

## Systems Engineering versus Systems Engineering

What is the difference between a systems engineer and a systems engineer? Well, you might say, a systems engineer is a systems engineer is a systems engineer. Not so!

Systems engineers, as referred to by the software and hardware vendors, who make much of what we do possible, are not really systems engineers at all. They may be engineers of some systems but they are certainly not systems engineers in the true sense of the word.

A true systems engineer has to do with the development of a new product or enhancement of an aspect of an existing product. This person starts with understanding the client's needs and wants, converting those desires into a fully fledged product using a disciplined but nevertheless creative process. It has to do with being able to consider a system not so much in its present form but in its evolution into a better system. The entire product life cycle influences the thought process. Issues of form, fit and function, combined with scalability and repeatability in the production process are considered amongst many other variables. Most systems engineers have advanced degrees in engineering combined with years of experience and mentoring by other engineers. Systems engineers can be found in biological, civil, mechanical and electrical fields and with new leading edge technologies, in multidisciplinary fields combining the aforementioned.

A systems engineer, as recognised by the IT environment as someone who works with a computer system, associated cables and connections, components and software is actually not an engineer at all. Of course there are exceptions where qualified electrical engineers with degrees in science and engineering become system engineers, but these workers are really just technicians. In fact it is possible to become an IT system engineer, certified by a manufacturer, simply by doing a bit of self study and an on-line test. There is no requirement for any minimum standard of education; no foundation in statistical or research methodology and indeed no accreditation by an academic environment save for that which the manufacturer has set up.

A true systems engineer considers a product from cradle to grave, from concept through design and utilisation to retirement and disposal. An IT system engineer considers the product from cardboard packaging to 19-inch rack and no further.

Arthur David Hall III and Werner von Braun were perhaps two of the greatest systems engineers and indeed Bill Gates himself might be called a true systems engineer. But the workers that Bill Gates needs to get his show on the road are technicians, not engineers.

In many countries, the use of the word engineer is restricted by law to people who have a degree in engineering or who hold some accreditation from a professional engineering body. That software environments have hijacked the word engineer and attached it to anyone who happens to be working in the software environment is a thorn in the side of many who have spent years studying to become an engineer. The fact is that many IT systems engineers can not describe the systems they purport to engineer and could certainly not hold their own in an engineering environment.