



REDCap External Modules

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Agenda



- Some History
 - Jargon busting: DETs, plugins, hooks, ...
 - Enter External Modules
- Finding and Deploying External Modules
- Some Cool (IMO!) Examples
- Anatomy of an External Module
 - What's under the skin
 - A simple example



A timeline of REDCap's customisation capabilities (and jargon buster!)

2010	2011	2012	20	013 1	2014	2015	2016	2017		2018	2019
API v3.3.0 Sep 2010	Data v5.0. Dec 2	-	er	v5.5	gin Methods 5.0 2013	Extens v5.8.0 Jan 20		V	Extern /8.0.0 Nov 20		les
External applications can connect to REDCap via HTTP requests Programmatic- ally retrieve or modify data or settings	reque whene survey create (any f URL ca exterr a plug	a HTTP Post st to a URL ever a record response is ed or modifie orm or surve an be of an hal system of in page on t REDCap serv	ed ey) r of he	for r data sett havi abou back data strue inte	t-in functions retrieving a or project ings without ng to know ut REDCap's k-end abase cture or rnal hods/classes	Specific which c can be Add add HTML, s JavaScr or perfe	style, ript to pages orm nal actions	F P C f e U V a	backag olugin/ Contro unctic easy in upgrad vithou access	work for ing custor hook cod Center nality ena stallation e for adm t back-en	e abling and nins d

Before External Modules



- API, DET, plugin methods, hooks provided large degree of customisability.
- Customisability became a key strength of REDCap:
 - A behaviour not to your liking? Change it!
 - A new, unusual requirement? Build it!
 - Better fitting institutions' specific needs.
- BUT!
 - Installation and maintenance requires administrator to have server access (or a responsive IT dept!)
 - Discovery and availability limited to Consortium users
 - Mechanisms for support and troubleshooting, and for release of fixes and new versions were "informal"

🎥 server - luke@redcap-test.mcri.edu.au - WinSCP	- 🗆 ×	
Local Mark Files Commands Session Options Remote	Help	
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📮 luke@redcap-test.mcri.edu.au 🗙 🚅 New Session		
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t	<u>t</u>	
global	global	
pid103	pid9	
pid105	pid33	
pid107	pid544	
pid110	pid650	
pid118 Piuke@t-redcap-01v:/site/redcap/mcri/hool	ks/server — 🗆 🗙	<u>, </u>
pid119		<u>`</u>
pid12 [luke@t-redcap-01v /]\$		^
pid121 [luke@t-redcap-01v /]\$ cd /site/ [luke@t-redcap-01v server]\$ 1s -		
pid122 total 324	-1	
pid123 drwxrwxr-x 2 luke luke 4096 Jun	15 2018 global	
pid125 drwxrwxr-x 3 luke luke 4096 Jun		
pid130 drwxrwxr-x 2 luke luke 4096 Jun	19 2017 pidl413	
pid131 drwxrwxr-x 2 luke luke 4096 Jun		
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pid138 drwxrwxr-x 2 luke luke 4096 Jun		
pid16 drwxrwxr-x 2 luke luke 4096 Jun		
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drwyrwyr y 2 luke luke 4096 Jun	19 2017 mid2304	h.d.





- The "External Modules Framework" as a core component of REDCap does not actually extend the customisation potential!
- But does bring major benefits to both developers and institution administrators:
 - Standardising how customisations are developed (class inheritance) and configured (config.json).
 - Formalising how code is packaged and released i.e. using GitHub repositories and releases. <u>https://github.com/topics/redcap-external-module</u>
 - Facilitates sharing and discovery via the REDCap Repo.
 - Makes installation and upgrading easy from the REDCap Control Center - no server access required.
- Spreads the benefits of consortium members' creativity and inspiration to all.



