Project
CS6750 Human Computer Interaction

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***Abstract*—** Microsoft Teams is a popular video conferencing platform used by millions of people around the world. However, the current placement of the video camera button in Teams can be a source of frustration for users, particularly when they accidentally activate their camera during a call. This problem is exacerbated by the close proximities of the camera and mute buttons, making it easy for users to press the wrong button. This redesign proposal for Microsoft Teams aims to address the problem of accidental camera activation during video calls caused by the current placement of the camera button. The proposed solution involves adding a camera activation prompt and a click, drag, hold & drop button customization feature. These changes aim to improve the overall user experience and usability of Microsoft Teams.

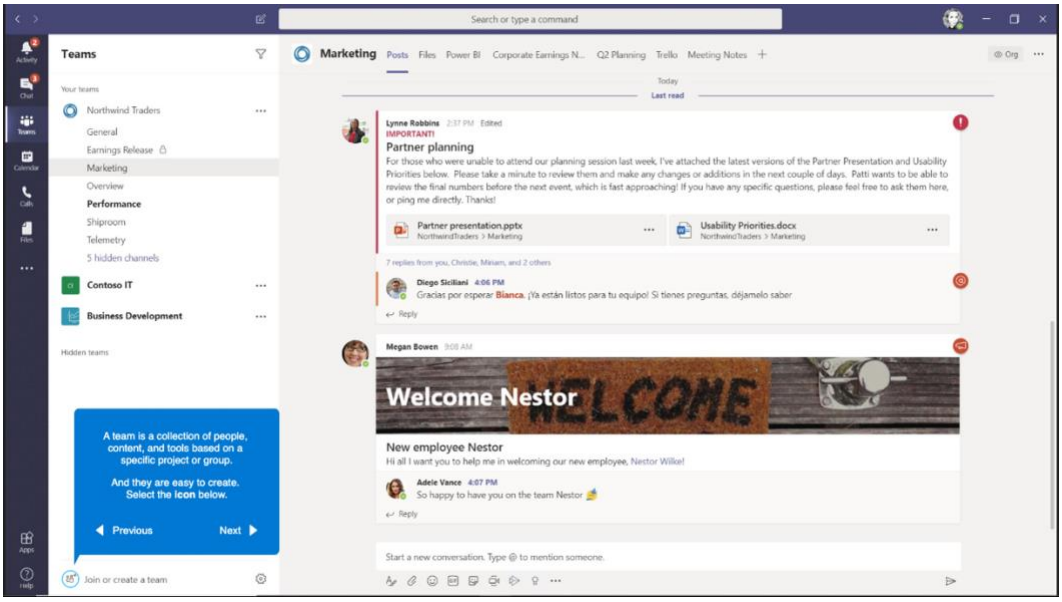

***Figure 1*—** Source: Microsoft Teams website.

1 INTRODUCTION

1.1 Description

The interface I have chosen to propose redesign as part of this project is **Microsoft Teams**. (Figure 1 above gives a quick snapshot of Microsoft Teams)

Microsoft Teams has been rapidly growing in popularity and has become one of the most widely used collaboration tools in the corporate world. In fact, according to Microsoft's earnings report in April 2021, Teams had 145 million daily active users, and this number has been growing steadily over the years.

The COVID-19 pandemic has accelerated the adoption of remote work, and Microsoft Teams has played a vital role in helping companies transition to remote work and stay connected with their teams. Its seamless integration with other Microsoft tools like Outlook and SharePoint has made it a popular choice for businesses of all sizes.

Therefore, it is assumably safe to say that Microsoft Teams has been shaping the future of corporate communication by providing a platform for teams to collaborate and communicate in real-time, no matter where they are located. It is imperative that some design nuances be addressed that can better this platform and exemplify as an indispensable USER-FRIENDLY tool for businesses looking to improve productivity and communication among their teams.

