

Technology project leaders must have design and implementation experience.

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*This article is part of our discussion
of the challenges of
leading a technology project.*

Often people with little technology experience are not aware of their limitations.

Many technology projects involve physics, electronics, computing, or mechanical design, and often a combination of all four. Whoever expects to manage or document such projects successfully must have a technical background in each of the subjects that apply. That experience must include designing and implementing technology projects. Those not having design and implementation experience are particularly likely to make serious mistakes.

Experience such as being elected to public office, making documentaries about technology, writing papers about the economics of technology, or writing news stories about technology is not sufficient.

It's not necessary or possible that someone know the answer to every question about technology. What is necessary is that the answers to thousands of questions like those below be part of the normal thinking of anyone who expects to provide reliable leadership or supply reliable information about technology. That kind of thinking comes from having experience designing, building, troubleshooting, and implementing projects involving each subject.

Someone who cannot answer questions like those here cannot understand enough of the details of technology issues to be a consistently accurate manager, adviser, or reporter.

Those who design and implement technological systems learn to be strictly logical.

New designs often have flaws that must be corrected. Correcting the flaws teaches the designers where they were illogical, and tends to teach them how to be strictly logical.

For example, when programmers write programs they are quickly faced with their mistakes and must understand where they were wrong enough to correct those mistakes. It would be impossible to convince someone that a program worked when it didn't.

People don't think they can do surgery if they aren't surgeons. They don't think they can fly an airplane if they aren't pilots. But somehow reporters who know little about nuclear energy, for example, believe they can accurately report a story about nuclear energy. Or politicians believe they can make laws about technology they don't understand.

Concern about being strictly logical and long-term habits of being strictly logical are the most important attributes of a leader of technological projects.

Leaders of technology projects must be able to answer questions like these.

Ability to answer questions like these helps establish that someone has the ability to lead a technology project.

Someone could be a good leader without knowing the answers to all of the questions, but

a competent leader of a technological project involving generation of energy, for example, is likely to know answers to all of them.

Physics:

What conditions are necessary to create nuclear fusion?

What is your evaluation of the reports of cold fusion?

Why does nuclear fission generate radioactive waste?

Name three kinds of radiation. Describe some of the differences between kinds of radiation.

What are the two common methods of generating electricity using solar energy?

What is the biggest challenge in making a nuclear fusion reactor that generates more power than it consumes?

Name three methods of storing energy received from the sun so that the energy can be used at night.

There is a big international project to create a nuclear fusion reactor. What general design does it use? How many reactors of that design are presently operating in the entire world?

Does cell phone radiation cause brain damage? Discuss that issue.

Electrical and Electronics Engineering:

What is a thyristor?

What devices are commonly used for non-volatile storage of data?

Why are volatile methods of storing data used?

What waveform is generated when an analog amplifier is overloaded?

Why do very long power lines use DC?

Computer Programming:

Why is the Java computer language not used for parts of a program that are time-critical?

What is the name used for software that connects a computer to external hardware?

Please discuss your general ideas about the importance of user interfaces in computer programs.

Mechanical Design:

Why are manhole covers round?

List four common metals in the order of ease of drilling a hole, easiest first.

Why doesn't bare aluminum corrode quickly?

Why are triangles used as elements of structural design?

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