Discovering and Deploying Modules

- Discovery
 - Control Center \rightarrow External Modules \rightarrow View REDCap Repo
 - Mentions in Consortium forum
- Deploying
 - Download and install via REDCap Repo
 - No warranty! Dev/Test environment first, not Production!
 - Pilot in one or two projects before making discoverable
- Production Configuration
 - Enable on all projects by default
 - Make discoverable by users
 - Module configuration permissions

Require Project Setup/Design privilege 🗸

Cancel Save



Answer by andy.martin · May 01 at 02:53 AM For the record., the survey ui tweaks em offers this option in probably the easiest configuration.

Enable module on all projects by default:

Make module discoverable by users:

Display info on External Modules page in all projects:

Module configuration permissions in projects:

individually:

order to do so:

Unchecked (default) = Module must be enabled in each project

By default, users with Project Setup/Design privileges can modify this

can be given explicit module-level permission (via User Rights page) in

module's project-level configuration settings. Alternatively, project users

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📩 View modules available in the REDCap Repo

= 2 control_group_data group data Control group data Image: Control group data Image: Control data Image: Control grou	1.2	2. Branchin	g logic:
Control common	-		
ntervention group Common	cc		ıp_data
		group	
	۲		۲
		۲	۲
	۲		۲
		۲	۲

Different forms by randomised allocation

- Randomisation allocation, randalloc, is the "Control field".
- Form "Intervention group data":
 - Show only when randalloc = '1', Intervention
- Form "Control group data":
 - Show only when randalloc = 2^{\prime} , Control
- No longer need to use "arms" or in-form message for "This form is not required".
- Can still import data or access via URL edit.
- Note that event settings do not get copied when copying project with EM settings:
 - Event IDs from source project are invalid in the copy

Cool Example #1: Form Render Skip Logic institute 1. Field: randalloc - Randomised allocation 1. Default/fallback value: 1.1. Branching logic: 1.1. Condition: 1.1.1. Target forms: intervention_group_data 1.1. Restrict this rule to specific events: 1.2. Condition: 1.2.1. Target forms: Record ID Randomisation 1 Intervention 2 Control 3 Intervention

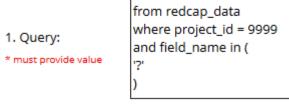
4 Control



Cool Example #2: MySQL Simple Admin

Production change with "critical" issues

- Sometimes we can see there is not likely to be any problem in approving a change containing "critical issues", e.g.
 - Affected record(s) look like test/dummy
 - Project title contains e.g. "Copy"/"Test"/"Practice"
- Module configuration enables saving a query.
 - Plug in project_id and field_name(s) and run.
 - Obtain listing of affected records and values.
 - Confirm the changes.
 - Include results in the confirmation message to the user:
 "here is the data you lost..."
- (Module allows read-only queries only)



select *

Fields to be DELETED:

1. Title:

* must provide value

parent_pi_postcode "Postcode" (1 records affected)

Custom Queries:	Query:	
Prod changes data affected Recent project activity (redcap log event) Recent user activity (redcap log event) Recent user activity (redcap log view) Users and roles by project	select * from redcap_data where project_id = 380 and field_name in ('parent_pi_postcode'	5
REDCap database tables:) Execute	

<pre>select * from redcap_data where project_id = 3805 and field_name in ('parent_pi_postcode') limit 0,500</pre>					
project_id	event_id	record	field_name	value	instance
3805	12214	1	parent_pi_postcode	1234	NULL

1. Custom SQL Queries:

Prod changes data affected

Admin Dashboard

- Built-in and custom SQL queries
- Survey UI Tweaks

- Customise button wording (useful for aut
- Hide the "question number" space!