1.2 Access

For users that do not have Microsoft Teams can use the link in the Appendix-I to access a *Free Version* that Microsoft provides to HOME users. Georgia Tech provides Office 365 subscription to its students and for the purpose of need finding for this project, participants may try out illustrations to expose themselves to the interface to aide to the need finding part of this project. Besides that, students that are part-time & that work in some corporations may also have access to Office 365.

1.3 Interface Experience Steps

Users that would like to experience the current interface can -

- Access it by logging into your account on the Teams website or by downloading the Teams desktop or mobile app.
- Once you've logged in, users may add a friend or a colleague to their contact (If you don't find anybody, you may add me, srao374@gatech.edu).
- Create a meeting with the contact or place a call directly by clicking on the Phone logo in the interface.

2 INITIAL NEEDFINDING

2.1 Interactive Needfinding – Selection

Survey is my choice for initial Needfinding.

2.2 Interactive Needfinding – Description

Survey hosted on Georgia Tech's PeerSurvey platform will take shape as my initial Needfinding method. Participants for this survey will be my fellow ***CS6750 OMSCS students*** that may have used Microsoft Teams for work or personal communication. Participants will be recruited through the ***Participant Recruitment forum*** created by Dr. Joyner for CS6750 on **ED**. This survey will take place ***online and will be Asynchronous***.

2.3 Interactive Needfinding – Questions

The following patterns of questions will be asked in the survey. These will be then tied to an appropriate data inventory to enable design segues.

1. You are a Part-time or Full-time OMSCS student?
2. If Part-time, are you a working professional?
3. Have you used Microsoft Teams as a channel for communication anytime?
4. If Yes, what was the context of your usage? Work or Personal?
5. What feature of Teams have you mostly used? Chat; Audio call; Video call; Meeting; Meeting Room
6. How easy do you think the interface is on a scale of 5?
7. How do you usually access Teams? Computer App; Mobile Phone
8. Do you think there is room for improvement in Teams interface design?
9. Have you had any problems using Teams? (For ex, misplaced buttons, difficulty in chat etc)
10. If yes, can you specify what problems you faced?

11. Choose what design heuristics you think needs improvement? (It can be one or more)
    Discoverability, Feedback, Constraints, Mapping, Consistency, Affordances, Simplicity, Tolerance, Flexibility, Ease
12. Can you please elaborate more on what you think needs improvement?

2.4 Passive Needfinding – Selection

Product Reviews from public product peer review sites.

2.5 Passive Needfinding – Description

I intend to employ public peer review sites such as Gartner to perform initial passive Needfinding. Public peer review sites like Gartner provide a platform for users to share their experiences with a product or service, without any influence from the vendor, Microsoft in this case. This means that the reviews are likely to be more objective and unbiased than reviews posted on Microsoft's website or marketing materials. By reading reviews from other users who have used Microsoft Teams, I can get an idea of its strengths, weaknesses, and overall value.

2.6 Initial Needfinding – Conclusions

2.6.1 *Survey Results*

11 participants responded to the survey asynchronously over a week's span and here is the summary. Survey placed here in Appendix-II.

- **88%** of participants are Part-time OMSCS students who are also working professionals; 12% of participants are Full-time.
- **100%** have used Microsoft Teams; either at work or for personal communication needs.
- **Chat** is the most commonly used feature, followed by **Audio** & **Video** calls, then followed by Meetings.
- **50%** of participants said Microsoft Teams is Easy to use while the other 50% were neutral.
- The majority of participants think **there is room for improvement** for the Teams interface.

- When asked about what design heuristics they thought needed improvement - ***Simplicity, Tolerance, Flexibility & Ease*** were the commonly suggested improvement areas indicated here in the order of their majorities.
- Some commonly faced problems were with looking for ***chat threads & inept search feature, improper feedback, and inadequate constraints with low tolerance***.
- Suggestions for improving the interface included *making it simpler, enhancing its search, make functions discoverable & making the interface more tolerant.*

2.6.2 *Survey Raw Results*

Raw results from the Needfinding survey placed in Appendix-III.

