



Google

Developers



Extending Google Docs with Apps Script

Jonathan Rascher
Software Engineer

Saurabh Gupta
Product Manager

What is Google Docs?

- Word Processing App
- Create and Share documents across devices
- Even without internet connectivity



What's new in Google Docs



Apps Script in Google Docs



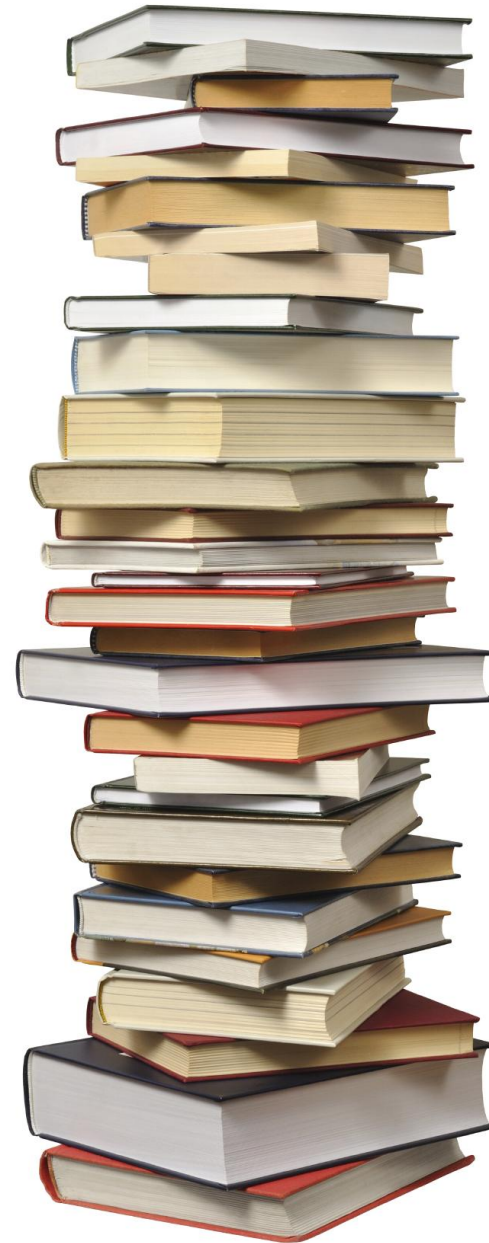
Bob, the researcher



oe divide
ing layers of high
rs) over the surface of the stru
[10], the attachment of mechanical vibrat
rs or magnetic eddy current dashpots [11, 12, 13] in
ezoelectric materials shunted with passive electric circuit
bers [16, 17]. It is also theoretically possible to increas
by appropriate heat treatment (of metallic copper-man
material damping, but this inevitably change
may not be totally advantageous [1
by changing the surroun
shape or size of
al and



What's Research without Search?



Credit Where Credit Is Due



An easy way to manage a Bibliography

Rascher 10

Works Cited

Cardullo, Bert. "The Children Are Watching Us." *Hudson Review* 54.2 (2001). 295–304.

Costello, Matthew. "The Pilgrimage and Progress of George Bailey: Puritanism, It's a Wonderful Life, and the Language of Community in America." *American Studies* 40.3 (1999). 31–52.

Jacobson, Herbert L. "De Sica's 'Bicycle Thieves' and Italian Humanism." *Hollywood Quarterly* 4.1 (1949). 28–33.

Kuntz, María Elena de las Carreras. "The Catholic Vision in Hollywood: Ford, Capra, Borzage and Hitchcock." *Film History* 14.2 (2002). 121–135.

Phelps, Glenn Alan. "The 'Populist' Films of Frank Capra." *Journal of American Studies* 13.3 (1979). 377–392.

Thompson, Kristin, and David Bordwell. *Film History: An Introduction*. 3rd ed. New York: McGraw–Hill, 2010.

Tomasulo, Frank P. "Bicycle Thieves: A Re-Reading." *Cinema Journal* 21.2 (1982). 2–13.

Add Sources



An easy way to manage a Bibliography

plight in a non-fantastic, undramatic style. Capra's actors are stars—1940s Hollywood would permit no less—but De Sica's characters are portrayed by amateurs (Graham). A similar distinction appears in the films' scenery. Capra uses clean houses, small town drug stores, and concealed swimming pools to contain his characters. But De Sica substitutes the open streets and squares of Rome—broken and beautiful, bombed-out buildings laid bare for all to behold. *Bicycle Thieves* transforms the quotidian to the sublime, following the Neorealist tendency to “make characters' personal problems gain universal significance” (Thompson and Bordwell 333). Capra's film shows the beauty a talented director can create, but *It's a Wonderful Life* carries with it a sense of underlying artificiality. Hollywood's escapist fantasies are wonderful, but fantasies they remain. Contrariwise, De Sica's film shows us “tremendous vitality seething in the actors, seeping out of the very stone buildings, made eloquent by the camera, bursting the limits of the screen itself, but always as if it were an expression of nature, not the ego of a director, however brilliant” (Jacobson 31).

The use of child actors also merits mention. Bailey's children are flat characters, adding little tension or exposition to Capra's production. Conversely, Bruno plays a vital role in De Sica's

Cite Sources



An easy way to manage a Bibliography

Rascher 10

Works Cited

- Cardullo, Bert. "The Children Are Watching Us." *Hudson Review* 54.2 (2001). 295–304.
- Costello, Matthew. "The Pilgrimage and Progress of George Bailey: Puritanism, It's a Wonderful Life, and the Language of Community in America." *American Studies* 40.3 (1999). 31–52.
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- Phelps, Glenn Alan. "The 'Populist' Films of Frank Capra." *Journal of American Studies* 13.3 (1979). 377–392.
- Thompson, Kristin, and David Bordwell. *Film History: An Introduction*. 3rd ed. New York: McGraw–Hill, 2010.
- Tomasulo, Frank P. "Bicycle Thieves: A Re-Reading." *Cinema Journal* 21.2 (1982). 2–13.

