SIGMOD Innovations Award (2003)

Don Chamberlin

The following remarks were made by Don Chamberlin of IBM Almaden Research Center
on receiving the SIGMOD Innovations Award at the SIGMOD Annual Conference,
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Many thanks to SIGMOD and to the Awards Committee for selecting me to receive the SIGMOD Innovations Award. I am deeply honored to join the other distinguished recipients of this award.

I would like to emphasize that all my accomplishments have been the result of teamwork. I am very much indebted to Ray Boyce, who collaborated with me on the design of SQL; to Jonathan Robie and Dana Florescu, who collaborated with me on the design of Quilt, the precursor to XQuery; and to my colleagues at IBM Research, who have created a wonderful working environment and a world-class system building team.

I would like to speak briefly about why I think the members of SIGMOD occupy a very fortunate position, and about the responsibilities that go along with this good fortune.

When I was a young boy, my family had a state-of-the-art information retrieval system, called an encyclopedia. It weighed about 100 pounds, so you couldn't carry it around, and its information quickly became out of date. Nevertheless, at that time, if you needed to know the capital of Peru, or how far it was to the moon, or the name of the 28th President of the United States, you went to the encyclopedia and looked it up.

A more visionary way of retrieving information was proposed in 1945 by Vannevar (pronounced Va-NEE-ver) Bush, President Roosevelt's science advisor. Bush published a famous article in the Atlantic Monthly, titled "As We May Think", in which he posed several post-war challenges for American scientists. One of these was a device called a "memex", which could store many books and other materials—a vast store of information—richly indexed and cross-referenced for fast retrieval.

We who have worked in the computer field during the last decade are privileged people, because we are the ones who were finally able to realize Vannevar Bush's

vision. Each of the wireless computers that many of us carry around is in fact a memex. A wireless laptop is actually much smaller than Bush's memex, which he envisioned as a piece of furniture. Bush also expected that a memex would need to be carefully loaded with information, whereas with a wireless laptop, all you need to do is turn it on. It's the size of a book, but it is really all books, and all works of art and all pieces of music. I Googled Vannevar Bush this morning on my laptop, and I got 38,300 references in 0.23 seconds. That's something you can't do with an encyclopedia!

If you were working on the railroad in the 1880's, you were where things were happening. The same is true if you were working on radio in the 1920's or on nuclear fission in the 1940's. For our generation, the main thing that is happening is digital technology in general and information handling in particular, and SIGMOD is right in the middle of the action.

Since its founding, the members of SIGMOD have seen two revolutions in data management. The first of these brought all the world's business data online, and resulted in credit cards, ATM's, and computer systems for billing and inventory control. In support of this revolution, we built relational databases, electronic transaction systems, and all the infrastructure that goes with them.

The second data management revolution began a decade ago when, suddenly, all the computers in the world were connected together by the Web. This revolution is still going on, and promises to be even bigger than the first in its impact on our daily lives. Until recently, our society has been largely built around the idea that information is scarce and expensive. It will take us some time to get used to the idea that information is cheap and ubiquitous. Every institution or practice that is based on concentrating information at specific places and times is subject to change in the next decade. Once again, the members of SIGMOD will build the tools and infrastructure that will make this revolution possible.

We occupy a privileged position in the world, because we are doing things that have never been done before, and we are building tools that are going to last a long time. This privileged position carries with it a responsibility. Generations of college students are going to have to learn the concepts that we dream up. We owe it to them to exercise some discipline in how we do our work.

I'm going to suggest a few pieces of advice that I think would be helpful to keep in mind as we develop the information processing tools of the next century. These aren't deep or subtle ideas—in fact, they are really just common sense. But I think common sense is important in our business. I don't claim any unusual degree of success in implementing this advice, but I try to keep it in mind and to learn from my mistakes.

The first bit of advice is simply this: Keep It Simple. Simple is Beautiful. Simplicity is a primary goal but an elusive one. Every feature has its constituency, and nobody ever got famous for leaving something out. But in fact, in many cases, the highest service that a designer can perform is to keep unnecessary complexity out of a language or an interface. In this regard, my personal favorite interface of the last decade is Google, which has incredible power and requires absolutely no training. This is an example we would do well to emulate.

My second piece of advice is this: Trust the User. Users are the ones who are paying the bills, and they are the ones who have a need to get a job done. What we need to do is to provide our users with a set of simple tools and let them use them as they see fit. I am very suspicious of arguments over the One True Way to organize data, or to represent missing information, or to do anything else. I believe that if we provide our users with a spectrum of simple, orthogonal tools, our users will vote with their feet for the best way to get their work done.

My third piece of advice is this: We should strive to empower our users without constraining them. An example of constraining the user is to force him through a telephone tree that doesn't have any branch that leads where he wants to go. There is a certain style of user interface design that attempts to anticipate all possibilities and put them on menus. I call this the "birthday card" style of interface, because it reminds me of a card company that thinks it can anticipate everything I might want to say to my wife on her birthday, and encapsulates each message in a card. I think this kind of interface is presumptuous and inflexible. I think we should strive for user interfaces that are open-ended and based on simple sets of orthogonal tools.

My last piece of advice is this: We need to be very serious about protecting the privacy of data. Everywhere we go these days, we leave a trail of digital information. How this information is used will have a big impact on the kind of society we live in in the 21st century. As computer professionals, we have a responsibility to provide users with control over how their personal information is used and to put standards in place to prevent the abuse of this information. The easier it is to collect and transmit data, the more important it becomes to guard against harmful uses of that data.

Once again, we are a very privileged group of people. We are privileged because we have important work to do, work that has an impact, and that kind of work is scarce. We have technology available to us that was only a dream in Vannevar Bush's day, and this technology is transforming the world. It's up to us to make sure that our work is worthy of this opportunity.

Again, I thank you for honoring me with the SIGMOD Innovations Award.