User Error Prevention

User Experience Design

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***Abstract*—To err is human. This statement implies that human have a tendency to make errors. This fact should be considered when making an application. To minimize the problem encountered by people when interacting with an app, the app should be designed with error prevention in mind. This error prevention is to counter user errors, which may come in slips or mistakes, each with its distinctive prevention method. However, slips and mistakes may sometimes overlap and are able to be prevented using the same method. This paper will underline the types of human errors and the method of prevention for each.**

Keywords—user experience, user errors, error prevention

I. Introduction

Today, web-based applications and mobile-based applications have spread across the world. The use of these applications is so incorporated to society that they can't be separated from everyday lives. These applications are made for multiple purposes, from connectivity, entertainment, shopping, and much more. However, using an application is not always easy. Users have a tendency to make errors, whether consciously or unconsciously.

There are two types of human errors: slips and mistakes. Slips are unconscious error made when a person is performing an action on autopilot, usually when they are not focusing at their action. Meanwhile, mistakes are conscious error made when a person does not receive enough instructions or made a wrong interpretation or mental model when trying to reach a certain goal. Errors made by users should be communicated effectively to users so that they will not make the same mistake when trying again.

In using an application, users are bound to err, intended or not. Although telling users that they made an error is recommended, the fact that users actually err is in itself the example of a 'not good enough' design. Rather than letting users from making errors, apps should prevent users from receiving error messages, or making an error in the first place. User error does not mean that the user is in the wrong, it means that the designers are the one who made the app too easy for users to commit errors, thus, the designers' fault. To counter this, user error prevention needs to be implemented in the app.

II. Error Prevention as User Experience Design

User experience is the overall experience users or people receive when using a product, usually implying to the ease or please when using a product. In user experience design, error prevention is one of the heuristics – standard rules of thumb – needed to provide users with the best experience when using a product. Users should enjoy using a product as it is intended, for instance, feeling challenged and fun when playing a game, not feeling challenged when using the game controls.

Furthermore, users hate errors, especially when they feel like they are the one who made the mistake. To counter this problem, product designs should consider users' habits and strive to eliminate error-prone conditions, check for possible errors, and if an error occurs, offer simple solutions without urging the users too much.

III. Error Prevention in Everyday life

Error prevention is done to prevent errors before they even happen. For example, when opening a door for the first time, most people do not know whether to push or to pull the door, given no instruction to tell them what to do with the door. This could lead to an error, where the person does the opposite to open the door, usually resulting in them unable to open it the first time. Even after successfully opening the door a few times, people still tend to make the same mistakes. Why does this happen?

There are two ways to open a simple door, to push or to pull. When a door has a handle without a keyhole, people will think that the door is intended to be pulled. Meaning, if a door has handles without keyhole on both sides, people expect the door to be able to be pulled from both sides, even though the door is a one-way door. To prevent this problem, one can add a "PUSH" or "PULL" label to the door to let users know or changing the push side of the door handle to a flat plate. Most people will push the door unwittingly if the door had a flat plate as the handle, because there is nothing else people can do to the door.

IV. Error Prevention in Application

Error prevention also works the same way for app design. For example, an input form field that says “numbers” should, if it was meant to, let users only be able to type in numbers. The error prevention in this case would be to make the input form field reject all kinds of non-number keys, without alerting the user. This is to ensure user not to receive error messages after they type in a wrong key.

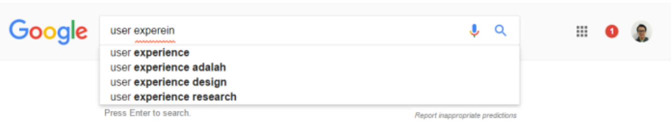
As mentioned earlier, there are two kinds of human error: slips and mistakes. This paper will discuss the error prevention for both possible user errors.

A. Slip

A person will start to do an action unconsciously when they have done the same action repeatedly, for instance, brushing the teeth. People will start to unconsciously take toothpaste and use almost the exact amount of it on their toothbrush. However, when a person is on autopilot mode, like thinking hard on a topic, they can actually use others toothbrush, or use hand soap rather than toothpaste to brush their teeth. This kind of error is called a slip.

