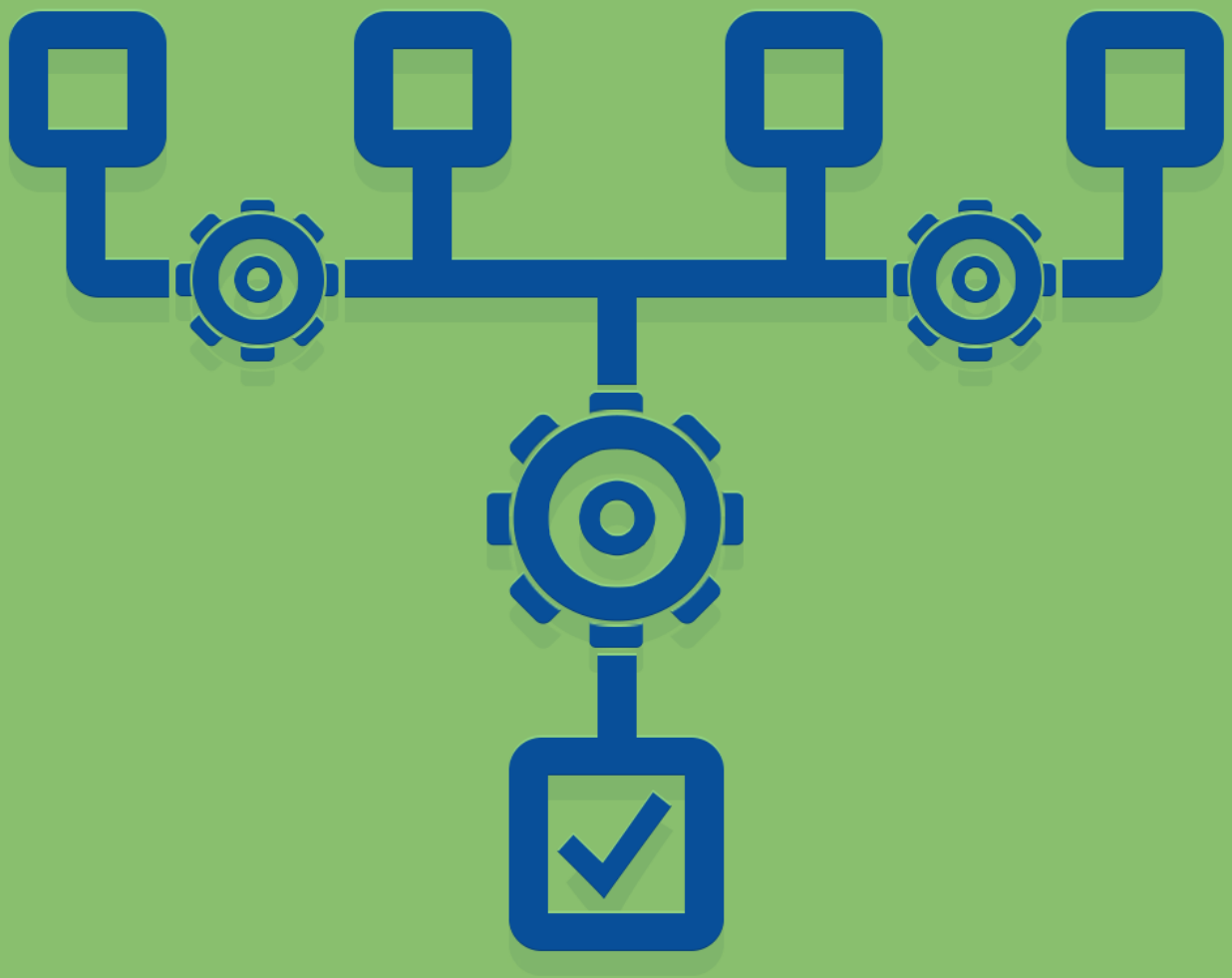
Altium

The Four Challenges to Transforming Data Management and Documentation into Designs



INTRODUCTION

When you think about data management and documentation, do you think about the results or the process? The process for both data management and documentation are thorns in the side of many engineers. The benefits of both aren't always apparent until after you are done with a design, but can make your job a whole lot easier when you finally ship it over to manufacturing. Proper implementation of data management and documentation provides **organization**, **traceability**, **accountability**, and **reproducibility**. Knowing which components have been used in each of your designs and why allows other engineers to learn from your design intent. When you need to review a design, you have fewer barriers to track down the root, cause, and complexity of issues. Data management and documentation are crucial in passing on your design knowledge to other engineers. So what can you do during your design process to set yourself and other engineers up for success?

