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The User Experience

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"I predict that within 10 years computers will be twice as powerful, 10,000 times larger, and so expensive that only the five richest kings of Europe will own them."

—Dr. Frink, *The Simpsons*

"Technology is anything that wasn't around when you were born."

—Alan Kay

"I think complexity is mostly sort of crummy stuff that is there because it's too expensive to change the interface."

—Jaron Lanier

"As far as the customer is concerned, the interface is the product."

—Jef Raskin

There is a sense in which technology is taking greater and greater control of our lives. Cast differently, it can be said that our lives are lived through a multitude of user interfaces. There may come a time in the future when things that are currently identified as user interfaces seem more like paperweights than like useful technological tools. For example, just compare the modern-day laptop to the 100-foot-long, 30-ton ENIAC computer developed in 1946, almost 71 years ago. Seventy years from now, technology may have advanced to a point at which we don't even notice the way we interface with it.

Until then, however, we can try to learn something from all the time we spend semi-consciously engaged with user interfaces. After all, everything we do as actuaries has an end-result for an intended user. Therefore, we should design our work in such a way as to create the optimal user experience (even if that intended user is you!).

As a matter of professionalism, we as actuaries are bound by the Code of Professional Conduct (the "Code") and the Actuarial Standards of Practice (ASOPs). In particular, this falls under Precept 4 of the Code and ASOP 41 for actuarial communications. As a matter of practicality, we like our user experiences to be clear and intuitive. When creating a deliverable, we (hopefully!) don't just paste numbers down into a spreadsheet, and then highlight

and label whatever cell happens to be the last one—say, cell FC10847—as "the answer." What sort of user experience would we be creating by structuring our work in this way? Instead, we take time to create a deliverable that showcases the results and allows the user to quickly understand their importance.

We actuaries should design our work product to create a user experience customized for a particular user—be it your boss, a client, or a reader of *Health Watch*. In the remainder of this article, we consider two case studies of effective user interfaces that have captured the public's attention, identify the common traits or principles necessary to create the ultimate user experience, and then apply them to actuarial work.

iPHONE CASE STUDY

A large percentage of us have an iPhone in our pockets, or in our hands, or within eyeshot at this very moment. Given that so many of us are iPhone users, even right now while you're reading this, it is a prime candidate to review in our discussion of user interfaces. In short, the iPhone is a miniature computer loaded with user-specific applications (apps) in a single menu called "the home screen." One such app allows the user to make phone calls, and despite the name of the device, probably is not the most frequented app by most users. To open an app, the user simply clicks on the home button to turn on the screen and then navigates to the desired app through finger swipes and screen taps. In comparison to other potential user interfaces, it doesn't get much simpler than that. The setup is simple enough that many toddlers can be seen in public using it without instruction—navigating through multiple apps to look at pictures and play games. And yet the interface simultaneously allows enough control to satisfy needy adults (although the neediest may switch to Android).

One of the taglines of the device is: "There's an app for just about anything." Translated for our purposes, this means the iPhone is highly customizable. App developers create apps limited only by their own creativity (and App Store rules and review). And then each iPhone is customized by each user through settings and downloaded apps.

The customizability, however, is limited to whatever is allowed within the iPhone's rigid modular structure. For example, unlike a desktop computer, there isn't a catch-all storage location in which you can stash files. While there have been many complaints about this feature (or lack thereof), this can be considered a deliberate design decision: strategically limited use. The benefit of this decision is that it maintains the simple modular structure of apps on a home screen, and also limits complications due to corrupt files, file types that won't open, and even infected or malicious files. So while this is a limitation that some users may gripe about, it may lead to an improved user experience in which everything works and remains simple.

To generalize, here are the three main design tenets of the iPhone that help create the best possible user experience:

1. Simplicity
2. Customizability
3. Strategically limited use (to maintain simplicity and stability)

FACEBOOK VS. MYSPACE CASE STUDY

Social media platforms provide another example of user interfaces that a large percentage of the population interacts with on a daily basis, perhaps without any thought as to how the features and setup are affecting their experience and time. With more than 200 million users in the United States, Facebook is the perfect example of a social media platform whose user experience draws in people of all ages and backgrounds. The premise is very simple: you create an account, link to your friends, and are able to share and receive updates about your respective personal lives. Additionally, you can follow your favorite companies, sports teams, bands and other organizations in order to receive news updates you might not get elsewhere. Users are in complete control of how they are portrayed on the site. They choose their primary photo, can post updates as often as they'd like, and can even restrict how other Facebook users share information about them.

However, the catch is that all of this control exists within the predefined Facebook structure. Before Facebook became popular, there was a boom in usage of other social media platforms, particularly Myspace. The information was much the same, but the user experience was wildly different. On Facebook, the appearance of your page is predefined and you can only edit existing text boxes or change photos as specified by the site itself. On Myspace, customization was virtually unlimited. Users could move aspects of the page around, assign a new background, and even choose a song to play when other users visited their page. While these features were undoubtedly appealing to a certain subset of the population, they violated the user experience tenet of simplicity and ultimately limited the growth of the site.

