

Do authentication websites adopt friendly password registration error message design?

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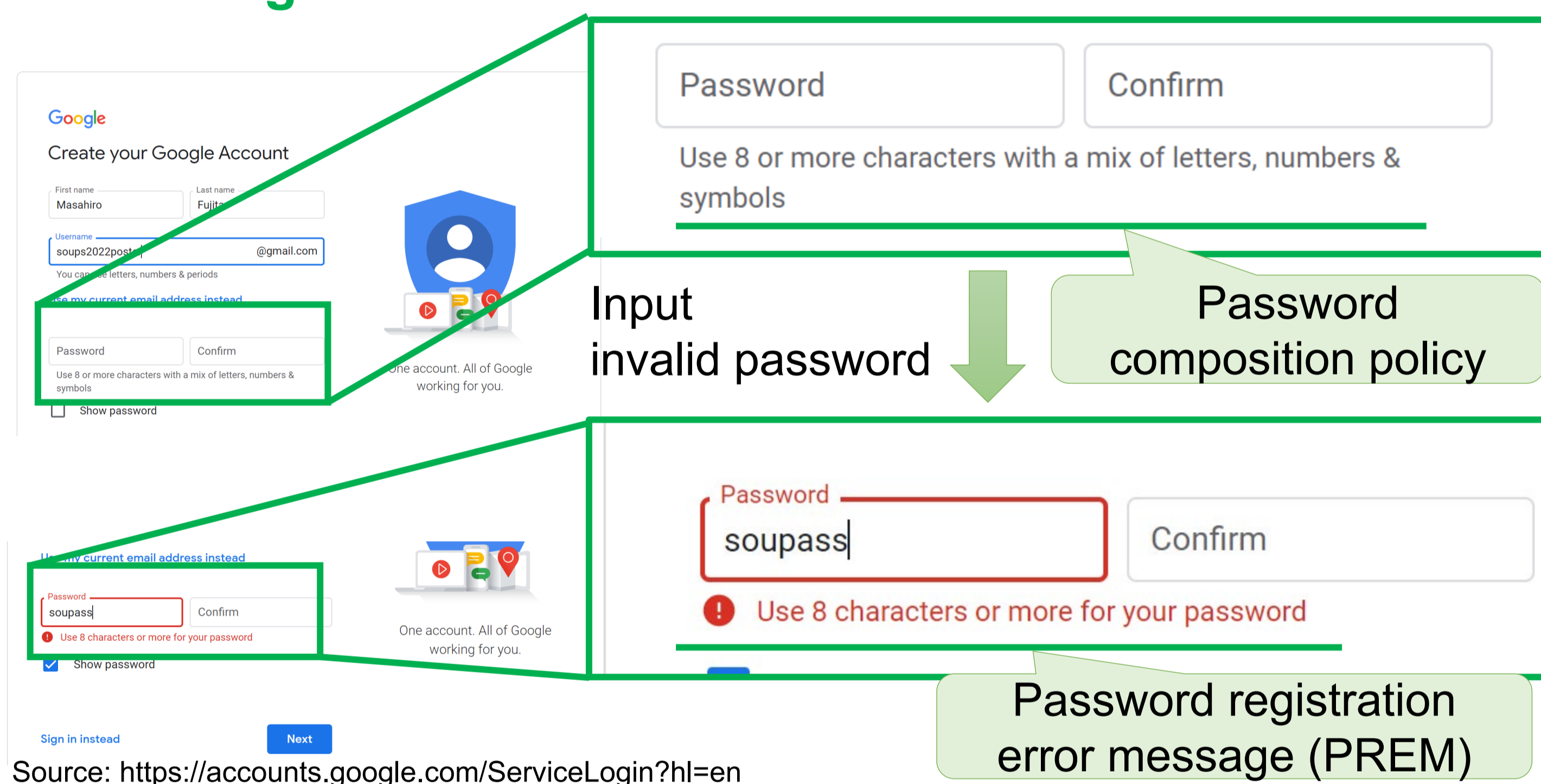
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1. Introduction

- To improve the user experience(UX), many guidelines have been published.
 - (e.g., [Babich 20], [Krause 19], [Metts 20], [Minhas 18])
- This gives rise to a big question:
 - Does the design of security systems follow the rules in the UX guidelines?
- However, no study has yet answered this question clearly.

