

## **Please type in your ProlificID before proceeding:**

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Please do not use the back button on your browser during this survey. Using the back button may cause errors that could prevent you from completing the survey. To ensure your responses are saved and the study proceeds smoothly, please navigate through the survey using the provided buttons only.

### **Welcome!**

In this survey, you will receive/use two passwords (which will be explained on the next page) and answer several questions related to them. During the survey, you will be asked to re-enter these passwords multiple times. Before proceeding, we ask for your consent.

### **Consent Form**

#### *Description of research:*

The purpose of this study is to investigate how well users remember and understand passwords based on themes, which are intended to protect them against forced login.

#### *Withdrawal:*

You can withdraw your consent to be part of the study at any time before the completion of the study, meaning before you submit the survey. In this case, your collected data will be deleted by the researchers. For more information on how to withdraw from a study before completion in Prolific, see this link: <https://participant-help.prolific.com/en/article/5316d7>. Please note that we cannot delete your data after you have completed the study, since the data we collect is anonymised and we, therefore, have no chance to identify you (unless you choose to disclose identifying information about yourself when using the voting system or answering the questionnaire, in which case your data will be anonymised as described below).

*Compensation:* Each participant will receive £ 2.25 at the conclusion of the study through Prolific.

*How we handle and delete data:* If a participant discloses any personal information about themselves or other people when answering the questionnaire that could lead to identification, the researchers will remove this from the dataset and replace it with a placeholder.

#### *What data we collect:*

The participants will be asked to share the following personal data:

- Gender
- Age

- Level of education
- Nationality

We further collect the answers that the participants give to the questions in the questionnaire.

*How we use the data:* These data will be used to derive statistical measures of users' recall rates, understanding, and errors of theme-based passwords. Furthermore, the data will be used to derive qualitative insights into how users perceive theme-based passwords. The data might be referenced or quoted but not printed in full unless it is completely anonymised in the published research reports and other academic publications.

*Who has access to the data:* The researchers have access to the original data until it has been edited to replace given personal information with placeholders to anonymise it.

*Researchers:*

The following researchers from XXX are involved.

XXX

For any questions concerning our processing of your personal data, please contact the researchers involved in the project (see contact details above)

**I consent to participate as a subject in the research described above. I consent by answering "Yes" and clicking "Next".**

(1) Yes

### **Password Explanation of Thematic Passwords**

In this survey, you will receive **two passwords**, and you must **always use both** when logging in:

1. **Your Main Password** – A secure password that you can save and store (e.g., in a password manager).
2. **Your Secret Thematic Password** – A password based on a specific theme (e.g., colours) that you **must remember** but **not write down**.

**How to Use Your Passwords:**

- **In a normal login (everything is fine):** You enter your **Main Password** + your **real Secret Thematic Password** (the one you remembered).
- **If someone is forcing you to log in:** You enter your **Main Password** + a **different word** from the same theme instead of your real Secret Theme Password.

## Example:

Situation	Main Password	Thematic Password (Colour)
Normal Login	Xy76@pQ!3	yellow
Forced Login	Xy76@pQ!3	green

When you log in using **either example**, the system will look the same and indicate a successful login. However, if you enter a different word instead of your real Secret Thematic Password (e.g., "green" instead of "yellow" the system will secretly detect that something is wrong and trigger a silent alarm. This alarm is discreet and doesn't notify the user directly. Instead, it sends a hidden alert to system administrators or security personnel, who can then take appropriate action without the user being aware that their input was flagged.

### Helpful Tip: Stick to the Theme

To help you avoid mistakes, the system **checks** if your Thematic Password matches the theme.

- **Correct Example:** Theme = Colours → Password = "yellow" "
- **Wrong Example:** Theme = Colours → Password = "pizza" (not an animal/country/colour)

If you enter a word **outside the theme**, the system will **show an error** so you can try again

### Key Things to Remember

- **You always enter TWO passwords to log in:** your Main Password and your Secret Theme Password.
- **Do NOT write down your Secret Thematic Password** – you must remember it.
- **If you're ever forced to log in, enter a different word from the same theme.**
- **Your Main Password can be saved, but your Secret Thematic Password stays in your memory.**

### Next Step

Click **Next** to receive your two passwords.

## Password Explanation of Thematic Passwords

In this survey, you will use **two passwords**, and you must **always use both** when logging in:

1. **Your Main Password** – A password that the system will generate and give to you. You can save and store this password (e.g., in a password manager).
2. **Your Secret Thematic Password** – A password you choose yourself, based on a specific theme (for example, the name of a colour). You must **remember** this password and **not write it down** anywhere.

