

Package ‘REDCapExporter’

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Title Automated Construction of R Data Packages from REDCap Projects

Version 0.3.1

Description Export all data, including metadata, from a REDCap (Research Electronic Data Capture) Project via the REDCap API
<<https://projectredcap.org/wp-content/resources/REDCapTechnicalOverview.pdf>>.
The exported (meta)data will be processed and formatted into a stand alone R data package which can be installed and shared between researchers. Several default reports are generated as vignettes in the resulting package.

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Encoding UTF-8

URL <https://github.com/dewittpe/REDCapExporter>,
<http://www.peteredewitt.com/REDCapExporter/>

Language en-us

LazyData true

Depends R (>= 3.5.0)

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Contents

as	2
build_r_data_package	3
col_type	4
example_data	6
export_content	8
export_core	9
format_record	10
read_text	11
REDCapExporter_keyring	11
write_description_file	12
Index	14

as	<i>as.*</i>
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Description

Coerce REDCapExporter objects to data.frame.

Usage

```
## S3 method for class 'rcer_raw_metadata'
as.data.frame(x, ...)
```

```
## S3 method for class 'rcer_raw_record'
as.data.frame(x, ...)
```

```
## S3 method for class 'rcer_raw_project'
as.data.frame(x, ...)
```

```
## S3 method for class 'rcer_raw_user'
as.data.frame(x, ...)
```

Arguments

x	any R object.
...	additional arguments to be passed to or from methods.

Details

These functions are S3 methods for `as.data.frame` for the raw exports from the REDCap API.

Examples

```
data("avs_raw_record")

avs_record <- as.data.frame(avs_raw_record)

str(avs_record)
```

build_r_data_package *Build R Data Package*

Description

Build a R Data Package from the core contents of a REDCap Project.

Usage

```
build_r_data_package(x, ...)

## S3 method for class 'rcer_rccore'
build_r_data_package(x, path = NULL, author_roles = NULL, verbose = TRUE, ...)

## Default S3 method:
build_r_data_package(
  x,
  uri = NULL,
  token = NULL,
  format = NULL,
  path = NULL,
  author_roles = NULL,
  verbose = TRUE,
  ...
)
```

Arguments

x	a rcer_rccore object
...	arguments passed to format_record
path	Path where the exported project source will be created/overwritten.
author_roles	a list naming specific roles for each user id found in the user table from an exported project. By default all users will be contributors ('ctb'). You will need to define a author/creator.
verbose	provide messages to tell the user what is happening
uri	The URI for the REDCap API. If NULL (default) the value <code>Sys.getenv("REDCap_API_URI")</code> is used.

token	The API token for the project you want to export from. If NULL (default) the value <code>Sys.getenv("REDCap_API_TOKEN")</code> is used.
format	The format to return. If NULL (default) the value <code>Sys.getenv("REDCap_API_format")</code> is used.

Details

To export the data from a REDCap project you will need to have an API Token. Remember, the token is the equivalent of a username and password. As such you should not list the token in plain text. Several alternative methods for passing the token to this method will be provided in examples and vignettes. We strongly encourage the use of the package secret <https://cran.r-project.org/package=secret> to build vaults to store tokens locally.

The initial export will consist of four pieces of data, the user data, metadata, project info, and records.

Examples

```
## Please read the vignette for examples:
## vignette(topic = "export", package = "REDCapExporter")

library(REDCapExporter)
# avs_raw_core <- export_core()
data(avs_raw_core)
tmppth <- tempdir()
build_r_data_package(avs_raw_core, tmppth, author_roles = list(dewittp = c("cre", "aut")))
fs::dir_tree(tmppth)
```

col_type

Column Types

Description

Define a type for each column of the records for a REDCap project based on the metadata for the project.

