

GuideAutomator: Automated User Manual Generation with Markdown



Allan dos Santos Oliveira
Supervisor: Prof. Rodrigo Rocha Gomes e Souza
Department of Computer Science
Federal University of Bahia



Introduction

- User experience as rising concern in the software industry
- However, user manuals are still required and desirable in many situations:
 - Inexperienced users
 - Domain policy
 - Support for critical actions
 - Revealing full potential of the application
- Multiple studies revealed user documentation importance as:
 - Essential for providing an effective support for users with different levels of skill (TORKZADEH; DOLL, 1993).
 - Significantly related to user satisfaction and, consequently, to the application success. (GEMOETS; MAHMOOD, 1990).

- Instructions use techniques such as systematic sequence to accomplish a certain task, which often make use of screen capture.

SIATEX

CADASTRO



O proponente, com o seu CPF e senha SIUS, acessa o SIATEX (www.siatex.ufba.br) e no menu do proponente inicia uma nova proposta. É fundamental que o proponente já tenha definido os itens listados abaixo.

A atividade será estruturada no sistema a partir das informações que o proponente irá disponibilizar e não será possível alterar a maioria delas.

1. Nome da atividade

2. Refere-se a uma de ação: permanente ou eventual

2.1. Periodicidade do envio do relatório da atividade permanente:
trimestral, semestral ou anual

Introduction

User manuals are often ignored by development teams because of their cost, which is due, especially, to:

- Standard tools, which slow down development speed and make versioning challenging due to binary files (WAITS; YANKEL, 2014).
- Screen captures, which make it harder to keep documentation synced with the software's growth.

Introduction

GuideAutomator comes in as an alternative to standard tools.

An user manual generation tool with automated screen capture built upon Selenium WebDriver, to be used with Markdown.

Background

- GuideAutomator relates to:
 - Standardized markup languages
 - Continuous integration
 - Functional testing

Background

Waits and Yankel (2014) claimed that standard documentation tools and processes based on collaborative writing of documents using binary files are not well integrated into software development tools and processes.

They proposed the use of plain text files, such as Markdown, and to convert it into PDF and HTML using Pandoc.

GuideAutomator follows this approach and extends it by enabling scripts interleaved with text.

Background

Continuous integration is the practice of checking in developers' source code changes to a shared repository frequently (FOWLER; FOEMMEL, 2006).

GuideAutomator can be included in the continuous integration cycle and enable creation and publication of documentation synced with the latest source code change.

Background

Functional testing focus on checking whether the application's behavior follows its specification (MYERS; SANDLER; BADGETT, 2011).

Web applications can automate functional testing with the Selenium framework (HOLMES; KELLOGG, 2006).

GuideAutomator uses Selenium to capture the application state and display it in the user manual.

Tools and Technology

- Markdown
 - Created in 2004 by John Gruber.
 - Enables conversion to formats such as HTML, PDF, LaTeX.
 - Very popular in the software community
 - Overcomes some binary files limitations
 - It can effectively reside in a version control system

```
This is a first-level heading
```

```
Second level
```

```
### Third
```

```
Lists
```

- one
- two
- three

```
> Blockquotes are awesome
```

```
> - Me
```

```
Italics for emphasis or bold for more emphasis
```

```
```{r my-first-chunk, results='asis'}  
code goes in here
```
```

This is a first-level heading

Second level

Third

Lists

- one
- two
- three

Blockquotes are awesome

-Me

Italics for *emphasis* or bold for **more emphasis**

```
## code goes in here
```

Simple Markdown example. Adapted from “Introduction to knitr”. 2016. Retrieved from <https://sachsmc.github.io/knit-git-markr-guide/knitr/knit.html>

Tools and Technology

- Selenium WebDriver
 - Tool for browser automation.
 - Enables one to drive a browser as a user would.
 - Supports the largest browser vendors.

GuideAutomator's API incorporates some of Selenium WebDriver's API commands.

However, it currently guarantees support only for Chrome WebDriver 2.21.

GuideAutomator

- Gathering requirements
 - A study was performed looking for popular characteristics of user manuals.
 - Three types of applications were chosen.
 - From the set of features identified, we selected: summary; viewport screenshot, cropped screenshot, highlight on screenshot by outline and page numbering.

GuideAutomator

The three main functions of PhotoMeister - Import, Improve, and Impress - can all be accessed from the main window as shown below.