MITIGATING DESIGN DATA MANAGEMENT CHALLENGES

According to a study by Aberdeen Group, there are six pervasive challenges in the data management realm (Figure 1).

Figure 1: Top Challenges of PCB Design Data Management

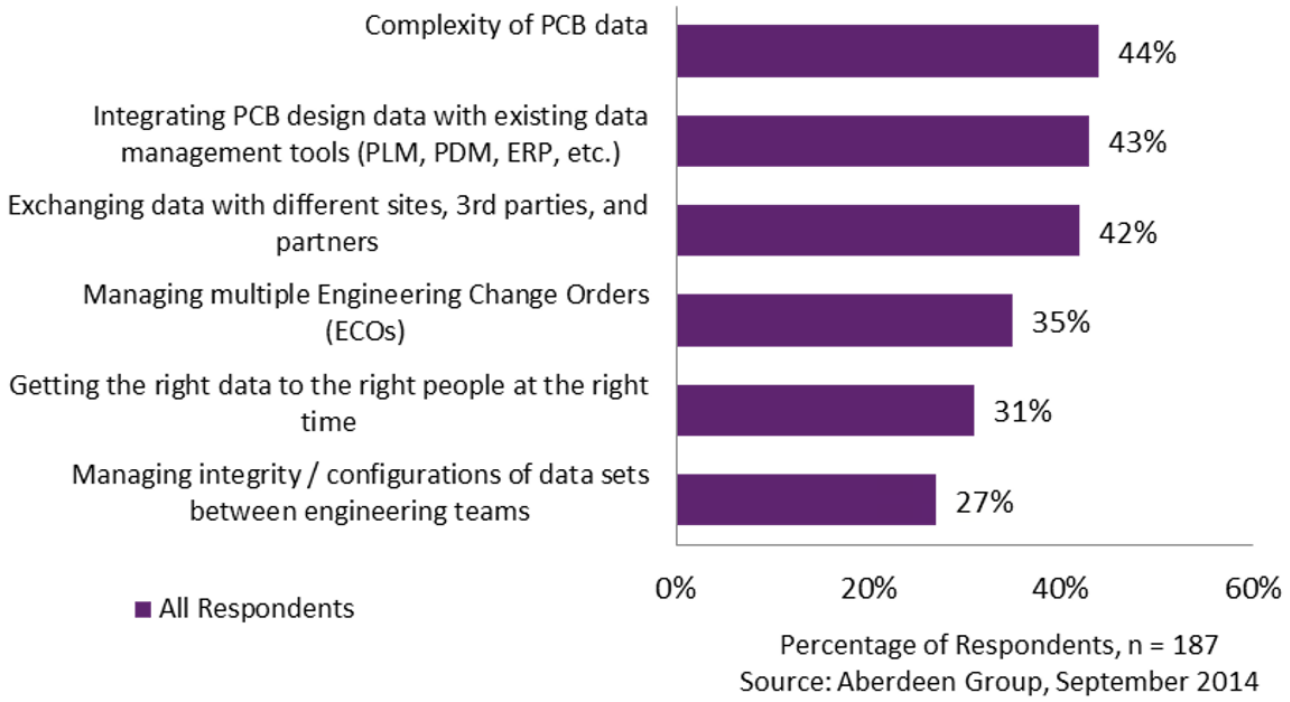


Figure 1: Top Challenges of PCB Design Data Management from Aberdeen Study[1]

Analyzing the above challenges can help you identify their root causes and their points of intersection. Sometimes the best offense when tackling design issues is a great defense. When you understand the root of potential issues, you can lay the groundwork to help you prevent issues from occurring or becoming unmanageable. When you shift focus from the process of data management and documentation, you can see the role they play in preventing problems that drain the joy of designing. With the overlap in these challenges, the six issues in figure 1 can be distilled to four major design challenges.