Usage

```
col_type(
  x,
  factors = TRUE,
  lubridate_args = list(quiet = TRUE, tz = NULL, locale = Sys.getlocale("LC_TIME"),
    truncated = 0),
  ...
)
```

Arguments

x	a rcer_metadata or rcer_raw_metadata object
factors	If TRUE (default) then variables reported via drop-down lists and radio buttons are set up to be factors. If FALSE, then the column type will be character.
lubridate_args	a list of arguments passed to the date and time parsing calls. See Details.
...	not currently used

Details

REDCap text fields for dates and times are formatted via lubridate

REDCap	lubridate parsing function
date_mdy	mdy
date_dmy	dmy
date_ymd	ymd
datetime_dmy	dmy_hm
datetime_mdy	mdy_hm
datetime_ymd	ymd_hm
datetime_seconds_dmy	dmy_hms
datetime_seconds_mdy	mdy_hms
datetime_seconds_ymd	ymd_hms
time	hm
time_mm_ss	ms

Other text files are coerced as

REDCap	R coercion
number	as.numeric
number_1dp	as.numeric
number_2dp	as.numeric
integer	as.integer
..default..	as.character

Variables inputted into REDCap via radio button or dropdown lists (multiple choice - pick one) are coerced to factors by default but can be returned as characters if the argument factors = FALSE is set.

Calculated and slider (visual analog scale) variables are coerced via as.numeric.

Yes/No and True/False variables are include as integer values 0 = No or False, and 1 for Yes or True.

Checkboxes are the most difficult to work with between the metadata and records. A checkbox field_name in the metadata could be, for example, "eg_checkbox" and the columns in the records will be "eg_checkbox___<code>" were "code" could be numbers, or character strings. REDCapExporter attempts to coerce the "eg_checkbox___<code>" columns to integer values, 0 = unchecked and 1 = checked.

Value

a rcer_col_type object

Examples

```
data("avs_raw_metadata")
col_type(avs_raw_metadata)
```

example_data

Raw Exports From an Example REDCap Project

Description

These data sets are the results of calling [export_content](#). An API token is required to reproduce these calls. No such token will be provided publicly, so these data sets are provided so end users can run examples for other tools provided in the REDCapExporter package.

Usage

```
avs_raw_project
avs_raw_metadata
avs_raw_user
avs_raw_record
avs_raw_core
avs_raw_project_json
avs_raw_metadata_json
avs_raw_user_json
avs_raw_record_json
avs_raw_core_json
```

Format

An object of class rcer_raw_project (inherits from character) of length 1.

An object of class rcer_raw_metadata (inherits from character) of length 1.

An object of class rcer_raw_user (inherits from character) of length 1.

An object of class rcer_raw_record (inherits from character) of length 1.

An object of class `rcer_rccore` of length 4.

An object of class `rcer_raw_project` (inherits from `character`) of length 1.

An object of class `rcer_raw_metadata` (inherits from `character`) of length 1.

An object of class `rcer_raw_user` (inherits from `character`) of length 1.

An object of class `rcer_raw_record` (inherits from `character`) of length 1.

An object of class `rcer_rccore` of length 4.

Details

`avs_raw_project` provides meta data about the project itself in a csv format. `avs_raw_project_json` is the same information in json format.

`avs_raw_metadata` is the data dictionary for the REDCap Project in a csv format. This information can be used with `format_record` to build a data frame that is ready for analysis. `avs_raw_metadata_json` is the same metadata information in json format.

`avs_raw_user` REDCap Project user table in csv format. `avs_raw_user_json` is the same information in json format.

`avs_raw_record` REDCap Project records, i.e., 'the data' in csv format. `avs_raw_record_json` is the same information in json format.

