



CIVET  
Contentious Incident Variable Entry Template  
- - - DRAFT - - - \*

Philip A. Schrodt  
Parus Analytics  
Charlottesville, VA  
schrodt735@gmail.com

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# 1 Introduction

This is the documentation for the beta version of the CIVET<sup>1</sup>—Contentious Incident Variable Entry Template—customizable data entry system. CIVET is being developed by the NSF-sponsored project titled “A Method for Leveraging Public Information Sources for Social Science Research” which is creating tools to improve the efficiency of data generation in the social sciences. The project has an initial focus on coding event data in the domain of contentious politics, but we expect that these tools will be relevant in a number of data-generation domains.

The core objective of CIVET is to provide a reasonably simple—yes, simple—set of commands that will allow a user to set up a web-based coding environment without the need to master the likes of HTML, CSS and Javascript. As currently implemented, the system is a rather ugly prototype; it will also be evolving as we add additional elements. Nonetheless, the system should now be useable for coding.

CIVET is implemented in the widely-used and well documented Python-based Django system<sup>2</sup> which is widely available on various cloud platforms: a rather extended list of “Django-friendly” hosting services can be found at

<https://code.djangoproject.com/wiki/DjangoFriendlyWebHosts>

The complete CIVET code is licensed as open source under the MIT license and provided on GitHub at <https://github.com/civet-software>.

CIVET currently has two modes:

**Coding form template:** This is a template-based for setting up a web-based coding form which implements several of the common HTML data entry formats and exports the resulting data as a tab-delimited text file. This is fully functional and should be useable for small projects.

**Text annotation/extraction:** This uses CIVET “workspaces” which combine related texts, their metadata, and the coding form. Workspaces allow for manual and automated text annotation, then the ability to extract various types of information into the fields of a coding form.

We are very interested in feedback on this system, including any bugs you encounter (please let us know what operating system (e.g. Windows, OS-X) and browser (e.g. FireFox, Explorer, Chrome) you were using), aspects of the manual that are unclear (and features that appear too complex), and additional features that would be useful. Please send any suggestions to [schrodt735@gmail.com](mailto:schrodt735@gmail.com).

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<sup>1</sup><http://en.wikipedia.org/wiki/Civet>

<sup>2</sup>An earlier prototype was implemented in the Flask framework: see Appendix 3

## 2 Installing CIVET

To date we've only installed the system on Macintosh computers, though the only difference between a Macintosh installation and other installations should be the installation of the Django system.

On Macintoshes running OS-X 9 and 10, the required Python 2.7 comes pre-installed. The `pip` installation program may also be pre-installed—I'm having trouble determining this from the Web, and forget whether I had to install it when I last upgraded—but if not, install that.

1. In the Terminal, run `sudo pip install Django`: you will need administrative access to do this.
2. Download the CIVET system from <https://github.com/civet-software/CIVET-Django>, unzip the folder and put it wherever you would like
3. In the Terminal, change the directory so that you are in the folder *Django-CIVET/djcivet\_site*
4. In the Terminal, enter `python manage.py runserver`
5. In a browser, enter the URL [http://127.0.0.1:8000/djciv\\_data/](http://127.0.0.1:8000/djciv_data/)

At this point you should see the CIVET home screen shown in Figure 1

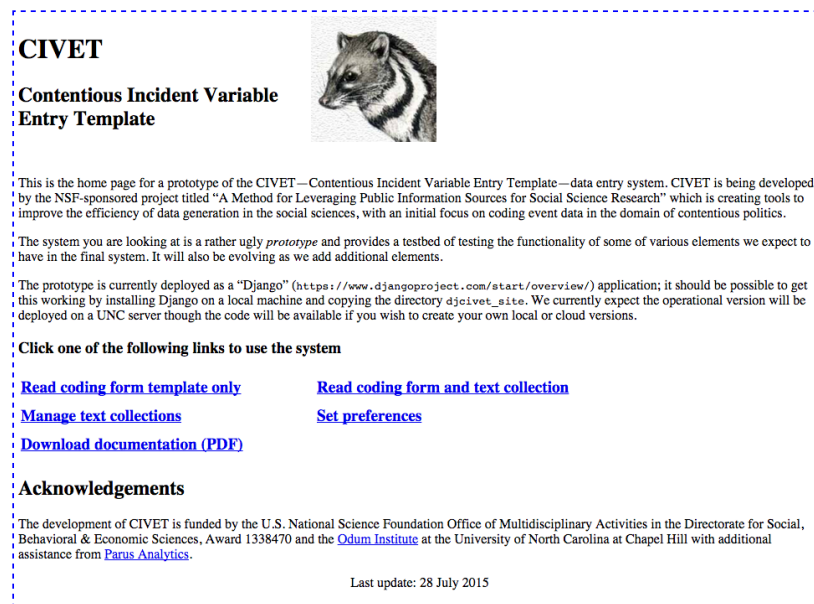


Figure 1: CIVET home screen

### 3 Home Page Options

The home page has the following links:

**Read coding form:** CIVET reads a coding form template without using a workspace: this is used if you want to use the web coding form without annotated texts. This option can also be used when debugging coding forms. Further instructions for the template-only mode are given in Section 4.

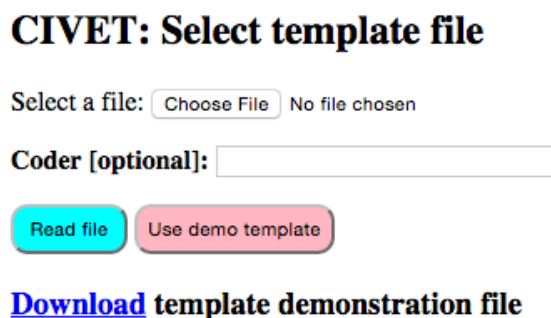
**Read workspace:** CIVET reads a set of text collections and their associated coding form from a zipped file: this mode allows for text annotation and extraction and is described in more detail in Section 5, 10 and 11.

