

# New Silicon Valleys Need a Demand Mountain

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Everyone wants to know how to build the next Silicon Valley, an innovation hub that draws talent and capital while creating jobs, companies and whole new industries. Developed-country governments scramble to subsidize technology that could be the Next Big Thing. Emerging-market policy makers hope that incentives like tax breaks and free land will induce innovators to settle and prosper there. But most of these well-meaning schemes are missing an essential ingredient: demand.

Demand for innovation in specific areas of technology has been the common force behind all high-tech hot spots, as well as the most important inventions. Technological breakthroughs such as antibiotics and cars responded to a compelling need felt by a huge number of consumers. Government projects such as the United States' Apollo program — intended to put a man on the moon — drove demand for more basic technologies (which are simply inventions that no one has asked for yet).

Silicon Valley itself was built on demand. The U.S. Department of Defense put up tens

of billions of dollars in contracts for microelectronics, a commitment that both paid down innovators' risk and created an infrastructure that would support the growth of startups.

All demand is not created equal, though, and it is instructive to examine the differences.

Consumer or market-driven demand — the kind most of us think of when we hear the word — is far less predictable, and therefore much riskier, than state-sponsored demand of the sort that landed a man on the moon. Companies that depend

solely on their products' commercial appeal are limited in the kinds of innovations that they can safely introduce because if one of their products fails in the marketplace they may not survive to build another one. This is especially true of startups and small companies — the very players that everyone hopes will show up in the next wave of Silicon Valleys.

Fortunately, by sponsoring long-term, targeted initiatives, governments can stimulate more predictable demand. The Apollo program gave innovators clearly defined goals and a road map for getting there: first put animals in orbit, then put people there, then send probes to the moon and then send people there.

Equally important, the government offered rewards for interim progress, not just ultimate success. Putting a monkey in space may not have been the most exciting achievement, but the government was paying for it so it happened. A smart government creates guaranteed demand not only for the solution itself, but for the steps along the way.

Coupling intermediate technical milestones with guaranteed incentives enables companies to focus on problems that might take ten years or more to solve. It also motivates innovators from a variety of industries to take on complex problems that must be addressed by more than one kind of invention. The U.S. Defense Department's microelectronics initiative required not only new materials and circuits but also new methods of fabrication. Because of the reward structure, these efforts could be coordinated, rather than pursued in isolation.

Unlike market-driven demand, which too often results in a winner-takes-all dynamic, state-sponsored demand creates an environment in which multiple solutions to technical problems can proliferate and coexist. The pioneers of microelectronics tried many strategies to supplant vacuum tubes, and they delivered a host of semiconductors and chip designs: germanium, silicon, aluminum, gallium arsenide, PNP, NPN, CMOS and so on. Some of these research efforts were never implemented, but many found their way into specialized devices. The diversity of options allowed widespread adoption, paving the way for the digital revolution.

As with the microelectronics program, government incentives don't have to line the road all the way to commercial success. At some point, companies will be ready to sell products and market demand can take over. The U.S. Department of Defense was the only customer for integrated circuits in 1962, but by the end of the decade consumers were buying transistor radios and pocket calculators in droves.

Likewise, state-sponsored demand should not take the form of subsidies to specific technologies or companies. The government has no business gambling taxpayer money on particular ventures. Assuming that risk is the job of venture capitalists and others

in finance, not public officials. But there is little risk in offering a contract for a job well done: there is no payout if the problem remains unsolved.

And those payouts are modest compared to the research and development efforts they stimulate. A program offering rewards of \$1 billion to \$5 billion in contracts or deployment commitments can generate many times that value in private-sector R&D. Innovators and their investors are willing to bet big because they know that the eventual reward in revenue will far exceed the initial investment. That makes state-sponsored demand a very efficient mechanism for generating innovation.

Because of the multiplier effect, small governments and states, and even large cities, can successfully sponsor the kind of demand that fosters a world-class innovation epicenter. Certain Scandinavian countries, Chinese provinces and the city-state of Singapore, for example, are ideally positioned to try this approach.

Some years ago, I calculated how many units of product need to be sold to launch a technology. The number is actually quite modest: If you can move between 100,000 and one million units of a disruptive product, you can establish

the technology standards for that category and in time become the global leader of a new industry. Government sponsorship ensures that a certain number of people will adopt your product. At the start, it need not be that many.

The economic planners and policy makers who are chasing Silicon Valley's taillights are learning that they cannot always replicate the entrepreneurial culture and finance mechanisms that flourish there now. But they have forgotten how it all started: guaranteed demand, which stimulates the most ambitious kind of innovation.

The lesson is a simple one: Don't try to build another Silicon Valley. Instead, build a Demand Mountain and the innovators will come.

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