

Implementing a patient-clinician interface for biomedical templates

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Agenda

- Goal and Context
- Reformatting/Standardizing Templates
- Template Interface
- Suggestion Programs

Goal and Context

Context

- Project by Neil Malur, Benjamin Chen, Hari Narayanan
 - ◆ Scraped data from clinical trials
 - ◆ Processed into 58 templates
 - ◆ Facilitate patient-trial connection

Goal

- Configure templates to be code-compatible
 - ◆ Standardized universal format
- Template interface
 - ◆ Clinicians formulate criteria using dropdown UI
 - ◆ Existing criteria can be optimized

Reformatting/Standardizing Templates

Initial Templates

Patients must have:

“Platelets >=

VARIABLE1 = {“100,000”, “75,000”, OTHER}

/mcL

VARIABLE2 =

{

EMPTY,

“ obtained <=

VARIABLE3 = {“21”, “14”, “30”, OTHER}

days prior to registration

VARIABLE4 =

{

EMPTY,

“(transfusion independent, defined as not receiving platelet transfusions for at least

7 days prior to enrollment)”

}”

}”

→ Variables for mutable values

→ Nested variables

→ Nonstandard format

Initial Templates

“Fasting cholesterol must be

VARIABLE1 <= {300} mg/dL

and triglycerides must be

<= VARIABLE2= {2.5} x IULN

VARIABLE3 = {EMPTY, “obtained within

VARIABLE4 = {28} days prior to registration”} VARIABLE5 = {EMPTY,

“patients may be on lipid lowering agents to reach these values.”}

→ Nonstandard format

→ Inconsistencies

◆ Quotations

◆ Spacing

◆ Formatting

Restructured Templates

- JSON
- Structure containing
 - ◆ All data potentially needed
 - ◆ Compatibility with recursive searching
- Centralized database

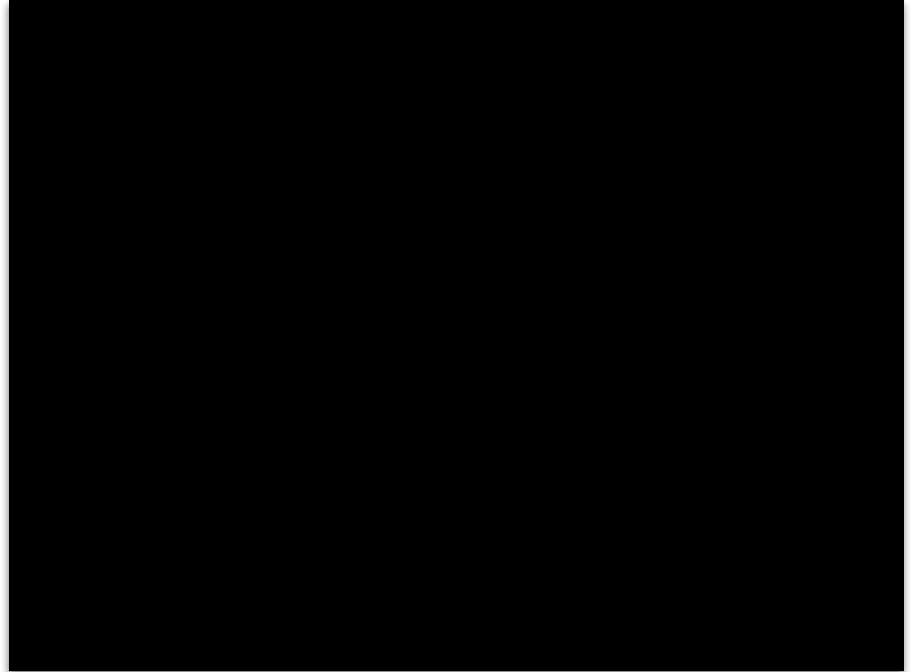
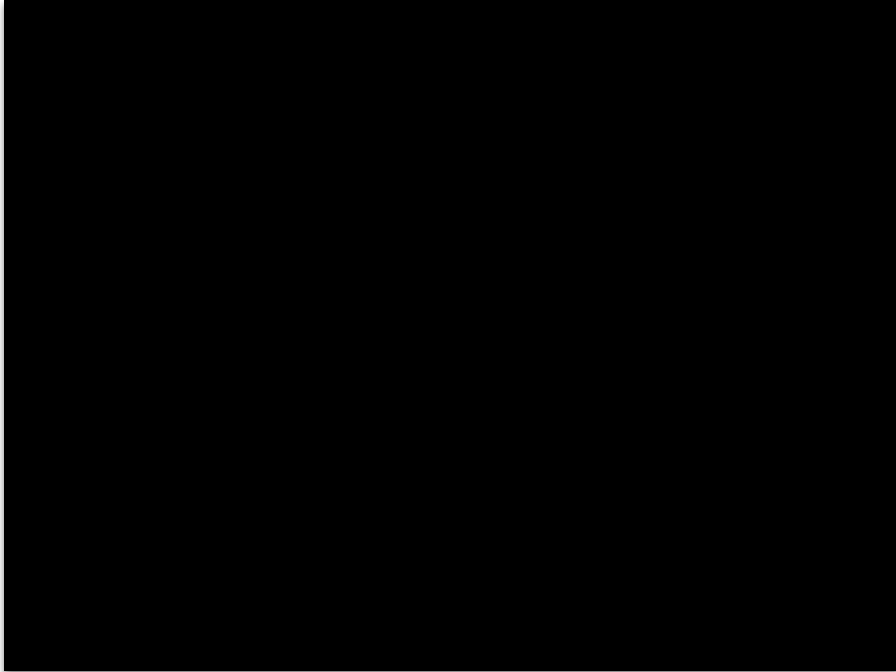
```
1 {
2   "name": "Platelets",
3   "English": {
4     "content": [
5       {
6         "type": "text",
7         "content": "Patients must have: Platelets >= "
8       },
9       {
10        "type": "dropdown",
11        "content": [
12          {
13            "type": "text",
14            "content": "100,000"
15          },
16          {
17            "type": "text",
18            "content": "75,000"
19          },
20          {
21            "type": "text",
22            "content": "OTHER"
23          }
24        ]
25      },
26      {
27        "type": "text",
28        "content": "/mCL"
29      },
```