**Manage workspace:** This links to various utilities that operate on workspace files (Section 5) including downloading the coded data as a tab-delimited file, editing the meta-data, and adding comments to the file. [Beta 0.7: only the data download is implemented]

**Set preferences:** This goes to a page where various program preferences can be set manually. [Beta 0.7: not currently implemented]

**Download documentation:** This downloads a PDF file with the current documentation.

The first three modes go to a file selection screen similar to Figure 2.



**CIVET: Select template file**

Select a file:  No file chosen

Coder [optional]:

[Download](#) template demonstration file

Figure 2: CIVET file selection screen

This provides the following options:

**Choose file:** Select a file containing a coding form template or workspace, then read this into the system by clicking the **Read file** button.

**Coder:** Any text entered here—typically a coder name or ID—will be included as metadata with any annotations or cases coded. This field is optional.

**Demo file:** Read the simple demonstration files built into the system.<sup>3</sup>

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<sup>3</sup>These files are named `CIVET.demo.template.txt` and `CIVET.extract.demo.zip` in the directory `djcivet_site/djciv_data/static/djciv_data/` and can be modified there.

**Download demonstration file:** This downloads a template or workspace demonstration file, which can be used as an example.

### 3.1 Program Navigation Placeholders

CIVET is currently under development and not all of the options have been fully implemented. If you see a page with a message of the form

The option ‘‘[something]’’ has yet to be implemented.

Use the back arrow in your browser to return to the previous screen.

you have encountered one of those options: as noted, just use the “Back” option in your browser to return to the previous screen.

## Download CIVET data:

Enter name of output file:

[" .txt" suffix will automatically be added]

To continue, use one of the following links:

- [Start new data file](#)
- [Continue coding](#)
- [Return to home page](#)

To quit, just close the window

Figure 3: CIVET Data download page

## 4 Simple Template-Based Data Entry Form

The basic data entry form just uses the presumably familiar standard HTML data entry fields and should be self-explanatory. The instructions for setting up a form are discussed in Section 4.

To save a set of coded fields, click one of the buttons which follow the title **Options after saving**:

**Code another case:** Save, then return to the same form

**Download data:** Save, then download data as a tab-delimited text file

The “Download CIVET data” page (Figure 3) provides a text box for a file name, and the **Download file** button downloads the coded data. Use the *Start new data file* link to restart the coding and the *Continue coding with this file* link to continue adding to the existing records.

- The .txt file is tab-delimited and contains the variable names in the first line.
- If the file name does not end in “.txt,” this suffix will be added.

To quit the program, just close the window.<sup>4</sup>

## 5 CIVET Workspaces

CIVET is part of a projected collection of open-source programs designed to work with very large sets of small text files: in the domain of contentious politics these are usually news articles but the issue of managing very large databases of small texts extends well beyond

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<sup>4</sup>This, it turns out, is a HTML/Javascript security feature which prevents rogue websites from closing windows unless they have created the window.

this application. For example, projects analyzing texts from legislative debates, legislation, campaign web sites and blogs all have much the same character when they are studied at a large scale.

In the CIVET system, files containing sets of individual stories are called “collections”: these are typically multiple related news stories—“texts”—from which one or more data records—“cases”—are coded. These are stored in a YAML format<sup>5</sup> which is a structured human-readable text file containing a number of data fields; the details of this are given in Appendix 2.

Sets of text collections are grouped into “workspaces” that also contain an associated coding form and, optionally, other information such as user-specified categories that will be used in automatic annotation. The template file begins with the string “**form.**” and uses the category and template commands described in Section 6. Workspaces are compressed (.zip) directories (folders).

In the current configuration of the system, workspace files are uploaded to the system, annotated and/or coded, then downloaded when a session is completed: no data remain on the machine where the CIVET system is running. In a future version, we expect to have an option for persistent data that could be used on a secure server, as well as options for reading these files from a server.

The workspace will generally *not* be downloaded to the same place it was originally: as a standard HTML security feature, the system does not retain any information about where it obtained a file. Instead, it will be downloaded to wherever your system downloads file: for example on the Macintosh this is a folder named **Downloads**.<sup>6</sup> If you wish to replace the original workspace file, this will need to be done manually or with a script operating locally.

There is some limited error checking as the workspace is processed. If errors are found you will get a screen similar to Figure 4 listing the errors, which must be corrected before the workspace can be used.

Like error messages in all programs, these are self-explanatory<sup>7</sup> though in general errors will occur either when you are processing a workspace for the first time or if you have manually edited it outside of the CIVET system: once a workspace has been successfully read by CIVET the program should not introduce any errors that would be caught at this point.<sup>8</sup>

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<sup>5</sup><https://en.wikipedia.org/wiki/YAML>

<sup>6</sup>If you read the workspace from the same directory where it will eventually be downloaded, the behavior presumably depends on the operating system: in the case of the Macintosh both the downloaded file and the decompressed versions get a suffix added. E.g. if the original workspace folder is named **test123** with the compressed version **test123.zip**, the system assigns the downloaded version the name **test123 (1).zip** which decompressed to a folder named **test123 (1)**. We are leaving the task of insuring that the original file is not over-written to the operating system and whatever other utilities you might be using to manage workspaces.

<sup>7</sup>Hahaha...just a little programmer joke...

<sup>8</sup>For example, the error in the variable values string in Figure 4 occurs because of the substring ‘**whois**’=‘**Case1-whois**’, which should actually be ‘**whois**’:‘**Case1-whois**’, but that ‘=’ could only have been introduced through external editing.

**The following errors were found in the workspace file "test123 (4).zip"**

No "texts:" segment found in the file "CIVyaml\_001.yml"

The following string of variable values in caseid Case-001-1

```
{'typeincid': 'One-sided Violence','suicide': 'no','whois' = 'Case1-whois','_date_': '2000-01-01','location':  
'Case1-location [XXX]','natincid': 'explosives ','injuries': 'Case1-injuries[3]','descrip': 'Case1-description',}
```

cannot be processed because it contains a formatting error. This case occurs in the file "CIVyaml\_002.yml"

No "texts:" segment found in the file "CIVyaml\_003.yml"

No 'form.\*' file was found in the workspace: This is required for coding.