Add Sources

Cite Sources

Compile a Bibliography

Follow Standards



Bibstro

an app that extends Google Docs

and

built using

Google Apps Script



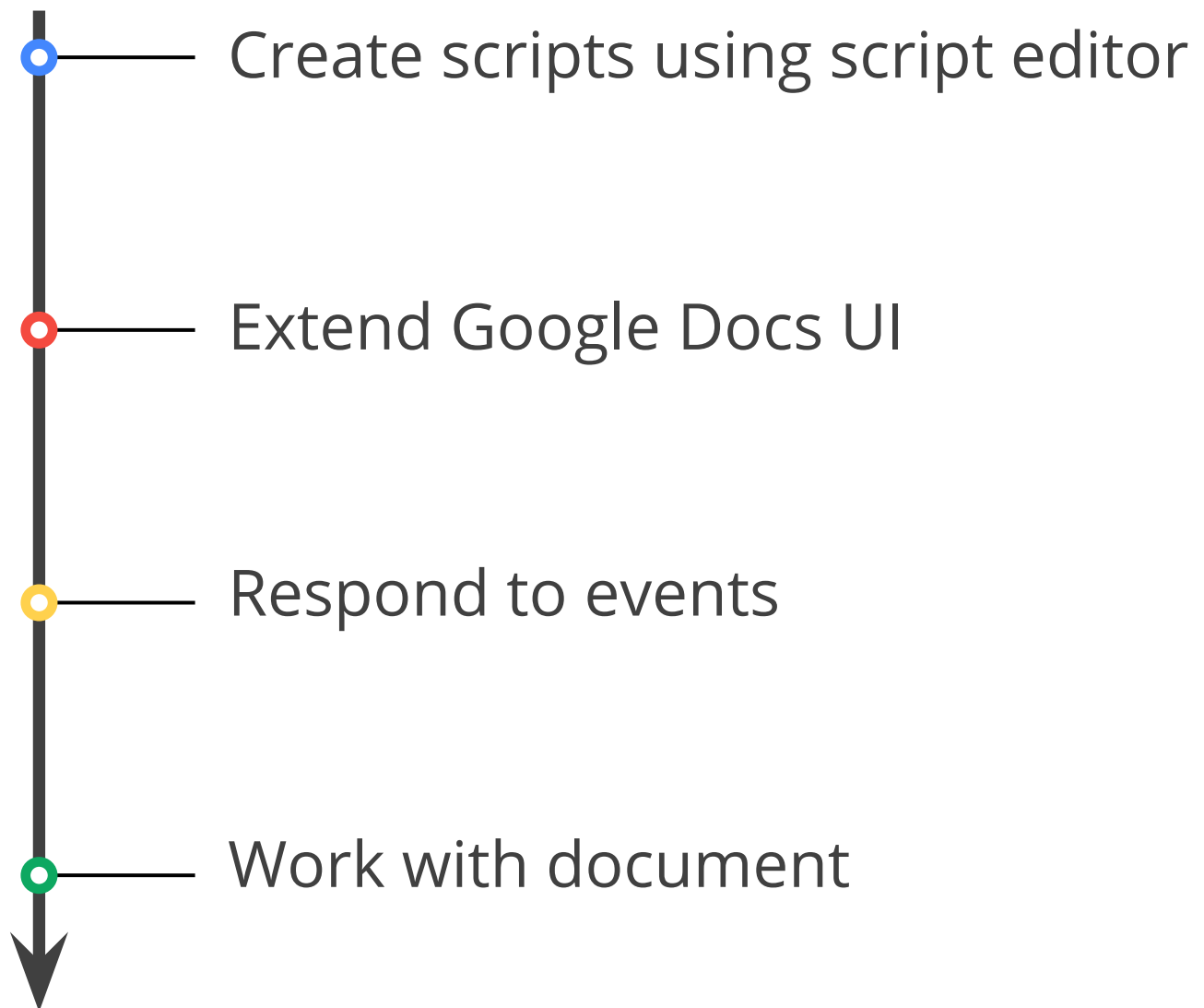
Build your own app

using

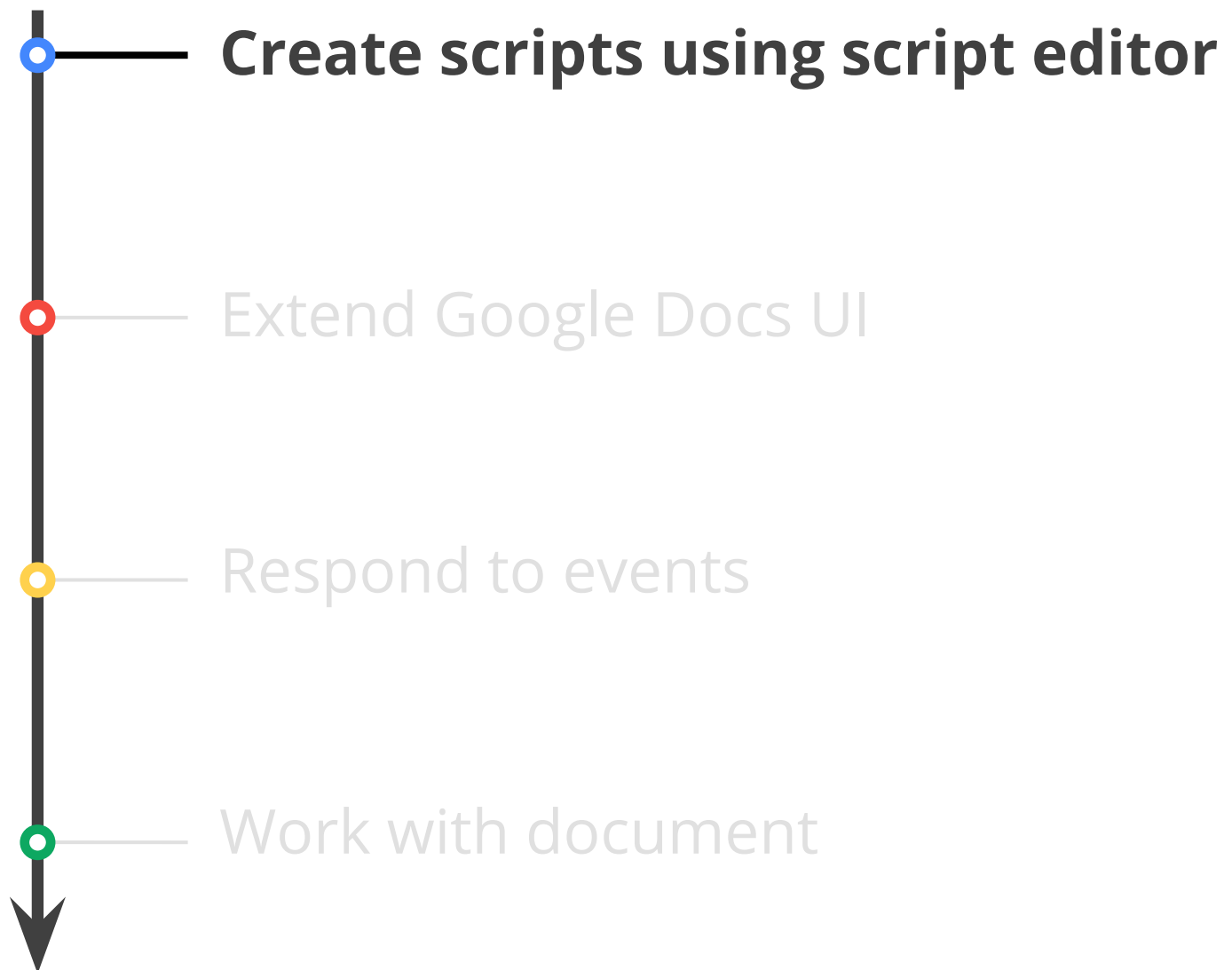
Google Apps Script



Steps to build Bibstro



Steps to build Bibstro



Create Scripts with Editor



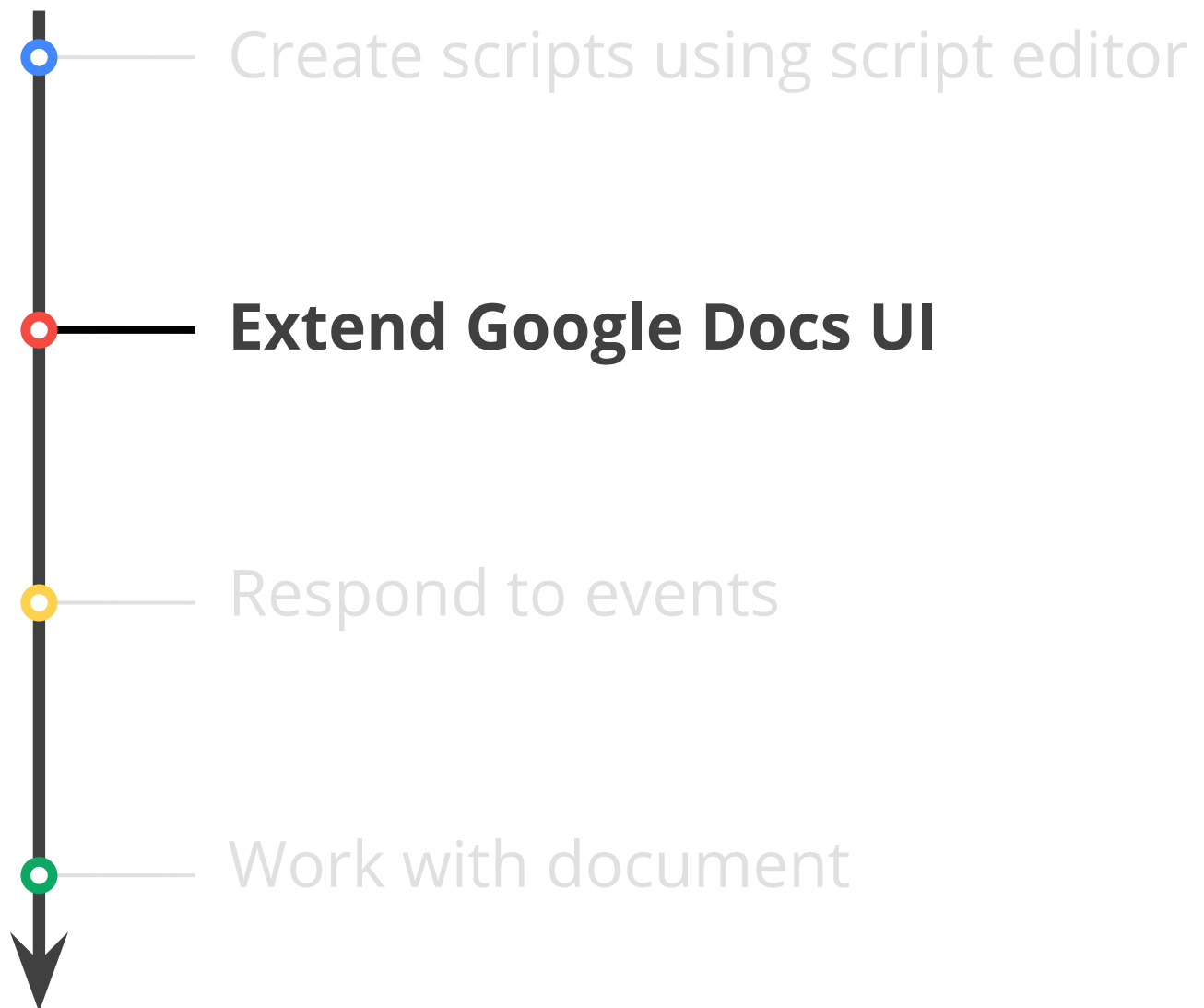
The screenshot shows a text editor window titled "Marketing Proposal". The menu bar includes File, Edit, View, Insert, Format, Tools, Table, and Help. The "Tools" menu is open, displaying options: Research (⌘⇧I), Define (⌘⇧Y), Word count (⌘⇧C), Translate document..., Script manager..., Script editor... (highlighted), and Preferences... The text area contains a paragraph about a film: "es was released in 1948, the midpoint of Italy's Neorealist period (Thompson set in post-World War II Italy, the film begins outdoors. De Sica shows a myriad Italians listen as a government official addresses the crowd—the men, Italy's turbulent postwar economy, eagerly await job opportunities. The Ricci (played by Lamberto Maggiorani), is called on; there is finally a steady Ricci is to travel across Rome pasting posters, a task too tiring to accomplish on foot. Hard times and lack of work previously forced Ricci to pawn his bicycle, and with no