2.6.3 *Public peer review platform - Review Results*

Reviewing reviews that are below 5-star ratings expose various Teams' design problems as faced by users with varying level of expertise.
Overall, Gartner suggests that while Microsoft Teams remains a strong collaboration and communication tool for many businesses, it **may not currently offer the level of customization** that users & organizations require that are on par with its competitors.
Also, while it may be a tangential communication platform that promises to seamlessly integrate with other Microsoft enterprise products, it still **lacks discoverability and simplicity** for novice users in general and expert users in functionalities like Search for files/chats etc.

3 HEURISTIC EVALUATION

3.1 Good What

Microsoft Teams is a good example of good HCI design, with its clean and intuitive interface, customizable features, easy-to-use chat feature, integration with other Microsoft products, high-quality audio and video conferencing, and accessibility features.

3.2 Good Why

- The Teams application makes all important features visible and easily accessible to users; Chat, Audio call, Video Call etc. are clearly and legibly displayed with no clutter.

- Teams provides prudent real-time feedback to users through animations, sounds, and visual cues.
- It also provides users with customizable options, such as the ability to rearrange the order of teams, channels, and apps, and the ability to customize notification settings. This allows users to work more efficiently and to tailor the application to their needs.
- Teams includes features that help prevent errors, such as preventing users from accidentally deleting channels or messages. Additionally, the application includes features that allow users to recover from errors, such as the ability to restore deleted channels.
- Teams maintains a consistent design throughout the application, with the same layout, colors, and typography used across all features. This consistency makes it easier for users to navigate and understand the application.

3.3 Good Principles

Microsoft Teams adheres to design heuristics that make it an excellent example of good interface design –

Visibility/Discoverability, Feedback, a good degree of Flexibility & Constraint/Recovery and, Consistency.

3.4 Bad What

Microsoft Teams has been criticized for its complexity for novice users, limitations in customization and accessibility, insufficient flexibility in customizing its features and lack of sufficient tolerance to error.

3.5 Bad Why

- Microsoft Teams can be overwhelming and complex, with a lot of options and features that may not be necessary for all users. This can make it difficult for users to find and access the features they need, which can lead to frustration and decreased productivity.
- Teams has limited customization options, which can make it difficult for users to tailor the platform to their specific needs. This can be particularly challenging for organizations that have specific workflows or requirements that are not met by the default platform settings.

- While Teams offers a wide range of integrations with third-party tools, the quality of these integrations can be inconsistent. Some integrations may be difficult to set up or use, which can lead to frustration for users.
- Teams has been criticized for its accessibility issues, with some users reporting difficulties with screen readers, keyboard navigation, and other accessibility features. This can make the platform difficult or impossible to use for some users with disabilities.
- Teams has also been drawing flak on social media with videos being circulated about exposing users to inadvertent video captures capturing them in bad light and not letting users even know about it, which is rather embarrassing and unprofessional.

3.6 Bad Principles

Simplicity, Tolerance, Flexibility, Ease & Equity are design areas found to be lacking and could do well with improvement.

3.7 Redesign Conclusion

From all the inferences from the Survey and offline public peer platform product review research, AND FROM MY OWN PERSONAL usage experiences, I wish to focus on proposing to improve Microsoft Teams' ***Flexibility & Constraint*** areas of design heuristics through this project.

And in the interest of the available timeline runway for this project, I wish to specifically focus on addressing this design fault in Microsoft Teams derived from the Needfinding above & pertaining to this zeroed-in on design principles:

3.7.1 *Problem Statement being addressed through this Interface Redesign effort*

"The current placement of the video camera button in Microsoft Teams, as illustrated in Figure-2 is causing users to accidentally activate their camera during calls, which can be embarrassing and frustrating. This problem is particularly acute for users who are trying to mute or unmute themselves during a call, as the camera button is located right next to the microphone button. Although Microsoft does provide keyboard shortcuts to avoid inadvertent mouse clicks, novice users (and perhaps even some long-time users) may not know of this and become susceptible to the above said anomaly. A redesign initiative is needed to improve the Teams interface and prevent unintended camera activation whilst improving user experience in that regard overall. Perhaps having the

interface provide adequate constraints as applicable to make it more tolerant to errors and letting users customize the placement of the video/mute buttons could make them less susceptible to inadvertent button clicks."

