

## Interoperability: the great enabler

By Michael Schrage

Published: February 5 2009 19:57 | Last updated: February 5 2009 19:57

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Global financial markets are in disarray but prospects for innovation in the real economy have never been more robust. Innovations once crafted to stand alone are increasingly built to work together, or "interoperate".

The interoperability quotient, or IQ, of discrete components and systems to influence constructively the behaviour of other systems and components increasingly determines economic value. A low IQ indicates innovation destined to underachieve. Playing well with others, not just ingenuity, has become the new standard for innovation excellence.

Look no further than the internet for the inspiration for interoperable innovation. The misunderstood genius of the internet is that interoperability makes "networks of networks" possible. Protocols permitting diverse data to mingle creatively explain why the internet's influence as a multimedia, multifunctional and multidisciplinary environment for innovation remains unsurpassed.

Consider "mash-ups" as a model: Google Maps can easily be mixed and mashed with property, seismic or epidemiological data to produce novel applications that might launch a company or an industry. Greater interoperability invites greater innovation – and vice versa.

But interoperability as a core innovation investment principle extends well beyond the internet into power-grid systems, defence technologies and medical devices. More innovators in more disciplines are investing more in interoperability as both a business and research strategy. Nascent nanotechnologies are being mashed up with biotechnologies. Facebook pages mash up with Global Positioning System mobile phones. Rechargeable batteries can mash up with programmable solar cells. Seemingly disparate devices and disciplines that ordinarily would have zero interest in interoperating creatively, or zero capacity to do so, might find novel relationships cheap and easy. Successful interoperability dramatically cuts the costs, risks and complexities of hooking up.

Barriers to interdisciplinary innovation tumble. Favourable economics of interoperable innovation will tempt ambitious "interpreneurs" to test their ideas.

How might interoperability between [Siemens](#) cochlear implants, [Apple](#) iPhones, [Nike](#) running shoe accelerometers, [LG](#) microwave ovens, [Nintendo](#) Wiis and [BMW](#) Series 3 Sedans create bold entrepreneurial, or diversification, opportunities? Who knows? But the fact that the question piques curiosity reveals fundamental changes in the global innovation climate.

The interoperability imperative creates a new innovator's dilemma: will greater market share or profitability come from making one's innovation more interoperable . . . or less? What IQ do current customers and potential prospects prefer? How should we collaborate, and compete, in the context of interoperability?

How much interoperability is enough, or too much, is impossible to know in advance. What is easier to anticipate is the growing need for innovators and customers alike to customise the interoperability they offer and use. For instance, this might involve giving people the power to determine whether their cardiac pacemakers should be able to influence their running shoes or allowing the breathalyser in their mobile phone to disable their car's ignition. Creating cost-effective rules of engagement for customised interoperability will be a fantastic business challenge.

Pervasive interoperability in both industrial and consumer markets suggests that a new generation of interfaces will be essential. Simple interfaces that allow access to complex interoperability promise to be the great enabler, or the horrendous bottleneck, to innovation. The incompetent design of video remote control devices will give way to more iPhone-like and Google-esque streamlined access. Interface technologies – whether keyboard, touch-sensitive, voice or visual – will prove crucial to interoperable innovation. Interoperability's economic potential is stunted without easy ways to gain access to it.

Of course, increased interoperability means increased vulnerabilities. The viruses, spam and malware that pollute today's laptops could crash fuel delivery trucks or implantable insulin pumps tomorrow. Wicked innovators, more than failed interpreneurial ingenuity, may be the dominant threat to interoperability's future.

Unsurprisingly, as interoperability becomes the technical locus of innovation strategy worldwide, regulators may feel compelled to enshrine, loosen or shatter market standards. Interoperability standards can create, or destroy, innovation oligopolies and monopolies. Interoperability represents a challenge to competition policies in Europe and America.

But where interchangeable parts enabled the mass production era more than a century ago, tomorrow's interoperable systems promise richer, more diverse and more customisable innovation. Economic historians and post-industrial pundits alike observe that high-impact innovations come less from scientific breakthroughs than from clever recombinations of existing inventions.

While trend should never be confused with destiny, interoperability potentially offers the best of both innovation worlds: a medium that gives scientific breakthroughs the opportunity to connect with other disciplines and a method for exploring more combinations more quickly and cheaply. That is a recipe for economic growth in difficult times.

*The writer researches the economics of innovation at MIT's Sloan School and at Imperial College's Business School*

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