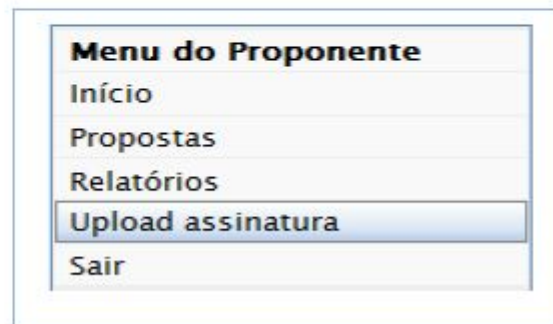


As you can see, each step is labeled within the window providing you easy and intuitive access.

Example of viewport screenshot on PhotoMeister user manual.

Para programas ou projetos **permanentes**, isto é, sem data determinada para finalização, deve-se encaminhar o relatório de acordo com a periodicidade escolhida na proposta.

Assim que o relatório for registrado e finalizado na PROEXT, o sistema já está apto para novo relatório referente ao período subsequente.



Example of cropped screenshot on SIATEX user manual.

Certificado para a equipe (Carga Horaria e Período) e participantes (frequência)

^ Nome Completo

^ Email

^ Categoria Não Informado ▾

^ Participação Não Informado ▾

^ Frequencia 0.0 % ⓘ

O participante foi alterado no relatório.

Dados para Certificação de Participantes

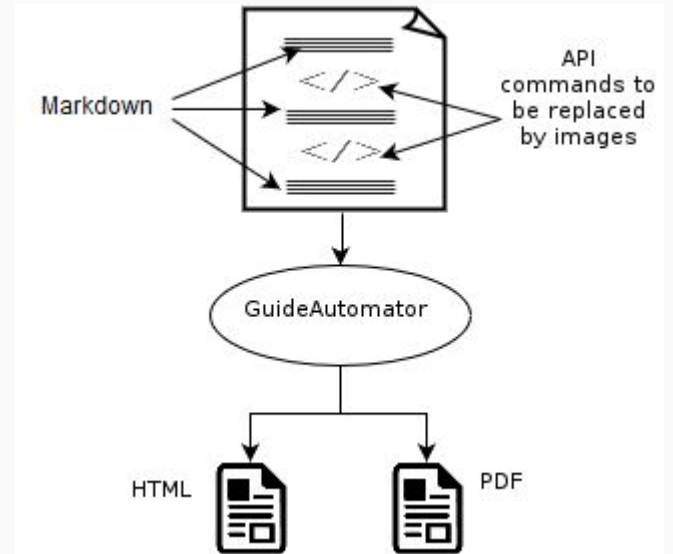
| NOME | EMAIL | SITUACAO | FREQ | RESULTADO | EXCLUIR | EDITAR | ENVIAR EMAIL | CERTIFICADO |
|----------------------|-----------------|-------------|--------|-----------|--|---------------------------------------|---------------------------------------|----------------------|
| Maria Joana Fernanda | aaaa@aaa.aaa.ae | Estudante | 100.0% | Aprovado | <input type="button" value="Excluir"/> | <input type="button" value="Editar"/> | <input type="button" value="Enviar"/> | Link |
| Paulo Fernanda José | bbbbbb@bbb.bbb | Funcionário | 78.0% | Aprovado | <input type="button" value="Excluir"/> | <input type="button" value="Editar"/> | <input type="button" value="Enviar"/> | Link |
| João Felipe José | cccc@ccc.ccc | Funcionário | 80.0% | Aprovado | <input type="button" value="Excluir"/> | <input type="button" value="Editar"/> | <input type="button" value="Enviar"/> | Link |

Example of highlight by rectangle on SIATEX user manual.

GuideAutomator

- Command line Node.js application
- The input file is a mix of Markdown with GuideAutomator's API for driving web browsers.

```
guide-automator docs\input.md docs
```



GuideAutomator

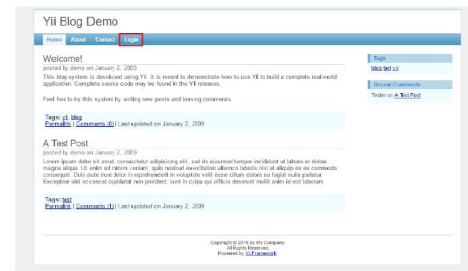
- Comandos da API
 - `get(url)`
 - `takeScreenshot([imageWidth])`
 - `takeScreenshotOf(selector[,crop,outline,imageWidth])`
 - `fillIn(selector,content)`
 - `submit(selector)`
 - `click(selector)`
 - `clickByLinkText(text)`
 - `wait(selector)`
 - `sleep(milliseconds)`

Login

Para fazer login no sistema acesse <http://www.yiiframework.com/demos/blog/>



Clique na aba de login



Preencha o formulário de login com nome de username e password válidos

Fill in with * are required

Username *

Password *

Hint: You may login with demo/demo.