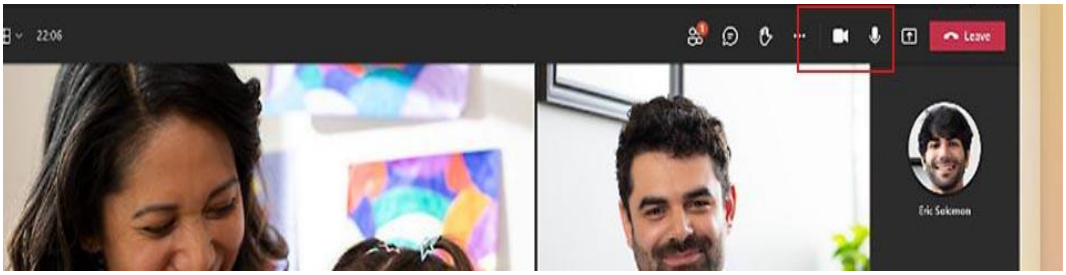

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Figure 2 — Source: Microsoft Teams website.

4 REDESIGN

4.1 Redesign - Appropriate Prototype

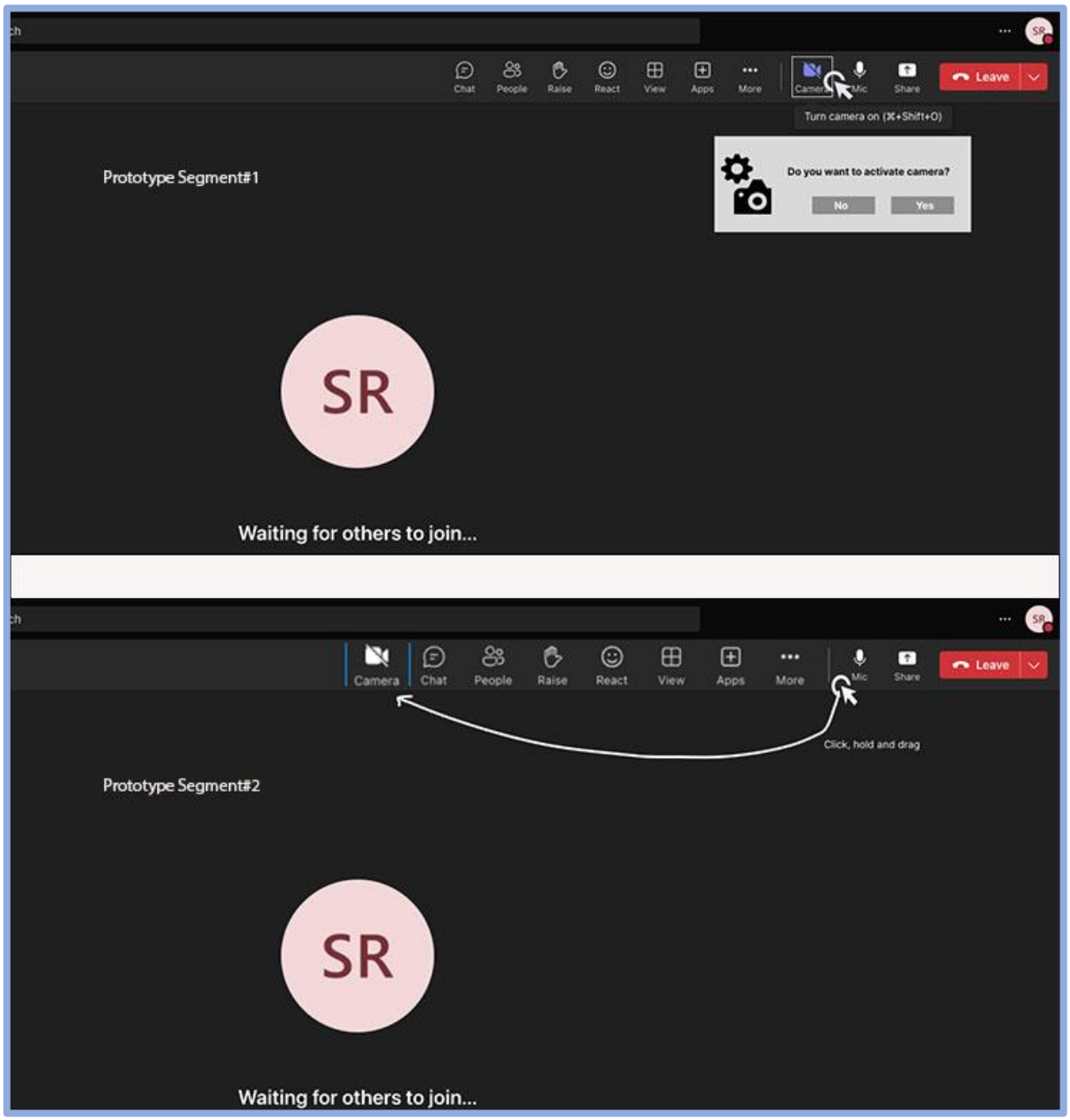

Figure 3 — Prototype indicating added constraint (Segment#1) and draggable camera button (Segment#2) on Teams Call/meeting screen

4.2 Redesign – Prototyping

Prototype Segment#1:

- The proposed prototype design aims to address the issue of accidental camera activation during video calls by adding a camera activation confirmation box for Microsoft Teams.
- This feature will provide users with an additional layer of security and privacy when using their cameras, requiring them to confirm their intention before proceeding.

Prototype Segment#2

- In addition to the camera activation confirmation box, the prototype design also includes customizable camera button location. Users would be able to click & hold on any icon (Camera in this case), to be able to drag them to a desirable location to suit users' convenience.
- This feature will allow users to move the camera button away from other buttons such as the mute button, reducing the likelihood of accidentally turning on their cameras while attempting to access other features (mute in this case) that are frequently used while attending meetings.

4.3 Redesign – Solutions

1. Redesign the user interface to include a prominent camera activation confirmation box that appears whenever a user attempts to activate their camera during a video call. This box should clearly indicate the action being taken and require users to confirm their intention before proceeding.
2. Allow users to customize the location of the camera button on their screen, making it easier for them to access while reducing the risk of accidental or unwanted camera activation. This feature should enable click-hold-drag operation to stay consistent with icon organization features that are prevalent on all platforms now viz. mobile phones, laptops & tablets etc.