**Please correct these and try again**

[Click here](#) to return to the selection page

Figure 4: Screen reporting errors found in a workspace

The program is sensitive to file names:

- Any file ending with `.yaml` is assumed to be a CIVET -formatted collections file
- There should be one and only file beginning with the string `"form."`: this specifies the coding form for the workspace
- Any file beginning with `codes.` is assumed to be a vocabulary list (Section 8). `codes.` must be followed by a `category` name then a period; the remainder of a `codes` file name can be anything, though typically it will end in `.txt`.
- Any file ending with `.ini` is assumed to be a configuration file [Beta 0.7: Not yet implemented]

Except for these restrictions, the directory can contain additional files of any kind: these will be preserved when the file is downloaded. A workspace file cannot contain subdirectories.

Additional notes on workspaces:

- So long as the YAML formatting is preserved—which should be fairly straightforward—the system is indifferent as to whether editing is done inside or outside of CIVET .
- If the `form` file is missing or contains errors, the system will display the errors it found, then return to the data selection page.
- If you are manually editing the variable values in the `cases` section, any single quotes ( `'` ) must be “escaped”; that is, replaced with `\'`. This will be done automatically when cases are generated from inside the program.



## 6 Civet Coding Form Templates

A CIVET template file specifies the individual components of the form: these are the familiar components from web forms but the syntax used to specify them is simpler than what you will find in HTML.

CIVET is simply adding these controls to an HTML `<form>` and, as with all things HTML, most of the placement of the fields is handled by the browser.<sup>9</sup> CIVET provides some limited formatting through the insertion of text and line breaks, and with some experimenting you should be able to keep the form from being too ugly.

The template file should be a simple text file—most systems are happier if this ends in the suffix `.txt`—similar to that used in an *R* or *Stata* script (that is, not a formatted file such as that produced by *MS – Word*). Appendix 1 gives an example of a template file, and the code for this can also be downloaded from a link in the program.

At present the program does only a very limited amount of error checking; more of this will be added in the future. If the template does contain one or more errors, the system will display this on a web page.

### 6.1 Command formats

Commands generally have the following format

```
command: entry-title [var-name] options  
comma-delimited list
```

Commands vary in how many of these components they have, but all follow this general pattern.

Each command ends with a blank line (or, if you prefer, the commands are separated by blank lines.)

Commands can also be cancelled by adding a “-” in front of the command: this will cancel the entire command, that is, all of the lines associated with the command, not just the first line. For visual symmetry, a “+” in front of the command “activates” it, though the command will also be active without the plus.

“#” denotes a comment: anything following a “#” is ignored, so lines beginning with “#” are completely ignored.

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<sup>9</sup>Writing in HTML5 and CSS, one can actually exercise a very fine degree of control over the placement, but if you are comfortable with that sort of code, you presumably aren’t using CIVET in the first place. That said, you can see the HTML generated by CIVET by using the *View source* option in your browser, then save it as a file using *Save Page As...* and that could provide a starting point for creating prettier code.

## 6.2 Items in template specification

The commands involve one or more of the following items:

**entry-title** : This is the title of data entry field. If this ends with / a line-break (`<br>`) is inserted after the text. The titles are escaped: at present the characters `<`, `>` and the single and double quotes are replaced with the equivalent HTML entities `&lt;`, `&gt;`, `&quot;`, and `&rsquo;`.<sup>10</sup> The **entry-title** field cannot contain the characters “[” or “]”—if these are present they will be interpreted as bounding the **var-name** field—but the escaped versions “\[” and “\]” are allowed.

**var-name** : The text of the variable name for this field; this will be used in the first line of the `.csv` output file

**comma-delimited-option-list** : a list of the items that can be selected, separated by commas. A “\*” at the beginning of the item means that it will be initially selected.

**comma-delimited-var-name-list** : a list of items which appear in **var-name** fields, separated by commas.

**page-text** : Any text

**number** : An integer

## 7 Templates: Specifying variables

### 7.1 Specifying variables to save

This command gives the variables that will be saved; these can be in any order but each of these must correspond to a **var-name** somewhere in the form, or are one of the special variables discussed below. A tab-delimited version of this list will be the first line of the output file. The command can occur anywhere in the file.

**save:**

comma-delimited-var-name-list

If the variable name has brackets following it, the *value* of the variable rather than the literal text will be written when the data are written to a tab-delimited file: the value is the string in brackets [...] in the annotated coding mode. If there is a variable name inside the brackets, that will be used as the column name for the values; otherwise the regular name will be used: this allows both the literal text and the value to be saved, as in the third example below. If **save** specifies a value output and not is found, a missing value will be used.

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<sup>10</sup>In the current implementation, named HTML entities such as `&copy;` and `&euro;` can be included and should produce the correct character. At present numbered entities such as `&#91;`—the HTML equivalent of ‘]’—do not work since the `#` is interpreted as a comment delimiter: depending on whether there is demand for this feature, the system could provide a way around this.

### Example:

```
save:
worldregion, eyewitness, groupname, comments
save:
worldregion [regioncode], eyewitness, groupname[], comments
save:
worldregion, eyewitness, groupname, groupname [groupcode], comments
```

## 7.2 constant

Sets the value of a variable to a constant; this can be used in a **save**:

```
constant: page-text [varname]
```

### Example:

```
constant: Data set 0.2 [data_id]
```

## 7.3 filename

Sets the default file name for the downloads: this can be changed before downloading. [Beta 0.7: Not yet implemented]

```
filename: page-text
```

### Example:

```
filename: our_wonderful_data.csv
```

## 7.4 Special variables

**\_coder\_** : Text entered in the *CIVET template selection* page

**\_date\_** : Current date. this is currently in the form DD-mmm-YYYY but later versions of the system will allow other formats

**\_time\_** : Current time in hh:mm:ss format

## 8 User-specified annotation vocabulary using category

The `category` command is used to set up special categories of words that will be color-coded and can be associated with text-extraction fields. The annotation can either be done automatically or by manually selecting the text and using the `Style` pull-down menu in the annotation editor (Section 10).