Rascher 2

income to reclaim it, his wife now convinces Ricci to pawn their bedsheets (her dowry)—a dire trade indicative of Italy's broken economy and its effect on the family unit. The bicycle reclaimed,



Steps to build Bibstro



Extending Google Docs UI



My Research Paper ☆

File Edit View Insert Format Tools Table Help All changes saved in Drive

Saurabh Gupta

Comments

Share

Normal text Arial 11 B I U A A

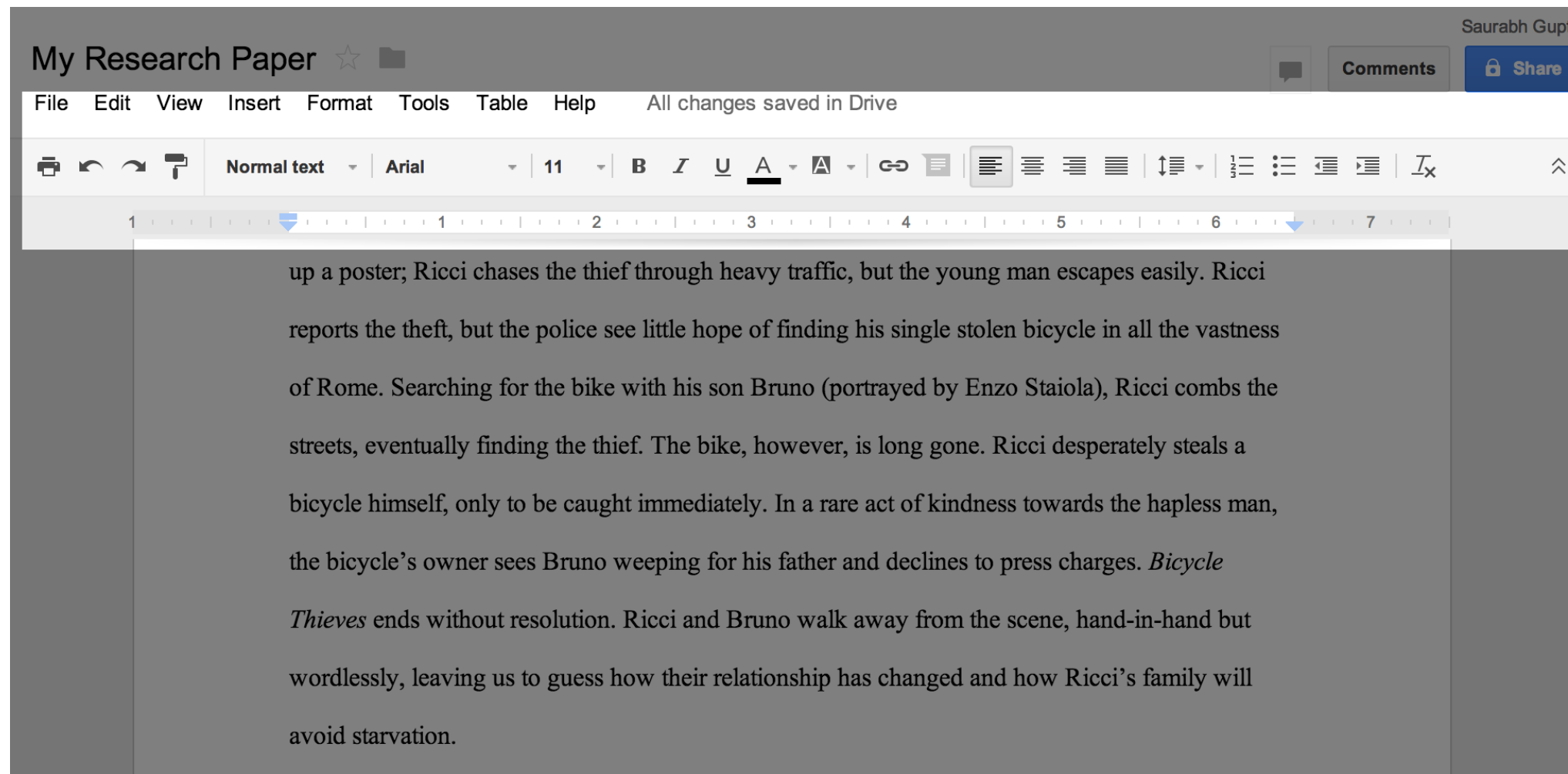
up a poster; Ricci chases the thief through heavy traffic, but the young man escapes easily. Ricci reports the theft, but the police see little hope of finding his single stolen bicycle in all the vastness of Rome. Searching for the bike with his son Bruno (portrayed by Enzo Staiola), Ricci combs the streets, eventually finding the thief. The bike, however, is long gone. Ricci desperately steals a bicycle himself, only to be caught immediately. In a rare act of kindness towards the hapless man, the bicycle's owner sees Bruno weeping for his father and declines to press charges. *Bicycle Thieves* ends without resolution. Ricci and Bruno walk away from the scene, hand-in-hand but wordlessly, leaving us to guess how their relationship has changed and how Ricci's family will avoid starvation.

