



Overturning convention

By streamlining work-in-progress data management it's possible to provide organisation, traceability and greater accountability, as **David Haboud** explains

With market pressures that leave no margin for error, electronic companies that don't address the needs of today's sophisticated design cycle management are vulnerable to the slightest disruption.

Companies that remain stuck with the conventional way of managing their ECAD data find it to be very costly and inefficient, but with the proper implementation of work-in-progress (WIP) data management, they will benefit from better organisation, traceability, accountability, and reproducibility.

No one is immune or impervious to disruption, but what are you doing to address it? Are you leveraging technologies that break traditional divides between multidisciplinary design teams; or investing in a strategic system that empowers your design team to turn your ECAD data into an asset? Or are you still relying on manual, error-prone methods to navigate through the complex and dynamic product development process?

The challenges of managing WIP design changes as your product portfolio grows can determine the success - or failure - of your project. Every electronics company that wants to stay competitive must manage WIP data efficiently. Your product may still be a WIP, but how do you handle change while keeping your

quality high and costs low? Given the iterative early stages of product development, it is also imperative not only how you manage WIP, but how you communicate changes internally and externally.

WIP ECAD data includes all the files associated with the PCB, including component parametric data. Any miscommunication or disconnect of the state and revision of any of this data may cause rework, project delays, cost overruns, and even production of the wrong version of your product.

Industry study

An industry study by the Aberdeen Group, found that several of the issues that arise with inconsistent data are due to poor WIP ECAD data management. Manual processes that lack reliable methods to communicate, track, govern, and release ECAD data, result in engineers spending a significant amount of time ensuring that their WIP ECAD data is up to date, is the latest version, and in the correct lifecycle state.

With globally dispersed teams, the risk is even higher for teams to use the wrong version when WIP ECAD data offline tracking and control. Without a holistic, transparent ECAD data management system, it is difficult to be confident that your team will always identify and use

the correct version in their designs. Dealing with the following four WIP data management challenges allow you to focus on creating amazing products instead of wrestling with your WIP data.

Managing data integrity with increasing design complexity: Have you ever had to track down a design problem from an engineer no longer with the company? You are better off starting from scratch if there is no documentation. Every design builds on 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. Defining the component creation process is incredibly important to managing data integrity.

Standardising component creation ensures all components follow a defined methodology for creation and provides 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 (accountability), where it was used (traceability), and why it was used in a design (reproducibility).

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 automation which will 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 understand design intent better. With the ability to quickly access parametric data and where-used data, future engineers can make better data-driven design decisions.

In addition, you can facilitate data exchange to the correct people by using a system that can restrict access to non-relevant aspects of the design process. Minimising distractions caused by non-relevant information eliminates time wasted analysing for relevant information. Providing a single source for all parties allows everyone to work on his or her 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 allowing accountability for organisation and traceability for your ECAD data.

Keeping your workflow intact: Many people struggle with multi-tasking. If you are one of them, switching from one task to another can slow you down. Whether you are 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 fully integrated system

in your design software eliminates the context switch time from design to data management. Plus, you will not 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 organisation.

Managing data sets and ECO changes: Data synchronisation across engineering teams breeds confusion over file revisions. Local revisions always rear their ugly head to mess up the whole system and no one realises until final review. How many last minute changes ruin the weekends of countless engineers dealing with ECO after ECO? A single source for your ECAD data eliminates 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.

Handling ECO changes together in one system minimises the complications of ECO and change management. Maintaining a single source for your ECAD data brings organisation, traceability, accountability, and reproducibility to all team members while removing common causes of data disparity.

You do not have to waste time tracking down correct revisions of your ECAD data, allowing you to stay synchronised with no added effort.

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A centralised system

When you take into account the four above challenges you begin to see patterns in causes: synchronisation, communication and data complexity. You need a data management system that can combat these problem causes. Tracy Woo from the Aberdeen Group wrote, "The road to successful PCB production starts by synchronising data, communicating early and often between R&D groups, and maintaining a single source of information."

According to the majority of respondents to that 2015 Aberdeen study, centralised library and component management are the two most important aspects of mitigating issues caused by synchronisation, communication, and data complexity.

An automated system that facilitates communication between engineering teams and provides a single source of information empowers your design process. When you eliminate synchronisation errors and organisation of elaborate 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 and manufacturing.

Managing the causes of data management issues mitigates the risks of getting errors in the first place.

A centralised, sole ECAD data source eliminates the complexities of synchronisation and facilitates organisation. The organisation partnered with version control affords traceability and accountability. Lastly, incorporating ECAD data creation standards brings reproducibility to your designs. You can leverage the same information to make more educated design decisions in the future.

So how are you going to handle your next WIP project?

Below: A centralised ECAD data management system