3. Provide users with clear instructions on how to use the new features, including how to customize the location of the camera button and how to confirm their intention when activating their cameras. This can be incorporated in the HELP section in the application and floated out to users as a notification or announcement of feature enhancements.

5 JUSTIFICATION

5.1 Justification – Redesign

The two features, camera activation confirmation box and customizable camera button location, have significant implications in terms of improved Design Heuristics.

- The camera activation confirmation box is an example added Constraint that provides an added level of security to users by providing them with a greater control over their privacy during calls/meetings. By requiring users to confirm their intention before activating their cameras, this feature helps prevent accidental or unauthorized camera usage. This feature enhances the user experience by providing a clear and intuitive interface that promotes user confidence and trust in the application.
- The customizable camera button location is an example of Flexibility that allows users to tailor the interface to their individual needs and preferences. By enabling users to move the camera button away from other buttons such as the mute button, this feature reduces the likelihood of accidental or unwanted camera activation. From an HCI perspective, this feature enhances usability by making it easier for users to access the features they need while reducing the risk of errors or confusion.

Overall, these two features demonstrate how HCI design can be used to enhance security and privacy while also providing greater flexibility and customization options for users. By incorporating these features into Microsoft Teams, we can create a more user-friendly and intuitive interface that meets the needs of our users while also promoting best practices in security and privacy.