1. MANAGING DATA INTEGRITY WITH INCREASED DESIGN COMPLEXITY

Have you ever had to track down a design problem from an engineer no longer with the company? You're better off starting from scratch if there is no documentation. Every design is built with the experience and knowledge of engineers. As experience and knowledge grow, so does complexity. Every design results in more parts that have their own data management needs: symbols, footprints, suppliers links, etc. Defining the component creation process is incredibly important to managing data integrity. Standardizing component creation ensures all components follow a certain methodology for creation and ensures consistency and reliability. When you combine component creation standards, usage statistics, and documentation, you enable re-use of components for future designs. You know how the part was created, where it was used, and why it was used in a design, giving you reproducibility.

2. EXCHANGING THE RIGHT DATA AT THE RIGHT TIME WITH THE RIGHT PEOPLE

How many times have you had to wait for someone earlier in the process to send you a status update? You are frozen until that information reaches you. The key is utilizing automation to enable teams to work on a design simultaneously. In the case of data management, tracking data creation and usage metrics creates accountability and reproducibility, allowing engineers to better understand your design intent. With the ability to quickly access parametric data and where-used data, future engineers can make better data-driven design decisions.

Additionally, you can facilitate data exchange to the correct people by utilizing a system that can restrict access to non-relevant aspects of the design process. Minimizing distractions caused by non-relevant information eliminates time wasted analyzing for relevant information. This concept should extend to all aspects of your ECAD data. Providing a single source for all parties allows everyone to work on their portion, while your system pieces together everything to eliminate the waiting game and distractions. Plus, a singular source for your ECAD data ensures everyone is referencing the same information. You can channel all the time you used to spend trying to communicate with your team and resolving misunderstandings into doing the work you love. You can fully commit to being accountable to your work and benefit from ECAD data organization and traceability.

3. KEEPING YOUR WORKFLOW INTACT

Many people struggle with multi-tasking. If you're one of these individuals, switching from one task to another can slow you down. Whether you're exchanging data with third parties or between engineering teams, having a disconnect between your design tool and data management tool takes time away from you during the context switch. Using a system that is fully integrated in your design software eliminates the context switch time from design to data management. Plus, you won't run into the issue of forgetting how to use it due to low frequency usage, which leads to workarounds. Operating in a unified environment allows the software to do the context switching, so there is minimal overhead to maintaining design data organization. That means you can spend more time on your design and less time switching between programs and struggling to keep your workflow intact.

4. MANAGING DATA SETS AND ECO CHANGES

Data synchronization across engineering teams breeds confusion over file revisions. Local revisions always rear their ugly head to mess up the whole system and no one realizes until final review. How many last minute changes have ruined the weekends of countless engineers dealing with ECO after ECO? When you have a single source for your ECAD data, you eliminate the possibility of data disparity across engineering teams. You can make all your changes in the source location and apply a single ECO to implement all changes. A system where all ECO changes are handled together minimizes the complications of ECO and change management. Maintaining a single source for your ECAD data brings organization, traceability, accountability, and reproducibility to all team members while removing common causes of data disparity. You don't have to waste time tracking down correct revisions of your ECAD data, allowing you to stay synchronized with no added effort.

A CENTRALIZED ECAD DATA MANAGEMENT SYSTEM WITH STANDARDS

When you take into account the four above challenges, you begin to see patterns in causes: synchronization, communication, and data complexity. You need a data management system that gives you the organization, traceability, accountability, and reproducibility to combat these problem causes. Tracy Woo wrote, "The road to successful PCB production starts by synchronizing data, communicating early and often between R&D groups, and maintaining a single source of information." [1]

Managing the causes of data management issues mitigates the risks of getting errors in the first place. A centralized, singular ECAD data source eliminates the complexities of synchronization and facilitates organization. The organization partnered with version control affords traceability and accountability. Lastly, incorporating ECAD data creation standards brings reproducibility to your designs.The added benefit is that you can leverage the same information to make more educated design decisions in the future. Once you have your ECAD data organized in a single source, you can find and reuse the same ECAD data in new designs. According to the majority of respondents to that 2015 Aberdeen study (Figure 2), centralized library and component management are the two most important aspects to mitigating issues caused by synchronization, communication, and data complexity.

