How Do You Create a Photonics Supply Chain?

The photonics industry loves to talk about technology, but not as much about how to manufacture it. Technologies like integrated photonics and quantum communications sound cutting-edge and cool. But developing the supply chains to make the products? Not so much. Yet, companies face these challenges all the time. Small companies often have difficulty finding suppliers who will accept their orders. Or if one does, it may be merely willing to manufacture a part to a specification, but it won't work with the startup to design it for manufacturing.

So how does one go about creating a photonics supply chain? One approach is to find a foundry to fabricate wafers, other partners to assemble and test the parts, and you (or your company) design some of your own equipment, if necessary, to fill the gaps missing in the manufacturing process. This loosely describes the approach of Luxtera, one of the first integrated photonics manufacturers.

Aurrion's approach utilized a foundry and made the manufacturing process as compatible as possible with existing commercial manufacturing equipment. This requires some design compromises, but can save development time and money to get the product to market.

Other companies are more vertically integrated. Intel leveraged its existing silicon manufacturing infrastructure to enter the silicon photonics market, eliminating the need for an outside foundry.

Infineon committed early on to being its own InP integrated photonics chip manufacturer by bringing the best practices of silicon electronics manufacturing to InP chip manufacturing. It also chose to be vertically integrated from chip to system. Some companies brought their suppliers inside. Cisco announced in December that it would buy Luxtera in a $660 million deal. Cisco previously bought Lightwire in 2012 for $271 million. Juniper Networks acquired Aurrion in 2016 in a $165 million deal.

There are now many small companies entering the integrated photonics ecosystem looking to create new products. The right supply chain strategy will vary from company to company. OIDA will be discussing this supply chain challenge at an upcoming workshop on 3 March, collocated with OFC 2019 in San Diego. The workshop will be the ninth in a series organized with the university center CIAN on current issues in optical communications. See here for more information on the workshop.

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