JS

```
var docs =  
  DocumentApp;
```



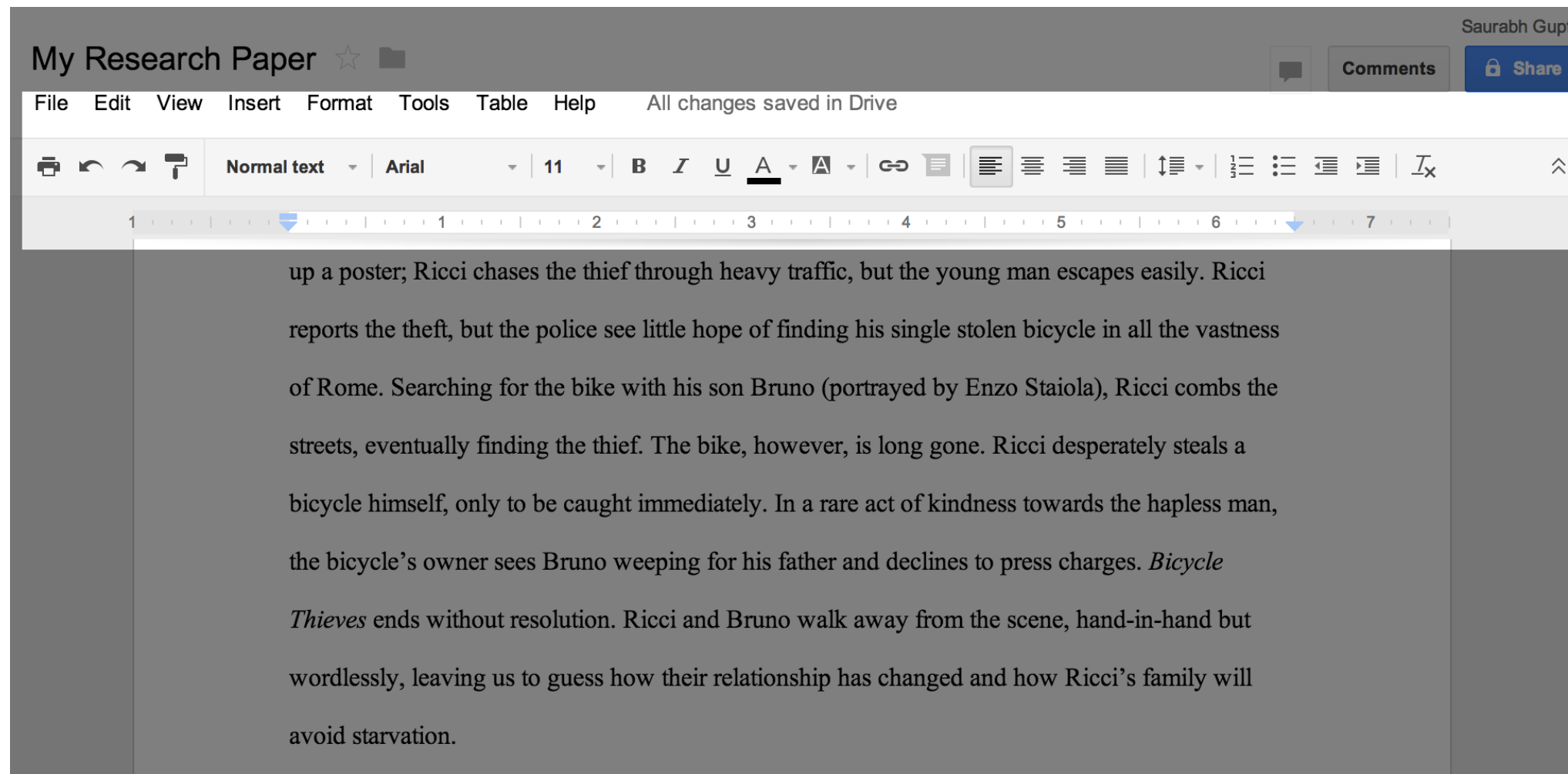
Extending UI



```
JS  
DocumentApp.getUi()
```



Extending UI with Menu



JS

DocumentApp

```
.getUi()  
.createMenu(...)  
.addItem(...)  
.addToUi();
```



Extending UI with Sidebar



My Reseach Paper

File Edit View Insert Format Tools Table Bibliography Help Last edit was made 7 minutes ago by Saurabh Gupta

Normal text Times Ne... 12 B I U A

Rascher 1

Jonathan Rascher
Prof. Brodhead
ENG*340*1
10 Feb. 2012

Pawned Sheets and Angels' Wings: De Sica and Capra on the Individual/Community Conflict

Nowhere is the diversity of men, women, and nations so vividly illustrated as in the comparison of temporally close but geographically distant films. Vittorio De Sica's *Bicycle Thieves* (translated from the Italian *Ladri di biciclette*) and Frank Capra's *It's a Wonderful Life* were produced just two years apart, and both films show how socioeconomic oppression can drive "good people" to harmful or criminal ends. We do not deny that *Bicycle Thieves* and *It's a Wonderful Life* discuss strikingly similar subjects; however, beneath the surface they show stark structural differences. We shall summarize the films' plots and briefly discuss their superficial resemblance before comparing De Sica's Neorealist *mise en scène* to Capra's traditional Hollywood style. Then we will treat the fundamental tension between *Bicycle Thieves* and *It's a Wonderful Life*: the conflict between De Sica's anti-establishment individualism and Capra's

Manage Bibliography Sources

Cardullo, Bert. "The Children Are Watching Us." *Hudson Review* 54.2 (2001). 295-304. Edit Remove Highlight

Costello, Matthew. "The Pilgrimage and Progress of George Bailey: Puritanism, It's a Wonderful Life, and the Language of Community in America." *American Studies* 40.3 (1999). 31-52. Edit Remove Highlight

Jacobson, Herbert L. "De Sica's 'Bicycle Thieves' and Italian Humanism." *Hollywood Quarterly* 4.1 (1949). 28-33. Edit Remove Highlight

Kuntz, María Elena de las Carreras. "The Catholic Vision in Hollywood: Ford, Capra, Borzage and Hitchcock." *Film History* 14.2 (2002). 121-135. Edit Remove Highlight

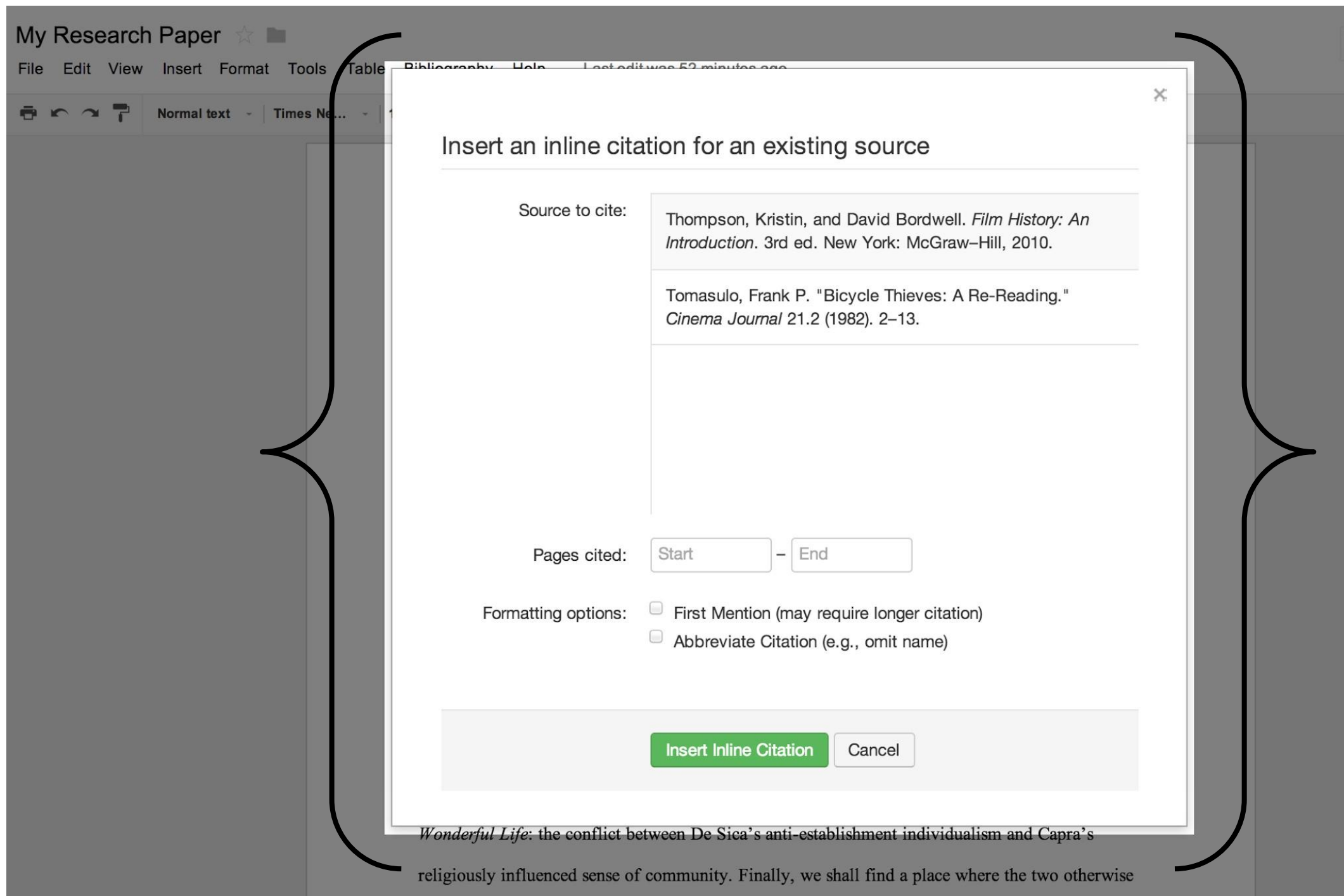
Phelps, Glenn Alan. "The 'Populist' Films of Frank Capra." *Journal of American Studies* 13.3 (1979). 377-392. Edit Remove Highlight

