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On Engineering and Design: An Open Letter

Microsoft Research Principal Scientist Bill Buxton calls for engineers and user-experience designers to learn to appreciate one another

By [Bill Buxton](#)

Well-intentioned engineers often ask me how they can become designers, or how they can "do" design. A typical question might be something like this: "Can you please share guidelines for maximizing [user experience](#) while designing a UI? For instance: When should I use radio buttons instead of drop down bars [to minimize clicks] and so on?"

Questions like this are tough in more than one way. So I thought I would share a considered response—in the form of a hypothetical e-mail reply—to the well-intentioned engineer:

Thanks for taking the initiative and demonstrating interest in user experience (UX).

Without intending any disrespect or discounting your sincerity, I must admit that my first reaction goes something like this: *You're kind of asking for a master's degree in an e-mail.* Let me explain by paraphrasing your question, but with the professions reversed.

"Can you please share guidelines around supporting concurrency, while avoiding deadlock and race conditions, while designing a real-time system that has optimal performance and minimal code footprint?"

HONE YOUR QUESTIONS, FIND THE TALENT

Imagine how a trained computer scientist would respond to this question if it were put by someone who came from a design school, or whose training was in the social sciences. You might not be entirely generous, right? That's how a designer would respond to the first question.

The magnitude of what is actually being asked is overwhelming, so the short answer to both questions is:

Add to your team the professional competence appropriate to the task. In your case, you need a UX professional. The UX people clearly need a professional computer scientist.

End-user satisfaction and quality of experience need to be the fundamental pillars of any worthy company's value system. Hence organizations must be structured in a way that tilts the odds in favor of achieving these goals. Good intentions are a start, but they are not sufficient. Appropriate tools and skills at the highest professional standards, applied according to best practice, are what's needed.

Every project thus needs equally high levels of competence in the mutually dependent but different disciplines of engineering and UX. Professional stature is equally hard to achieve in each, and there are no simple shortcuts that let one jump from one to the other: This is no place for amateurs.

DESIGN AWARENESS FOR EVERY WORKER

None of this is to suggest that it is not worth your time to build up your knowledge of design. To help guide you in your approach, it might be useful to think of design in terms of four layers, each demanding a progressively larger investment.

Design awareness can and ideally should be something that every employee of a company makes their best effort to acquire. I would say exactly the same thing about technology awareness. In the corporate culture I dream about, there would be a balance between the two—along with a healthy respect for best business practices—in every employee.

Design literacy is also something that can be acquired with a bit more effort by any employee, regardless of background. If your company has employees who suffer from "Apple ([AAPL](#)) envy" in terms of the nature of the products that they produce, building such literacy is a very real and useful step in helping combat that particular affliction. Designers need technological literacy, too, and both need an equal dose of business acumen. Without this, none of us has any right to complain about not being understood by those in other disciplines. We all need to be able to handle multiple directions.

Design thinking is something that takes even more of an investment, requiring a level of competence that—with dedication and practice—can be acquired by anyone, to a reasonable degree. Cognitive science makes it clear that the strategies designers use in approaching problems or questions are different (not "better") than those employed by those trained in engineering disciplines. Both strategies are complementary. Given the complexity of the problems that confront us, it seems to me that expanding our collective arsenal of techniques is something we could all benefit from.

Design practice, however, is not something available to everyone. This is a full-time job for highly trained professionals. It requires people who have invested just as much to acquire their set of skills as the computer scientists have put in for theirs. Yes, there are exceptions. There always are on both sides of the table. But it is risky, if not foolhardy, to generalize from the exception.

I recognize that you are between a rock and a hard place, and that you are not responsible for having wound up in this position. That you asked this question in the first place demonstrates a real concern for the quality of your product and for your customer. That is exactly what your company should value, so you are to be congratulated for this. But it is exactly because I share your concern that I give the response I've provided. Your products and customers deserve a solution worthy of your concern. That will not happen if you try to do it yourself. This requires a professional who is as good at his or her discipline as you are at yours. If it will help, share this with your management.

Thanks for asking.

*Bill Buxton is Principal Scientist at Microsoft Research and the author of *Sketching User Experiences: Getting the Design Right and the Right Design*. Previously, he was a researcher at Xerox PARC, a professor at the University of Toronto, and Chief Scientist of Alias Research and SGI Inc.*

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