Leveling Up Existing Products Through DFX

Introduction

Developing successful new products from scratch is challenging enough, but what about improving on existing designs? Many companies find themselves struggling to optimize the manufacturability, reliability, and serviceability of products that have been in the market for years.

In this eBook, we'll dive into the real-world experiences of DFX subject matter expert John DePiano, exploring the common areas where existing product owners excel, as well as the key opportunities where targeted DFX support can drive major improvements.

By understanding these insights, you'll be equipped to honestly assess your own products and determine if working with a DFX specialist could unlock significant untapped value.

What Existing Clients Do Well

"Opportunities for cost reduction are not only in the product, but in the manufacturing and assembly methods being used."

Through his experience working with a wide range of companies, DePiano has observed that the companies that are most successful in utilizing DFX principles are exemplars in a few key areas:

Leveraging Automation and Tooling

With the benefit of well-defined production volumes, successful companies are able to understand and justify investments in specialized assembly tooling and automation. This allows them to leverage features like time saving snap-together plastic components and space saving multi-layer PCBs that dramatically streamline the manufacturing process and add long term savings.

Incorporating Diagnostics

Recognizing the importance of reliability, leading product design and development teams build in robust self-diagnostic capabilities within the electronics. This enables faster identification and resolution of issues, both on the factory floor and in the field.

Optimizing Part Commonality

Clever design choices around part reuse and interchangeability help top-tier design companies minimize component counts, simplify inventory management, and achieve economies of scale in procurement, driving down costs to increase profitability throughout the product lifecycle.

Conclusion

These advanced DFX techniques require significant upfront investment, specialized expertise, and accurate production estimates to be viable. **"At times people are too close to the issue and just need a second set of eyes to review and possibly discover opportunities for cost savings that they weren't aware of,"** according to DePiano. If you are considering designing with these principles, understanding the associated design costs (both time and money) are important to determining the return on investment. The tradeoffs between potential improvements and the development cost should be reviewed by a subject matter expert in conjunction with your team.

Common Design for X Pitfalls

While the largest players demonstrate mastery of certain DFX best practices, DePiano has also observed a wide range of missteps and missed opportunities across the broader client base. Some of the most common issues he encounters include:

Clinging to Breadboard Components
Many clients become overly attached to the specific parts and materials used in their initial breadboard or prototype, even when those choices are not well-suited for high-volume manufacturing. This can lead to reliability, availability, and cost issues down the line.

Retrofitting for Cost Reduction
Rather than starting with a clean-sheet design optimized for production, clients often try to "design for cost" by iterating on an existing breadboard or prototype. This approach is inherently flawed and tends to be more expensive than a ground-up redesign.

Resistance to Innovation
DePiano frequently encounters a "not invented here" or "textbook engineering" mentality that makes clients resistant to challenging established practices and embracing more innovative DFX approaches. Overcoming this mindset can be a major hurdle.

Supply Chain Oversights
Failing to proactively manage the supply chain - from component sourcing to inventory management - is another common blind spot. This can undermine even the best technical design by introducing unexpected cost and availability issues.

Conclusion
These pitfalls are frustratingly common and will result in the opposite of the desired outcome: overall increase in cost with little or no improvement in product performance. The above pitfalls are readily addressable with the right Design for X expertise and a willingness to challenge the status quo.

Unleashing the Power of DFX

So where do most clients request the most help from DFX specialists like DePiano?
The overwhelming need centers around cost reduction - a perennial challenge for product teams.

"I think the most requests for DFX is for cost reduction," DePiano explains. "Clients have come to us with various understandings of DFC, but many are willing to ask for help."

The key insight here is that opportunities for cost savings often extend well beyond just the product design itself. Manufacturing processes, assembly workflows, and supply chain management can all have a major impact on the bottom line.

"Many times the opportunities for cost reduction is not only in the product, but in the processing and assembly methods being used," says DePiano. "It makes sense to break down the top level assembly and redistribute the lower level parts into subassemblies that could be tested at that level or just savings in the way it is handled, stocked, or supplied."

Conclusion
By bringing an objective, expert perspective, DFX specialists can often uncover hidden cost reduction opportunities that the internal team has overlooked. This fresh set of eyes is invaluable for clients looking to squeeze more value out of existing products.

Design for X Readiness Checklist

Assess whether your organization could benefit from collaborating with a DFX expert.
Here's a quick checklist to get you started:

Product Design and Prototyping

☐ Do you rely heavily on breadboard or prototype designs as the basis for production units?
☐ Have you struggled to translate your prototypes into cost-effective production-ready designs?
☐ Are you uncertain about the best manufacturing processes to incorporate into your design?

Assembly and Supply Chain

☐ Do you experience frequent issues with part availability or supply chain challenges?
☐ Is your assembly process overcomplicated, with multiple reorientation steps and specialized tools?
☐ Have you identified opportunities to streamline your bill of materials & leverage common components?

Reliability and Serviceability

☐ Do you receive a high volume of returns or warranty claims related to product failures?
☐ Is it difficult for end users to access and replace consumable components like batteries or filters?
☐ Are you unsure about the best materials and design features to ensure long-term durability?

Cost and Profitability

☐ Are you consistently missing your target product cost goals?
☐ Have you struggled to identify ways to reduce manufacturing and assembly expenses?
☐ Do you feel like you're leaving money on the table with your existing product lineup?

If you answered "yes" to any of these questions, there's a strong chance that partnering with an experienced DFX specialist could unlock significant value for your business. Their fresh perspective and proven methodologies will help you overcome longstanding challenges and set your products up for greater success.

Contact Boston Engineering for a DFX Consultation today!