Add New Source... Refresh Document Bibliography

```
JS  
DocumentApp  
.getUi()  
.showSidebar(...);
```



Extending UI with Dialog



```
JS
DocumentApp
  .getUi()
  .showDialog(...);
```

How to show UI in dialog



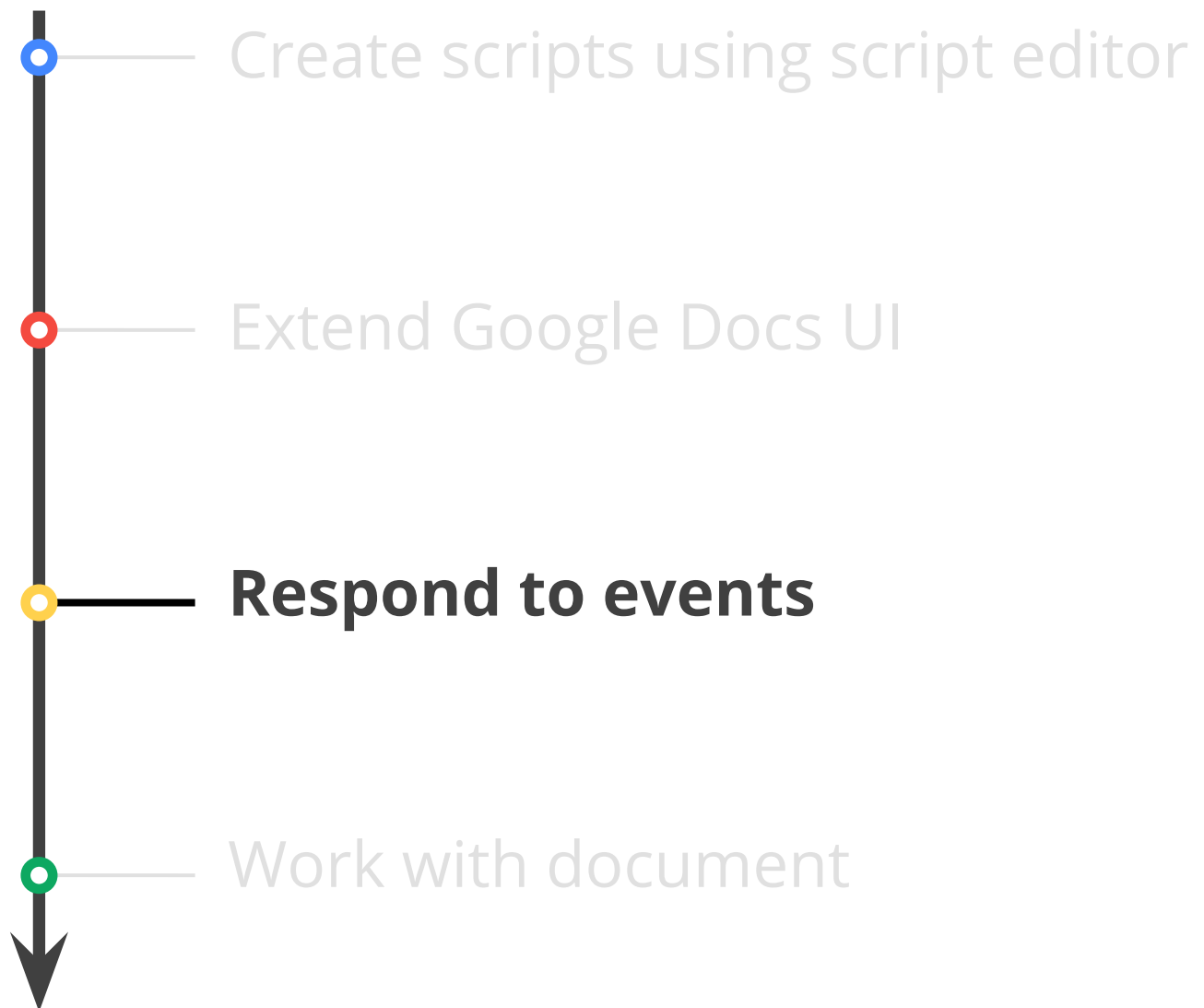
JS

```
var htmlOutput = HtmlService
  .createOutputFromFile('configdialog.html')
  .setWidth(width)
  .setHeight(height)
  .setSandboxMode(HtmlService.SandboxMode.NATIVE);
```

```
DocumentApp
  .getUi()
  .showDialog(htmlOutput);
```