Instance Table

- Descriptive text field with table of data 1 and repeating event/form instances
- DAG Switcher
 - Enable users to switch between Data Access Groups (or to "No assignment")

Admin Dashboard

Projects by Use	er 😩 Users by Project 🛛 🕹 Researd	ch Projects 🥜 🌶 Development Pro	jects 🖻 🖕	All Projects	
Projects with Ex	xternal Modules 🛛 👂 Credentials Check	(Fields)			
Settings			🛓 Export C	SV File	•
	List of External Modules and	the projects they are enabled in.			
Module Title 🔶	Project Titles 🗢	User Emails	¢	Total Projects	¢
annotated crf	PPOIT-3 Study Phase REDCap II: Training Project (Demonstration)		^	2	



Honourable Mentions

- Admin Dashboard
 - Built-in and custom SQL queries
- Survey UI Tweaks
 - Customise "Submit" wording (useful for auto-continue)
 - Hide the "question number" space!
- Instance Table
 - Descriptive text field with table of data from repeating event/form instances
- DAG Switcher
 - Enable users to switch between Data Access Groups (or to "No assignment")

Survey 1		Resize font:
S1Q1		
	Next Page >>	



Resize font:

Survey		
S1Q1		
	Submit	
iue)		

(Not so) Honourable Mentions

- Admin Dashboard
 - Built-in and custom SQL queries
- Survey UI Tweaks
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- DAG Switcher*
 - Enable users to switch between Data Access G (or to "No assignment")

Repeating Instruments



🛯 Instance Tables

						Data Access 0	iroup: DAG1 ?
	🥜 Editi	ng existing Record ID DA	G1-001				
	Even	t Name: Baseline					
r	Record	ID			DAG1-001		
	Repeati	ng Forms					
	Table of	f repeating form instan	ces: Non-schedul	e/Contact Log			
	Show 1	0 🗸 entries				Search:	
	A					Results of	
	#	Date/time of contact attempt	Contact made by	Purpose of contact	Specify other purpose	contact attempt	Form Status
	1	2018-05-07 20:10	Alice (1)	Arrange visit (1)		Success - spoke with P1	۲
	2	2018-05-12 15:05	Bob (2)	Other (specify) (9)	Check some info re. appointment	Line engaged	۲
5	3	2018-06-07 15:05	Alice (1)	Arrange visit (1)		Visit 2 arranged	۲
נ	<u>4</u>	2019-03-08 14:05	Alice (1)	Other (specify) (9)	test	success? "almost"	۲
	Showing	g 1 to 4 of 4 entries				Previous	1 Next
-	🕀 Ado	l new					

* Author Luke Stevens

(Not so) Honourable Mentions

- Admin Dashboard
 - Built-in and custom SQL queries
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 - Enable users to switch between Data Access Groups (or to "No assignment")

A	Users			
Data Access Groups	Irdemo	Irtest	luke.stevens	luke1
[No Assignment]				
Site A		\checkmark		\checkmark
Site B				
Site C				

0	Current Data Access Group:	Site A	Switch	
Switch Da	ata Access Group			×
Select the D	DAG to switch to:			
Site C				•
			Cancel	Ok



Anatomy of an External Module

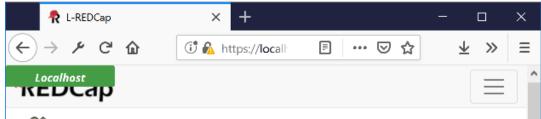
config.json

1	-	{
2	T	"name": "Demo Module",
3		"description" "Demo for SLHD REDCap Day 2019",
4		"namespace": "MCRI\\DemoModule",
5	¢	"authors": [
6	占	
7	Т	"name". "Luke Stevens",
8		"email". "luke.stevens@mcri.edu.au".
9		"institution" "Murdoch Children's Research Institute"
10	F	}
11		
12	F],
13	ģ	"permissions": [
14		"redcap_every_page_top"
15	-	1,
16		<pre>"enable-every-page-hooks-on-system-pages": true,</pre>
17	¢	"links": { },
18	户 曱	"no-auth-pages": [],
19	Ę.	"system-settings": [
20	白	ſ
21		"key": "button-label",
22		"name": "Button Label",
23		"type": "text",
24		"required": true
25	F	},
26	P	{
27		"key": "button-url",
28		"name": "Button URL",
29		"type": "text",
30		"required": true
31		}
32	上],
33	P	"project-settings": []
34		}

