

Group 4 - Pilot Study

CONSENT FORM

You are invited to take part in a research study being conducted by Group 4, a group of undergraduate and graduate students in Computer Science at Dalhousie University. The purpose of this research is to objectively identify and assess the key usability factors associated with browser-based password managers. This will be done through an online questionnaire conducted via Google Forms. Any user with access to an Internet connection can participate. The study is unfunded.

If you choose to participate in this research you will be asked to answer approximately 21 questions in an anonymous, online survey on browser-based password managers, as well as give feedback on a proposed implementation. The survey should take approximately 10 minutes.

Your participation in this research is entirely your choice. You are welcome to stop the survey at any time if you no longer want to participate. All you need to do is close your browser. We will not include any incomplete surveys in our analyses. If you do complete your survey and you change your mind later, we will not be able to remove the information you provided as we will not know which response is yours.

Your responses to the survey will be anonymous. This means that there are no questions in the survey that asks for identifying details such as your name or email address. All responses will be saved on a secure Google server. Only Caleidgh Bayer, André Gagné, Sunny Jagasia, Sithara Jayachandran, Ms Shehzeen, and Zachary Wilkins will have access to the survey results.

We will describe and share general findings of this research at the Seventeenth Symposium on Usable Privacy and Security (SOUPS 2021). We may include direct quotations from short-answer questions. Your answering of these questions implies consent that we may use them as part of our work. We will destroy all survey results no later than 12 months after completing/reporting the results.

The risks associated with this study are no greater than those you encounter in your everyday life, as the survey is anonymous and the only personal information collected is general demographic information.

There will be no direct benefit to you in participating in this research (i.e.: no compensation).

The research, however, might contribute to new knowledge on the usability and security of password managers. If you would like to see how your information is used, please feel free to visit our website [\[https://web.cs.dal.ca/~bayer/csci4169/\]](https://web.cs.dal.ca/~bayer/csci4169/) after August 31, 2021.

You should discuss any questions you have about this study with Zachary Wilkins and Ms Shehzeen. Please ask as many questions as you like before or after participating. Our contact information is zachary.wilkins@dal.ca and shehzeen@dal.ca.

If you have any ethical concerns about your participation in this research, you may contact Research Ethics, Dalhousie University at (902) 494-3423, or email ethics@dal.ca (and reference REB file # 20XX-XXXX)."

***Required**

1. I give my informed consent and agree to participate in this pilot study. *

Mark only one oval.

☐

No

Stop filling out this form.

☐

Yes

Group 4 - Pilot Study

The purpose of the study is to objectively identify and assess the key usability factors associated with browser-based password managers.

This introductory section has been designed to guide the participants through the process of the study. The study emphasis is on assessing the usability of a browser-based password manager wireframe that was created using evidence-based research with the intention to improve the overall usability.

The Google Form you're using will begin by assessing your existing password manager experience and preferences. It will then prompt you to go through a series of static wireframe images to understand the proposed method. This will be followed by a set of questions to be answered. Each question needs to be evaluated on a scale of 1–3, representing a negative, neutral, or positive user response. If at any time you need further clarity at any sub structure of the questionnaire, or the wireframe please contact the assessors.

The purpose of this study phase is to identify key usability indicators for using browser-based password managers which will help the group proceed with Phase 2 of the prototype.

Password Manager Preferences

In this section, we will ask questions regarding the user's experience with, and preferences toward, password managers.

For the purposes of this section, we define a browser-based password manager as a password manager that is accessed and employed through the user's web browser (e.g.: Google Chrome's built-in password manager). This differs from a password manager that must be launched separately from the browser (e.g.: KeePass).

2. Have you used a password manager before? *

Mark only one oval.

- ☐ Yes
- ☐ No

3. Have you used a browser-based password manager? *

Mark only one oval.

- ☐ Yes
- ☐ No
- ☐ Never used a password manager before

4. In your opinion, should password managers have a minimum criteria for password strength? *

Mark only one oval.

- ☐ Yes
- ☐ No
- ☐ Unsure

5. **Would a real-time password feedback feature aid you in choosing a password? (E.g.: tell you you're using a weak password) ***

Mark only one oval.

- ☐ Yes
- ☐ No
- ☐ Unsure

6. **Should password managers be able to generate randomized passwords? ***

Mark only one oval.

- ☐ Yes
- ☐ No
- ☐ Unsure

7. **If you have used a password manager before, please tell us why you use it. Check all that apply.**