Figure 2: Automated Software Methods for PCB Data Management

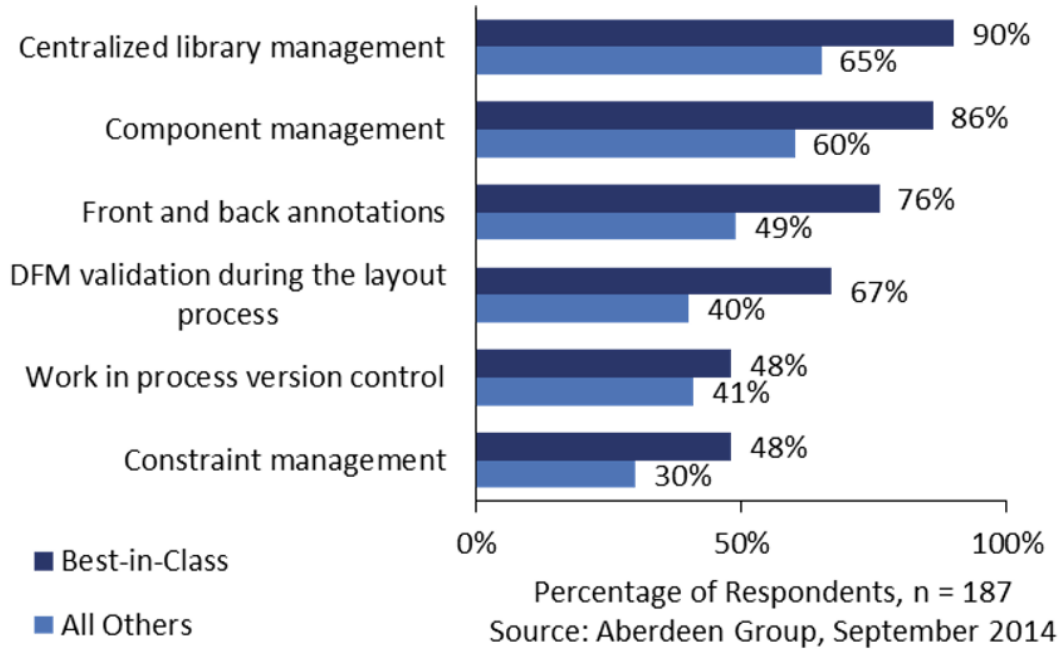


Figure 2: Automated Software Methods for PCB Data Management from Aberdeen Study[1]

An automated system that facilitates communication between engineering teams and provides a single source of information empowers your design process. When you eliminate synchronization errors and organization of complex data sets, you are liberated to focus on your design. Plus, the assurance that everyone is referencing the same piece of data facilitates the conveyance of design intent to other engineers.

TRUST YOUR ECAD DATA WITH ALTIUM VAULT

Altium® Vault® is an ECAD data management solution that addresses everyday work in progress engineering tasks. Architected with the designer in mind, it addresses library and design management challenges by facilitating data checking, centralization, and sharing. With a native Altium Designer interface, exploring and using Altium® Vault® content has never been easier. Regardless of the size of your organization, Altium® Vault® provides a system that meets **YOUR** data management needs.

With Altium® Vault®, everyone is speaking the same language and can minimize miscommunication. With all ECAD data in a central location, you can spend more time designing and less time trying to communicate. All ECAD data can be organized in a system that allows everyone to interact the way they need to without changing the way they already work. Altium® Vault® simply unifies your individual and team workflows into a singular workflow. You can design with trust and release with confidence knowing that you and everyone you work with is speaking the same language and using the same design standards. You can use Altium® Vault® to release verified design content with good supply chain visibility to give you the organization, traceability, accountability, and reproducibility you need when designing. Learn more about Altium Vault at http://www.altium.com/altium-vault/.

[1] Woo, Tracy. "PCB Data Management: How Industry Leaders Are Mananging Their Data" Aberdeen Group, Aberdeen Group, Aug. 2015, v1.aberdeen.com/launch/report/research_report/11017-RR-PCB-Data-Management.asp. Accessed 6 Mar. 2017.