Remember me next time

E submeta o formulário clicando no botão login

Você está agora logado no sistema.

```
1 # Manual de usuário do Yii Blog Demo
2 ## Login
3 Para fazer login no sistema acesse http://www.yiiframework.com/demos/blog/
4
5 <automator>
6 get('http://www.yiiframework.com/demos/blog/');
7 takeScreenshot();
8 </automator>
9
10 Clique na aba de login
11
12 <automator>
13 takeScreenshotOf('#mainmenu li:last-child > a','0','1');
14 click('#mainmenu li:last-child > a');
15 </automator>
16
17 Preencha o formulário de login com nome de username e password válidos
18
19 <automator>
20 fillIn('#LoginForm_username','demo');
21 fillIn('#LoginForm_password','demo');
22 takeScreenshotOf('#login-form','1');
23 </automator>
24
25 E submeta o formulário clicando no botão login
26
27 <automator>
28 submit('#login-form');
29 </automator>
30
31 Você está agora logado no sistema.
```

Evaluation

- Pilot Experiment
 - Comparative test for creating user manuals with and without GuideAutomator
 - 1 participant: computer science undergraduate student with low web programming skills.
 - Asked to reproduce a short user manual for SIPOS using both approaches.
 - Evaluation criteria
 - Time taken
 - Ease of use (1-5)
 - Learning curve (1-5)
 - Advantages
 - Disadvantages
 - Training for using GuideAutomator and traditional tools (text processors and image editors).

Evaluation

| | Without GuideAutomator | With GuideAutomator |
|----------------------|---|---|
| Time | 41 minutes | 71 minutes |
| Ease of use (1-5) | 5 | 4 |
| Learning curve (1-5) | 5 | 3 |
| Advantages | Native softwares, which users are more familiar to. | Automated process, reduced maintenance cost when the interface changes. |
| Disadvantages | Non-efficient maintenance when the interface changes. | Requires a base web programming knowledge. |

Evaluation

- Lessons from the pilot experiment
 - Basic web programming knowledge is required, which may reduce the audience
 - GuideAutomator may take more time at an initial state, however it gives signs of a better performance on long term usage.

Conclusion

- User manuals are usually ignored due to standard tools and processes.
- GuideAutomator comes as alternative tool providing an automated process.
- Major features are screen capture automation and its ease for versioning due to the use of Markdown.
- Pilot experiment revealed a lower performance at initial stage but suggested a better performance on long term usage.

Conclusion

- Future work
 - Perform more experiments for assessing GuideAutomator usage
 - Expand browser support
 - Expand API commands
 - More variety on highlight
 - Document styling
 - Screen recording for video tutorials
 - Integrated use with tests
 - Provide a web app

References

- TORKZADEH, G.; DOLL, W. J. The place and value of documentation in end-user computing. *Information & Management*, Elsevier, v. 24, n. 3, p. 147–158, 1993.
- GEMOETS, L. A.; MAHMOOD, M. A. Effect of the quality of user documentation on user satisfaction with information systems. *Information & management*, Elsevier, v. 18, n. 1, p. 47–54, 1990.
- HODGSON, P. Tips for writing user manuals. 2007. Available at: <<http://www.userfocus.co.uk/articles/usermanuals.html>>.
- WAITS, T.; YANKEL, J. Continuous system and user documentation integration. In: IEEE. 2014 IEEE International Professional Communication Conference (IPCC). [S.l.], 2014. p. 1–5.
- KNUTH, D. E. Literate programming. *The Computer Journal*, Br Computer Soc, v. 27, n. 2, p. 97–111, 1984.

References

- KRAMER, D. Api documentation from source code comments: a case study of javadoc. In: ACM. Proceedings of the 17th annual international conference on Computer documentation. [S.l.], 1999. p. 147–153.
- FOWLER, M.; FOEMMEL, M. Continuous integration. Thought-Works. [http://www.thoughtworks.com/Continuous Integration. pdf](http://www.thoughtworks.com/Continuous%20Integration.pdf), p. 122, 2006.
- MYERS, G. J.; SANDLER, C.; BADGETT, T. The art of software testing. [S.l.]: John Wiley & Sons, 2011.
- HOLMES, A.; KELLOGG, M. Automating functional tests using selenium. In: IEEE. AGILE 2006 (AGILE'06). [S.l.], 2006. p. 6–pp.
- UFBA. Manual SIATEX. 2015. Available at: https://siatex.ufba.br/siatex/arquivos/NOVO_passo_a_passo.pdf
- PAESSLER. PhotoMeister Professional. Available at: <http://download-cdn.paessler.com/download/photomeistermanual.pdf>

Thank you!