Facebook has been successful for a long period of time because of the simplicity of the website. Though additional features have been added over time, Facebook has effectively limited the confusion associated with using the site by maintaining a consistent experience for users. Facebook largely looks the same whether you log on using your computer, cellphone or tablet. The steps to upload a photo or post a picture are the same in any setting and the directions to do so are clearly labeled and easy to understand. The average Facebook user in the United States spends 40 minutes per day on the site. While many of those users might tell you that they'd like to spend less time on the site, they may not realize that the simplicity and consistency of their user experience (often enjoyed through the iPhone user interface) continues to draw them back in.

In summary, if we reference back to the tenets of the iPhone's user experience success, Facebook has also tapped into each of these: it is simple to use, customizable to the needs of most potential users, and strategically limited in its functionality. In comparison, Myspace offered extensive customization at the expense of simplicity and strategically limited use. Which one do you prefer to use?

WHY IS THIS ARTICLE IN AN ACTUARIAL PUBLICATION?

How can the principles and lessons learned from the iPhone and social media networks be applied to our actuarial work? All of our work is created for users—either the party that pays us, a colleague, or even ourselves at a future time. Given that our work often involves a great deal of complexity, conveying that work effectively to a user can be a challenge. How many times have you opened a spreadsheet and had no clue what you were supposed to be looking at? Your eyes jump all over the sheet; you can't distinguish input and output; you don't know which cells are formulaic; and you have to flip sheets endlessly and still don't understand how the workbook is organized. In this case the intended information was not conveyed effectively, and the user experience was negative. This scenario can be avoided by respecting the user and the user experience by making deliberate design decisions.

For example, when developing a model in a spreadsheet, you should consider how easy it is to use. Many analyses are single-use in which ease of use may not be as important as timeliness. (But don't forget how often we repeat analyses that we thought we'd only do once!) Other projects require a model that can be reused by different teams for different goals. It is these

models that require especially thoughtful and forward-thinking design to balance simplicity and flexibility. We list some considerations that the developer should think through when preparing a model, regardless of platform:

1. **Who is the user?** How and by whom will the work be used?
2. **Do I like my technical reviewer?** Don't forget that a technical reviewer is a real person and has feelings and, therefore, counts as a user. Work that is hard to check is generally suboptimal. To this end, don't hide numbers in formulas.
3. **How can I reduce user effort?** Minimize user effort. Equivalently, allow only the desired level of flexibility and customization.
4. **Is the file layout clear?** The organization of the file can enhance the user experience. Does the spreadsheet work left-to-right or right-to-left? Does it contain a "Notes" worksheet explaining how to use the model? Is it appropriate to have a table of contents with hyperlinks to sheets where specific inputs or summaries are located?
5. **How much detail should I display?** If your work is static, make a decision about the level of detail to display centrally. Is there a main user or most important user you'd like to serve first? Consider if it's worth the effort to allow the user to display different levels of detail. Appendixes in the rear are an option.
6. **Are the user controls intuitive?** If your work is dynamic, make sure that the user controls are fool-proof. This may involve clearly defined inputs, limited input ranges, and exhibits flexible enough to account for strange instances. If there are buttons that run code in the background, is it clear to the user when that code needs to be rerun if inputs are changed?
7. **How does your model address version control?** For models built for long-term use, updates are inevitable. Will you track version changes within the model or in an external support document? Can the user easily identify that they are using the latest version? If the user needs to understand what changed between versions, is there a clear way for him to do so?
8. **Is a dashboard needed for inputs/outputs?** Anything more complicated than a small grid of values generally requires some sort of dashboard. Maybe the dashboard will contain inputs and summary output.
9. **How many inputs are needed?** One of your goals should be to achieve reliable accuracy and appropriate precision. In that case, what is the smallest and simplest collection of inputs that will suffice? You may end up including more inputs, but developing the best model requires understanding the extremes. It is possible to have too many inputs in a model. A certain degree of customizability is needed, but it generally comes at the expense of simplicity.
10. **Are formulas and processes efficient?** Respect calculation or run-time efficiency. Computers are getting faster by the day, but they still seem to get bogged down by the complexity of formulas in our models. A bulky and unresponsive workbook is no fun to use—do you need all of that data in the same workbook at the same time?
11. **Is the documentation clear?** Respect future users. Write clear and accurate documentation so that future users can modify the model if you're no longer around.

This list is not exhaustive but instead is intended to briefly illustrate the practice of being mindful of the user experience.

This article focuses on the trade-offs involved in developing user interfaces to create the desired user experience. One of the most oft-proclaimed tasks of an actuary is to convey information to disparate audiences. In the context of this article, that means: Respect the user and respect the user experience. Accomplishing this requires extra time and thought, but the use and impact of your work are limited without it.

Don't let your work control itself. Let the intended use by the intended audience inform deliberate design decisions.

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