- Type
- Content
 - Array of text options
 - Can include dropdowns
 - Nesting

Expediting the Process

- 58 templates
- Manual conversion -> Errors
- Visual template builder

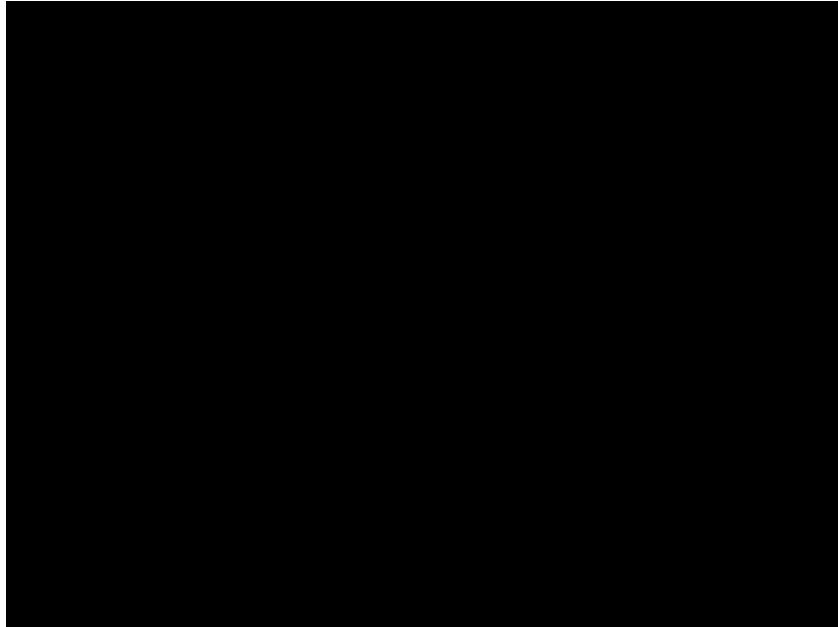
Expediting the Process



Template Interface

Direct Access

- Interact directly with templates
- Dropdown interface
- Search feature
- Edit resulting text



