Interview — Paul E. Black (PB)
Interviewers: Michael Davis (MD)
Location: NIST, Gaithersburg, MD
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QUESTIONNAIRE

SOFTWARE DEVELOPERS WRITE A CODE OF ETHICS

1. What is your educational background?

B.S. (1973) in Mathematics (with minor in Computer Science/Physics), from Southern Utah State College. M.S in Computer Science (1983) from the University of Utah (Software Emphasis). Ph.D. in Computer Science from Brigham Young University (1998). My dissertation was *Verification of a Secure Web Server.*

2. What sort of organization do you work for? What do you do there?

I work for the National Institute of Standards and Technology (NIST). It used to be called the Bureau of Standards. It's part of the federal government. There are about 3000 employees, mostly well educated. Part of what NIST does is develop voluntary standards for chemistry, time, length, and so on. For example, an industry may want to standardize a certain screw or software interface. We develop the standards. This is an ethical, objective, and honest organization. I've been here five years. I work in computer and math services. My title is Computer Scientist. I help develop standards for testing software. I am also interested in formal methods, including proofs of program correctness.

3. What experience, if any, have you had in software development? If you are a software developer, what led you into that field?

Lots. My first real job was at a small insurance company (about 20 people) in Salt Lake City (1977-82). I designed systems for accounting, payroll, tracking insurance policies, and so on and then oversaw their implementation. I spent another seven years at a company that designed integrated circuits (1984-91). I built design tools, that is, software to aid in designing circuits. I worked in software quality control and configuration management at other companies until 1993 when I moved to Utah to finish my degree.

I loved the idea of programming computers since I was 12. Software development was just working at that.

4. Are you an engineer?

Not by title. I like to think of myself as doing engineering stuff, but engineers have lots of training

that I don't have. So, maybe I'm an "amateur engineer" or someone aspiring to be an engineer. I design and construct programs. Designing and constructing is what engineers do too. I also look beyond the specifications I'm given to the larger issues: delivery, administering the life cycle, and so, just as engineers do.

5. How did you hear about the IEEE/ACM Joint Task force on Software Engineering and Professional Practice (SEEPP)?

If I recall right, I saw a blurb in the *Communications of the ACM* late in 1997 about V. 3 of the code.

6. What lead you to participate in SEEPP's work?

I felt a duty to get involved. They were, after all, setting standards. That was something I though I could help with. The standards might help to shape the making of software. Those standards could be important.

7. Were you familiar with codes of ethics before you became involved in SEEPP? Explain.

I'd read the ACM code, of course; and the Hippocratic oath. I had also read about civil engineers. [MD: At this point, PB pulled from his shelf what seemed to be a textbook on civil engineering practice published in 1891.He pointed out the mature and detailed standards the book laid out.] We need to develop ways to write software that works. Either we should be able to prove that a particular piece of software is reliable or keep the software simple enough so that its reliability is obvious. Of course, a third possibility is for society to accept buggy software and the losses that come from it. But I don't think we should just accept bugs, especially if the software has an important social use. Maybe bugs are okay in games but that's about the only place.

8. In what ways did you participate in SEEPP's work, especially in the process of preparing the code? (The more details, the better.)

I sent in comments on V. 3 after seeing that blurb. I also commented on V. 4 after receiving an invitation to do so from Donald Gotterbarn. Most of my comments were on presentation, for example, why use the word "third party" in a few places when the text would be clearer if it used one or more of the terms already standard throughout the code ("public", "user", etc.)? Only a few of my comments were substantive. In a few places, I thought they had gone beyond what was appropriate for a professional code, for example, by calling upon software engineers to volunteer for civic work. I liked the code overall, especially, it saying that it was intended as "guidelines" to help you think through the problems you'll face.

9. By what means did you participate? For example, did you participate by email, or by phone, or through face-to-face meetings, or by letter, or by

informal conversation, or the like?