Examples

```
## Not run:
avs_raw_project <- export_content(content = "project", format = "csv")
avs_raw_metadata <- export_content(content = "metadata", format = "csv")
avs_raw_user <- export_content(content = "user", format = "csv")
avs_raw_record <- export_content(content = "record", format = "csv")
avs_raw_core <- export_core(format = "csv")

## End(Not run)

data(avs_raw_project)
data(avs_raw_user)
data(avs_raw_metadata)
data(avs_raw_record)
data(avs_raw_core)

str(avs_raw_project)
str(avs_raw_user)
str(avs_raw_metadata)
str(avs_raw_record)
str(avs_raw_core)

avs <- format_record(avs_raw_record, avs_raw_metadata)
str(avs)
```

export_content	<i>Export Content</i>
----------------	-----------------------

Description

Export specific data elements from REDCap

Usage

```
export_content(content, uri = NULL, token = NULL, format = NULL, ...)
```

Arguments

content	The element to export, see Details.
uri	The URI for the REDCap API. If NULL (default) the value <code>Sys.getenv("REDCap_API_URI")</code> is used.
token	The API token for the project you want to export from. If NULL (default) the value <code>Sys.getenv("REDCap_API_TOKEN")</code> is used.
format	The format to return. If NULL (default) the value <code>Sys.getenv("REDCap_API_format")</code> is used.
...	additional arguments passed to handle_setform .

Details

The content and format arguments are used to control the specific items to be exported, and in what format. ****Review the API documentation****

The uri, token, and format arguments are set to NULL by default and will look to the `Sys.getenv("REDCap_API_URI")`, `Sys.getenv("REDCap_API_TOKEN")`, and `Sys.getenv("REDCap_API_format")`, respectively, to define the values if not explicitly done so by the end user.

Value

The raw return from the REDCap API with the class `rcer_raw_<content>`.

Examples

```
# A reproducible example would require a REDCap project, accessible via an
# API token. An example of the return from these calls are provided as data
# with this package.

# avs_raw_metadata <- export_content(content = "metadata")
data(avs_raw_metadata)
str(avs_raw_metadata)
```

 export_core

Export Core

Description

Export Core Contents of a REDCap Project.

Usage

```
export_core(uri = NULL, token = NULL, format = NULL, verbose = TRUE, ...)
```

Arguments

uri	The URI for the REDCap API. If NULL (default) the value <code>Sys.getenv("REDCap_API_URI")</code> is used.
token	The API token for the project you want to export from. If NULL (default) the value <code>Sys.getenv("REDCap_API_TOKEN")</code> is used.
format	The format to return. If NULL (default) the value <code>Sys.getenv("REDCap_API_format")</code> is used.
verbose	provide messages to tell the user what is happening
...	not currently used

Value

A `rcer_rccore` object: a list with the project info, metadata, user table, and records, all in a "raw" format direct from the API.

Examples

```
# A reproducible example would require a REDCap project, accessible via an
# API token. An example of the return from these calls are provided as data
# with this package.
```

```
# avs_raw_core <- export_core()
```

```
data(avs_raw_core)
str(avs_raw_core)
```

format_record	<i>Format Record</i>
---------------	----------------------

Description

Use REDCap project metadata to build a well formatted data . frame for the record.

Usage

```
format_record(x, metadata = NULL, col_type = NULL, ...)
```

Arguments

x	a rcer_rccore, rcer_raw_record, or rcer_record object.
metadata	a rcer_metadata or rcer_raw_metadata object. Will be ignored if col_type is defined.
col_type	a rcer_col_type object.
...	other arguments passed to col_type

Value

A data.frame

See Also

[export_core](#), [export_content](#), [vignette\("formatting", package = "REDCapExporter"\)](#)

Examples

```
data("avs_raw_metadata")
data("avs_raw_record")

# Formatting the record can be called in different ways and the same result
# will be generated
identical(
  format_record(avs_raw_record, avs_raw_metadata),
  format_record(avs_raw_core)
)

avs <- format_record(avs_raw_record, avs_raw_metadata)
avs
```

read_text	<i>Read Text</i>
-----------	------------------

Description

Read raw REDCap API return. Built to parse csv or json.

Usage

```
read_text(x)
```

Arguments

x the raw return from the API call to REDCap

Details

This is a non-exported function and not expected to be called by the end user. Used by the `as.data.frame` methods.