Research question in this work

- Do authentication websites adopt friendly password registration error message (PREM) designs based on the design rules?**



2. Methodology

Procedure

Step 1. Definition of design requirements

- We extracted the design rules that are strongly related to PREM design from the guidelines.
- We defined the design requirements based on the rules.

Step 2. Obtaining authentication websites

- We used a Japanese crowdsourcing service, Lancers.
- We conducted the task on November ninth, 2019.
- We requested each worker to report to five URLs of authentication websites.
- We paid each worker 100 Japanese yen per a valid URL.

Step 3. Checking websites

- One of the authors checked whether each authentication websites satisfy the design requirements or not

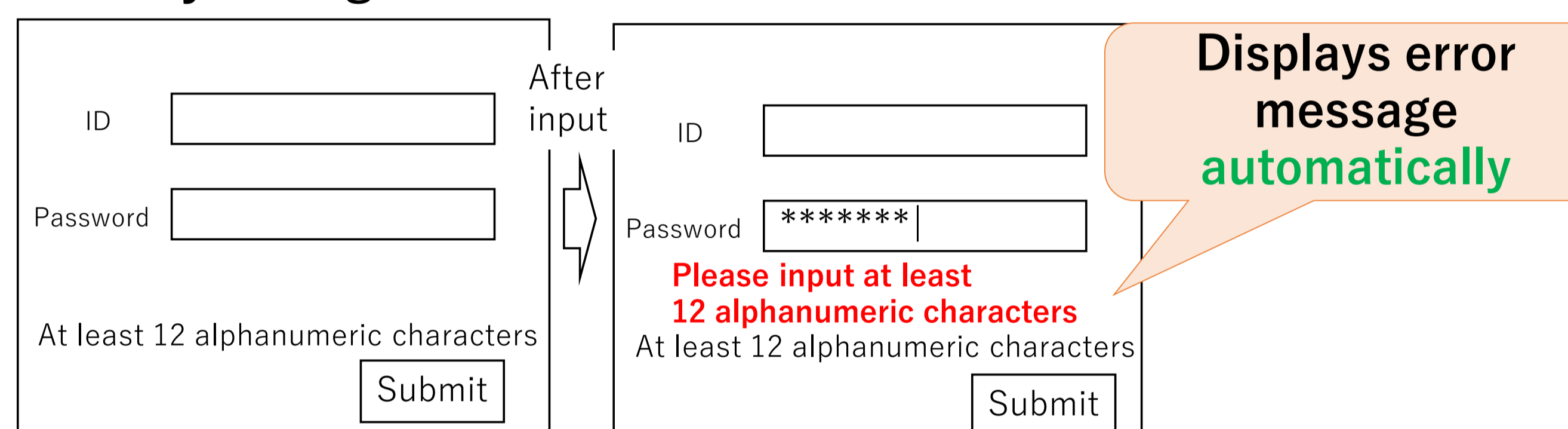
Requirements

- We defined two friendly PREM design requirements based on the rules.**
 - This was conducted based on discussions with some of the experts on usable security.

