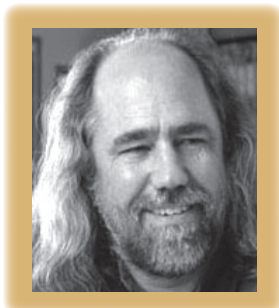


The Elephant and the Blind Programmers

Grady Booch

Once upon a time, there lived five programmers in a valley whose hills glittered with silicon. One day, there was a posting on Slashdot (www.slashdot.org), inspired by a rumor first found on Valley-Wag (valleywag.gawker.com) that talked about a strange new animal that had lumbered into town. Some of the older villagers mumbled something about it not being new at all and that they'd had one as a pet long ago (though it was much smaller back then, they claimed, and much easier to take care of). Most of the younger villagers were so busy playing with their rubies and pearls that they'd collected along the hills that they



didn't pay any attention at all. But the animal was large enough, noisy enough, and smelly enough that it could not be ignored. It wandered about the village for a while, trailing spaghetti-like tendrils that wrapped themselves around every object it encountered, until the entire village was tangled and scattered with these many random bits. Finally, the beast sat itself down in the middle of the village and refused to move.

Along Came Five Blind Programmers ...

In that village were five blind programmers. They had no idea what this large, noisy, smelly thing was. They said to one another, "Though we are blind, we can still see with our minds and reason with our wit, so let us go forth and examine this beast as best we can." All of them went out

to the center of the village. Each of them, in turn, touched the creature.

The first programmer reached out and touched the animal, proclaiming, "The thing's hollow—it goes on forever—and—oh my goodness! It's full of objects! Everywhere I touch I feel the edges of these objects, some large, some small, some well defined, many of them quite fuzzy. They all seem interconnected in different ways, and when I touch from the bottom to the top of this creature, I feel distinct layers. Strangely, when I touch from left to right, I feel separate pillars, almost like a row of grain silos standing side by side. Why, this is not a beast at all, but it is a vast enterprise of nearly independent, well-encapsulated things with clear separation of concerns." The first programmer went silent for a moment, put his ear to the beast, and paused for a moment. "And, if you listen closely," he said, "you will hear many patterns of movement."

The second programmer stepped forward and put her ear to the creature. "Why yes!" she exclaimed, "I hear its pulse. My hearing is finer than yours, and when I listen closely, I hear the life coursing through this beast. It throbs and rumbles and zooms. It rattles and coughs and sometimes whirs. This is clearly not just one animal, but many who are entangled with one another. I think I can distinguish many separate threads of sound, each a little different from one another, but somehow weaving and dancing about such that there really is a very melodious sound coming from this thing." She stepped back, paused, and reconsidered. "Why, this is not an animal at all,

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but a box with a jazz band—or maybe a symphony orchestra—inside. They don't always seem in tune, but most of the time it sounds not bad at all."

The third blind programmer pushed the other two aside, wanting his turn. He was a very practical man; in his home, there was a place for everything and everything was in its place. Every day, at precisely the same time, he would ensure that all was in a proper, stable configuration. When he had visitors, which was often, he would give his friends a full and complete copy of his entire house, from top to bottom, that they could fiddle with as they liked. But like clockwork, every day at precisely that same time, he would take in the changes his visitors had made and, if he found them to be good, he would merge them into his home. In this way, his place grew over time, and it was filled with the memories of what his visitors had done. Yes, it was a bit messy in places, but it was home, and he liked it. Approaching the creature, he paid less attention to the things the first two programmers had noticed, and instead felt about what appeared to be boxes or luggage or crates that the beast had carried along. "Why, this is not a beast at all," he cried out, "but rather it is a jumbled pile of packages." Reaching out in one direction, he touched a collection of jars. Reaching out in another direction, he touched a vast number of files lying on the ground, some of which were piled on top of one another, some of which were more organized in their own filing cabinets. Groping about further, he found some boxes that were hot to the touch and rumbled and whirred all on their own.

While the third blind programmer sat down amid this pile of boxes, randomly picking up jars and trying to open them, the fourth blind programmer came forward. Well, if truth be told, she was not really a programmer at all, although she was known to be in the company of programmers from time to time. She smelled strangely of fresh solder and plastic and warm metal, and everywhere she went a breeze rose from her feet (which were very cool) to her head (which was very hot, especially when she was thinking or working hard). She had this strange habit of carrying a jumble of logic analyzers and oscil-

losopes and multimeters with her, poking and prodding every new thing she came across. Her encounter with this creature was no different. Dashing from one end of the village to another (for, though blind, she was a very nimble woman), she appeared to be less interested in the squishy bits of the beast itself, or its clanking and rumbling sounds, or its luggage, and rather focused on the platforms upon which the creature was apparently sitting. "Why, notice how distributed this creature is! As I dash to and fro, I see that the platform under this beast is scattered all over the village. Over here is a main frame that supports one of the biggest platforms, but over here I feel a multitude of small frames, all the same, and over here, an uncountable number of small pads I find scattered about the valley. Although I've never ventured beyond the hills of our valley, I would imagine that this creature sits on an even larger, uncountable, and ever-changing multitude of platforms beyond this valley. This is not one beast, but it is legion!"

The fifth programmer, a fine arts major and a part-time historian and somewhat of an artist as well as a therapist, stepped forward. Well, not really stepped, she climbed, up a tall ladder she always carried with her. She defended her ladder-climbing by telling her friends that she liked to step above the details of everything, wanting to know where things had come from, where they were going, and what people were doing with them. She didn't bother defending herself with her enemies—it was useless, and in any case they just wouldn't under-

stand. But she was known and respected as a woman of vision. The fifth programmer was not exactly blind either. She could see light and dark and edges but not the details, which seemed to be abstracted away. Perched high on her ladder, she shouted down, "I see where this beast has traveled to and fro. Most of the paths it takes are well worn; some of them diverge and a few of them positively fall off the edge of the valley. Why, this is a most useful creature!"

... And Then the Wise Rashomon

Carefully climbing down her ladder, she met with the other four programmers, who had begun to argue quite noisily. Everyone insisted his or her point of view was the only correct one, and no one could attend to the others' viewpoints. They started throwing PowerPoint slides at one another (the fourth-programmer-who-was-not-really-a-programmer threw chips and disks and cables). A wise man (whose name was Rashomon, by the way) was passing by. He stopped and asked, "What is so divisive that you bicker and squabble and fuss thusly?" They said, "We cannot agree on what this creature is." Each repeated his experience to the wise man.

He went silent for a moment, scratched his head, lit his pipe (for it gave him time to think), then said, "All of you are right. The reason that each of you groks this creature differently is because you are examining it with a different set of concerns and thus each with a distinct point of view. So, in truth, this creature has all the characteristics that each of you observed."

The moral of this story is this (with apologies to John Saxe, but since he's long dead, I suppose he won't mind):

*So oft in methodological wars,
The disputants, I ween,
Rail on in utter ignorance
Of what each other mean,
And prate about an Enterprise
Not one of them has seen. ☹*

**Once upon a time,
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in a valley whose hills
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Grady Booch is an IBM Fellow and one of the UML's original authors. He also developed the Booch method of software development (*Object-Oriented Analysis and Design*, Addison-Wesley, 1993). He's working on a handbook of architectural patterns, available at www.handbooksofsoftwarearchitecture.com. Contact him at grady@handbooksofsoftwarearchitecture.com.