

Examining Cross Browser Inconsistencies with Web Based Event Loggers

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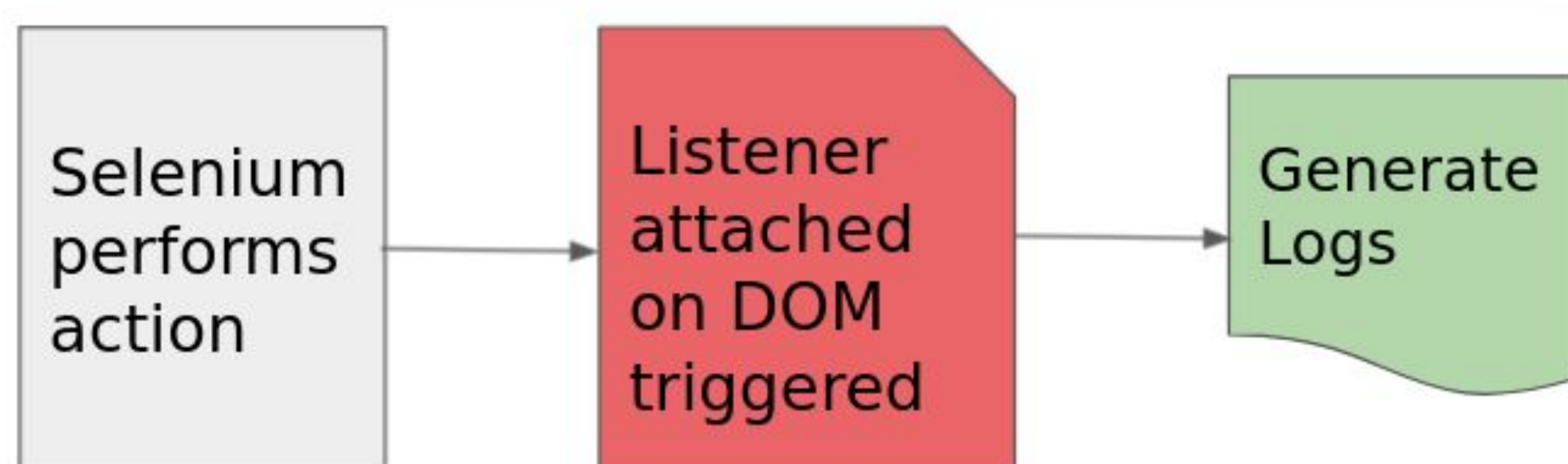
Introduction

- Different browsers reacting in different ways to the same action on a web page is called Cross Browser Inconsistency (XBI).
- Browsers use different engines which leads to XBI and is very problematic for web developers [1].
- Hard to pinpoint XBI at granular level because of lack of a good tool.
- Web-based event logger (LogUI [2]) attaches listeners to elements of DOM.
- Results show that browsers load web-pages differently and sometimes change the order in which actions are performed.