## How to Use Your Passwords

- **In a normal login (everything is fine):** You enter your **Main Password** + your **real Secret Thematic Password** (the country which you chose).
- **If someone is forcing you to log in:** You enter your **Main Password** + a **different word** from the same theme instead of your real Secret Theme Password. For example, if your real Thematic Password is "Yellow," you could enter "Green" instead.

### Example:

Situation	Main Password	Thematic Password (Colour)
Normal Login	Xy7&@pQ!3	yellow
Forced Login	Xy7&@pQ!3	green

When you log in using **either example**, the system will look the same and indicate a successful login. However, if you enter a different word instead of your real Secret Thematic Password (e.g., "Green" instead of "Yellow"), the system will secretly detect that something is wrong and trigger a silent alarm. This alarm is discreet and doesn't notify the user directly. Instead, it sends a hidden alert to system administrators or security personnel, who can then take appropriate action without the user being aware that their input was flagged.

### Helpful Tip: Stick to the Theme

To help you avoid mistakes, the system **checks** if your Thematic Password matches the theme.

- **Correct Example:** Theme = Colours → Password = "yellow" "
- **Wrong Example:** Theme = Colours → Password = "pizza" (not an animal/country/colour)

If you enter a word **outside the theme**, the system will **show an error** so you can try again

## Key Things to Remember

- **You always enter TWO passwords to log in:** your Main Password and your Secret Theme Password.
- **Do NOT write down your Secret Thematic Password** – you must remember it.
- **If you're ever forced to log in, enter a different word from the same theme.**

- Your Main Password can be saved, but your Secret Thematic Password stays in your memory.

## Next Step

Click **Next** to receive your two passwords.

### Your Main Password

Below, you will find your **Main Password**, which you **can save and store** (e.g., in a password manager).

- **Rm2VRGNrWp**

This password must always be used together with a thematic password when logging in. Click **next** to receive your thematic password.

### Your Thematic Password

Below, you will find your **Secret Theme Password**, which you **must remember but NOT write down**. The theme for your secret theme password is colours.

- **Purple**

This password must always be used together with your main password when logging in.

### Your Thematic Password

**Please choose your Secret Theme Password — it must be the name of a colour. You must not write it down. This password must always be used together with your main password when logging in.**

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### Understanding of Theme-based Passwords

In this part of the survey, we will ask you questions about your understanding of thematic passwords.

**Imagine your theme is "colours" and your theme password is "Red". Which of the following words would signal that you are being forced to log in?**

- (1) Brown
- (6) Pizza
- (2) Turtle
- (5) Red
- (3) Japan
- (4) None of these

**Imagine the theme of your second password is "colours". What will happen if you try to log in using the word "pizza"?**

- (1) The login will be successful
- (6) The login will fail
- (2) The login will succeed, but you will be asked to provide your main password as well
- (5) The system would prompt you to choose a new theme
- (4) None of these

**Imagine your theme is "colours" and your theme password is "Red". Which of the following words would signal you are not being forced to log in?**

- (1) Dog
- (6) Pizza
- (7) Red
- (8) Japan
- (5) Green
- (4) None of the these

## **Re-calling Your Passwords**

In this part of the survey, we will ask you to recall your main password and your secret thematic password, which you received earlier in the process. We kindly ask that you do not go back and check the passwords, as we are investigating recall rates.

### **1) Please enter your main password.**

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### **1) Please enter your Secret Thematic Colour Password.**

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## **Usability of Theme-based Passwords**

In this part of the survey, we will ask you questions about the usability of thematic passwords.

### **If you were asked to recall the secret thematic password in one week, how likely would you be to remember it?**

- (1) Very likely
- (2) Somewhat likely
- (3) Neutral
- (4) Somewhat unlikely
- (5) Very unlikely

### **How easy was your thematic colour password to remember?**

- (1) Not easy at all
- (2) Slightly easy
- (3) Somewhat easy
- (4) Moderately easy
- (5) Very easy
- (6) Extremely easy

(7) Perfectly easy

**Would you prefer to choose your own password within a given theme, or have the system assign one for you? Why or why not?**

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**I would feel more confident using a thematic password I created myself rather than one assigned by the system.**

(1) Strongly disagree

(2) Disagree

(3) Slightly disagree

(4) Neutral

(5) Slightly agree

(6) Agree

(7) Strongly agree

**How likely would you be to use thematic passwords—consisting of a main password and a secret thematic password—outside of this study?**

(1) Very likely

(2) Somewhat likely

(3) Neutral

(4) Somewhat unlikely

(5) Very unlikely

## **Security of Theme-based Passwords**

In this part of the survey, we will ask you questions about the security of thematic passwords.