**category:** category-name [color]  
comma-delimited-phrase/code-list or file-name

The `category-name` must be unique and cannot be one of the standard categories ‘`name`’, ‘`num`’ or ‘`date`’. The program currently accommodates up to 99 categories.<sup>11</sup>

`color` can be any of the 140 named HTML5 colors,<sup>12</sup> a six-digit hexadecimal RGB color (e.g. 6A5ACD corresponds to the named color “SlateBlue”; the hex notation provides a presumably sufficient choice of 16,777,216 colors), or a two-digit color from the CIVET palette.<sup>13</sup> The palette, shown in Figure 5, can be accessed by entering the address

`http://127.0.0.1:8000/djciv_data/make_color_list`

while the program is running on a dedicated machine. If [color] is empty—that is, ‘‘[]’’—the system uses a color from the standard list in the listed order.

**CIVET Default Category Colors**

1: Magenta	2: SeaGreen	3: Orchid	4: Brown
5: Purple	6: Gold	7: Olive	8: Slateblue
9: Cyan	10: Thistle	11: CornflowerBlue	12: DarkGray
13: Lime	14: Turquoise	15: SlateGray	16: Tan

### Colors shown as text

Plain text Named entity Number Date Magenta SeaGreen Orchid Brown  
Purple Gold Olive Slateblue Cyan Thistle CornflowerBlue DarkGray  
Lime Turquoise SlateGray Tan

**Close the window to exit**

Figure 5: CIVET Default Category Colors

The program will find capitalized versions of the words in the list—in the example below, both `killed` and `Killed` will match—but not all-capitalized versions: `KILLED` would not

<sup>11</sup>If you need more, this can be changed by allowing more digits in the “{:02d}” format in the code `UserCategories[newcat].append('termst{:02d}'.format(len(UserCategories)))` in `CIVET_template.make_category()`

<sup>12</sup>see [http://www.w3schools.com/html/html\\_colornames.asp](http://www.w3schools.com/html/html_colornames.asp)

<sup>13</sup>This palette was assembled in a very ad hoc manner, is not color-blind-friendly, and we would be delighted to substitute something better. The list is set as `CIV_template.CatColorList`

be matched. A word or phrase can only be in a single category: putting one in multiple categories will not cause an error, but only the first category evaluated—generally this will occur in the order the categories were entered—will be marked. Words and phrases within a category are evaluated in the order they are listed—see the example in Section 10.1—which can be used to establish precedent when words or phrases overlap. At present the program does not allow partial matches, though a facility for this may be added in the future.<sup>14</sup>

The comma-delimited-phrase/code-list can have codes assigned to each of the phrases: these occur in brackets following the phrase and are added to the text during automated markup. The codes can be any character string. Either the phrase or the code or both can be specified in the output. If some of the phrases in the list have codes and others do not, the blank codes will be assigned a null (or, optionally, missing) string.

The vocabulary list can also be read from a file in the workspace. The file name must begin with ‘‘codes.+category-name.’’; the remainder of the file name can be anything.<sup>15</sup> This be a text file with one phrase per line and the code in brackets; a line beginning with # is treated as a comment.

**Example:**

```
category:action [red]
killed [1], wounded [2], shot and killed [1], bombed [3], clashed [3]

category:people [Brown]
civilians, workers, authorities, troops, soldiers, rebels, people, group

category:nationstate [Gold]
codes.nationstate.txt

category:weapons [Olive]
codes.weapons.mnsa.weaponslist_150724.txt
```

---

<sup>14</sup>If you want it now, delete the test

“if endx == idx+len(st):” in CIVET.utilities.do\_string\_markup().

<sup>15</sup>The period following the category-name is required!: the file name `codes.weapons_mnsa_list.txt` would not be recognized as a valid `codes.` file. Or rather it would be interpreted as applying to a category `weapons_mnsa_list`, not the category `weapons`.

## 9 Templates: Data Entry Fields

### 9.1 Checkbox

A simple binary check-box. The value of the variable will be first item in the list when the box is not checked; the second item when the box is checked. The \* notation on the second item can be used to specify whether or not the box is initially checked.

```
select: entry-title [var-name]
comma-delimited-option-list
```

**Example:**

```
select: Eyewitness report? [eyewit]
no,*yes
```

### 9.2 Select from pull-down menu

Pull-down menus—which are called a “select” in HTML—are specified with the syntax

```
select: entry-title [var-name]
comma-delimited-option-list
```

**Example:**

```
select: Region [worldregion]
North America, South America, Europe, *Africa, Middle East, Asia
```

### 9.3 Radio buttons

A series of radio buttons are specified with the syntax

```
radio: entry-title [var-name]
comma-delimited-option-list
```

The entry / in the option list causes a line-break (<br>) to be inserted

**Example:**

```
radio: Region/ [worldregion]
North America, South America, Europe, *Africa, /,Middle East, Asia
```

### 9.4 Enter single line of text

This creates a box for a single line of text (HTML `type="text"`). The `width = number` is optional and specifies the size of the text entry box in characters: the default is `width = 32`

**textline:** entry-title [var-name] width = number  
initial-text

**Example:**

```
textline:  Name of group [groupname]
<enter name>
```

## 9.5 Extract single line from annotated text

This creates a box for a single line of text (HTML `type="text"`) that will interact with annotated text; in addition information can be manually entered or cut-and-pasted into this box. If this command is used in a form that does not have associated annotated text, it behaves the same as **textline** and the **class** information is ignored.