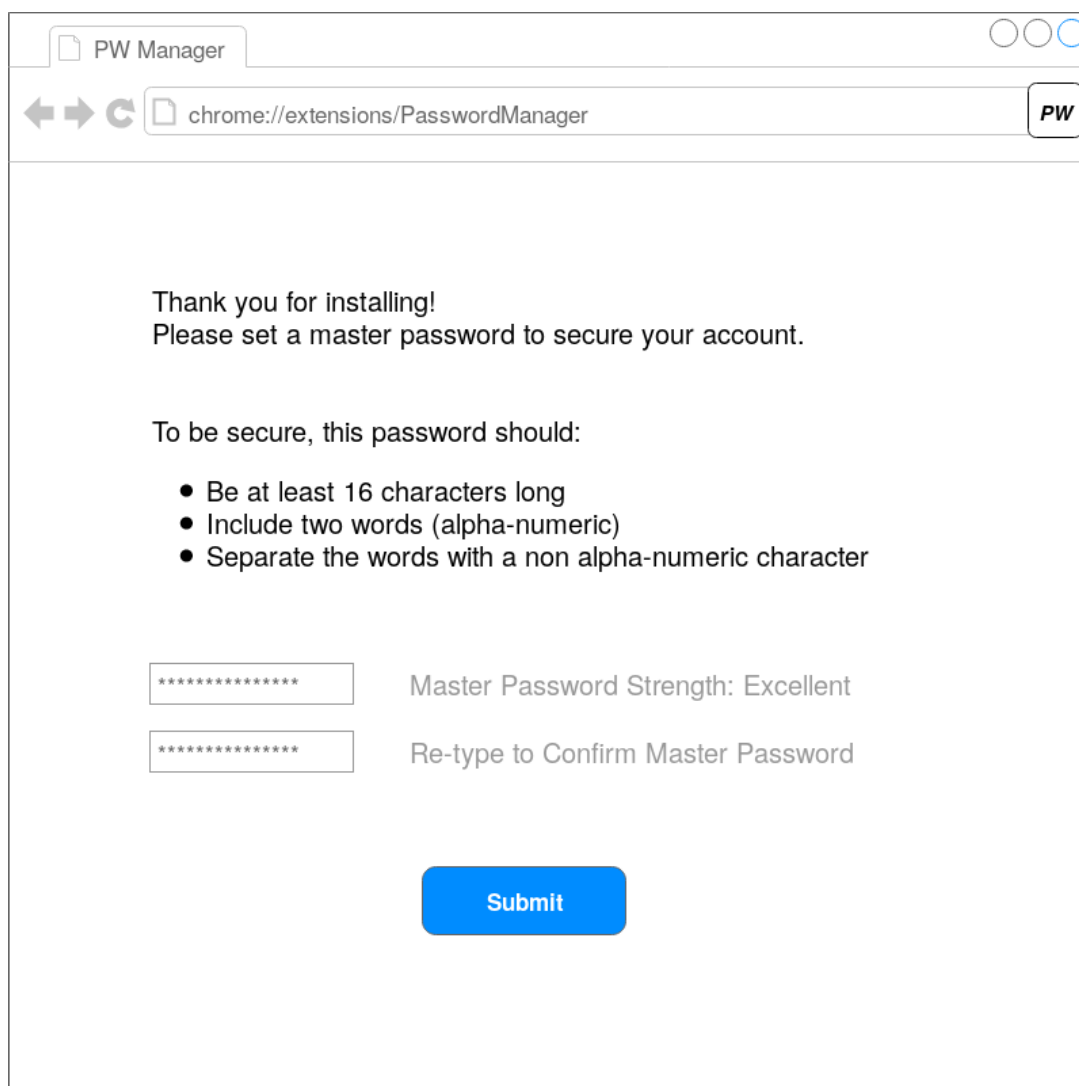
Tick all that apply.

- ☐ Don't have to remember many passwords
- ☐ Helps me generate secure passwords
- ☐ It's built-in to my browser
- ☐ Other: _____

Password Manager Walkthrough

In this section, we will walk you through the key functionality of our proposed browser-based password manager. You will not be asked for feedback at this time.

On installation of the extension, a new tab or window will open. In this window, the user will be prompted to set a master password to secure the password manager.



The screenshot shows a Chrome browser window with the 'PW Manager' extension active. The address bar displays 'chrome://extensions/PasswordManager' with a 'PW' icon on the right. The main content area has a white background and contains the following text and elements:

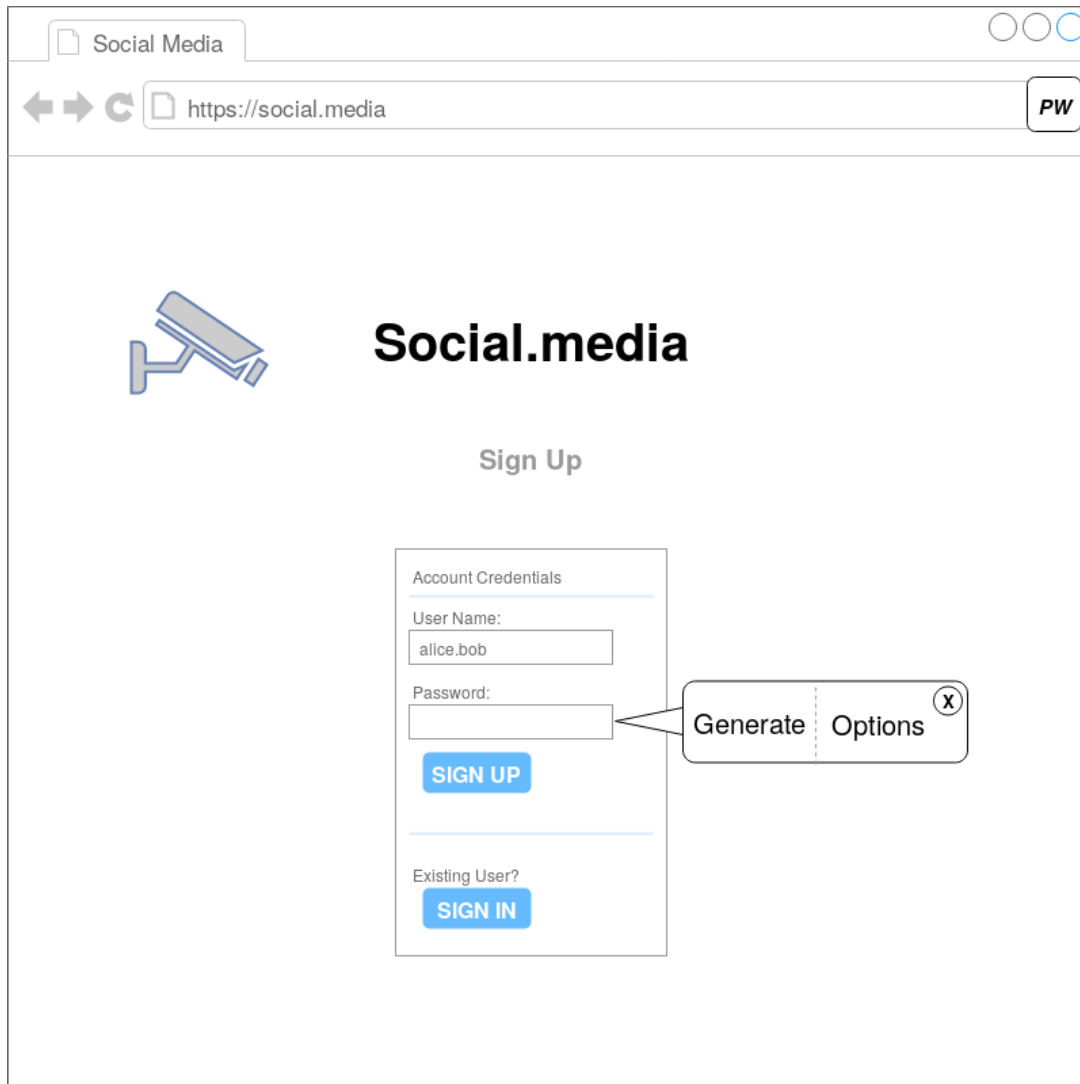
Thank you for installing!
Please set a master password to secure your account.

To be secure, this password should:

- Be at least 16 characters long
- Include two words (alpha-numeric)
- Separate the words with a non alpha-numeric character

Below the list are two input fields, each containing 16 asterisks. To the right of the first field is the text 'Master Password Strength: Excellent'. To the right of the second field is the text 'Re-type to Confirm Master Password'. At the bottom center is a blue 'Submit' button.


When visiting a new website and creating an account, the user is given the option of generating the password through the password manager.



Social Media

https://social.media

PW



Social.media

Sign Up

Account Credentials

User Name:
alice.bob

Password:

SIGN UP

Existing User?

SIGN IN

Generate Options (X)

There is also an option of specifying generation settings to help make the password memorable and allow for flexibility if the website has specific criteria. The user can dismiss this dialogue if necessary.

Social Media

https://social.media

Social.media

Sign Up

Account Credentials

User Name:
alice.bob

Password:

SIGN UP

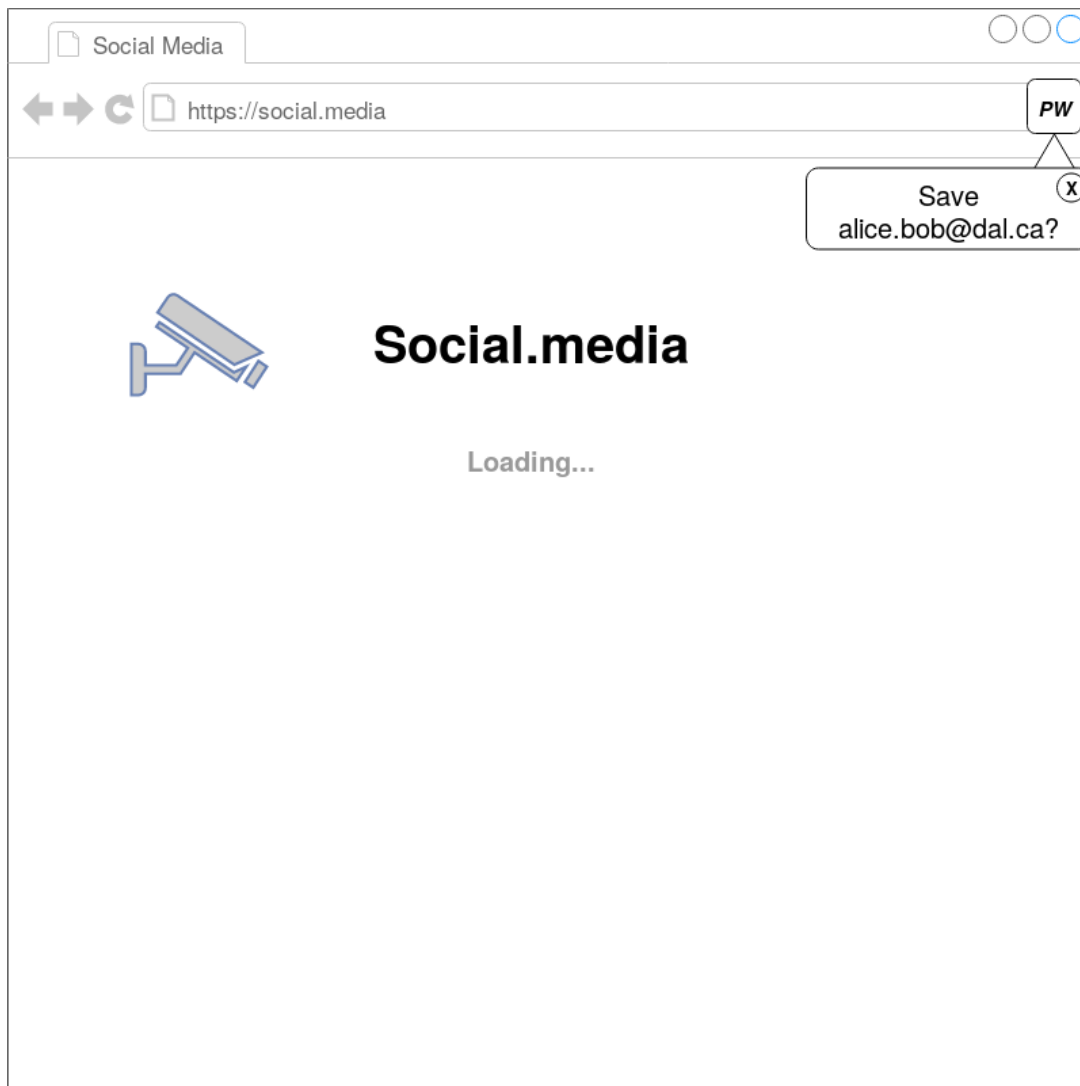
Existing User?
SIGN IN

Generate Options (X)

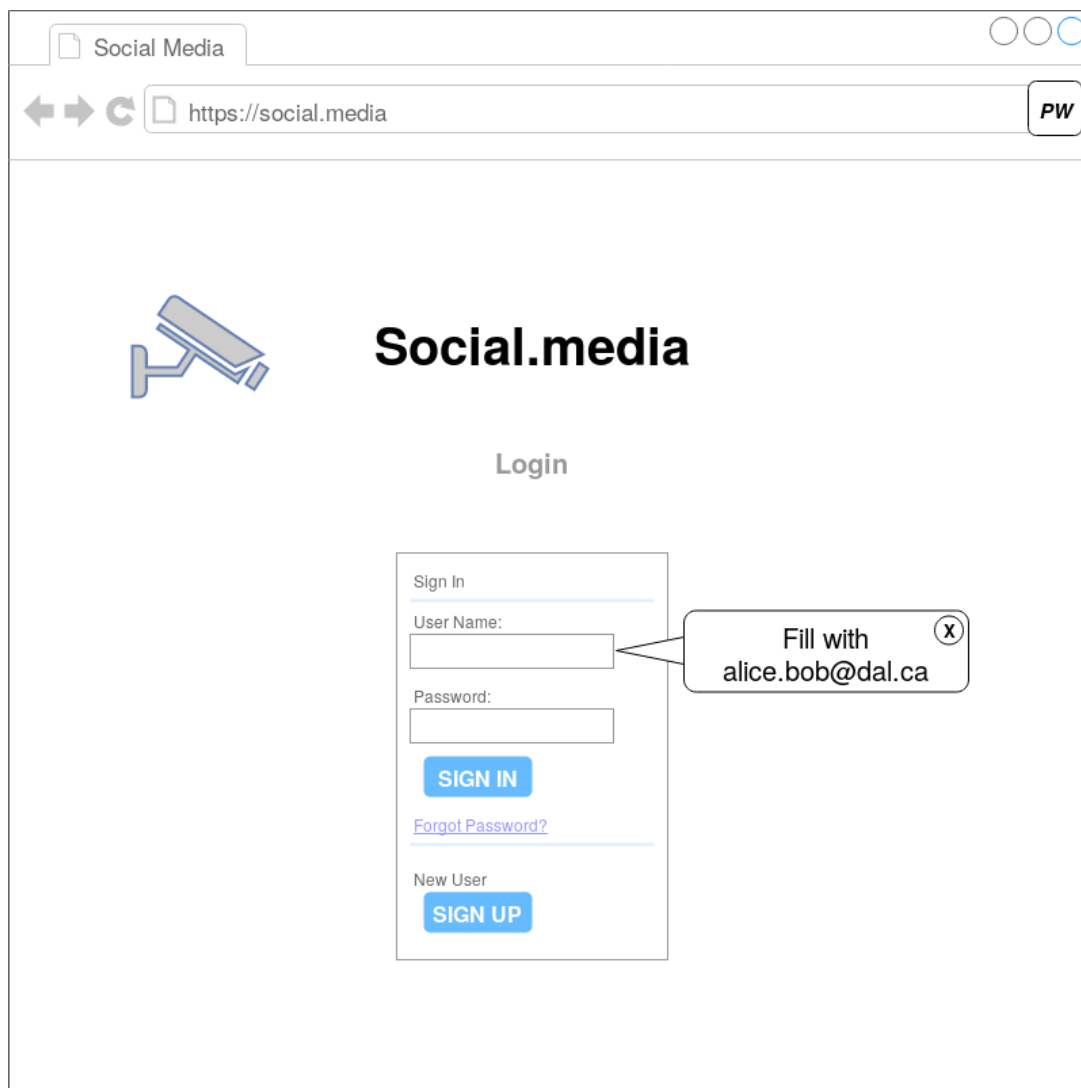
- ☐ Letters
- ☐ Numbers
- ☒ **Special Characters**
- ☐ Words