Steps to build Bibstro



onOpen and other events

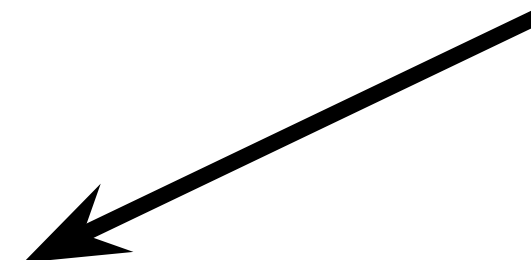


Document opened

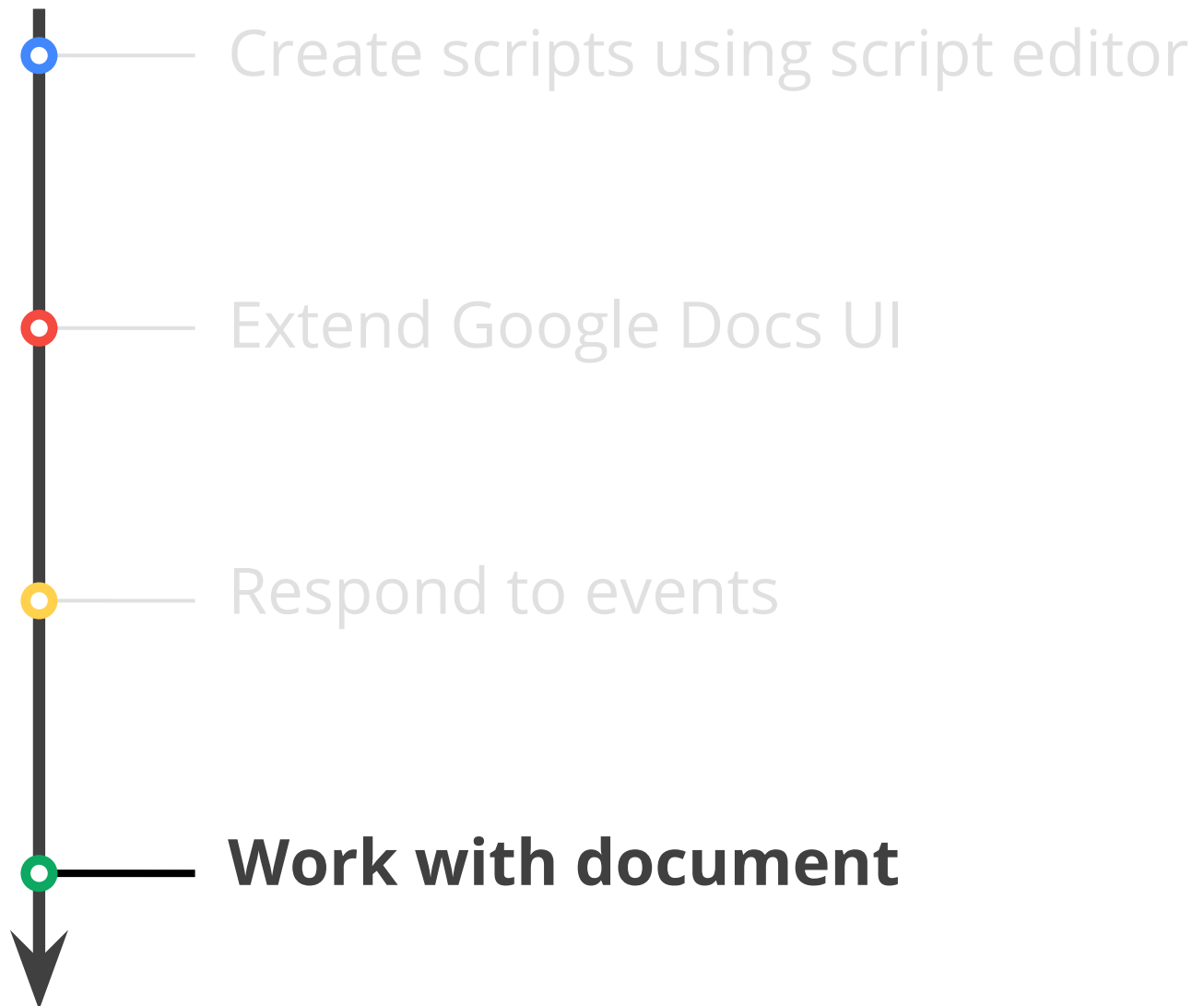


```
JS function onOpen() {  
    DocumentApp.getUi()  
        .createMenu('Bibstro')  
        .addItem(  
            'Manage Sources',  
            'onManageSources')  
        .addToUi();  
}
```

```
function onManageSources() {  
    var html = getHtmlOutput(loadSourceData());  
  
    DocumentApp.getUi().showSidebar(html);  
}
```



Steps to build Bibstro



Document models




- **Tree of elements**, *à la* HTML or XML



Google Docs document structure



This is the first paragraph in the document. The quick brown fox jumps over the lazy dog. Paragraphs can contain text, and other things as well. Here is a picture of some balloons: . And here is some more text after the balloons. This is the end of the paragraph.

This is the second paragraph in the document. It also contains text. And here is some more text.

- This is a list item.
- Another list item.
- A third list item.

Here	is
a	table

This is a footer at the bottom of the page.

- Document (from `getActiveDocument`)
 - Body
 - Paragraph
 - Paragraph
 - ListItemImage
 - ListItem
 - ListItem
 - TableItem
 - FooterSection
 - Table
 - FooterSection



Updating bibliography: Find

A screenshot of a document page. At the top, there is a navigation bar with a ruler and page numbers 1 through 7. Below the navigation bar, the text "Works Cited" is centered and enclosed in a blue rectangular box. Below this box, there are seven entries of text, each representing a citation. The entries are:

Cardullo, Bert. "The Children Are Watching Us." *Hudson Review* 54.2 (2001). 295–304.

Costello, Matthew. "The Pilgrimage and Progress of George Bailey: Puritanism, It's a Wonderful Life, and the Language of Community in America." *American Studies* 40.3 (1999). 31–52.

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Phelps, Glenn Alan. "The 'Populist' Films of Frank Capra." *Journal of American Studies* 13.3 (1979). 377–392.

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Tomasulo, Frank P. "Bicycle Thieves: A Re-Reading." *Cinema Journal* 21.2 (1982). 2–13.



Updating bibliography: Find



JS

```
var body = DocumentApp.getActiveDocument().getBody();
```

```
var titleParagraph;
```

```
var result = null;
```

```
while ((result = body.findElement(DocumentApp.ElementType.PARAGRAPH, result)) != null) {
```

```
  var paragraphResult = result.getElement().asParagraph();
```

```
  if (paragraphResult.editAsText().getText() == 'Works Cited') {
```

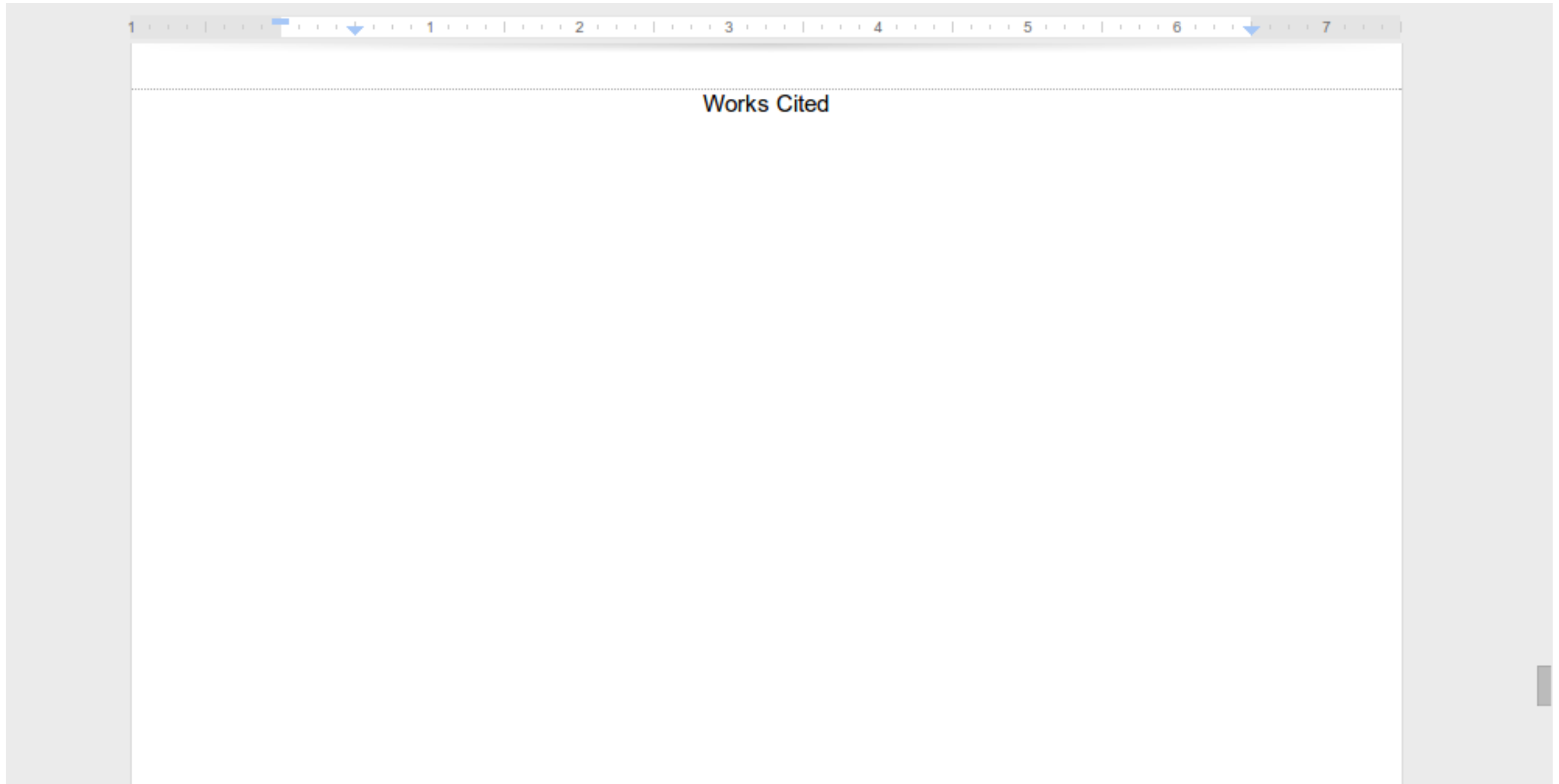
```
    titleParagraph = paragraphResult;
```

```
    break;
```

```
  }  
}
```