### **What concerns, if any, do you have about the security of thematic passwords?**

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### **How likely is it that an attacker could detect that you used a wrong thematic password instead of your correct one?**

- (1) Very likely
- (2) Somewhat likely
- (3) Neutral
- (4) Somewhat unlikely
- (5) Very unlikely

### **How secure are thematic passwords compared to traditional passwords?**

- (1) Much less secure
- (2) Less secure
- (3) Slightly less secure
- (4) About the same
- (5) Slightly more secure
- (6) More secure
- (7) Much more secure

## **Personality Questions**

In this part of the survey, we will ask some questions about your personality to investigate how this influences your password behaviour.

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

Very  
inaccurate      Moderately  
inaccurate      Neither  
accurate  
nor  
inaccurate      Moderately  
accurate      Very  
accurate

Worry about things      (1) m      (2) m      (3) m      (4) m      (5) m

Make friends easily      (1) m      (2) m      (3) m      (4) m      (5) m

Have a vivid  
imagination      (1) m      (2) m      (3) m      (4) m      (5) m

Trust others      (1) m      (2) m      (3) m      (4) m      (5) m

Complete tasks  
successfully      (1) m      (2) m      (3) m      (4) m      (5) m

Get angry easily      (1) m      (2) m      (3) m      (4) m      (5) m

Love large parties      (1) m      (2) m      (3) m      (4) m      (5) m

Believe in the  
importance of art      (1) m      (2) m      (3) m      (4) m      (5) m

Use others for my own ends (1) m (2) m (3) m (4) m (5) m

Like to tidy up (1) m (2) m (3) m (4) m (5) m

Often feel blue (1) m (2) m (3) m (4) m (5) m

Take charge (1) m (2) m (3) m (4) m (5) m

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

Very inaccurate      Moderately inaccurate      Neither accurate nor inaccurate      Moderately accurate      Very accurate

Experience my emotions intensely (1) m (2) m (3) m (4) m (5) m

Love to help others (1) m (2) m (3) m (4) m (5) m

Keep my promises (1) m (2) m (3) m (4) m (5) m

Find it difficult to approach others (1) m (2) m (3) m (4) m (5) m

Am always busy (1) m (2) m (3) m (4) m (5) m

Prefer variety to routine (1) m (2) m (3) m (4) m (5) m

Love a good fight (1) m (2) m (3) m (4) m (5) m

Work hard (1) m (2) m (3) m (4) m (5) m

Go on binges (1) m (2) m (3) m (4) m (5) m

Love excitement (1) m (2) m (3) m (4) m (5) m

Love to read challenging material (1) m (2) m (3) m (4) m (5) m

Believe that I am better than others (1) m (2) m (3) m (4) m (5) m

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are**

**now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

Am always prepared (1) m (2) m (3) m (4) m (5) m

Panic easily (1) m (2) m (3) m (4) m (5) m

Radiate joy (1) m (2) m (3) m (4) m (5) m

Sympathise with the  (1) m  (2) m  (3) m  (4) m  (5) m  
homeless

Jump into things (1) m (2) m (3) m (4) m (5) m without thinking

**Fear for the worst** (1) **m** (2) **m** (3) **m** (4) **m** (5) **m**

Feel comfortable around (1) m (2) m (3) m (4) m (5) m  
people

Enjoy wild flights of (1) m (2) m (3) m (4) m (5) m  
fantasy

Believe that others have (1) m (2) m (3) m (4) m (5) m  
good intentions

Excel in what I do (1) m (2) m (3) m (4) m (5) m

Get irritated easily (1) m (2) m (3) m (4) m (5) m

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

Very inaccurate	Moderately inaccurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
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Talk to a lot of different (1) m (2) m (3) m (4) m (5) m  
people at parties

See beauty in things that (1) m (2) m (3) m (4) m (5) m  
others might not notice