DemoModule.php

9		php</th					
2	+	/** REDCap External Module: Demo Module5 lines */					
7		namespace MCRI\DemoModule;					
8		use ExternalModules\ <mark>AbstractExternalModule</mark> ;					
9		class DemoModule extends AbstractExternalModule					
10	Ģ	{					
Â		<pre>public function redcap_every_page_top(\$project_id) {</pre>					
12	¢.	<pre>if (strpos(PAGE, 'ExternalModules/manager/control_center.php') > 0) {</pre>					
13		<pre>\$btnLbl = \$this->getSystemSetting('button-label');</pre>					
14		<pre>\$btnUrl = \$this->getSystemSetting('button-url');</pre>					
15		?>					
16	þ	<pre><button class="btn btn-info btn-sm" id="demo-module-button"></button></pre>					
17							
18		php echo \$btnLbl;?					
19							
20	白	<style type="text/css"></td><td></td></tr><tr><th>21</th><td></td><td><pre>#demo-module-button { display: none; margin-left:5px; }</pre></td><td></td></tr><tr><th>22</th><td></td><td></style>					
23	白	<script type="text/javascript"></td><td></td></tr><tr><th>24</th><td>þ</td><td><pre>\$(document).ready(function() {</pre></td><td></td></tr><tr><th>25</th><td></td><td><pre>\$('#demo-module-button')</pre></td><td></td></tr><tr><th>26</th><td>白</td><td>.on('click', function() {</td><td></td></tr><tr><th>Â</th><td></td><td><pre>window.open('<?php echo \$btnUrl;?>', '_blank')</pre></td><td></td></tr><tr><th>28</th><td></td><td>})</td><td></td></tr><tr><th>29</th><td></td><td>.insertAfter('#external-modules-download-modules-button')</td><td>1</td></tr><tr><th>30</th><td></td><td>.show();</td><td></td></tr><tr><th>31</th><td></td><td>});</td><td></td></tr><tr><th>32</th><td></td><td></script>					
33		php</td <td></td>					
34		}					
35		}	13				
36		}	1 J				

Anatomy of an External Module

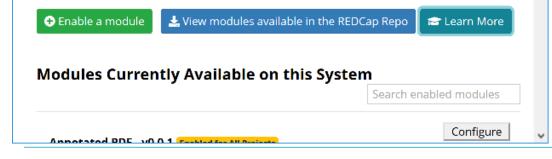




Set custom text for Project Module Manager page

External Modules are individual packages of software that can be downloaded and installed by a REDCap administrator. Modules can extend REDCap's current functionality, and can also provide customizations and enhancements for REDCap's existing behavior and appearance at the system level or project level.

You may click the "View modules" button below to navigate to the REDCap Repo (Repository of External Modules), which is a centralized catalog of curated modules that have been submitted by various REDCap partner institutions. If you find a module in the repository that you wish to download, you will be able to install it, enable it, and then set any configuration settings (if applicable). If you choose not to enable the module in all REDCap projects by default, then you will need to navigate to the External Modules page on the left-hand menu of a given project to enable it there for that project. Some project-level configuration settings, depending on the module, may also need to set on the project page.



- Write button HTML to page
- Write style settings to page
- Write JavaScript function to page
 - Attach click handler to button
 - Move the button to where we want it
 - Unhide it
- Click the "Learn More" button and a new tab opens with the page you specify in the module configuration.
- Full documentation by Vanderbilt available at <u>https://github.com/vanderbilt/redcap-external-</u> modules/blob/testing/docs/official-documentation.md
- Look at modules' GitHub repositories for patterns to use in your own.



Thank you. Any questions?

And thanks to the REDCap team at Vanderbilt University		
Title: Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support		
Author: Paul A. Harris,Robert Taylor,Robert Thielke,Jonathon Payne,Nathaniel Gonzalez,Jose G. Conde		
Publication: Journal of Biomedical Informatics		
Publisher: Elsevier		
Date: April 2009		
DOI: https://doi.org/10.1016/j.jbi.2008.08.010		