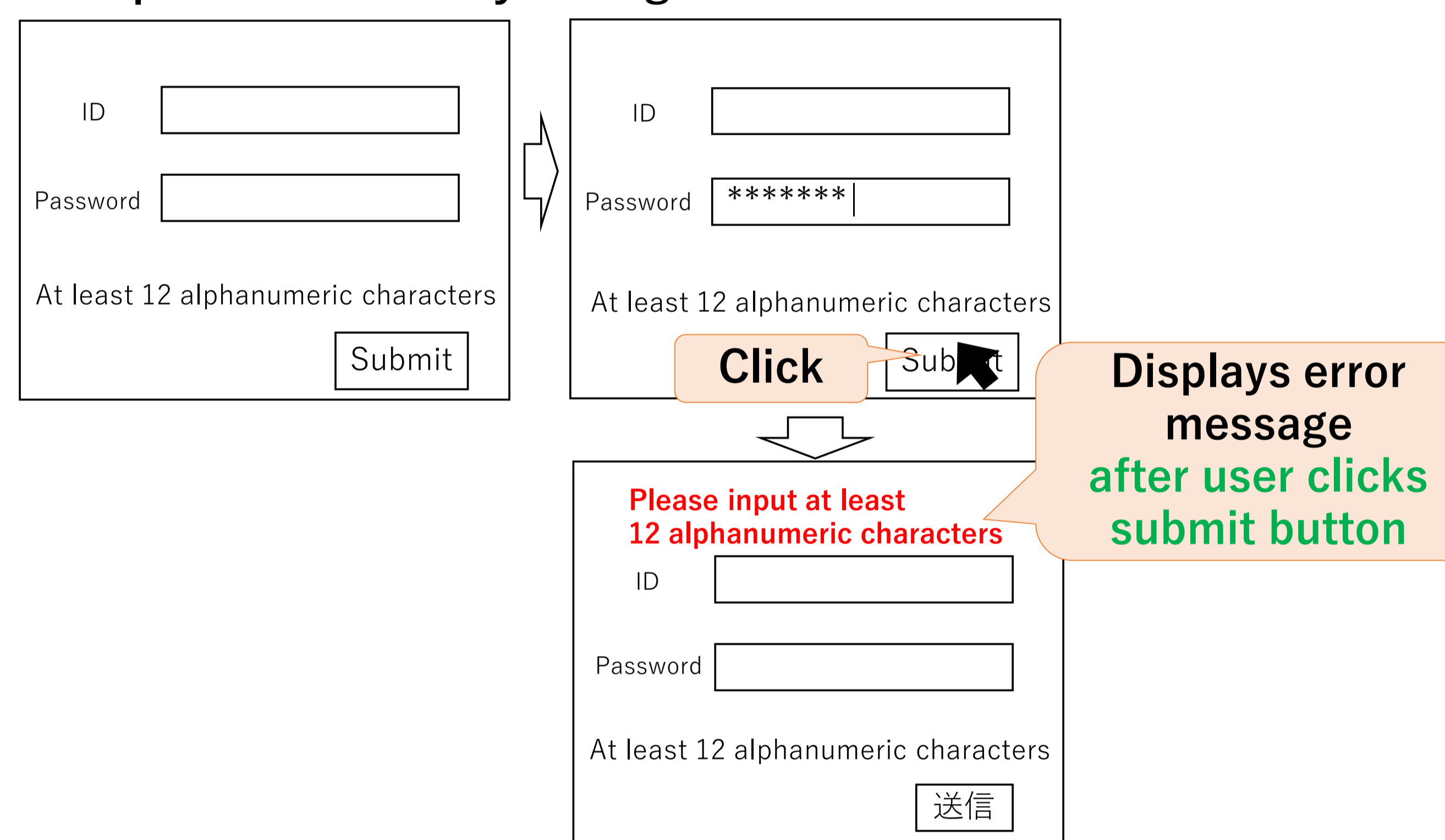
Requirement 1 (Friendly-timing).

A PREM should be displayed automatically after a user inputs an invalid password.

Friendly-timing :



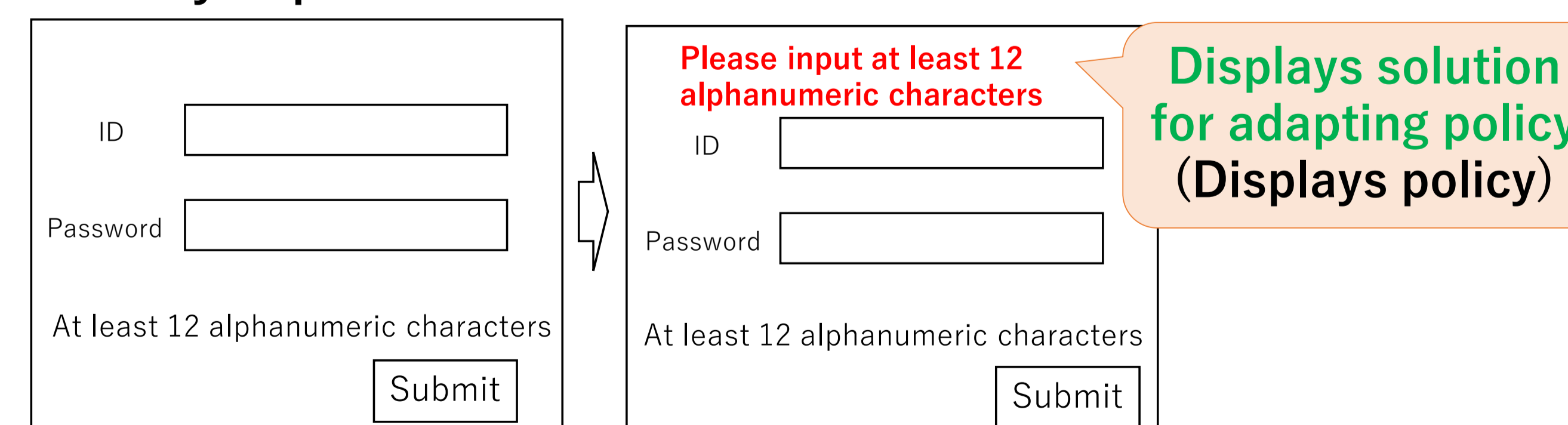
Example of not Friendly-timing :



