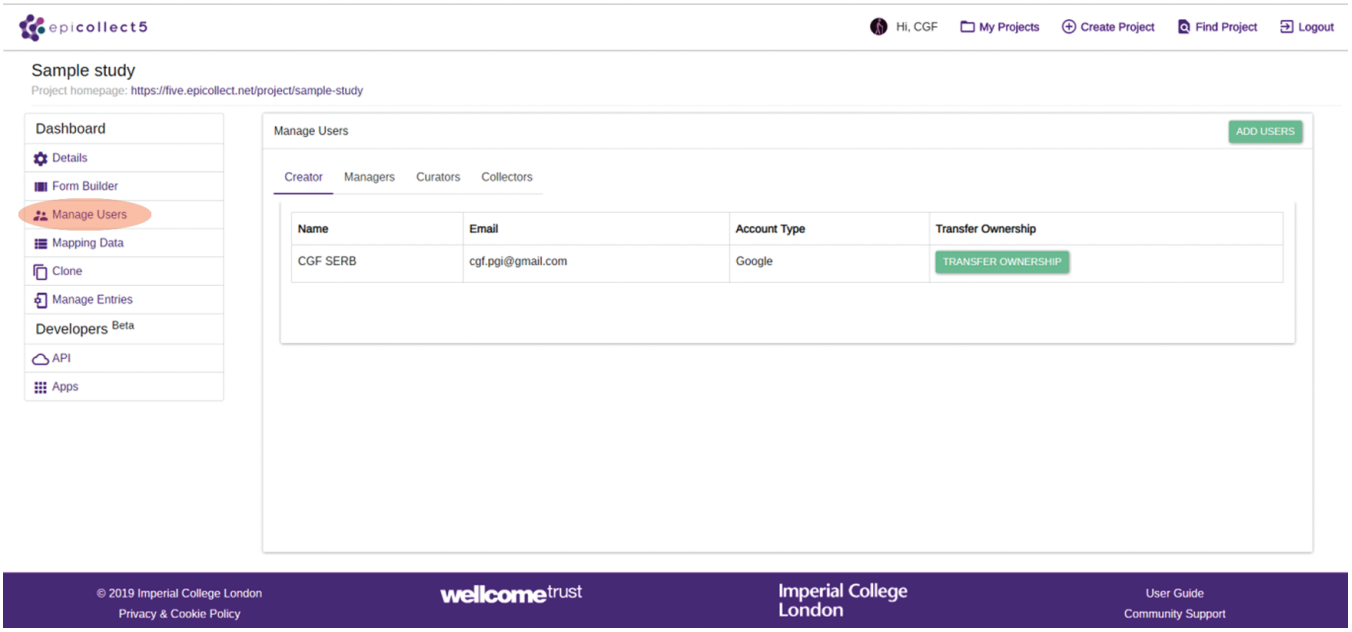

Fig. 4: Managing project users

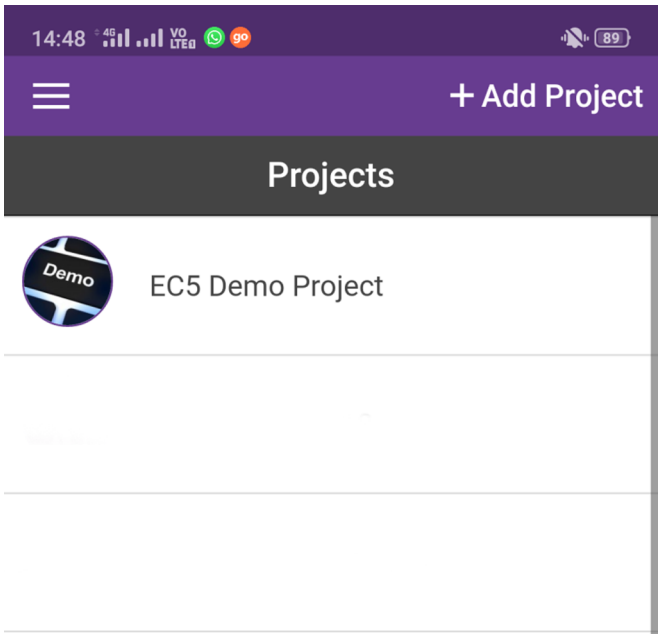

Fig. 5: The Epicollect5 mobile application

amendments to the form. However, the "collector" can only upload and view his data set and cannot make any sort of changes.

Step 4: Epicollect Mobile: Access to Data Collection Tool from Mobile Device

To use the Epicollect application, the user downloads the freely available application from the Google Play Store and installs it on his or her smartphone. Once this is done, the project that has been created can be downloaded on the smartphone device to collect data online or off-line. Projects can be added on the device by clicking on "Add project" on the app home page (Fig. 5). The user can search for their projects and download it. Once the project has been downloaded to the smartphone, data can be viewed and uploaded.

Quick Notes/Tips

- Data can be collected and stored on the smartphone off-line—when the user is back online, the information can be synchronized.
- Epicollect5 has set up a Google community for the discussion of issues pertaining to the web and mobile application.
- For the same screen display, questions within a group can be added.
- To skip questions based on the response to a particular question Jump tab can be used. For example, if there is a question, do you drink: Yes or No. If the answer is No, by applying Jump, the question gets skipped to the next question.
- The exported file can be opened or imported into spreadsheet in CSV format

Limitations

Although the Epicollect5 application is free of cost and allows the users to create fully customizable forms, it is not without its limitations. First, the number of options in a dropdown list is restricted to 300. Second, only a single question can be viewed on the screen at a time. Finally, a question text can only be up to 255 characters long. However, it should be noted that the application developers may address one or more of these limitations in future upgrades.

Conclusion

Paperless data entry is the future of clinical research and in future, perhaps all data collection will be paperless. Epicollect5 is one of the few freely available, fully customizable data collection applications that can work with smartphone as well as computer-based platforms. Researchers are encouraged to try paperless data collection applications such the one discussed in this review.

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