Cheat to get ahead (1) m (2) m (3) m (4) m (5) m

Often forget to put (1) m (2) m (3) m (4) m (5) m

things back in their proper place

Dislike myself (1) m (2) m (3) m (4) m (5) m

Try to lead others (1) m (2) m (3) m (4) m (5) m

Feel others' emotions (1) m (2) m (3) m (4) m (5) m

Am concerned about others (1) m (2) m (3) m (4) m (5) m

Tell the truth (1) m (2) m (3) m (4) m (5) m

Am afraid to draw attention to myself (1) m (2) m (3) m (4) m (5) m

Am always on the go (1) m (2) m (3) m (4) m (5) m

Prefer to stick with things that I know (1) m (2) m (3) m (4) m (5) m

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see**

**yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

	Very inaccurate	Moderately inaccurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
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Yell at people (1) m (2) m (3) m (4) m (5) m

Do more than what's  
expected of me (1) m (2) m (3) m (4) m (5) m

Rarely overindulge (1) m (2) m (3) m (4) m (5) m

Seek adventure (1) m (2) m (3) m (4) m (5) m

Avoid philosophical  
discussions (1) m (2) m (3) m (4) m (5) m

Think highly of myself (1) m (2) m (3) m (4) m (5) m

Carry out my plans (1) m (2) m (3) m (4) m (5) m

Become overwhelmed  
by events (1) m (2) m (3) m (4) m (5) m

Have a lot of fun (1) m (2) m (3) m (4) m (5) m

Believe that there is no absolute right or wrong (1) m (2) m (3) m (4) m (5) m

Feel sympathy for those who are worse off than myself (1) m (2) m (3) m (4) m (5) m

Make rash decisions (1) m (2) m (3) m (4) m (5) m

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

Very inaccurate      Moderately inaccurate      Neither accurate nor inaccurate      Moderately accurate      Very accurate

Am afraid of many things (1) m (2) m (3) m (4) m (5) m

Avoid contact with others (1) m (2) m (3) m (4) m (5) m

Love to daydream (1) m (2) m (3) m (4) m (5) m

Trust what people say (1) m (2) m (3) m (4) m (5) m

Handle tasks smoothly (1) m (2) m (3) m (4) m (5) m

Lose my temper (1) m (2) m (3) m (4) m (5) m

Prefer to be alone (1) m (2) m (3) m (4) m (5) m

Do not like poetry (1) m (2) m (3) m (4) m (5) m

Take advantage of others (1) m (2) m (3) m (4) m (5) m

Leave a mess in my room (1) m (2) m (3) m (4) m (5) m

Am often down in the dumps (1) m (2) m (3) m (4) m (5) m

Take control of things (1) m (2) m (3) m (4) m (5) m

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are**

**now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

Rarely notice my emotional reactions (1) m (2) m (3) m (4) m (5) m

Am indifferent to the      (1) m      (2) m      (3) m      (4) m      (5) m  
feelings of others

Break rules (1) m (2) m (3) m (4) m (5) m

Only feel comfortable (1) m (2) m (3) m (4) m (5) m with friends

Do a lot in my spare time. (1) m (2) m (3) m (4) m (5) m

Dislike changes (1) m (2) m (3) m (4) m (5) m

Insult people (1) m (2) m (3) m (4) m (5) m

Do just enough work to    (1) m                    (2) m                    (3) m                    (4) m                    (5) m  
get by

Easily resist temptations (1) m (2) m (3) m (4) m (5) m

Enjoy being reckless (1) m (2) m (3) m (4) m (5) m

Have difficulty understanding abstract ideas (1) m (2) m (3) m (4) m (5) m

Have a high opinion of myself (1) m (2) m (3) m (4) m (5) m

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

Very inaccurate      Moderately inaccurate      Neither accurate nor inaccurate      Moderately accurate      Very accurate

Waste my time (1) m (2) m (3) m (4) m (5) m

Feel that I'm unable to deal with things (1) m (2) m (3) m (4) m (5) m

Love life (1) m (2) m (3) m (4) m (5) m

Am not interested in other people's problems (1) m (2) m (3) m (4) m (5) m

Rush into things (1) m (2) m (3) m (4) m (5) m

Get stressed out easily (1) m (2) m (3) m (4) m (5) m

Keep others at a distance (1) m (2) m (3) m (4) m (5) m

Like to get lost in thought (1) m (2) m (3) m (4) m (5) m

Distrust people (1) m (2) m (3) m (4) m (5) m

Know how to get things done (1) m (2) m (3) m (4) m (5) m

Am not easily annoyed (1) m (2) m (3) m (4) m (5) m

This question is not part of the survey and just helps us to detect bots and automated scripts. (1) m (2) m (3) m (4) m (5) m

To confirm that you are a human, please choose 'Very inaccurate' here.