Length 16

After creating the account, the user is prompted to save the password in the password manager.




Upon subsequent visits to the login web page, the user is prompted to make use of the saved account associated with the website. This takes the form of a pop-up appearing next to the user text box on the page. The pop-up clearly identifies the user that will be used to automatically fill the credentials. The user is able to dismiss the dialogue if desired.



Social Media

https://social.media

PW



Social.media

Login

Sign In

User Name:

Fill with (X)
alice.bob@dal.ca

Password:

SIGN IN

[Forgot Password?](#)

New User


SIGN UP

If multiple accounts are associated with the website, a list of credentials to select from is provided instead with the same identifying information for each option. The user is able to dismiss the dialogue if desired.

Social Media

https://social.media

PW

 **Social.media**

Login

Sign In

User Name:

Password:

SIGN IN

[Forgot Password?](#)

New User

SIGN UP

Fill with... (X)


- alice.bob@dal.ca
- alice.b@gmail.com
- alice_bob@hotmail.com

If the password for the account has changed, the user can update the password in the manager in one of three ways:

1. On a given website's password update page, the user is prompted if they'd like to generate a password for their account, following the same pop-up options as new account creation. The user is then prompted if they'd like to store the new password for the account.

Social Media

https://social.media PW

 **Social.media**

Sign Up

Account Credentials

User Name:
alice.bob

Password:

SIGN UP

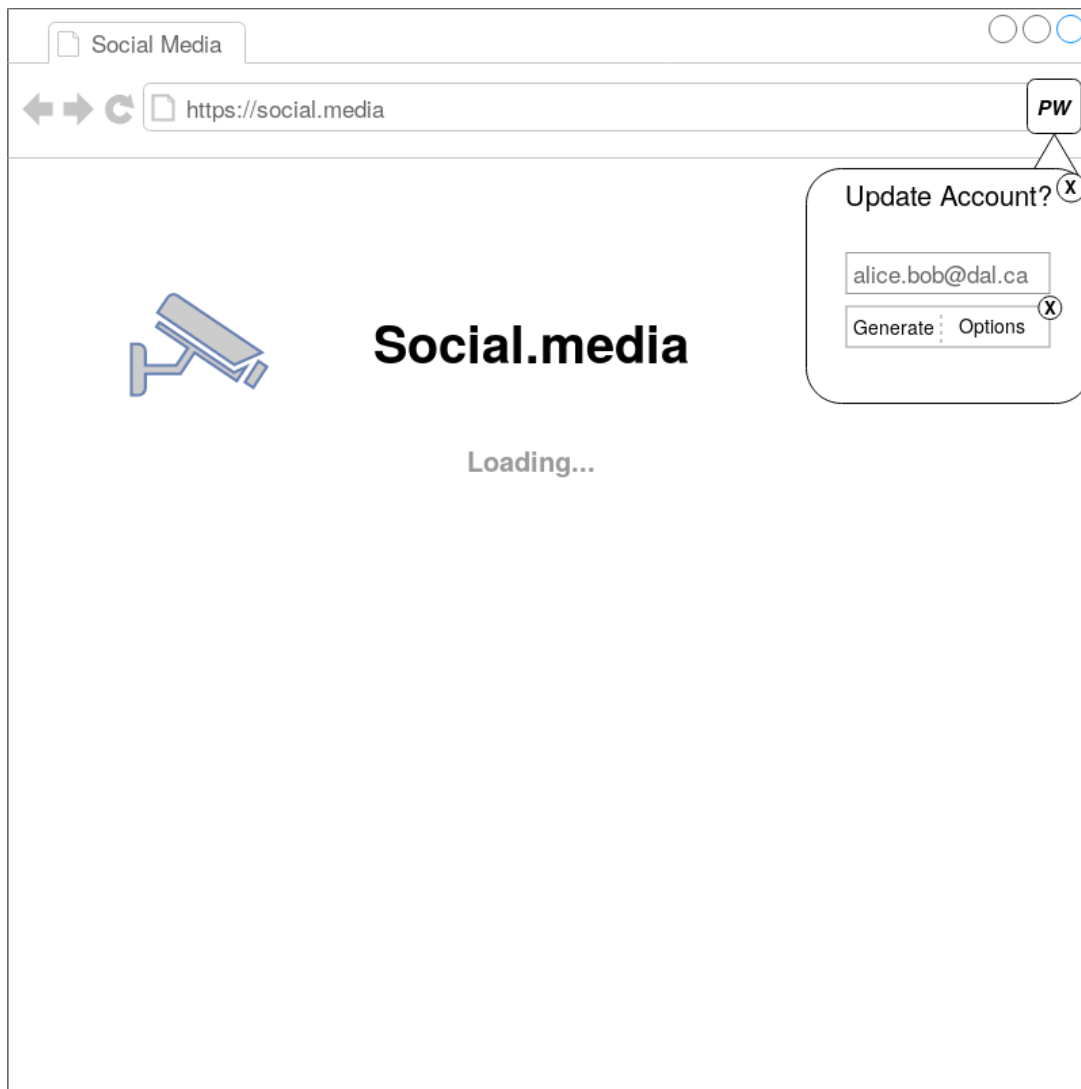
Existing User?
SIGN IN

Generate Options (X)

- ☐ Letters
- ☐ Numbers
- ☒ Special Characters
- ☐ Words

Length 16

2. The user can open a drop-down menu from the icon on the browser bar when on a website with saved credentials. This provides an option to update the password, and also gives the option of generating a new password. Options for password specification are available to allow matching the website's password generation criteria.



The user can open a new tab/window allowing for managing all password and accounts at any time. Each account is identified by the username used and the website associated. This allows for updating passwords using either a generated password similar to account creation or a user-defined password. This page also allows the user to delete accounts from the password manager through the options dialogue.

The screenshot shows a web browser window with a tab labeled 'PW Manager'. The address bar displays 'chrome://extensions/PasswordManager/Modify' with a 'PW' icon on the right. The main content area is titled 'Manually Alter Stored Passwords'. It lists several stored passwords grouped by domain: 'Social.media' (three entries), 'Dal.ca' (one entry), and 'Brightspace.com' (one entry). Each entry consists of a username field, a masked password field (represented by asterisks), and an 'Options' button. At the bottom of the form is a large blue 'Submit' button.

Domain	Username	Password	Action
Social.media	alice.bob@dal.ca	*****	Options
	alice.b@gmail.com	*****	Options
	alice_bob@hotmail.co	*****	Options
Dal.ca	alice.bob@dal.ca	*****	Options
Brightspace.com	alice.bob@dal.ca	*****	Options

Submit

Password Manager Feedback

In this section, you will be asked questions about the proposed browser-based password manager.

A scenario will be described (via text or image), and you will respond on a scale of 1–3 (negative, neutral, or positive).

In the following questions, please refer to this image.

PW Manager

chrome://extensions/PasswordManager PW

Thank you for installing!
Please set a master password to secure your account.

To be secure, this password should:

- Be at least 16 characters long
- Include two words (alpha-numeric)
- Separate the words with a non alpha-numeric character

***** Master Password Strength: Excellent

***** Re-type to Confirm Master Password

Submit

8. Do you understand the master password requirements? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

9. Are the master password requirements reasonable? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

In the following question, please refer to this image.

PW Manager

chrome://extensions/PasswordManager

Thank you for installing!
Please set a master password to secure your account.

To be secure, this password should:

- Be at least 16 characters long
- Include two words (alpha-numeric)
- Separate the words with a non alpha-numeric character

Master Password Strength: Poor

The password you have chosen is weak and could be broken. Please choose another.

X

10. Do you understand why your password has been rejected? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

Password Manager UI

In this section, we will compare various user interface design choices.

We will now compare password generation user interface choices. For the following two images, please consider how usable you find the interface.

In this image, the generate/options dialogue sits to the side of the sign-up area.

The image shows a web browser window with the address bar displaying 'https://social.media'. The page title is 'Social Media' and the main heading is 'Sign Up'. The form contains the following elements:

- Account Credentials**
 - User Name:
 - Password:
 -
- Existing User?**
 -

A dialogue box is positioned to the right of the password field, containing the text 'Generate' and 'Options' separated by a vertical line, with a close button 'X' in the top right corner. A callout line points from the dialogue box to the password field.

11. Are you likely to use a generated password? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)


12. Are you able to manually enter a password, if so desired? **Mark only one oval.*

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

In this image, the generate/options dialogue sits on top of the sign-up area.

Social Media

https://social.media PW

 **Social.media**

Sign Up

Account Credentials

User Name:
alice.bob

Password:
Generate Options X

SIGN UP

Existing User?
SIGN IN

13. Are you likely to use a generated password? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

14. Are you able to manually enter a password, if so desired? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)


We will now compare password change user interface choices. For the following four images, please consider how usable you find the interface.

In this image, the generate/options dialogue appears when the user is on the password change page for a website.