5.2 Justification – Resolving Weaknesses

The existing Microsoft Teams interface in the current context of the problem space lacks sufficient *constraining* that may lead users to unintended camera activation indicating low *tolerance* of the interface to unintentional button press. In addition, it does not provide enough *Flexibility* to let users customize buttons to their convenient access areas in the Teams call/meetings screen.

- The camera activation confirmation prompt is a constrained feature that requires users to confirm their intention before activating the camera. This

constraint improves tolerance by reducing the likelihood of accidental camera activation.

- The customizable camera button location feature provides flexibility for users to move the camera button to a more convenient location on their screen. This flexibility allows users to customize buttons according to their needs and preferences, which can help reduce the risk of accidental activation and improve user experience.

By combining these two features, the weakness of the Teams interface would be mitigated in terms of accidental camera activation while also providing users with more control over their call settings.

5.3 Justification – Preserving Strengths

The proposed features of adding a camera activation confirmation box and customizable camera button location preserve Microsoft Teams' interface strength by improving user experience without compromising the existing functionality of the platform.

- The camera activation confirmation box is a non-intrusive feature that does not interfere with the existing video call functionality of Teams. It simply adds an extra layer of protection against accidental camera activation, which can improve user experience and reduce embarrassment during video calls.
- Similarly, the customizable camera button location feature does not compromise the existing functionality of Teams. It simply provides users with more control over their video call settings, allowing them to customize buttons according to their needs and preferences. This can improve user experience by making it easier for users to access frequently used features during video calls.

These proposed features enhance user experience by addressing a common weakness in the platform while preserving its core functionality and usability.

5.4 Justification – Improvement Principles

The proposed features of adding a camera activation confirmation box and customizable button relocation follow several heuristic design principles that are as follows:

1. Constraints: The camera activation confirmation box forces users NOT to commit unforced errors by requiring users to confirm their intention before activating the camera. This reduces the likelihood of accidental camera activation, which can lead to embarrassing situations.
2. Flexibility: The customizable camera button location feature gives users more control over their video call settings, allowing them to move buttons to a more convenient location on their screen. This provides users with greater freedom to customize the interface according to their needs and preferences.
3. Perceptibility: The camera activation confirmation box provides users with clear feedback on the status of the camera, indicating whether it is on or off. This improves visibility of the system status and helps users avoid accidental camera activation.
4. Consistency: The proposed features are consistent with existing interface standards for video conferencing platforms, such as providing a camera activation prompt and icon drag and drop in mobile/laptop app layouts. This consistency makes it easier for users to navigate the interface and reduces cognitive load.
5. Tolerance: The proposed features improve the interface tolerance by not making it susceptible to unforced errors by unassuming users that are exposed to unintended camera activation.

6 EVALUATION PLAN

6.1 Evaluation Plan – Selection

The prototype designed here will be qualitatively evaluated using Surveys hosted on Georgia Tech's PeerSurvey platform.

6.2 Evaluation Plan – Description

Participants for this survey will be my fellow ***CS6750 OMSCS students*** that may have used Microsoft Teams for work or personal communication. Participants will be recruited through the ***Participant Recruitment forum*** created by Dr. Joyner for CS6750 on **ED**. This survey will take place ***online and will be Asynchronous***.

The survey will include a brief description that depicts the problem space to the participants to enable them to be prepared to perform the survey effectively. The

description is aimed to be BRIEF to neither under-inform or overload information onto the participants.

This redesign proposal for Microsoft Teams aims to address the problem of accidental camera activation during video calls caused by the current placement of the camera button. The proposed solution involves adding a ***camera activation prompt*** *and* ***a click, drag, hold & drop button customization*** *feature. The camera activation prompt provides a warning message to users, reducing the likelihood of accidental camera activation. The customization feature allows users to customize the placement of frequently used buttons, such as mute and unmute.*

The prototype will be hosted on Imgur, an online image hosting and sharing platform. The survey will direct participants to review the prototype via a URL to the Imgur post and rally them through a series of questions. Survey Questions will primarily aim to get as much feedback as possible from the participants.