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

	Very inaccurate	Moderately inaccurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
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Avoid crowds (1) m (2) m (3) m (4) m (5) m

Do not enjoy going to art museums (1) m (2) m (3) m (4) m (5) m

Obstruct others' plans (1) m (2) m (3) m (4) m (5) m

Leave my belongings around (1) m (2) m (3) m (4) m (5) m

Feel comfortable with myself (1) m (2) m (3) m (4) m (5) m

Wait for others to lead (1) m (2) m (3) m (4) m (5) m

the way

Don't understand people (1) m (2) m (3) m (4) m (5) m  
who get emotional

Take no time for others (1) m (2) m (3) m (4) m (5) m

Break my promises (1) m (2) m (3) m (4) m (5) m

Am not bothered by (1) m (2) m (3) m (4) m (5) m  
difficult social situations

Like to take it easy (1) m (2) m (3) m (4) m (5) m

Am attached to (1) m (2) m (3) m (4) m (5) m  
conventional ways

**The following statements describe people's behaviours. Please select how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.**

Very inaccurate	Moderately inaccurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
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Get back at others (1) m (2) m (3) m (4) m (5) m

Put little time and effort into my work (1) m (2) m (3) m (4) m (5) m

Am able to control my cravings (1) m (2) m (3) m (4) m (5) m

Act wild and crazy (1) m (2) m (3) m (4) m (5) m

Am not interested in theoretical discussions (1) m (2) m (3) m (4) m (5) m

Boast about my virtues (1) m (2) m (3) m (4) m (5) m

Have difficulty starting tasks (1) m (2) m (3) m (4) m (5) m

Remain calm under pressure (1) m (2) m (3) m (4) m (5) m

Look at the bright side of life (1) m (2) m (3) m (4) m (5) m

Believe that we should be tough on crime (1) m (2) m (3) m (4) m (5) m

Try not to think about the needy (1) m (2) m (3) m (4) m (5) m

Act without thinking (1) m (2) m (3) m (4) m (5) m

## Demographics

In this part of the survey, we will ask you demographic questions.

### What gender do you identify as?

- (1) Woman
- (2) Man
- (3) Non-binary
- (4) Prefer not to disclose
- (5) Prefer to self-describe \_\_\_\_\_

### How old are you?

- (1) 18-24
- (2) 25-34
- (3) 35-44
- (4) 45-54
- (5) 55-64
- (6) 65 or older
- (7) Prefer not to say

### What is the highest degree or level of school you have completed?

- (1) No schooling completed
- (2) Some high school

- (3) High school
- (4) Some college
- (5) College
- (6) Trade, technical, or vocational training
- (7) Associate's Degree
- (8) Bachelor's Degree
- (9) Master's Degree
- (10) Professional Degree
- (11) Doctorate
- (12) Prefer not to disclose
- (13) Other: Please specify \_\_\_\_\_

### **What is your nationality?**

- (1) USA
- (2) United Kingdom
- (5) Australia
- (6) New Zealand
- (7) Austria
- (8) Belgium
- (9) Chile
- (10) Czech Republic
- (11) Denmark
- (12) Estonia
- (13) Finland
- (14) France
- (15) Germany
- (16) Greece
- (17) Hungary

- (18) Iceland
- (19) Israel
- (20) Italy
- (21) Japan
- (22) Korea
- (23) Latvia
- (24) Luxembourg
- (25) Mexico
- (26) Netherlands
- (27) Poland
- (28) Portugal
- (29) Slovenia
- (30) South Africa
- (31) Spain
- (32) Sweden
- (33) Switzerland
- (34) Other

### **Which of the following best describes your educational background or job field?**

- (1) I have an education in, or work in, the field of computer science, computer engineering, or IT.
- (2) I do not have an education in, nor do I work in, the field of computer science, computer engineering, or IT.
- (3) Prefer not to say

### **Re-calling Your Passwords**

In this part of the survey, we will ask you to recall your main password and secret theme password once again. We kindly ask that you do not go back and check the passwords, as we are investigating recall rates.

**1. Please enter your main password.**

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**1. Please enter your Secret Thematic Colour Password.**

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**Improvements of Survey**

**Do you have any thoughts or suggestions on the survey?**

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**Thank you for participating in our survey!**

You might be invited back for a second survey within 2 weeks of the completion of this survey.