The **class=class-name** is required and specifies the name of the annotation class that the text-entry box is connected with; a class can be associated with multiple text-entry boxes. There are three standard classes:

- **nament:** named-entries, which are determined by capitalization
- **num:** numbers
- **date:** dates

The **width = number** is optional and specifies the size of the text entry box in characters: the default is **width = 32**

**textclass:** entry-title [var-name] class=class-name width=number  
initial-text

**Example:**

```
textclass:  Name of city [cityname] class=nament
<enter city>
```

## 9.6 Enter multiple lines of text

This corresponds to an HTML “TEXTAREA” object. The **rows = number cols = number** is optional and specifies the size of the text entry box in characters: the default is **rows = 4 cols = 80**

**textarea:** entry-title [var-name] rows = number cols = number  
initial-text

**Example:**

```
textarea:  Comments [comments] rows = 2 cols = 64
-- put any additional comments here --
```

# Templates: Additional Web Page Formatting

## 9.7 Set page title

Sets the title of the web page: that is, the HTML `< title > ... < /title >` section of the header. [Beta 0.7: Not yet implemented]

**title:** page-text

**Example:**

**title:** CIVET-based coding form

## 9.8 Insert text

Adds text to the form: the various options follow the usual HTML formats. In interests of simplicity, text is “escaped” so that special characters are not interpreted as HTML: note that this means that in-line mark-up such as `< i >`, `< b >` and `< tt >` will not work, so if you need this activate and use the **html:** command. Also keep in mind that these commands need to be separated by a blank line.

**h1:** page-text

**h2:** page-text

**h3:** page-text

**h4:** page-text

**p:** page-text

**Example:**

**h1:** Primary data set coding form

**p:**Please enter data in the fields below, and be really, really careful!

The simple command

**p:**

is useful for putting some space between form elements.

## 9.9 Insert HTML

[This command may or may not be included in the operational version of the system, as it provides some opportunities for mischief. Stay tuned. It is in the code but currently



deactivated; if you are installing your own version of the system, it can be activated by changing a single character in the source code.]

Adds arbitrary HTML code without escaping.

**html:** page-text

## 9.10 Insert a line break

Adds a new line in the form

**newline:**

## 10 Annotation and Editing Collections

The annotation and editing page for workspace collections implements a minimal version<sup>16</sup> of the Javascript `ckeditor` which allows the texts to be edited and annotated. Editing works as you would expect, including cut/copy/paste options.

Annotation is handled with the **Styles** drop-down menu in the window toolbar (Figures 6 and 7 ) which should show both the standard CIVET categories—named-entity, number and date— and any user-specified categories. To annotate, just select the text you want to annotate and then select the annotation to apply.



Figure 6: CIVET Editor

The following options are available on this screen

### Annotate the collection:

This applied the automated markup system which currently identified the following:

**Named-entities:** This is based on capitalization; consecutive capitalized words are combined.

**Numbers:** Digits and numerical words and phrases such as “one” and “two-hundred.”

**User-specified categories:** See Section 8

### Save edits and select new collection:

This saves whatever annotation has been done to the internal database<sup>17</sup> and returns

<sup>16</sup>that is, the version of `ckeditor` deliberately uses only a very small set of the features that are available for the editor: if you want to customize this, additional features can easily be added.

<sup>17</sup>That is, the data is saved on the machine where CIVET is running; it is not saved on your local machine until the workspace is downloaded.

# Collection: TestTexts\_001

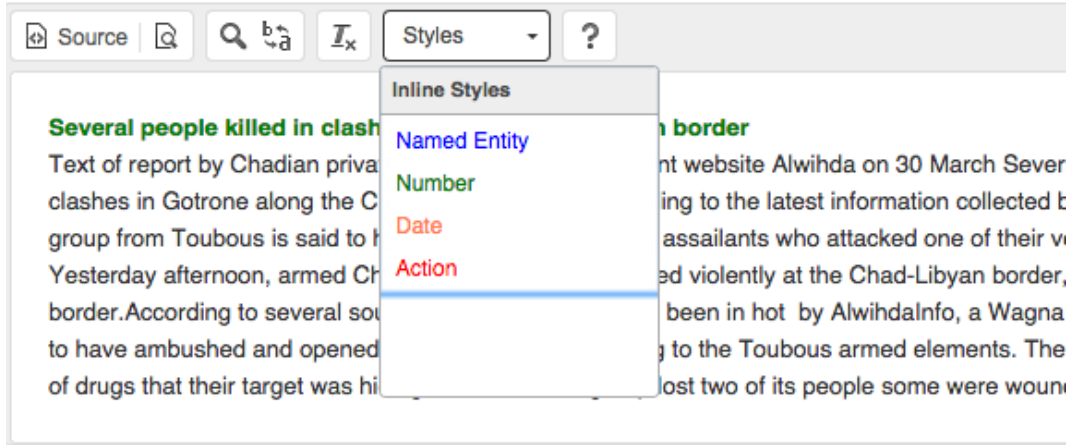


Figure 7: CIVET Editor

to the collection selection screen : this option would be used if you are only annotating text rather than coding them. Annotations are saved in the `textmkup` field of the YAML file along with the date of the annotating and the coder ID.

## Save edits and code the collection:

This saves whatever annotation has been done to the internal database and goes to the coding and text extraction page described in Section 11.

## Discard edits and select new collection:

This discards the edits and returns to the collection selection screen.

## Download workspace and return to home screen:

This downloads the current workspace without doing any coding.

## 10.1 Comments on annotation and editing

1. Associated codes in brackets following a term can be edited: when writing variable values, the system will simply be looking for a value in a bracket.
2. A word or phrase can be annotated only once.<sup>18</sup> The user-specified `category` words are annotated before the general named-entity, so if a named entity occurs in a `category`, that will take precedence. Similarly, any numbers that occur in a `category` phrase will be part of the phrase, not separately marked as numbers.

<sup>18</sup>It would be possible to modify the system to allow for phrases to be in multiple categories, but at present this seems like a low priority; such a feature may or may not be included in future versions.

3. Words and phrases in `category` lists are evaluated in the order they are listed, which can be used to establish precedence. Consider the sentence

A local political leader was shot and killed by unknown gunmen.