In application design, slip prevention is done by gently guiding users to stay on the right path. The general rules of slip prevention is to 1) prevent slips before they occur, 2) detect and correct slips when they occur, and 3) allow users to correct themselves after a slips occur. A few example of slip prevention may be done by giving constraints, suggestions, automatic error detection, confirmation notices, or undoable actions. Constraints are mostly used on input types of interactions. For example, allowing users to type only letters instead of numbers for their names, a combo box for selection type of inputs, or a date or time picker for specific types of input. This kind of error prevention lets users know what kind of input is expected from them without telling them “this is not what we want,” right after they press the enter key.

Suggestions can also be used to prevent users from making errors. A good example would be the search bar. When searching for something, users would most probably make typological errors (typos). There are a few ways to prevent typos from becoming a real problem, one of which is by giving suggestions to users, or giving a “Did you mean...” to let users know that they may be typing something wrong.



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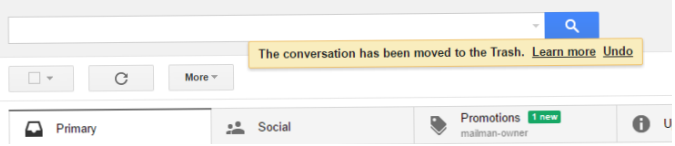
Press Enter to search.

Report inappropriate predictions

Fig. 4.1 Google Search Bar Suggestion

Detecting errors automatically helps users to know that they made an error before things actually went bad. In a registration page, when filling in a password, most apps has a password strength level that users need to fulfill before being accepted. Rather than telling them their mistake after their first attempt, it would be much better that those forms come with a list of needed combinations of password and notify them continuously of their fulfillment.

Another example of error prevention would be giving confirmation notices to user before an action is done. Commonly seen examples of confirmation notices are destructive actions such as deleting an item. Telling users “are you sure you want to delete this item?” will let them double-check if they really want to delete the item beforehand. Using a simple action such as an “UNDO” button will also help users to recover from their mistake. Following the previous example, even after a delete confirmation notice, users sometimes unconsciously click or misclick the delete button. Giving an undo button will let users retrieve said item before it is lost.



The conversation has been moved to the Trash. Learn more Undo

Fig. 4.2 Gmail Undo Function

B. Mistake

Unlike slips, mistakes happens consciously. This does not mean that users want mistake to happen, rather, they know what they are doing but do not expect it to happen. Mistake happens when users had a different or incorrect mental model towards a certain design than intended, leading them to take action unbefitting of the situation or goal. One example of mistakes would be, as mentioned before, the door opening problem. Pulling a supposed to be pushed door is a kind of mistake where the user expects the door to be pulled, while reality says otherwise.

Mistake prevention can be done similar to slip prevention. Automatic error detection, confirmation notices, or undoable actions can be used to prevent mistakes from happening. A few other examples of mistake prevention are to follow design conventions for certain devices, communicating affordances, and gathering usage data from users to understands their habits and the reason they make mistakes.

Design conventions are a series of design standards and best practices usually coming in different styles for different devices. Android devices have a different style in almost all aspects, whether in the use of icons, dimensions, positioning, interactions, or flows than iOS devices, albeit both being mobile devices. Following a set design conventions will give users the ability to interact with things they are more familiar with, reducing the chances of an error from occurring.

Affordance is how an interface can be interacted with. Letting user know that a button could be clicked will actually let them click the button, reaching discovery or a goal. To communicate affordance, following a design conventions may also help. For example, an add button in an Android device usually comes as a floating button on the button right, with shadows “behind” them. This shadows let users know that this button could be clicked, because of their “higher” positioning. If an affordance is not communicated effectively, users may not know how to interact with the app, resulting in mistakes.

Gathering user’s usage data can also help in countering user errors. Designers should know why users make those mistakes, why users do this first rather than that. A designer’s mental model is different from a user’s mental model; designers know what they made, or at least have often used. By gathering usage data, designers can reduce mental model differences and developing a more user-friendly design.

V. Conclussion

User error will always happen no matter who the user is. A new user will have difficulty adjusting and constantly making mistakes, while an experienced user will somehow made little unconscious slips as they use an application. However, reducing the errors could be done by using good design. Possible errors should be determined beforehand and prevented to maximize usability. Provide guidelines and communications to users to prevent the most commonly seen mistakes. If possible, allow user feedbacks and improve the overall experience of the application.

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