1. *You are a Part-time or Full-time OMSCS student?* – Yes/No
2. *Have you used Microsoft Teams anytime?* – Yes/No
3. *If Yes, what was the context of your usage?* – Work/Personal/Both
4. *On a scale of 1 to 5, what is your agreement to the relevance of this problem space in the description above?*
5. *Take a look at this Prototype here (Teams Redesign)* – Imgur Link
6. *Was the prototype understandable?* – Yes/No
7. *For Segment#1, which is Camera Activation Confirmation prompt, how effective do you think this feature would be in avoiding accidental camera button press? (Assuming this feature extends to both mobile & computer apps)* – Effective/Ineffective
8. *If ineffective, could you please suggest any other ideas that could make it simpler & better?*
9. *For Segment#2, button placement click+drag+drop, how effective do you think this feature would be in customizing user experiencing to suit users' preferences and eventually avoid unintended button presses?* – Effective/Ineffective
10. *If ineffective, could you please suggest any other ideas that could make it simpler & better?*
11. *Assuming instructions will be provided on the feature availability in Teams documentation, any other way to provide instructions to user on how to avail these new features?*

12. *Any further thoughts on making the interface better in this context?*

6.2.1 *Data Inventory*

This evaluation would tie to the data inventory in as follows:

Category	**Attribute**	**Survey Questions Tag**
Users	Who are the users?	#1, #2, #3
	What are the User Types?	
	What are the types of students?	
Environment	Where are the users?	
	What is the environment?	
	What are the types of students?	
Context	What is the Context?	Survey Context
	What else is competing for user's attention?	
	Impact of this to the interface	
Goals	What are the user goals?	#7, #8, #9, #10, #11, #12
	What are they trying to accomplish?	
	Do their goals meet?	
Needs	Right now, what do they need?	
	What are the physical objects?	
	What Information do they need?	

6.3 Evaluation Plan – Execution

The survey was hosted on Georgia Tech's PeerSurvey platform, and the prototype was hosted on Imgur. Hyperlinks to these are added for your reference in addition to the links in Appendix-IV and Appendix-VI.

- The survey was asynchronous with data collected from participants over a week's span.
- The survey link was posted on the Participant Recruitment Megathread created by Dr. Joyner on Ed.
- 25 participants responded to the survey.
- Survey broadcasted a gist of the problem statement and the intent of the design to overcome that.
- Image of the prototype wireframe, around which questions were asked in the survey, was uploaded on IMGUR and link was shared in the survey.
- All 25 participants were able to visually comprehend the prototype with ease.
- All 25 participants recorded successful completion of the survey.

6.4 Raw Results - Summary

The Survey had 12 questions in total; 8 were Choose-one option type out of which 1 was 1 Agreement scale; 4 questions had Short Answer options. Overall, the survey had participants identifying their status as a full-time or part-time student in the OMSCS program, and their feedback on the prototype.

6.5 Raw Results

Raw results to the survey are placed here in Appendix-V.

6.6 Analysis - Summary

Here is the analysis summary spread from the survey.

- **80%** of participants are Part-time OMSCS students; **20%** are Full-time OMSCS students.
- **100%** of participants have used Microsoft Teams; 80% of the context was work, 8% for personal and 12% have used it for both the contexts.
- 48% agreed with the relevance of the stated problem space, 44% were neutral, 4% did not agree while none strongly disagreed.

- **100%** of the participants stated they were able to view the prototype and that it was comprehensible.
- For Segment#1, which is the Camera Activation Confirmation prompt in the prototype, 92% of participants thought the prototype redesign would be effective in curbing the problem space.
- For Segment#2, button placement click+drag+drop, 80% thought it would be effective in providing the flexibility to the users.
- Suggestions for improving the prototype were captured and will be discussed in the takeaways below.

6.7 Analysis - Takeaways

Most participants seemed to agree with the problem statement and approved the interface update proposal. Here we discussed some of the feature amendment feedback we received from the participants.