Value

a `data.frame`

REDCapExporter_keyring	<i>Set up and use of a Keyring for REDCap API Tokens</i>
------------------------	--

Description

Tools for checking for, and setting up, a file based keyring for storing REDCap API tokens.

Usage

```
REDCapExporter_keyring_check(keyring = "REDCapExporter", password = NULL)
```

```
REDCapExporter_add_api_token(
  project,
  keyring = "REDCapExporter",
  user = NULL,
  password = NULL,
  overwrite = FALSE
)
```

```
REDCapExporter_get_api_token(
  project,
```

```

keyring = "REDCapExporter",
user = NULL,
password = NULL
)

```

Arguments

keyring	a character vector identifying the name of the keyring, defaults to "REDCapExporter"
password	This is the password for the keyring. The default is an empty password.
project	the name of the REDCap project the API token is identified by.
user	user name to associate the token with. Defaults to Sys.info()[["user"]].
overwrite	logical, if TRUE overwrite the existing token.

Value

REDCapExporter_keyring_check returns TRUE, invisibly, as does REDCapExporter_add_api_token. REDCapExporter_get_api_token returns the token invisibly as not to print the value to the console by default. Still, be careful with your token.

See Also

```
vignette(topic = "api", package = "REDCapExporter")
```

Examples

```

## Not run:
# Check if a keyring exists. If it does not, create one.
REDCapExporter_keyring_check()

# add token if it does not already exist. If a token
# already exists, then you will be told so unless overwrite is set to TRUE
REDCapExporter_add_api_token("Project1")

# get a token and set as an environmental variable
Sys.setenv(REDCap_API_TOKEN = REDCapExporter_get_api_token("Project1"))

## End(Not run)

```

```
write_description_file
```

Write DESCRIPTION File from REDCap Metadata

Description

Create the DESCRIPTION file for the R Data package based on an Exported REDCap Project

Usage

```
write_description_file(access_time, user, roles, project_info, path)
```

```
write_authors(user, roles = NULL)
```

Arguments

<code>access_time</code>	The <code>Sys.time()</code> when the API calls were made
<code>user</code>	User(s), as noted in the REDCap project meta data. This parameter is singular as it refers to the "user" content one can access from the REDCap API.
<code>roles</code>	roles the user hold with respect to the R data package. These roles have no relationship to REDCap roles.
<code>project_info</code>	project metadata
<code>path</code>	path to the root for the generated R data package.

Details

This is a non-exported function and is not expected to be called by the end user.

`write_description_file` creates the DESCRIPTION file for the exported R data package and `write_authors` creates the "Authors@R" field of the DESCRIPTION based on the "user" data extracted from the REDCap project.

Index

- * **datasets**
 - example_data, 6
- as, 2
- as.data.frame, 2
- avs_raw_core (example_data), 6
- avs_raw_core_json (example_data), 6
- avs_raw_metadata (example_data), 6
- avs_raw_metadata_json (example_data), 6
- avs_raw_project (example_data), 6
- avs_raw_project_json (example_data), 6
- avs_raw_record (example_data), 6
- avs_raw_record_json (example_data), 6
- avs_raw_user (example_data), 6
- avs_raw_user_json (example_data), 6

build_r_data_package, 3

col_type, 4, 10

dmy, 5

dmy_hm, 5

dmy_hms, 5

example_data, 6

export_content, 6, 8, 10

export_core, 9, 10

format_record, 3, 7, 10

handle_setform, 8

hm, 5

mdy, 5

mdy_hm, 5

mdy_hms, 5

ms, 5

read_text, 11

REDCapExporter_add_api_token
(REDCapExporter_keyring), 11

REDCapExporter_get_api_token
(REDCapExporter_keyring), 11

REDCapExporter_keyring, 11

REDCapExporter_keyring_check
(REDCapExporter_keyring), 11

write_authors (write_description_file),
12

write_description_file, 12

ymd, 5

ymd_hm, 5

ymd_hms, 5