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Mr. Ken Follett

Dear Ken,

This is a terrific novel--perhaps your most compelling and taut since *Eye of the Needle*. I thoroughly enjoyed it. Don't you think Sharon Stone should play Jeannie in the movie, and Tom Cruise might be perfect as the twins?

I have made detailed notes of all the proper names to check and some fairly minor problems/inconsistencies that I'll mention in my report beginning of next week. But I thought my overall reaction to the information technology should come right away.

The first problem. It seems odd to me--and will perplex other computer savvy readers--that in a novel where you carefully detail the methods of DNA testing and CD-ROM searching, you provide virtually no information about Jeannie's search engine. What is it? What computer language is it written in? How does it work? What makes it so innovative? Most importantly, how can it so easily find pairs among such disparate databases as electrocardiograms, brain waves, and fingerprints? I think this needs to be fleshed out. Jeannie's description of the search engine to Berisford Jones on pages 108-109 is much too simplistic. What is the "tricky logical puzzle" you mention on page 270?

While I have much expertise in database searching, my profession (thank God) does not require me to write search engines or do serious programming of any kind. Therefore, I cannot tell you how to solve this problem.

I spoke briefly with two friends--both computer experts who have some knowledge about these areas but are not the ultimate specialists I should contact. Jeannie's software engine would probably involve fuzzy logic, used to speed up pattern matching. The computer language she would probably use is 4GL or 5GL (which stands for 4th Generation Language, about 6 years old; or 5th Generation Language, about 2 years old, an icon, windows-based version of 4GL). The amount of data that must be searched in your scenario is *huge*. The fuzzy logic (adaptive logic) in these languages deals with probabilities--it extrapolates, looks at a curve of possible responses, then decides what seems best to solve the problem.

If you wish, I can talk with perhaps two real experts on database search engines to verify and flesh out the above information, and find an article or two for you to read. I think it is important you add detail and authenticity in these areas.

I believe these experts will say that the ease with which you use this broad-based engine sounds unrealistic. I'm particularly unhappy with the Pentagon scene in which the search engine succeeds even though Jeannie is not present to customize it, she has no knowledge of what data is available, in what form, or even what operating system is used on that particular Pentagon computer. Is their system Windows-based or written in ADA, a language used by much Department of Defense systems? If I can ask such questions, so can many of your readers.

Also, in the Pentagon scene (page 520) it makes no sense that finding a match of field 14 would be the key in finding matched pairs of twins. A single field in a database record would contain a single value, such as the number 145, or the letter X, or a Yes or No. Are you saying that an entire electrocardiogram was stored in field 14 and Jeannie's search engine compared it to all the others? Or simply that the patient had an EKG in his medical record? I think we need an expert to make this Pentagon scene a lot more realistic.

If I do contact experts I would like your permission to offer them a small fee (no less than $500 each) so their response is quick and attentive.

Second problem. Is it likely a lone psychologist who appears to have no programming experience, can impress the many computer geeks at the well-funded FBI? I think Jeannie should have worked as a programmer/analyst or perhaps assisted a professor on a similar project while a student. In contacting the search-engine experts I could find a plausible job or computer project she might have worked on that will convince your readers she could later create such an innovative search engine. Statisticians might well study 4GL or 5GL. Perhaps she minored in statistics while in college.

Third problem. Some of the medical and dental records available for search by a database search engine sound implausible. In a world where everything becomes more computerized every year, I believe your readers will suspend their disbelief to some degree in this area. But the dental example on page 109 particularly troubled me.

I spoke with a dentist who thinks finding identical twins via dental records would be *very* cumbersome, if not impossible. Most of the dental records kept by US insurance companies are written records--x-rays are sent back to individual dentists. Dental x-rays are just now starting to be scanned, digitized, and stored on hard drives. The problem is that dental x-rays are two dimensional images, shot by different dentists, on different equipment, from different angles. Comparing dental x-rays of different patients to see if they might be identical twins is impossible. This is totally different from identifying a plane crash victim's dental work though his dental files--a realistic type of dental search.

I asked if some genetic dental predisposition or peculiarity might make finding twins possible. He thinks no. Even identical twins would not have identical tooth decay patterns (too many environmental factors). Not enough people are born with too many teeth, a serious overbite, or missing adult teeth to make finding twins likely using such records.

If you'd like a second opinion, I've got the name of a dentist/professor who is at the forefront of computerizing dental records and x-rays. Should I call him?

If you wish me to locate some more plausible ways for a database search engine to find twins, perhaps I should consult with a medical records expert also. The expert might suggest some real studies that used medical data in similar ways to Jeannie, allowing you to sound more authentic.

I'm aware you need to leave Jeannie open to the *New York Times'* charge of privacy invasion, so some vagueness in her use of medical data may be necessary.

Other possible problems with no solution?

I spoke with a physician (an internist, not a cardiologist) who questions whether EKGs are unique enough, even among twins to help you find identical twins. He wonders why EKGs would have been performed on infants or even 18 year-old soldiers, unless they had a medical condition. (It does seem reasonable to me that scientists cloning babies would give them EKGs and other tests at birth).

The doctor also says that brain wave tests (EEGs) would only be performed on people who had suffered a serious neurological event, such as a seizure. If you want to pursue this problem we need to talk with a specialist or two.

One of the computer experts I spoke with said that warehousing vast amounts of medical records such as EKGs and EEGs is just now becoming a reality. But he says that what is stored are complete pictures in digital form (really just a cheap alternative to microfilm storage). This is the field of electronic records management. These images are not yet software-searcheable as digitized images. I would want to confirm this information and learn more before you used it.

Both of the these problems strike at the very heart of your novel and may need to be ignored (poetic license). But if you wish to learn about authentic-sounding alternatives, or ways around these realities, let me know.

All the best,

Daniel Starer