- Feature Instruction: Some of the participants wanted to have a Hover-over feature to provide instructions on the new feature availability to NOVICE users or provide a Pop-up or Tool-tip capability to keep users informed of the feature update that this prototype redesign aims to propose.
- Some participants thought that this feature, being designed to maintain consistency with other interfaces, is rather self-explanatory for experienced users or users that have exposure to computing.
- Feature Operability: Some participants suggested that this prototype would add an additional mouse click and that any option to reduce mouse clicks would be ideal.

6.8 Evaluation Plan – Next Steps

6.8.1 *Next Steps - General Overview*

The next steps would be to implement some of the feedback on the Microsoft Teams interface update proposal.

1. Incorporating a hover-over feature or pop-up/tool-tip capability to provide instructions to keep users informed of feature availability.
2. Ensuring that the feature design matches the user's knowledge and experience, reducing the cognitive load required to use the system.

3. Exploring options to reduce the number of mouse clicks required to operate the new feature, increasing the flexibility and efficiency of use.
4. Conducting additional usability testing with a diverse range of users to ensure that the changes are effective and meet the needs of all users.
5. Iterating the design based on feedback from usability testing and incorporating any additional changes or improvements.
6. Launching the updated interface (in this case, it would be amendments to the existing prototype) with clear communication to users about the changes and how to use the new features effectively.
7. Continuing to monitor user feedback (via surveys/interviews/think aloud protocols) and making further adjustments as needed to ensure that the interface is optimized for usability and user experience.

6.8.2 *Next Steps - Additional Need finding*

I believe I achieved a good deal of critical pointers from this round of evaluation with the appointed prototype. To refine and enhance design possibilities, additional need finding will emphasize on why certain participants did not find this feature useful or understanding what other modalities can be looked at to overcome the problem statement. These need finding can happen via *Surveys* or *Interviews* as exercised in this cycle.

6.8.3 *Next Steps - Design Alternatives*

From the survey outcomes as indicated earlier, some users seemed to not like additional mouse clicks and one participant wanted to adopt a method to curb accidental camera activation on Teams mobile with the phone in pocket. In view of these, I would consider exploring options to reduce the number of mouse clicks required to operate the new feature and devising a way to avoid camera activation with the phone in users' pockets.

6.8.4 *Next Steps - Prototypes*

If we were to go with the prototype deemed acceptable by participants from the survey, I will need to incorporate elements from the takeaways discussed above. Also incorporate HOVER-OVER/Tool tip features to provide guidelines to users and indicate accurate guardrails to make it more intuitive.

6.8.5 *Next Steps - New Evaluations*

With the design alternatives exercised, I would follow similar *Survey execution* to evaluate qualitatively as I seemed to have had great success with this iteration and perform evaluations to compare results and zero-in on the design incorporation.

7 APPENDICES

7.1 Appendix-I: Microsoft Teams Free Version URL (Back to Read Link)

https://www.microsoft.com/en-us/microsoft-teams/free

7.2 Appendix-II: Link to Needfinding Survey – PeerSurvey (Back to Read Link)

http://peersurvey.cc.gatech.edu/platform/survey-responses.html?id=f3c8f7dc7c7d4190a2698cb6d0f43f5a

7.3 Appendix-III: Needfinding Survey Raw Results (Back to Read Link)

https://gtvault-my.sharepoint.com/:x:/g/personal/sra0374_gatech_edu/EbF3eRRQJRVNrbwxGBJp--UBzm5jdeG-7XpQoJUacTs4Yw?e=nRjp2i

7.4 Appendix-IV: Link to Evaluation Survey – PeerSurvey (Back to Read Link)

http://peersurvey.cc.gatech.edu/platform/survey-responses.html?id=0acb826ce16b4f26bd249207d57a9e0b

7.5 Appendix-V: Evaluation Survey Raw Results (Back to Read Link)

https://gtvault-my.sharepoint.com/:x:/g/personal/sra0374_gatech_edu/EY50Ub2x--9IuA3Auab-FekBPXtu-vUpt0HFJ1ROp_wrjg?e=jDQah7

7.6 Appendix-VI: Link to Prototype on Imgur (Back to Read Link)

https://imgur.com/gallery/oRHrp4E