Assignment on Human-Computer Interaction

Course Essay

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1 Introduction of the digital service and user interfaces (UIs)

1.1 Digital-service selection and rationale

The chosen digital service is Gmail, Google's email platform. It is a great example of something people use every day and that almost everyone is familiar with. Because it is so widely used, Gmail has been designed to work for very different kinds of users, from teenagers to older adults. This variety makes Gmail an interesting service to analyze, since Google has to balance ease of use with many advanced features at the same time.

1.2 Service overview: users, contexts, devices, required skills

As mentioned, Gmail has a very wide range of users. Today, a large part of modern communication goes through email, whether it is for work, education, or even personal matters like vacations and trips. For this reason, Google has adapted the service to different contexts, offering both a web version for desktops and an application for mobile devices (available on both Android and iOS). The service combines very simple actions, such as writing or reading an email, with more advanced features, like creating folders or using tags to organize messages. At the same time, these extra options do not get in the way of users who are not interested in them, so everyone can still have a smooth experience.

1.3 Personal experience and emotions

Personally, I use Gmail on a daily basis, mostly the mobile app rather than the desktop version. For everyday use, I find the user experience very good, because it is easy to turn an intention into an action: if I want to write a new email, there is always a visible button to do so. Things become more complicated with advanced actions. In general, Gmail handles the basic tasks of sending and managing emails well, such as marking favorites or archiving messages. However, when it comes to managing labels or using other advanced features, the user experience becomes less smooth. For the average user, these functions can feel discouraging because, instead of being a helpful shortcut, they start to feel like real work. The interfaces often appear overwhelming, full of options and menus to select from, making the whole process confusing rather than intuitive.

2 Analysis using the user's mental model

2.1 Mental models and interface success (with examples)

A mental model is the way users imagine how a system works and how their actions will affect it. It is not always an accurate or complete representation, but it guides how people interact with digital services [1]. For example, many users believe that pressing an elevator button several times will make it arrive faster, and even though this belief is wrong, the mental model shapes their behavior in that situation [2]. When looking at Gmail, it is clear that the service relies on strong and familiar mental models. As in every other mail service, the inbox is directly linked to the physical mailbox and the idea of an email is based on the concept of a "digital letter". These analogies make the basic use of Gmail very intuitive and easy to learn, because the mental models of sending and receiving letters are simple and familiar [3]. However, more problems start to appear with advanced features. For example, Gmail uses labels instead of traditional folders. While labels are technically more flexible, many users try to use them with a "folder" mental model, expecting that assigning a label to an email will move that email into the "label folder". This mismatch can generate confusion, because assigning a label does not remove the email from the inbox unless the user also archives it. To address this, Gmail provides a parallel command, "Move to", which both assigns the label and removes the email from the inbox. In practice, this makes the interaction behave much more like a traditional folder, but creates confusion in identifying the real behavior of a label.

2.2 Metaphors and analogies in Gmail's interface

Metaphors and analogies are a powerful way to make complex systems understandable. They allowusers to transfer their knowledge from familiar, real-world objects into digital environments [2]. In user interface design, this means relying on common background using concepts that people can quickly understand without having to read instructions.

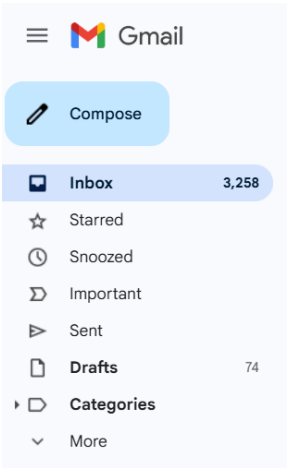

Figure 1: Gmail sidebar icons (Compose, Star, Snoozed).

As shown in the Gmail sidebar, the interface makes strong use of visual metaphors that are familiar to most users. The pencil icon for “Compose” recalls the idea of handwriting a letter, but even the star for “Starred” emails and the clock for “Snoozed” messages. Similarly, the paper airplane used in the send button acts as an analogy for sending a message out into the world. These conventions are not unique to Gmail but are widely used across different email services, and by aligning with them, Gmail lowers the learning effort for users. People can rely on their existing expectations instead of having to learn a new set of symbols, which makes basic interaction faster and more intuitive.

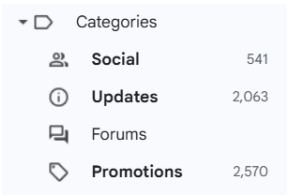

Figure 2: Gmail Categories section.

The situation changes with the Categories section. While the icons are simple enough, the meaning of the categories is not always clear from a user’s perspective. For example, what does “Social” mean? Does it include emails from social networks, personal contacts, or group messages? In the same way, how is “Updates” different from normal emails? All these ambiguities create a mismatch between the designer’s conceptual model and the user’s mental model, reducing the effectiveness of the metaphor and sometimes causing confusion [1].