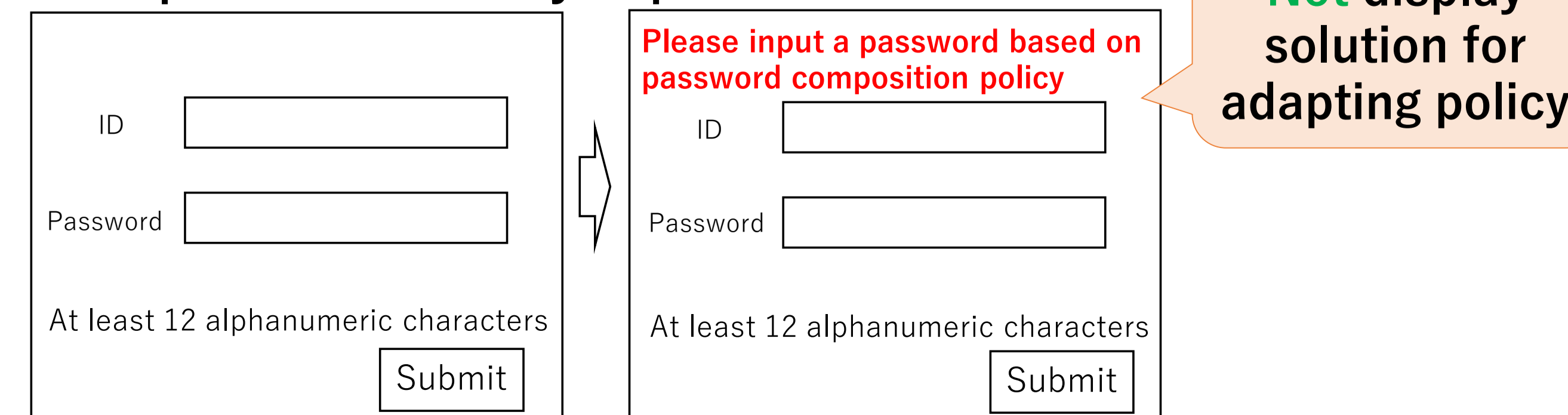
Requirement 2 (Friendly-explanation).

A PREM should contain the password composition policy

Friendly-explanation :



Example of not Friendly-explanation :



3. Result

	Friendly-timing	Not friendly-timing	Total
Friendly-explanation	80 (34.6%)	54 (23.3%)	134 (58.0%)
Not friendly-explanation	33 (14.3%)	64 (27.7%)	97 (42.0%)
Total	113 (49.0%)	118 (51.1%)	231

Types of websites not satisfying friendly-explanation

	Total	“only alphanumeric characters” was used as the policy but...
No policy	33	the error message did not contain the policy.
Unreachable	34	an error message had a priority than the PREM
Check mistake	17	“p@ssword” was accepted.
Message inconsistency	10	the error message was “please input valid password composed of alphanumeric characters and symbols(,)”
No error message	3	no error message was displayed

4. Discussion

Answer to research question

- Most (approximately 65%) authentication websites do not adopt the friendly PREM design.**

Implications

- If a website does not satisfy requirement 1 and/or 2, an extra user operation is required.
 - ⇒ Websites should be corrected to satisfy requirements 1 and/or 2 to reduce the extra time required.
- Check mistake and Message inconsistency are implementation mistakes by the developers.
 - ⇒ More supports for the developers to prevent the mistakes are needed. (e.g., more specific test tools)

New research question

- Why do developers of authentication systems not follow the rules in the UX guidelines?