Photonic devices are rapidly evolving. Technical requirements and technical approaches for these devices are increasing in complexity and performance to such an extent that the limiting factor on the final product may be the capabilities of the photonic device design software. Therefore, choosing a software product that supports the largest array of modeling and simulation features is the best way to ensure that your photonic products are differentiated in the market.

The first step for any design is modeling the structure geometry. Given a design tool with maximum flexibility, a designer can experiment with multiple design forms to meet a design specification or goal; the more configurations you're able to consider, the more likely you are to achieve an optimal solution.

It's essential to have a design environment that can be used to draw both simple and arbitrary geometries. The RSoft CAD Environment™ is fully parametric: any parameter can be expressed as a user-defined symbol that can be defined as an arithmetic function of any other parameter. In this way, complicated designs can easily be created and parameter scans can easily be used to determine optimal device performance.

Another modeling challenge you might encounter is including fabrication defects. Although it is useful to simulate ideal structures, the reality is that no device can be perfectly fabricated. RSoft Photonic Device Tools enable you to study the effects of misalignment, fabrication defects such as sidewall roughness, and other manufacturing defects to ensure device performance. While these may seem like straightforward capabilities, they are not universally found in photonic design products.

Photonic device design software should also be able to simulate a wide variety of device types. One type of device that can be difficult to simulate is photonic crystals. The RSoft Plane Wave Expansion (PWE) algorithm accurately models these devices. Without PWE, it can be impossible to fine-tune the bandgap of photonic crystals. While other methods such as Finite-Difference Time-Domain (FDTD) can be used, they can be inefficient and far from optimal.