2.3 Gulfs of execution & evaluation: analysis and challenges

The concepts of the "gulf of execution" and the "gulf of evaluation" describe two possible gaps in the interaction between users and digital systems. The gulf of execution is the distance between the user's intention and the actions that the interface makes available to achieve that intention. The gulf of evaluation, instead, is the distance between what the system does in response to the user's action and how easily the user can interpret that feedback [1, 2]. In Gmail, the gulf of execution is very small when it comes to basic actions. Writing a new email, for example, is always achievable in one click thanks to the "Compose" button. Similarly, sending, replying, or forwarding are supported by clear and conventional icons, so users can easily translate their intentions into actions without much effort. However, the gulf widens with more advanced functions, since creating a filter or managing labels often requires navigating through menus and understanding technical terminology. In the same way, the gulf of evaluation in Gmail is narrow for common tasks such as sending a message, after which, for example, Gmail provides immediate confirmation with a notification banner, giving the user clear feedback that the action was successful.

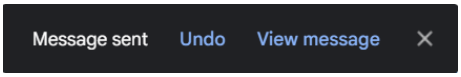

Figure 3: Message sent confirmation in Gmail.

The same applies to archiving or deleting, where messages instantly disappear from the inbox. But again, more complex features lead to more complex experiences, for example, when an email is automatically categorized under "Promotions" or "Updates," the system does not always make it clear why this happened. Users may feel that an important message has been "lost," while in reality it has only been archived or sorted in a way that is not fully transparent. Overall, Gmail succeeds in keeping both gulfs small for everyday actions that most users rely on. At the same time, the challenges of advanced features show how these gulfs can widen when the conceptual model of the system does not align with the user's mental model. However, it is important to recognize that, given the complexity of advanced features, some additional difficulty is acceptable, especially considering that the users who engage with these functions are likely to be more experienced.

3 Discussion

3.1 Design implications for UIs

Mental models represent the foundation and common knowledge of each user. Of course, they can vary depending on context, society, and culture, but being able to identify these characteristics and design a product that aligns with them is essential to avoid creating a “perfect” product that users are unable to use, wasting its full potential.

For this reason, it is crucial to always keep mental models, the gulf of execution, and the gulf of evaluation in mind throughout the entire design process. The cyclical nature of prototyping, implementation, and testing shows that it is not enough to just build prototypes: they must also be tested with users, feedback must be collected, and the product improved accordingly. There are different ways to conduct user testing: observing users while they interact with the product, asking them to think out loud, or having them complete a questionnaire. Among these methods, the think-aloud technique is particularly relevant in this context. Even though it is not always practical with real users and is often used in controlled testing sessions, it provides a clear way to identify users’ mental models and the potential problems that may lead to both gulfs. The goal is not only to detect problems but also to continuously refine the UI so that it evolves according to the users’ mental models and remains intuitive as new features are introduced.

3.2 Improvement suggestions (with sketches)

Based on the previous analysis, Gmail already provides a very effective user experience for basic tasks such as writing, sending, and archiving emails. However, some aspects of the interface could be improved to better support users’ mental models and reduce the gulfs of execution and evaluation.

As mentioned earlier, many users expect labels to behave like folders, assuming that assigning a label will move the email out of the inbox. This assumption comes from the mental model of desktop folders, and Gmail’s current design does not fully align with it and, in my opinion, simplifying the process of managing labels is essential. While creating a new label is very easy, deciding which emails should be tagged with it is unnecessarily complicated. At the moment, users either need to manually select emails one by one, as shown in the figure or set up complex filters, which can be difficult for non-expert users.

