Video conferencing

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OCR A-level Computer Science NEA

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Analysis

1.1 Problem identification

1.1.1 Context

My client Axel Alabi has asked me to create an interactive video conferencing application to allow others to view talks in realtime. The current solution is to use the *Zoom* video conferencing application. While it is true that the application is technically sound and can work fine, there is a large number of elderly users that also try to connect to the talks. These users often don't fully understand how to correctly use the application and then end up accidentally disturbing the conference/talk, by leaving their microphone's on, accidentally raising their hands and so on. This makes my client's job difficult since he is in charge of managing the *Zoom* call. To combat this situation he would like a simple and user friendly video conferencing application that provides the features needed for people to view and interact with the conferences/talks in real time. This includes features like (but not limited to) audience participation, the ability to speak to others via one's microphone and the ability to vote on polls. The application should be created specifically to help elderly people have a better experience whilst watching any conferences/talks, so may also include extra accessibility features to ensure comfortable viewing for all, irrespective of one's age and/or disabilities.

1.1.2 Stakeholders

Stakeholder: Axel Alabi

Category: Client

Description:
Axel Alabi is a 22 year old male, and is currently in charge of managing the video broadcasts for conferences and/or talks. He also works as a data analyst for a company specialising in analysing geographical data. Unfortunately, managing the broadcasts has become quite challenging because there is often a number of elderly people who join the broadcast and find difficulty in interacting with the broadcast. Axel would use the proposed the solution to not only allow everyone to be able to access and interact with the broadcast no matter how much experience they have with technology. He would also use the solution to make his life easier and prevent people from disturbing the conference, allowing him to never have to worry about manually muting individuals during the broadcast. The proposed solution would be appropiate to his needs because it simplifies his life significantly giving him less things to worry about and allowing him to focus solely on managing the broadcast.

Stakeholder: People aged ~ 40 and over

Category: Target users/audience

Description:
This group of users typically have limited experience working with technology. I aim to develop the system to be especially suitable towards this category of people. These users will use the software to be able to interact and access their video conferences in a simple and intuitive manner, without having to worry about the complexity and difficulty in trying to get modern software to work correctly. The

final solution will be appropiate to their needs as it will allow the user to access video conferences no matter what their experience level with technology is.

Stakeholder: IT Staff

Category: Support/Maintainers

Description:
The IT Staff would be experienced in working with technology because of their qualifications in this field. This group of users should be expected to be able to update and maintain the system as required. To allow the staff to be able to properly maintain the system independently it is important to ensure that the code is readable and clear, such that anyone reading it can have an idea on what is going on. This will then allow the relevant staff to make needed changes to the code without having to try and understand what each portion of the code is doing.

I now provide a transcript of an interview that took place with my client.

Interview with Axel Alabi

Date: `29/06/24` **Time:** `3.50pm`

Q: What are some essential features that should be required in the final application?
A: Well to start the app should allow users to see and hear one another in real-time, there should be a focus on simplicity and users should be able to raise their virtual ”hand” to interact with the talk.

Q: What are some non-essential features that would be desirable in the final application?
A: The app could perhaps provide a suite of accessibility features to allow disabled ones to have a comfortable viewing experience. This may include closed captioning, volume control and a screen reader.

Q: What operating system should the application be for?
A: There is no preference for operating systems.

Q: What are the software requirements?
A: It should be a web-based application. Any suitable mainstream programming language is fine.

Q: What are the security requirements?
A: There should be some form of end to end encryption to ensure that hackers or others cannot access the video feeds. There should also be some kind of username and password system in order to enter a call. Passwords should also be of a good strength e.g. at least 1 symbol, capital and lowercase letters

1.1.3 Features that make the problem solvable via computational methods

Feature	Justification
Real-time audio/video feeds.	To justify this feature, note that *video* and *audio* feads should be nessecary for a *video* chat application. It is also explicitly requested for by my client. To complete this part of the application we could apply decomposition. This problem can be decomposed into multiple sub problems, for example: 1) Establish a connection to server. 2) Ensure user has connected a webcam. 3) Access the webcam via the relevant API. 4) Send the video feed data to the server/host so that everyone in the call may view the footage. This idea of breaking the problem down into smaller steps allows for a clear and logical approach to implementation.
The application should be simple and user friendly.	We may apply the technique of abstraction in implementing this feature. By removing irrelevant information from the user interface we can ensure that the user only sees information that is relevant to them in a simple and clear manner, directly achieving one of our client's requests.
Reliability and robustness	