Social Media

https://social.media

PW



Social.media


Sign Up

Account Credentials

User Name:

alice.bob

Password:

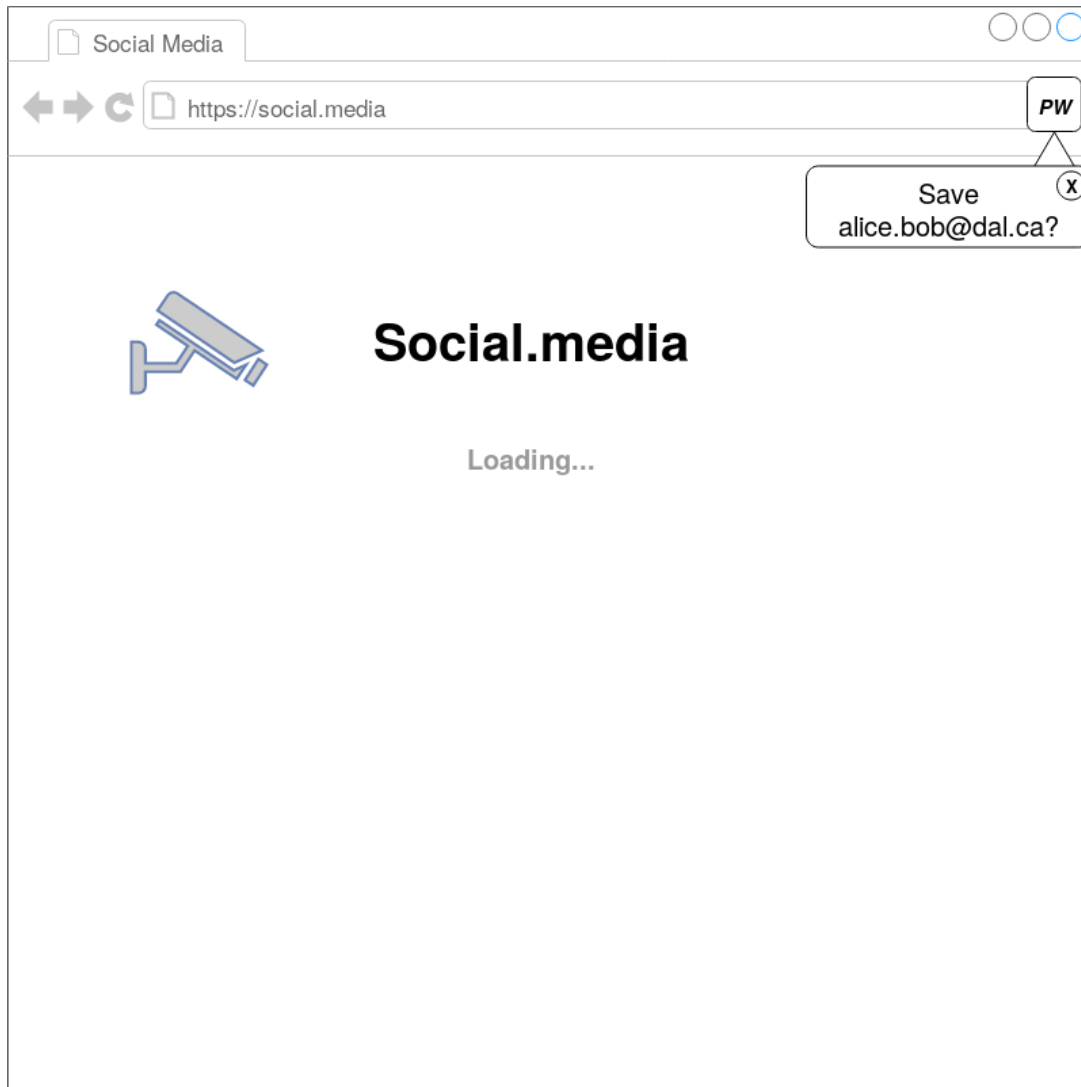


SIGN UP

Existing User?

SIGN IN

After the user updates their password on the website, a dialogue will appear prompting the user to save the updated password to the password manager.

