Quantum Picks and Shovels

The commercialization of "Quantum 2.0" is already underway, with products such as optical clocks and gravimeters, but there will also be opportunities selling quantum "picks and shovels" while the industry races to commercialize more challenging quantum computer and quantum communication networks. That was one of the messages from a town hall session on quantum photonics at last month's OSA Frontiers in Optics conference, in Washington, DC.

OIDA organized the discussion, which included a presentation on the quantum market today and in the future. It's not necessarily a market in the usual sense; the conventional product market (shown below at left) is still at an early stage, with the future size and timeline very speculative. However, there is another market (at right in the figure), for the tools and labor required for research and development (R&D). The funding comes from corporate spending on R&D, venture investment in start-up companies, and government spending on R&D in national labs and universities. The funding is spent on labor and hardware, such as lasers, optical benches, dilution refrigerators, and microwave cables.
At such an early stage, the R&D market can be as large or larger than the conventional market, amounting to the low hundreds of millions of dollars per year in sales of hardware, and low thousands of researchers and staff. It's a "picks and shovels" adjacent market because it supports the conventional market, but does not necessarily go into the final product. It's similar to the sale of expensive ultrafast lasers for biophotonics R&D; such high-end lasers are aimed exclusively for research labs. The term dates to the California Gold Rush, where the most money was made selling picks and shovels, while most of the speculating miners went broke. Today, it often refers to an investing strategy (see here).

OIDA is preparing a roadmap on quantum photonics, and conducted some initial interviews and focus group discussions during the conference to gather information. OIDA will be going deeper into this effort in the next months, for report release in 2020. For questions about the roadmap, or if you want to contribute, please contact Tom Hausken at thausken@osa.org.

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