Updating bibliography: Remove



Updating bibliography: Remove



JS

```
var titleParagraph = findBibliography(); // From previous slide...

var bibEntryElement = titleParagraph.nextSibling();
while (bibEntryElement && bibEntryElement.getType() == DocumentApp.ElementType.PARAGRAPH) {
  var bibEntryParagraph = bibEntryElement.asParagraph();

  bibEntryParagraph.clear();
  bibEntryParagraph.merge();

  bibEntryElement = titleParagraph.nextSibling();
}
```



Updating bibliography: Insert

A screenshot of a presentation slide. At the top, there is a navigation bar with a series of small squares and numbers 1 through 7. Below this is a white rectangular area containing the text. The title 'Works Cited' is centered at the top of this area. Below the title is a list of seven references, each indented from the left margin. The references are:

Cardullo, B. (2001). The Children Are Watching Us. *Hudson Review*, 54(2), 295–304.

Costello, M. (1999). The Pilgrimage and Progress of George Bailey: Puritanism, It's a Wonderful Life, and the Language of Community in America. *American Studies*, 40(3), 31–52.

Jacobson, H. (1949). De Sica's 'Bicycle Thieves' and Italian Humanism. *Hollywood Quarterly*, 4(1), 28–33.

Kuntz, M. (2002). The Catholic Vision in Hollywood: Ford, Capra, Borzage and Hitchcock. *Film History*, 14(2), 121–135.

Phelps, G. (1979). The 'Populist' Films of Frank Capra. *Journal of American Studies*, 13(3), 377–392.

Thompson, K., & Bordwell, D. (2010). *Film History: An Introduction* (3rd ed.). New York: McGraw–Hill.

Tomasulo, F. (1982). Bicycle Thieves: A Re-Reading. *Cinema Journal*, 21(2), 2–13.



Updating bibliography: Insert



JS

```
var titleParagraph = findBibliography(); // From previous slide...

var parentElement = titleParagraph.getParent();
var insertionPoint = parentElement.getChildIndex(titleParagraph) + 1;

var sources = loadSources();
for (var i = 0; i < sources.length; i++) {
    var sourceStr = formatSource(sources[i]);
    parentElement.insertParagraph(insertionPoint + i, sourceStr)
        .setIndentStart(36 /* pt, or 0.5 in */)
        .setIndentFirstLine(0);
}
```



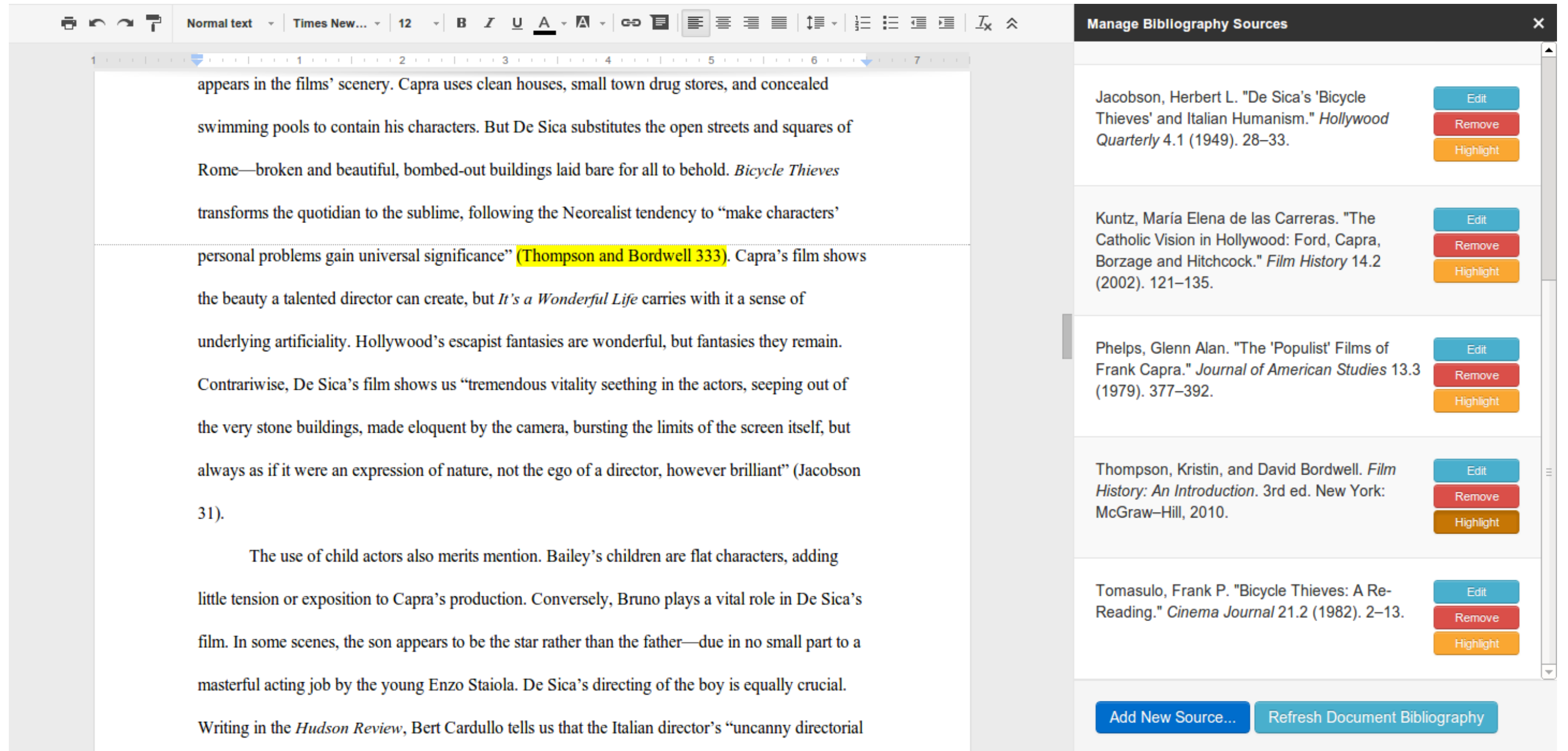
Document models



- Tree of elements, *à la* HTML or XML
- **String of formatted text**



Highlighting citations



appears in the films' scenery. Capra uses clean houses, small town drug stores, and concealed swimming pools to contain his characters. But De Sica substitutes the open streets and squares of Rome—broken and beautiful, bombed-out buildings laid bare for all to behold. *Bicycle Thieves* transforms the quotidian to the sublime, following the Neorealist tendency to “make characters’ personal problems gain universal significance” (Thompson and Bordwell 333). Capra’s film shows the beauty a talented director can create, but *It’s a Wonderful Life* carries with it a sense of underlying artificiality. Hollywood’s escapist fantasies are wonderful, but fantasies they remain. Contrariwise, De Sica’s film shows us “tremendous vitality seething in the actors, seeping out of the very stone buildings, made eloquent by the camera, bursting the limits of the screen itself, but always as if it were an expression of nature, not the ego of a director, however brilliant” (Jacobson 31).

