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Technology As Command Performance?

No, technology grows as an evolutionary, emergent process



One of the great conceits that developing countries delude themselves with is that revolutionary technology of the highest order, the sort that brings with it commanding leadership of the global economic marketplace, can be conjured up as a command performance.

It is very easy to disabuse oneself of this delusion if one is willing to accept that technology



evolves just the way the natural world and all of science evolved. The defining feature about evolution is its open-endedness. This is not often

understood by the Grand Designers I wrote of in an earlier column. Nor is the role science plays in the evolution of high-tech.

One interesting case study that most appealed to my imagination is illustrated by the saga of a relatively unheard of and unsung "Global Indian". I had to rely on a foreign magazine, *The Economist*, to bring to my notice the role played by Narinder Singh Kapany, at a crucial stage in the history of modern telecommunications. The point I want to make is that Narinder Kapany never thought he was going to set in motion a billion dollar industry, the fibre-optics

Milestones

In 1951, some American researchers were able to demonstrate the transmission of an image through a bundle of glass fibres.

... Narinder Singh Kapany in 1953 developed fibres with cladding. This greatly improved transmission characteristics ... They could carry light only a few feet ... The first use was to probe inside the body ...

In 1960, the laser was developed by Theodore Maiman ...

In 1966, Charles Kuo and Charles Hockman proposed the use of fibre optics for long-distance communication ...

In 1970, Corning Glass Company produced low-loss fibres ...

... In 1980, AT & T began the first major fibre optic communication link between Boston, Massachusetts & Richmond, Virginia.

the telephone business

Western Union, the telegraph company, turned down the chance to buy Bell's 1876 telephone patent for a small sum. Instead, thinking long-term, it offered to stay out of telephones if Bell stayed out of telegraphy. (Bell himself, by the way, missed the point: He titled his patent "Improvements in Telegraphy".)

communications explosion. It is impossible for anyone to have had that kind of prescience.



Alexander Graham Bell

Interestingly I read elsewhere in *The Economist* that even Alexander Graham Bell had no idea that his invention will

create the miracle of Telecommunications, and that Bell Lab lawyers never thought the laser could become a useful device. Which all goes to show how open-ended, evolutionary, and emergent, technological growth is. So the best way to grow technology is to fund basic

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The

following viewgraphs illustrate the delicious irony of how technology grows as an evolutionary, emergent process.

Gangan Prathap

[New Millennium Indian Technology Leadership Initiative](#)

the laser

Lawyers at Bell Labs were initially unwilling even to apply for a patent on their invention, believing that it had no possible relevance to the telephone industry.

Today, beyond uses in measurement, navigation and chemical research, applications have expanded to include the reproduction of music; surgery; printing; the cutting of cloth and other materials; and its most significant use to date, telecommunications. Together with fibre optics the laser has revolutionised the telephone business.

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