For V. 3, I participated by email. For V. 4, I think I used a web site set up for that purpose. I also initially learned of the process from a paper communication. I never raised the subject with my colleagues. So, I didn't participate by face-to-face meetings. I'm not sure why I never raised the subject with my colleagues. Perhaps it was because I was new here [at NIST] and didn't know anyone who I thought would be interested. Maybe I would have if the blurb, email, or web site had said "discuss this with your colleagues".

10.   Did any of these means of participation seem to work better than the others? Any seem to work worse? Which would you recommend as best? Why?

Email seemed very effective to me. I liked the web site too. It had lots of resources presented in an order much easier to use than if everything had been on paper.

11.   Any events that particularly stick in your mind relevant to the process? (The more details, the better.)

Most of my "work" was just taking the time to sit down, read through the code, and think about it. Other than reading the two versions of the code, I didn't take part in any of the discussions. An advantage of just reading the code is that I could represent those reading the code in the future: what was confusing, ambiguous, or hard to understand? If I had been involved in the discussions, I may have thought I knew what the passages meant, not realizing understanding came from experience in the discussion.

12.   Do you have any documents, paper or electronic, relevant to your participation in the process? May we have a copy?

Yes. I will forward them by email attachment. [MD: I now have them.]

13.   Has your thinking about codes of ethics changed as a result of your participation in SEEPP's work? How?

Yes. I was enlightened (and glad to see) that a code of ethics could be written as guidelines saying—explicitly—here are things to think about, but rules can't cover everything. You're going to have to think whether the code may have left something out. Good Preface!

14.   What, in your opinion, is important about having a code of ethics?

There are at least two. First, the code is there so that if someone is unethical, we can point to the code and say, "See, you're being unethical." The code provides a common standard. This is important, but not nearly as important as the second: the code is a personal guide in choosing

one's own behavior. It reminds us of what we might otherwise forget. It inspires us to do more than we might otherwise do. It is an aid to personal improvement. I'd like to live an ethical life. I appreciate a bunch of people getting together to offer me advise on how I might be more ethical in my work.

15.   Is there anything about your *participation* that you are especially pleased with or unhappy about?

No. Just happy to have participated.

16.   Is there anything about the *final code* that you are especially pleased with or unhappy about?

I am very pleased that this code exists. I am also pleased with the Preface because of how it explains the code (the code as guide lines to help in thinking issues through). What I'm unhappy about—and this is only a minor unhappiness—are phrases here and there that sound like jumping on the latest bandwagon, for example, provisions that use "code words" like "diversity" or "environment". I think I agree with the underlying sentiment in these provisions but when one of those code words is there, I can't be sure how it might be interpreted in the future.

17.   Is there anyone whose participation in the process seems to you especially important? Explain.

Gotterbarn (esp. for V. 3). Leonard Tripp for V. 4. Tripp seemed to be in charge at this stage. I was always able to reach him at twood@computer.org. These were the only people I corresponded with.

18.   Anyone who you think we should be sure to talk to? Explain.

No.

19.   If you had been in charge of the process, what, if anything, would you have done differently?

Practically speaking, probably nothing. Ideally, though, I think I would have made sure than every invitation to participate included a statement urging people to talk to the people around them about the code—before sending in comments. That might have enlarged input considerably.

20.   Is there anything we should have asked but didn't? Anything you want to add to what you have already said?

You didn't ask about my background as a person. It might help you to understand my other

answers. I'm a religious person, a member of the Church of Christ of the Latter Day Saints. I attend church regularly. The Church encourages us to join civic organizations to help society be better, even if joining is not convenient or comfortable. That may explain why I said I felt a duty to participate in SEEPP's work. It may also explain another way I am unhappy with the code, though I understand that nothing much could have been done about it. It saddened me that there was no place in the code for God. The U.S. Constitution has a place for God; so, why not the code? Of course, that question raises very large issues about how a code should be used in a society.

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