Suggestion Programs

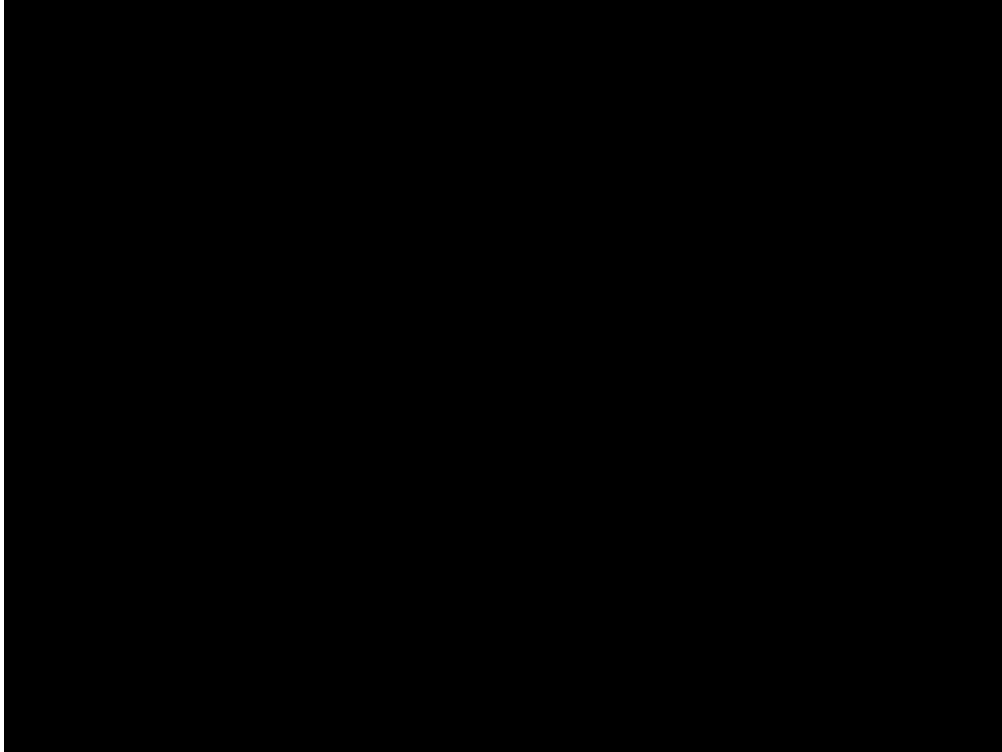
Desktop/Web application

- Built with Electron
 - ◆ Desktop app written in JS, CSS, HTML
 - ◆ Cross-platform, same code base
- NLP (Natural Language Processing) software
 - ◆ Co-written by Jason Zhou
 - ◆ Uses templates to suggest changes to text



ELECTRON

Desktop/Web application



Microsoft Word Add-in

→ Using Office JS API

→ Pros

◆ More accessible

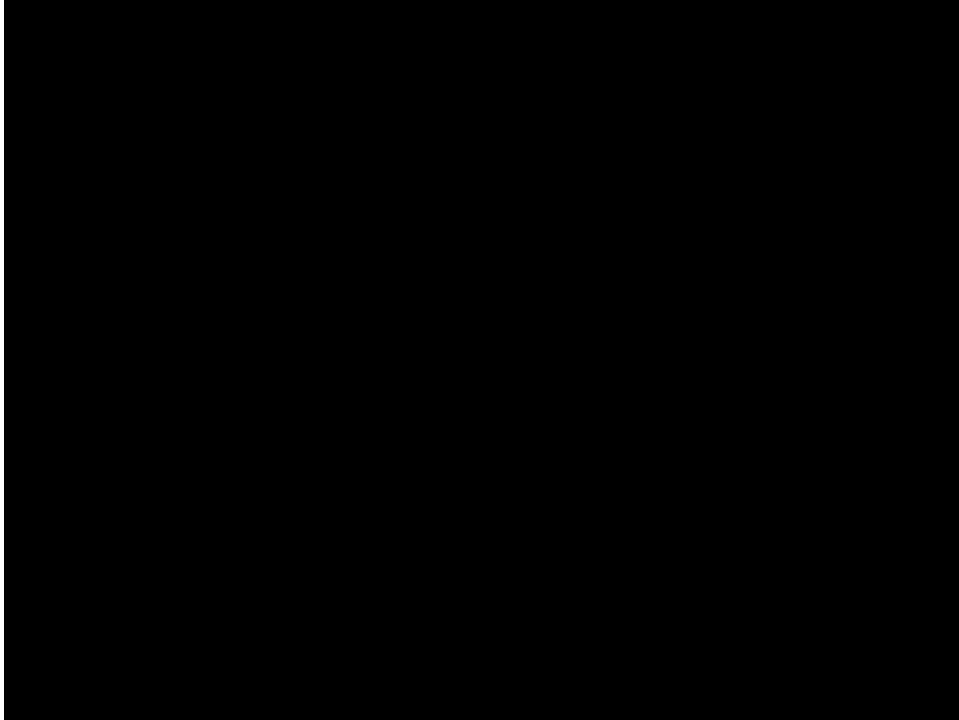
◆ No auxiliary application download required

◆ Right within Word

→ Cons

◆ No access of template dropdown

Microsoft Word Add-in



Summary

→ Formatted templates

- ◆ Current 58

- ◆ Easy to format new ones

→ Dropdown UI to interact with templates

→ Suggestion programs for existing criteria documents

Acknowledgements

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- My parents

Questions