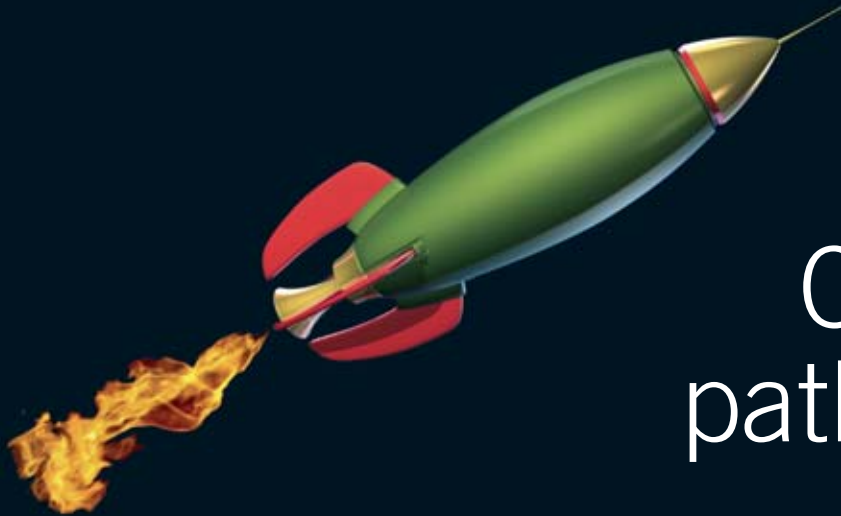


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Clearing the path to launch

For any new product development to be successful, time to market is critical. Having to resolve manufacturing or cost issues late in the development can be both disproportionately costly and time-consuming. The key to avoiding disasters and shortening time to launch is to seek to integrate the product development, launch-volume build, and production manufacture processes. But how?

The term DFX encompasses design for manufacturability (DFM), design for assembly (DFA), design for testing (DFT) and design to cost (DTC). DFX activities tend to be considered quite late in the

development process, usually after the 'design and development' phase is completed and at the point of manufacture or, in some cases, not at all. Using the same supplier for design and development and pilot manufacture means that DFX can be considered much earlier and can be incorporated into the design and development phase.

Preferably, DFX should not be carried out by the design team. At this stage, you are looking for impartial reviewers whose focus is to reduce manufacturing cost, improve production yield and avoid major cost issues or complexity issues during the transfer to manufacture phase. The added benefit of performing DFX early is that it will avoid retest, re-qualification or costly redesign when issues are encountered later during manufacture.

Where production volumes are low or the potential cost savings have minor impact, DFX can be as simple as scheduling review meetings into the design cycle. As DFX encompasses DFM and DFT, it will improve product reliability as well as product yields. For higher volume or cost-competitive product manufacture, the benefits can extend further. Typically, you will need to map out possible production line scenarios from end to end, including component supply, testing and packaging. The next stage is to run the current product concept down this virtual production line to identify potential manufacturing issues and bottlenecks and then feed the findings back to the design team. In the case of

high-volume production, it is important not to fall into the 'automate everything' trap. Some transfer, process or test steps will be more cost-effective or less risky if performed manually.

Lower-volume production lines will consist of manual assembly workstations, so it is important here to think about how the product is handled, assembled and tested. Do not rule out the possibility that, during further DFX iterations, certain manufacturing steps or testing steps may be eliminated through product redesign.

Quality assurance and control is essential, but it can cause a bottleneck. This can be minimised by ensuring that the QA team or analytical labs can handle the product throughput.

Remember, the aim here is not to design the final production line. Rather, it is to stimulate early thought about how the product is going to be made and tested, and to ensure that it can be made for the target price.

Feeding the latest bill of materials and manufacturing costs into a cost model will allow you to compare cash flow and return on investment for various design concepts, volume ramp-up scenarios and supply chain scenarios. The output from an early basic cost model will help verify pricing strategy and will provide a key decision tool to focus the design effort.

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