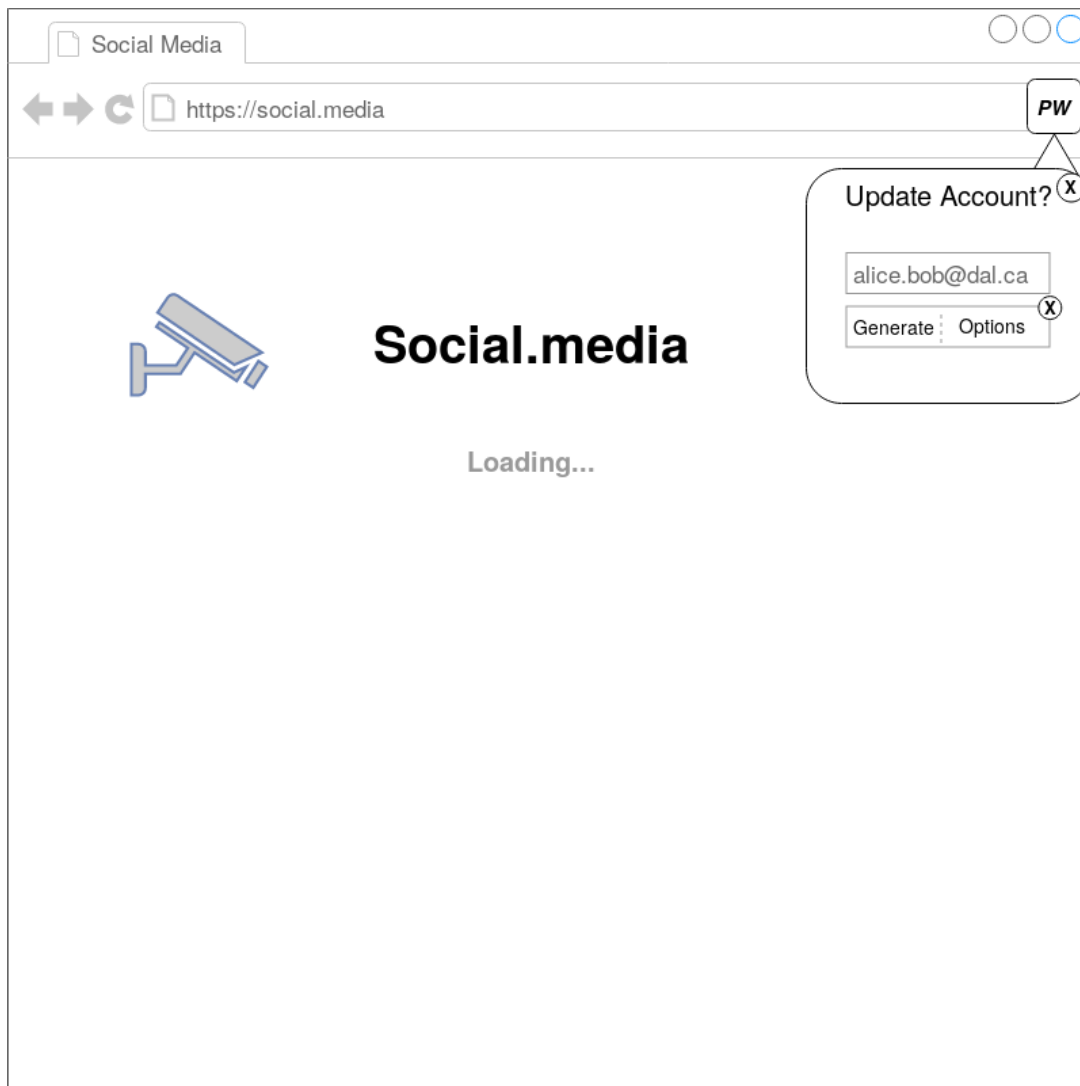


15. Would you use this method to update your password? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

In this image, the user has clicked on the password manager extension button, and a dialogue allows for the editing of the stored password.



16. Would you use this method to update your password? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

In this image, the user has opened the browser extension window, which allows them to see all of their saved accounts.

PW Manager

chrome://extensions/PasswordManager/Modify

PW

Manually Alter Stored Passwords

Social.media

alice.bob@dal.ca	*****	Options
alice.b@gmail.com	*****	Options
alice_bob@hotmail.co	*****	Options

Dal.ca

alice.bob@dal.ca	*****	Options
------------------	-------	---------

Brightspace.com

alice.bob@dal.ca	*****	Options
------------------	-------	---------

Submit

17. Would you use this method to update your password? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

18. Considering the previous three methods, which would you be most likely to use for updating your password? *

Mark only one oval.

- ☐ Option 1 (prompt for update)
- ☐ Option 2 (click on password manager button)
- ☐ Option 3 (open password manager webpage)

Concluding Thoughts

In this section, we will ask some for some final thoughts about the proposed browser-based password manager.

19. Do you understand the intended use and functionality of the browser extension? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

20. Would you use this browser extension for your daily activities? *

Mark only one oval.

- ☐ 1 (Negative)
- ☐ 2 (Neutral)
- ☐ 3 (Positive)

21. Is this browser extension missing any features?

22. If you have any other thoughts, please share them below.

Demographic Information

In this section, we will ask broad, demographic related questions.

23. I identify as a: **Mark only one oval.*

- ☐ Female
- ☐ Male
- ☐ Non-binary

24. I live in: **Mark only one oval.*

- ☐ Africa
- ☐ Asia
- ☐ Australia
- ☐ Europe
- ☐ North America
- ☐ South America

25. I have completed education up to: **Mark only one oval.*

- ☐ No formal education
- ☐ Elementary school
- ☐ High school
- ☐ College/trade school
- ☐ University (undergraduate)
- ☐ University (graduate)
- ☐ University (post-graduate)

26. I identify as a member of the following ethnic groups (check all that apply, add as necessary) **Tick all that apply.*

- ☐ Aboriginal
- ☐ Black
- ☐ Caucasian
- ☐ Indian
- ☐ Inuit
- ☐ Metis
- ☐ Mi'kmaq
- ☐ Other: _____

