

20

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The Pragmatic Programmer


your journey to mastery

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Chapter 10

Postface

In the twenty years leading up to the first edition, we were part of the evolution of the computer from a peripheral curiosity to a modern imperative for businesses. In the twenty years since then, software has grown beyond mere business machines and has truly taken over the world. But what does that really mean for us?

In *The Mythical Man-Month: Essays on Software Engineering* [Bro96], Fred Brooks said “The programmer, like the poet, works only slightly removed from pure thought-stuff. He builds his castles in the air, from air, creating by exertion of the imagination.” We start with a blank page, and we can create pretty much anything we can imagine. And the things we create can change the world.

From Twitter helping people plan revolutions, to the processor in your car working to stop you skidding, to the smartphone which means we no longer have to remember pesky daily details, our programs are everywhere. Our imagination is everywhere.

We developers are incredibly privileged. We are truly building the future. It’s an extraordinary amount of power. And with that

power comes an extraordinary responsibility.

How often do we stop to think about that? How often do we discuss, both among ourselves and with a more general audience, what this means?

Embedded devices use an order of magnitude more computers than those used in laptops, desktops, and data centers. These embedded computers often control life-critical systems, from power plants to cars to medical equipment. Even a simple central heating control system or home appliance can kill someone if it is poorly designed or implemented. When you develop for these devices, you take on a staggering responsibility.

Many nonembedded systems can also do both great good and great harm. Social media can promote peaceful revolution or foment ugly hate. Big data can make shopping easier, and it can destroy any vestige of privacy you might think you have. Banking systems make loan decisions that change people's lives. And just about any system can be used to snoop on its users.

We've seen hints of the possibilities of a utopian future, and examples of unintended consequences leading to nightmare dystopias. The difference between the two outcomes might be more subtle than you think. And it's all in your hands.

The Moral Compass

The price of this unexpected power is vigilance. Our actions directly affect people. No longer the hobby program on the 8-bit CPU in the garage, the isolated batch business process on the mainframe in the data center, or even just the desktop PC; our software weaves the very fabric of daily modern life.

We have a duty to ask ourselves two questions about every piece of code we deliver:

1. Have I protected the user?
2. Would I use this myself?

First, you should ask “Have I done my best to protect the users of this code from harm?” Have I made provisions to apply ongoing security patches to that simple baby monitor? Have I ensured that *however* the automatic central heating thermostat fails the customer will still have manual control? Am I storing only the data I need, and encrypting anything personal?

No one is perfect; everyone misses things now and then. But if you can't truthfully say that you tried to list all the consequences, and made sure to protect the users from them, then you bear some responsibility when things go bad.

Tip 98

First, Do No Harm

Second, there's a judgment related to the Golden Rule: would I be happy to be a user of this software? Do I want my details

shared? Do I want my movements to be given to retail outlets? Would I be happy to be driven by this autonomous vehicle? Am I comfortable doing this?

Some inventive ideas begin to skirt the bounds of ethical behavior, and if you're involved in that project, you are just as responsible as the sponsors. No matter how many degrees of separation you might rationalize, one rule remains true:

Tip 99

Don't Enable Scumbags

Imagine the Future you Want

It's up to you. It's your imagination, your hopes, your concerns that provide the pure thought-stuff that builds the next twenty years and beyond.

You are building the future, for yourselves and for your descendants. Your duty is to make it a future that we'd all want to inhabit. Recognize when you're doing something against this ideal, and have the courage to say "no!" Envision the future we *could* have, and have the courage to create it. Build castles in the air every day.

We all have an amazing life.

Tip 100

**It's Your Life.
Share it. Celebrate it. Build it.
AND HAVE FUN!**