The category listing

```
category:action [red]
shot and killed [4], killed [1], wounded [2], bombed [3]
```

would result in the annotation

A local political leader was **shot and killed [4]** by unknown gunmen.

whereas category listing

```
category:action [red]
killed [1], shot and killed [4], wounded [2], bombed [3]
```

would result in the annotation

A local political leader was shot and **killed [1]** by unknown gunmen.

because the “killed” part of the phrase “shot and killed” has already been annotated, and the remainder does not fit any of the patterns.

4. CIVET does not identify a capitalized word as a named-entity if it occurs as a single word and is in the list of common “stop words” in the file `djcivet_site/djciv_data/static/djciv_data/CIVET.stopwords.txt`. In other words, `The` will be included as part of a named-entity in the phrase `The New York Times` but not in the phrase `The village was...`
5. Words referring to numbers such as `one`, `ten` and `fifty` have the corresponding numerical value added in brackets following the number; these phrase and their associated values are obtained from the file `djcivet_site/djciv_data/static/djciv_data/CIVET.numberwords.txt`.<sup>19</sup> This file only contains the most commonly-encountered phrases; bracketed values can be added manually as well.
6. At present, CIVET does not recognize leading punctuation—typically quotes—and will not automatically mark named entities or numbers beginning with this: this is on the list of changes for the future. It does handle most trailing punctuation. In named entities, the lower-case prefixes `al-`, `bin-` and `ibn-` are recognized as part of a name.<sup>20</sup>

---

<sup>19</sup>Looking for a little programming exercise?: This needs more development in at least three ways. First, generate all of the standard English equivalents, e.g. “eighty-five”, since these follow a simple set of rules. Second, and perhaps more important, allow the user to specify the values for common approximations such as “several,” “many” and “dozens.” The second can be done by just editing the file `CIVET.numberwords.txt`, though generally we don’t want the user to have to figure out how to do that. Finally, there should probably be some error checking to make sure the value in brackets is actually a number: CIVET will just writing the value in brackets without trying to convert it, but non-numbers will presumably create issues further down the processing pipeline.

<sup>20</sup>This list can be extended in the regular expression `pat1` in `civet.utilities.do_NE_markup()`.

**Document:**

**Rwandan Hutu fighters kill 22 civilians in eastern DR Congo in March 2015**

Text of report by DR Congo's UN-sponsored Radio Okapi on █ March [Presenter] At least three people have been reported to have been killed on Sunday █ March in three different villages of Ikobo groupment by armed men. Ikobo is situated to the northeast of Walikale territory near the border with Lubero territory. Local rights organization activists said victims were respectively from Kalehe, Kanune and Rusamambo villages. Here is a report filed by Bernadin Nyangi. [Reporter] Local sources said the recent killings increased the number of those who have so far been killed or kidnapped in the entity this month to █. The rights activists pointed an accusing finger at the FDLR [Democratic forces for the Liberation of Rwanda] fighters under the command of a certain Mutoka, as perpetrators in the killings and kidnappings. They accused the same FDLR faction of having raped at least █ women this month alone as █ other individuals were victims of torture and other sorts of human rights abuses.

**Template form for CIV-yaml demo files**

Type of incident: ☒ Demonstration ☐ One-sided Violent ☐ Armed Clash

Nature of incident

If "Other", provide details in the report section

Did incident involve local authorities? ☒

Location

Maximal injuries

Brief description of incident

**Options after saving:**

Figure 8: CIVET Coder

## 11 Coding and Text Extraction

The CIVET coding form screen in the demonstration version is shown in Figure 8.<sup>21</sup>

The general operation of the coder/extractor is described below:

1. Clicking a text entry boxes associated with an annotation category will highlight the relevant words in text: In the demonstration version these are

**Location:** named-entities

**Maximal injuries:** actions

The 'tab' key cycles between the coding fields, or an option can be selected using the mouse.

2. When an annotated category field is active, all of the words and phrases in the text for that category are changed to red, with the first word highlighted using a green background. The arrow keys can be used to move the highlighted text into the field. These operate as follows:

**Right arrow:** Highlight the next text in the category<sup>22</sup>

**Left arrow:** Highlight the previous text in the category

<sup>21</sup>The form displayed is specified in the file `djcivet_site/djciv_data/static/djciv_data/CIVET.demo.coder.template.txt` and can be modified if you want to experiment.

<sup>22</sup>Occasionally you will need to hit the key twice when changing directions: this is a bug, not a feature, and may be corrected at some point. Usually it works the first time. If you would like to try to fix this, look at the Javascript in the file `civet_coder.html`

**Down arrow:** *Replace* the contents of the field with either the currently selected text—this is effectively a single-key shortcut for a copy-and-paste—or, if no text is selected, the highlighted text.<sup>23</sup>

**Up arrow:** *Append* the contents of the field with either the currently selected text or, if no text is selected, the highlighted text

3. Copy-and-paste from the text to the data fields work as you would expect; text can also be entered manually.
4. To save a set of coded fields, click one of the buttons along the bottom. At present, all three buttons save; we will be adding “cancel” and “reset” options. The options are:

**Continue coding this collection:** Save the data internally, then return to the same text to code additional cases.

**Code next collection:** Save the data internally, then select the next collection in the workspace and go to the annotation screen.<sup>24</sup>

**Select new collection:** Save the data internally, then select a new collection

**Download workspace and return to home screen:**

This downloads the workspace with the coded cases to the local machine. The **Manage workspace** facility (Section 12) can then be used to download any coded cases.

---

<sup>23</sup>If you are tabbing between fields and extracting the first highlighted text, you will need to hit down arrow twice: also a bug rather than a feature.

<sup>24</sup>Beta 0.7: In the final version of the program, there will be an option for going to either the annotation or coding screen; the annotation screen will also have a “Next” button.

## 12 Workspace Management

The `Manage workspace` link on the home page will take you first to a workspace selection page, and then to the page shown in Figure 9. In Beta 0.7, only the `Export data in tab-delimited format/Use save-variable list in the template` is implemented: this will download any coded cases found in the workspace.