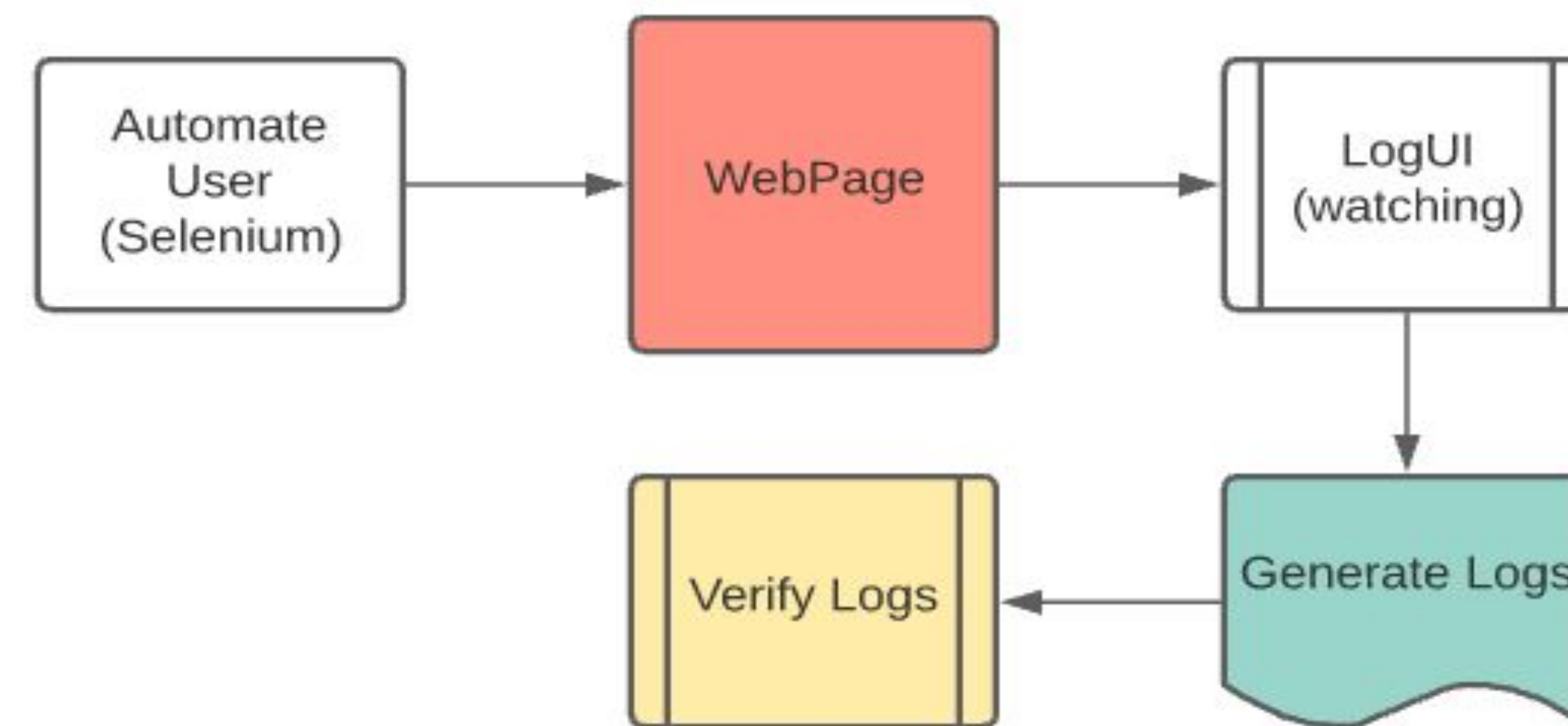
Research Question

- How do web browsers handle interaction events differently?
- How do different browsers report a sequence of events and differences exist if any?

Event Capturing in Browser



Flow Diagram



Test Suite Results

Test	Safari	Firefox	Description
F1: test_page_focus	✗	✓	Page is in focus
V1: test_viewport_resize	✗	✗	Resize viewport
Q1: test_querybox_focus	✓	✓	Focus on query box
Q2: test_querybox_keyup	✓*	✓	Send keyboard input to query box
Q3: test_querybox_submit	✓*	✓	Submit query
Q4: test_querybox_blur	✓	✓	Blur query box on exit
T1: test_timestamp	✓	✓	Verify timestamp delay of two events
C1: test_click_once	✓*	✓	Click event is logged
C2: test_click_thrice	✓	✓	Click events are logged
RC1: test_right_click_once_browser	✗	✓	Right click once (browser event)
RC2: test_right_click_thrice_browser	✗	✓	Right click thrice (browser event)
RC3: test_right_click_once	✓	✓	Right click once
RC4: test_right_click_thrice	✗	✓	Right click thrice
D1: test_doubleclick_once	✗	✓	Double click
D2: test_doubleclick_thrice	✗	✗	Double click thrice
H1: test_hover_once	✓*	✓	Hover over element once
H2: test_hover_thrice	✗	✓	Hover over element thrice
H3: test_hover_different	✓	✓	Hover on different elements
D1: test_drag_drop	✗	✗	Drag and drop element
CT1: test_hover_hover_click_hover	✗	✗	Hover twice, click and hover

Approach

- Listener attached to DOM is triggered when user performs an action
- Simulate users with Selenium Webdriver on a web page.
- Compare actions performed and actions logged to detect XBI on different browser.

Results

- XBI are few and hard to find.
- Web pages are loaded differently.
- Actions like hover are re-ordered.

Implications

- Not necessarily a XBI if all engines behave similarly
- Reordering of events can be an optimization

References

- [1] M. Watanabe¹ W, F. Christian, and D. Silva "Towards cross-browser incompatibilities detection: A systemic literature review," 6, vol. 10, International Journal of Software Engineering & Applications, 2019.
- [2] Contemporary logging infrastructure for web-based experiments," in Advanced in Information Retrieval (Proc. ECIR) , 2021, pp. 525–530.