Feature: Communication Establishment

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Major Positives

1. The design is mostly complete for the most part in the DTO’s that will be used, and clarifies what they all look like within the design at the top of CE-1

Major Negatives

1. The Design as a whole is flawed in its basic implementation, where you do not separate a chat from a session.
    a. The way the IChat is designed, each IChat object appears to be a single object associated with one single message, linked together to other messages by their `sessionID`
    b. This design may lead to confusion or be harder to handle. For example, in CE-2 where you describe sending an IChat object, you are sending all the values of that individual message, without verifying that the message being sent is going to the right conversation. It could be possible that the user manually modifies the `sessionID` value to send a message to someone they are not supposed to, or maybe to a session that does not exist at all, and that could lead to a whole new set of errors. If two chats are created simultaneously, there is a chance they can receive the same `sessionID`
    c. There is no way to check what `sessionID` values are valid, there is no constraints to what chats can have what `sessionID`

Unmet Requirements

- Because of the severely flawed implementation, there is a very real chance that the none of the implementation may work at all
- CE-1
  - There is no validation to make sure that the messages are going to the correct chat
  - There is no validation that determines whether you are allowed to mention a specific user
  - There is no functionality to notify the user they have been contacted
  - There is no functionality to signal whether or not a chat has been closed (Whether by a user, or whether by a week as stated in brd)
- CE-3
  - There is no details onto what an `IMessage` consists of
  - If we are just sending a message separate from the chat, it might be better to just use our emailing service, which is already implemented
  - There is also no authentication implemented at all

Design Recommendations

1. A better approach may be to potentially create an `IChat` object, which represents one session, and an `IMessage` object, which represents the entire chat session
2. If we had a list of chat sessions, each of which contained a list of messages, it would also make it easier to figure out how many chats there are, rather than trying to figure it out by checking every `sessionID` value in each of the messages. Because Chat sessions can exist without any messages being sent yet, this also gives the option of

opening a chat session without sending a message yet. It also makes it possible to use serial values for the sessionID, so we can automatically assign the next available `sessionID` value

3. It also allows for input validation, as we can check if the `sessionID` exists before adding a chat to that value

Test Recommendations

1. Because there were no tests mentioned in the design, here are some additional, on top of the required tests mentioned in the BRD
    a. There should be testing for all the create functionalities, such as whether you can upload one and multiple messages to a chat
    b. There should be front end testing to validate that all values show up within 3 seconds. A major concern with any implementation would be the scaling, I would recommend doing tests with many chat messages present if possible, to test how the system would scale, in particular once you have created many many messages and the database has to search through all of them to pair them together
    c. It may be useful to have some front end testing to validate whether the endpoints are checking authentication or not. Testing whether an unauthenticated user, can send a chat message to a chat they are not part of would be something to validate. Checking whether an authenticated user can open a chat with someone they shouldn't be talking with. Testing whether an authenticated user can send a message into a chat they are not a part of would also be useful to validate.