The use of child actors also merits mention. Bailey’s children are flat characters, adding little tension or exposition to Capra’s production. Conversely, Bruno plays a vital role in De Sica’s film. In some scenes, the son appears to be the star rather than the father—due in no small part to a masterful acting job by the young Enzo Staiola. De Sica’s directing of the boy is equally crucial. Writing in the *Hudson Review*, Bert Cardullo tells us that the Italian director’s “uncanny directorial

Manage Bibliography Sources

- Jacobson, Herbert L. "De Sica's 'Bicycle Thieves' and Italian Humanism." *Hollywood Quarterly* 4.1 (1949). 28–33. [Edit](#) [Remove](#) [Highlight](#)
- Kuntz, María Elena de las Carreras. "The Catholic Vision in Hollywood: Ford, Capra, Borzage and Hitchcock." *Film History* 14.2 (2002). 121–135. [Edit](#) [Remove](#) [Highlight](#)
- Phelps, Glenn Alan. "The 'Populist' Films of Frank Capra." *Journal of American Studies* 13.3 (1979). 377–392. [Edit](#) [Remove](#) [Highlight](#)
- Thompson, Kristin, and David Bordwell. *Film History: An Introduction*. 3rd ed. New York: McGraw–Hill, 2010. [Edit](#) [Remove](#) [Highlight](#)
- Tomasulo, Frank P. "Bicycle Thieves: A Re-Reading." *Cinema Journal* 21.2 (1982). 2–13. [Edit](#) [Remove](#) [Highlight](#)

[Add New Source...](#) [Refresh Document Bibliography](#)



Highlighting citations: Set styles



JS

```
var bodyTextElement = DocumentApp.getActiveDocument().getBody().editAsText();
var bodyString = bodyTextElement.getText();

var citationRegExp = RegExp('\\([^\n]+\\)', 'g');
var citationMatch = null;

while ((citationMatch = citationRegExp.exec(bodyStr)) != null) {
  if (shouldHighlight(citationMatch)) {
    bodyTextElement.setBackgroundColor(
      citationMatch.index, citationMatch.index + citationMatch[0].length - 1, '#ffff00');
  }
}
```



Document models



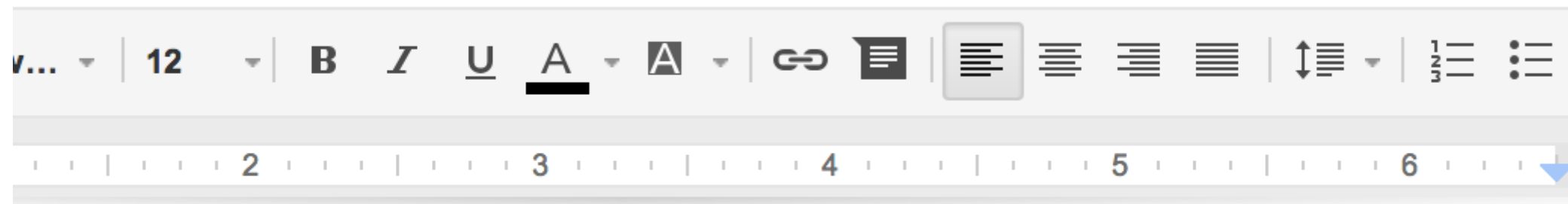
- Tree of elements, *à la* HTML or XML
- String of formatted text
- **Using cursor or selection (coming soon!)**



Coming soon: cursor & selection!



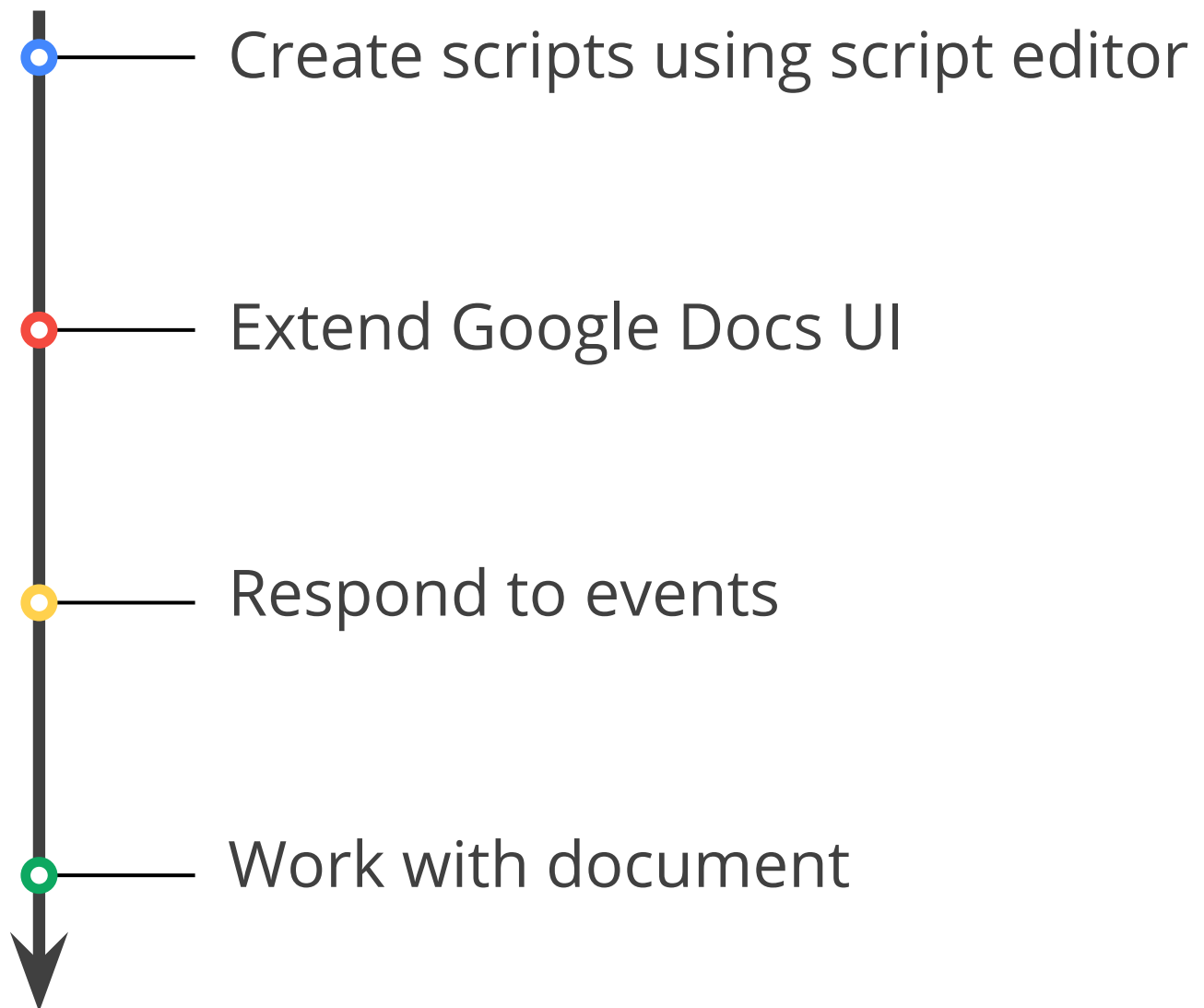
Table Bibstro Help All changes saved in Drive



1948, the midpoint of Italy's Neorealist period (Thompson and Bordwell 330). Set



Steps to build ~~Bibstro~~ your app!



Extend **Google Docs** with the power of **Apps Script**!

Have any questions?



Google Apps Script: <https://developers.google.com/apps-script/>

Extending Google Docs: <https://developers.google.com/apps-script/guides/docs>

Document API reference: <https://developers.google.com/apps-script/reference/document/>



Google
Developers



Appendix