### **CIVET: Workspace Management**

**Current workspace: CIVET.workspace\_example.zip**

**Select a task from the options below:**

- **Export data in tab-delimited format**
  - [Use save-variable list in the template](#)
  - [Select the variables to export](#)
- [Edit text meta-data](#)
- [Add comments to workspace](#)

Figure 9: CIVET workspace management page

## 13 Projected Features

CIVET is part of a projected system designed for managing tens-of-thousands, or even millions, of small text files. The transition in the past three decades from paper-based to electronic sources has dramatically increased the amount of information that can potentially be coded, but results in a "drinking from a fire hose" problem where a huge number of false positives must be managed because typically only a very small percentage of the texts obtained for a project actually contain unique codeable events: yields of 1% to 3% are not uncommon. There is very little existing software designed to deal with this situation, since the texts are too large to be treated as nominal variables in a statistical package and too numerous to be treated as documents in a word processor. Consequently large projects typically write customized systems in a language such as perl or Python, but these require programming skills which are not always easily available in the social science community.

We are planning to extend the CIVET workspace format to become the basis of an integrated series of well-documented and user-friendly utilities for dealing with this situation. All of the software will be open-source under the MIT license, and made available to the community on GitHub. These utilities will provide at least the following capabilities:

- Near-duplicate detection which will collect articles which appear to be dealing with the same incident
- Extraction programs for converting common formats such as Lexis-Nexis, Factiva and GigaWord to the CIVET document format.
- Filtering and classification of texts based on one or more of the following methods

**Pattern-based:** These will include regular expressions and boolean phrases with proximity measures

**Semi-supervised learning:** The system will construct one or more machine-learning models (for example support vector machines) to determine whether an article is relevant based on a set of positive and negative examples provided by the user

**Action-based:** These will use either the open source TABARI or PETRARCH political event coders to determine the type of activity being described

**Actor-based:** These will use a set of standard lists maintained on a common server of political actors such as nation-states, international organizations and militarized non-state actors

**Geographical:** These will use systems such as the open-source Mordecai location resolution system developed by Caerus Analytics.

- Workflow management software for allocating and tracking the coding of incidents in large coding teams; these will use web-based tools so that coders can work from any location and across institutions. We will also provide scripts for interfacing to MySQL installations, GitHub and Dataverse as remote servers.



- Extension of CIVET to allow the various classification tools (actions, actors, and location) to automatically be used in coding forms.
- Semi-automatic conversion of the resulting coded data to the Dataverse format, and more generally integrate the CIVET tools with the Dataverse metadata, APIs and other tools as well as providing an access and authorization protocol modeled on the categories used in Dataverse.
- Development of training materials, both text and video, for the system

# Appendix 1: Sample Template File

```
# CIVET template demonstration file

h1:Ministry of Magic Hogwarts Incident Report

radio: House where incident occurred: [house]
Gryffindor, Hufflepuff, Ravenclaw, *Slytherin

p:

select:Nature of incident [natincid]
*Minor mischief, Unauthorized absence, Accident, Major infraction, Unforgivable Curses, Other

p:If "Other", provide details in the report section

checkbox: Was incident reported to school authorities? [authreport]
No,*Yes

checkbox: Did incident involve muggles? [muggles]
No,Yes

p:

textline: Name of student(s) [names] width=80
Enter names here

p:

textarea:Brief description of incident [descr] cols = 80
Enter brief description here

p:

textline:Reporting official [reporter] width=40
Enter your name here

h3:Thank you for your assistance; we will contact you by owl should we require more information

save:
_date_, house, natincid, authreport, muggles, names, descr, reporter
```

This produces the form shown in Figure 10

# Ministry of Magic Hogwarts Incident Report

House where incident occurred: ☐ Gryffindor ☐ Hufflepuff ☐ Ravenclaw ☒ Slytherin

Nature of incident

If "Other", provide details in the report section

Was incident reported to school authorities? ☒ Did incident involve muggles? ☐

Name of student(s)

Brief description of incident

Reporting official

**Thank you for your assistance; we will contact you by owl should we require any additional information**

Options after saving:

Figure 10: CIVET data entry form generated by the sample template file

## Appendix 2: Input Format

Fields marked with \*\* are required.

### 13.1 Collection fields

**collid** : Collection ID, which needs to be unique within the workspace. If this is not provided in the file, collfilename is assigned by the program

**collfilename** : directory and name of the YAML file (without the suffix) where the file was read from; this is assigned by the program

**colldate** : collection date YYYY-MM-DD

**colledit** : \*\* datetime of editing of this collection \*\* [provided by system]

**colcmt** : collection comments

**texts** : one or more related texts

**cases** : zero or more coded records

### 13.2 Text fields

- **textid** : \*\*unique text ID for CIVET. This needs to be unique within the workspace, and given how collections might get mixed across workspace folders, ideally should be unique for the entire project. If a value for the **text** field is not provided it will be assigned by the program.

**textdate** : text date YYYY-MM-DD \*\*

**textpublisher** : publisher [any string]

**textpubid** : publisher ID [any string]

**textbiblio** : bibliographic citation

**textgeogloc** : geographical locations

**textauthorr** : author [any string]

**textlang** : language

**textlicense** : copyright notification or other license information

**textlede** : \*\* lede/headline/abstract—this is a short summary of the article which will be highlighted and also will appear in the sorting routine.

**textcmt** : comment

**textoriginal** : \*\*original text of the story; this will not be modified by the system

**textmkup** : marked up text: this is the annotated version of the story with any mark-up that has been added either automatically or manually

**textmkupdate** : datetime time of editing of this block [provided by system]

**textmkupcoder** : coder ID

### 13.3 Case fields

- **caseid** : \*\* Internal case/event ID. This is assigned by the program and probably should not be changed; external IDs can be entered as variables.