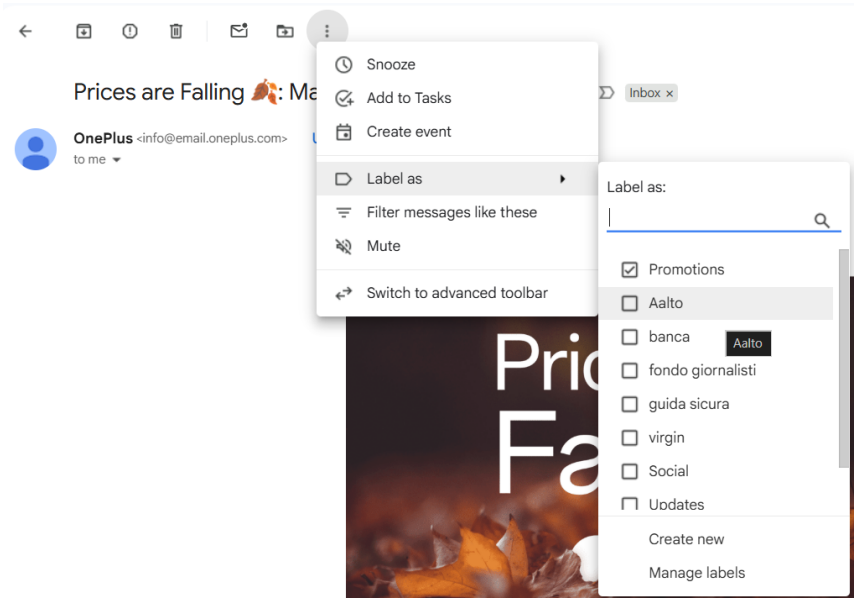

Figure 4: Assigning a label manually to an email in Gmail.

A more user-friendly approach would be to let people define rules directly while interacting with their emails. For instance, it could be as simple as giving the option to say: “All messages from this sender should go under this label.” This would save users from the current, more complicated process of setting up filters in the settings menu. In the same way, the visibility of labels could also be improved, since currently, labels emails are hidden in a separate section which makes them feel disconnected from the inbox. Placing them directly next to the inbox, just as the “Updates” tab, would make the relationship between incoming emails and their labels much clearer and easier to understand.

Finally, the “Move to” command and the “Label as” option creates unnecessary confusion. Since labels are meant to be a flexible way to organize emails, Gmail should stick to that idea instead of create a confusing mix of models, which only creates confusion for users. Archiving is a great feature and can stay as an option, but it should be clearer how archived emails interact with labels, maybe with a short note right inside the label view. In this way, Gmail would reduce misunderstandings and make advanced features easier to adopt for everyday users.

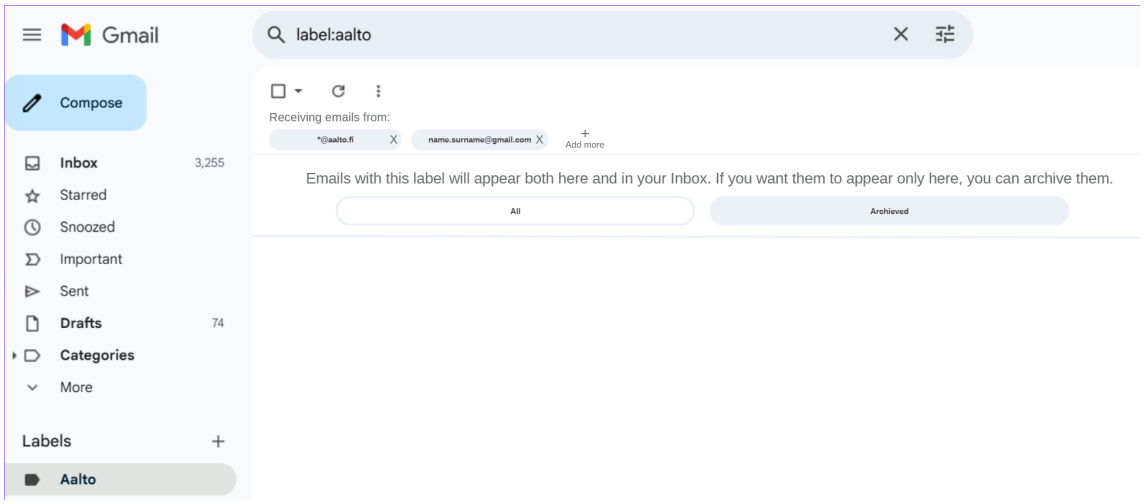

Figure 5: Modified UI for label section

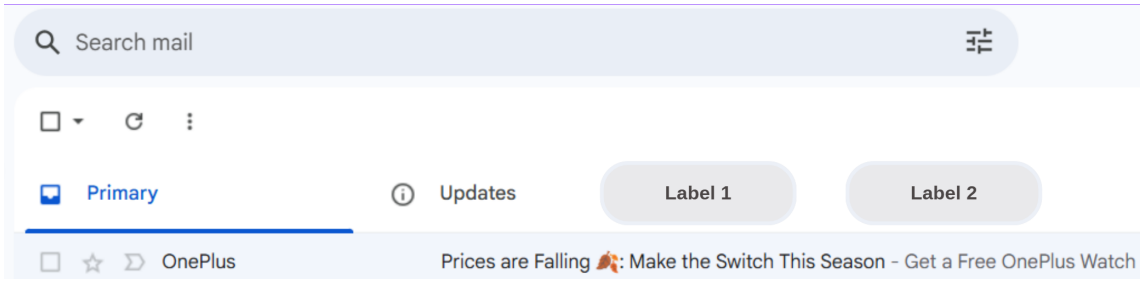

Figure 6: Modified inbox section with labels

References

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