CONCERNS ABOUT EDUCATION

In “Determining Computing Science’s Role” (The Profession, Dec. 2004, pp. 128, 126-127), Simone Santini speaks for many of us who are worried about the direction of computer science—and higher education in general.

I’m concerned that we are fast approaching a time in this country when science will be directed by powerful industry and business objectives first and foremost, and “pure research” will become increasingly marginalized.

I believe this is the end result of a capitalist system, where money rules nearly every activity. This process was given a big push by US President Ronald Reagan 20 years ago, and it’s now accelerating under the Bush administration.

Unfortunately, I don’t see any way to stop this slide under the present conditions and cultural climate.

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I enjoyed reading Simone Santini’s excellent article in Computer’s December issue. From working in both academia and industry for many years, I can add the following.

Industry is concerned not just with commercial applicability, but with immediate commercial applicability (their thinking is very short term) in response to current requests from customers—it’s an easier sale if the customer is already demanding the product. A breakthrough that has immediate commercial applicability, but is so novel that no customer has thought of it and asked for it, is of lesser value.

There is an infinite number of algebras that can be defined and an infinite number of algorithms that can be developed, but relational algebra is very helpful and so is Quicksort.

All academic pursuits are not equal, and there needs to be some measure of the usefulness of one over another. I agree that short-term industrial concerns should not dictate this measure.

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Simone Santini responds:

Consumer wishes often don’t convey the infallible foresight that industry would like. In 1920, consumers didn’t know they wanted radio. In 1975, they didn’t know they wanted CDs—they were perfectly happy with vinyl. At most, they merely desired better pick-ups so as not to ruin their records, and they wanted better hi-fi systems to play them on. The list goes on.

The problem is that, in many cases, industry only takes small steps for fear of the risks, forgetting that no focus group will ever propose the next major step. All you can get from a focus group is advice on how to marginally improve an existing product. This is important, of course, but there is more to innovation, even to industrial innovation than that—academia, as I have tried to argue, should have different priorities.

I have nothing against practical applications of computing science, of course. In fact, I think any mathematician would be happy to know that his theorem has improved the bread-to-prosciutto ratio in sandwiches worldwide. I am just saying that practical applications can’t be the force that drives the discipline.

The fact is that Quicksort and relational databases do not spring up whole like Athena from the head of Zeus. They are part of a process, and the process must proceed by its own internal logic.

It would be an illusion to think that you can get results that have practical applicability without the “pure” research that lies behind them. No amount of money could have convinced engineers in the Victorian era to invent television. It took Maxwell’s aesthetic dissatisfaction when faced with the asymmetry of the field equations to get things started.

Industry would like to have “ready-to-wear” research—applicable results without the cultural (and often not directly applicable) background—but this is an illusion.

J2EE FRAMEWORK DEVELOPER

The article titled “J2EE Development Frameworks” (Rod Johnson, IT Systems Perspectives, Jan. 2005, pp. 107-110) was well-written and insightful. However, it would have been useful to know that the author is also one of the creators of the Spring framework.

This connection does not detract from the article, but it is clearly a relevant piece of information that should have been disclosed to the reader.

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Rod Johnson replies:

As a former academic, I agree that it is important to remain impartial with regard to specific technologies. Therefore, I took care to mention alternatives to Spring when writing this article.

RETOOLING FOR SUCCESS IN A KNOWLEDGE-BASED ECONOMY

In “People and Software in a Knowledge-Based Economy” (The Profession, Jan. 2005, pp. 116, 114-115), Wojciech Cellary uses simple and elegant service sector taxonomies to analyze human roles in a knowledge-based economy. He rightly points out that even as the increasing use of computers to provide routine intellectual services shrinks the market for humans performing these services, humans will continue to excel in areas that involve
the production of intangible goods and advanced services.

Although the author anticipates that robots and automated machines will prevail in the production of tangible goods (presumably in the industrial sector), he does not elaborate on the impact of automation in the manual services sectors.

It is particularly interesting to observe the evolving roles of humans in manual skill areas that not so long ago required only moderate intellectual abilities. For example, modern automobiles come with complex electronically controlled subsystems that require using sophisticated diagnostic machines for troubleshooting when they fail. In addition to learning how to operate these machines, auto mechanics also must keep up to date with new technologies so they can recognize and fix problems, especially as additional innovations are incorporated into newer models.

The proliferation of self-serve systems has eliminated the need for many services that humans formerly performed; instead, the human role now focuses on providing supervision and offering assistance if needed. Even household appliances are becoming intelligent—vacuum cleaners that can guide themselves around a room are now well within the reach of the average consumer.

While technology improves human productivity and frees people from tedious effort, at times it also has the effect of eliminating employment opportunities. The challenge for those affected is to retool their skills in ways that emphasize the same qualities that would enable them to succeed in intellectual areas, namely creativity, manual expertise, and interpersonal skills.

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