**casedate** : \*\* Date and time this case was coded [provided by system]

**casecmt** : comment for case

**casecoder** : coder ID

**casevalues** : This is a string formatted as a Python dictionary which contains pairs of variable names and values

Dates are ISO-8601 ([http://en.wikipedia.org/wiki/ISO\\_8601](http://en.wikipedia.org/wiki/ISO_8601); <http://www.w3.org/TR/NOTE-datetime>; <https://xkcd.com/1179/>; <http://www.cl.cam.ac.uk/~mgk25/iso-time.html>) so generally either

- YYYY-MM-DD
- YYYY-MM-DDThh:mm:ss
- YYYY-MM-DDThh:mm:ss[+-]hh:mm

Figure 11 shows an example of a simple YAML file.<sup>25</sup>

```
collid: TestTexts_001
colldate: 2015-06-08
colledit: 2015-06-08
collcmt: Text file source: Apr15.OTH.stories.txt

texts:

- textid: TestTexts_002_001
  textdate: 2000-01-01
  textpublisher: BBC Monitoring Africa
  textpubid: BBCAP
  textbiblio: BBCAP00020150401eb4100105
  textgeoloc:
  textlang: English
  textlicense: (c) 2015 The British Broadcasting Corporation. All Rights Reserved. No material may be reproduced except
with the express permission of The British Broadcasting Corporation.
  textlede: Several people killed in clashes along Chadian-Libyan border
  textcmt:
  textoriginal: |
    Text of report by Chadian privately-owned, pro-government website Alwihda on 30 March

    Several people have been killed and others injured in violent clashes in Gotrone along the Chad-Libyan border. According
    to the latest information collected by AlwihdaInfo, since yesterday [29 March], a heavily armed group from Toubous is
    said to have been in hot pursuit of assailants who attacked one of their vehicles, leading to the death of two of
    their people.

  textmkup: |
    <div class="textblock" data-textid=" TestTexts_002_001"><div class="textlede" style="color:green; font-weight: bold;">
    Several people killed in clashes along Chadian-Libyan border</div><div class="textcontent">Text of report by
    <span style="class:nament; color:blue">Chadian</span> privately-owned, pro-government website
    <span style="class:nament; color:blue">Alwihda</span> on <span style="class:num; color:green">30</span>
    <span style="class:nament; color:blue">March</span> Several</span> people have been
    <span style="class:termst; color:red" title="whacked">killed</span> and others
    <span style="class:termst; color:red" title="whacked">injured</span> in violent clashes in
    <span style="class:nament; color:blue">Gotrone</span> along the
    <span style="class:nament; color:blue">Chad-Libyan</span> border. <span style="class:nament; color:blue">According</span>
    to the latest information collected by <span style="class:nament; color:blue">AlwihdaInfo</span>,
    since yesterday [29 <span style="class:nament; color:blue">March</span>], a heavily armed group from
    <span style="class:nament; color:blue">Toubous</span> is said to have been in hot pursuit of assailants who
    <span style="class:termst; color:red" title="whacked">attacked</span> one of their vehicles, leading to the death of
    two of their people.
  textmkupdate: 2015-06-08
```

Figure 11: YAML file

---

<sup>25</sup>This is a screen capture of a file being edited with BBEdit, hence the color mark-up.

## Appendix 3: Files in /static/djciv\_data

### Files that can be modified using a text editor

**CIVET.demo.template.txt:** Demonstration template file for simple coding

**CIVET.workspace.demo.zip:** Demonstration workspace with sample collections, coding form and user-specified coding categories

**CIVET.stopwords.txt:** Stop words for automatic named-entity annotation

**CIVET.numberwords.txt:** Number words and phrases for automatic number annotation

**civetstyle.css:** Style sheet for some of the program (this is modified with the user-specified categories)

### Modify at your own risk

**ckeditor:** This is a `ckeditor` file downloaded from <http://ckeditor.com/>: if you would like additional features you should be able to create your own and swap it in here.

### Files that can be replaced by a file with the same name

**CIVET.Documentation.pdf:** Documentation

**civet\_logo.png:** Don't like our little guy, or want to put your own mascot here?—this is the place to make the change

## Appendix 4: Prototype on Google Application Engine

An earlier demonstration version of the program, written in the Flask framework, is deployed as an application on the Google App Engine at <http://ace-element-88313.appspot.com/>. The “Coding Form Template” option in this program works as described in Section 4. The code for this version can be downloaded from <https://github.com/philip-schrodt/CIVET-Flask>

The other option in the program is the “Text-Extraction Demonstration Form” which was a prototype of the full annotation/extraction system. To activate the demo, from the home page, click the link in the line *See a demo of the text-highlighting system by clicking here*

1. Select a text file to edit: you can use either the pull-down menu or radio boxes, then click the **Edit the file button**.
2. Click one of the text entry boxes will highlight the relevant words in text: For demonstration purposes these are words beginning with the letters ‘a’, ‘c’, ‘d’, ‘e’ and ‘s’. The ‘tab’ key cycles between these options, or an option can be selected using the mouse.
3. When a text entry box is active, the first relevant word in the text is highlighted. The right-arrow key will cycle the highlighted word. To copy a highlighted word into the text box, use the down-arrow key.
4. Text can also be selected using the mouse: To copy the selected text into the text box, use the left-arrow key.
5. Cut-and-paste from the text to the date fields work as you would expect [TEST THIS]
6. Text can also be entered manually.
7. To save a set of coded fields, click one of the buttons along the bottom. At present, all three buttons save; we will be adding “cancel” and “reset” options. The options are:

**Return to this case:** Save, then return to the same text

**Select new case:** Save, then return to the same text

**Download data:** Save, then download data as a text file

8. The “CIVET Download” page provides a text box for a file name, and the **Download file** button downloads the coded data. Use the *Start new data file* link to re-start the coding and the *Continue coding with this file* link to continue adding to the existing records.
  - The .txt file contains the variable names in the first line.
  - If the file name does not end in “.txt”, this will be added.
9. To quit the program, just close the window.<sup>26</sup>

---

<sup>26</sup>This, it turns out, is a HTML/Javascript security feature which prevents rogue websites from closing windows unless they have created the window.