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Data Management - Pain Point Assessment

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DATA MANAGEMENT - PAIN POINT ASSESSMENT

It's that phase of the project when you're about to hand over a development released product to production. From the development perspective, everything, from designs, parts, models, BOMs, and documentation, are all in their release state. It's a time that calls for a true celebration after weeks of sleepless nights to finish the design on time and within budget. Then you get the flash back with few what-if questions; did sourcing get the new part with the right footprint? Is the last version of the design that is actually being hand-over to production? Has the BOM been updated after the recent design review? Did we make sure our offsite mechanical team made the necessary last minute enclosure adjustments? And then all of the sudden, what was meant to be a moment of achievement and joy, could be turning into a not-so-sure moment with the last resort strategy in mind; to cross your fingers!

POST-DEVELOPMENT STRESS DISORDER

This post-development stage concerns are very common to many companies in the tech industry, and rightly so. The reason being is that many businesses still have poor control over their ECAD data assets, and as a consequence, their manual error prone system often result in things slipping through the cracks. These cracks in their ECAD data management can come from varying steps in the process, such as, to highlight few:

- Manual spot-checking ECAD designs

- Collecting manual signatures

- Forcing Engineers to perform extra manual steps outside their CAD environment which leads to forgetting pushing revision

- Manual, custom data management processes (BOMs, models, footprints, Part numbers)

- Manual release and change process

- Uncontrolled access to all type of users

This uncontrolled ECAD data management processes are having serious impact on the these businesses bottom lines. Every customer is calling for solutions that are rich in features and functionalities, which can only be satisfied with more intricate electronics. With an escalating product development complexity, the market pressures to differentiate your offering, along with regulatory constraints to navigate, technology companies are under tremendous pressure to find solutions to manage their ever growing complex product data.

The complexity of the new sophisticated electronic products, not only stops with the ECAD data per se, but it makes the data management exponentially more difficult as most development environments are multi-disciplines (Mechanical, Software, etc.). Furthermore, these development teams are often dispersed across different time zones and geographies, and most likely are using different tools and applications. These added layers of complexities only makes the manual data management system cracks even wider and more prone to errors without a robust integration that can unify the data management as a whole.

THE PCB DEVELOPMENT PAIN POINTS

Like they say, prevention is better than cure, and your first step in fixing your post-development stress disorder pain, is knowing the causes that could lead to it. Only when you see the a holistic picture of what elements play a role in your PCB development, and how they affect each other, only then you can understand what the cure should look like.

WHERE IS YOUR ECAD DATA STORED

The reality is, many companies are still relying on network drives to store their ECAD data. Services like Dropbox are doing well because even the consumer himself is no longer storing his or her photos and files on local drives! So what could go wrong with this 90's scheme? Well, it turned out quite many things, as storing ECAD data on network drive is one of the culprits preventing your business to make any efficiency improvement. And here are few we want to highlight:

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- Access limitation: while there are ways to access your drives from outside the network with services like a VPN, ECAD being stored inside your network will always be limited to your local team. Offsite teams and partners can be out of luck. It also makes it difficult to enforce and role based access to ensure your ECAD data is not deleted or modified

- Poor data control: with this scheme, there is simply no efficient and practical way to manage your ECAD lifecycle and revisions. This scenario often result in many data duplication, lack of documentation compliance, and a very poor leverage of existing ECAD data

- Disparate complex data: When stored in this fashion, it makes it difficult to make sense of your ECAD data. It's impossible, without a lot of time wasting, to relate different type of data to each other, such a procurement information to a ECAD file without it being integrated with your ECAD tool. Network drives simply don't understand complex data structures

- No lifecycle support: if and when your ECAD changes revision to its lifecycle, no one knows about it, and this often lead to wong revisions, design, parts, or BOM's being pushed to production or other stakeholders

This poor ECAD data storage management painful practice doesn't help design teams make data driven decisions, as they can't map out, and access, required information such as PCB libraries parametric data. This in turn drive the BOM to be out of synch with the design files themselves.

HOW DO YOU SHARE & COMMUNICATE ECAD DATA

If you haven't implemented yet a solution in place that enables you to share your ECAD data across multiple domains, you're most likely not practicing design-reuse and you're slowing your development cycle. If you're still imposing an FTP like system to share your ECAD data, you're setting up yourself for failure as you have no way to:

- Keep your master ECAD files synchronized with the shared files

- Control access or track users

- Have a file history, lifecycle management, or change notifications

- Ensure engineers are pushing the latest changes outside their ECAD environment

- Verify that the correct files being used by other project team members

Information can be easily lost during these manual file transfers between other R&D teams and external vendors. This is one of the major challenges to successfully fabricate the intended design.

HOW DO YOU MANAGE YOUR ECAD DATA CHANGE PROCESS

During development, board designs often go through several revisions, and these changes sometimes are not well communicated and often don't make it to the board fabricator on time. If you are still using a manual system, such as paper or emails, to manage your ECAD data change information, well, you're not alone, misery often loves company! Here are some common pains and limitations to this practice:

- Can't compare versions to identify change

- Difficulty assessing impact of an ECO as it gets introduced into the design

- No work-in-process change status or notification

- No signoff visibility on approved changes

- Lead to workarounds and by passing standard procedures

- Inconsistent workflow as it depends on the change impact (simple vs. complex)

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Change is an essential part of engineering good products that solve customer problems, and your task is not to completely eliminate them. They are many variables that you can't simply control, sometimes they are even out the business control itself (Think a new FDA regulation). It is a reality, but it's also realistic to know that you can reduce them, and if and when they arise, they can be managed, tracked, and controlled.

NO TIME TO WASTE

The culprit discussed above might not be the only challenges inflicting pain on your ECAD data management process, but they are the most critical ones we see many of today's electronics companies need to immediately address. When you talk to engineers, the theme is common as they often voice the concern about how they never have time to design to the specific requirements within the project deadline. Mostly, they complain, is due to not being able to find the scattered information in variable locations, and when they find it they are not confident the information is up-to-date. They are on a constant battle with changing priorities as requirements change, schedules move, need to update designs, qualify parts, manage data change, and coordinate tasks with internal and external partners. But you have an opportunity to end the pain and chaos, by recognizing the need and importance of managing your ECAD complex environment and taking the step to implement your ECAD data management platform to:

- Standardize PCB development processes

- Improve your engineering collaboration and enable concurrent engineering

- Improve cross-discipline collaboration as well as external collaboration

- Increase design reuse

- Reduce design cycle time

- Reduce rework and late ECO

One thing to keep in mind is that most of the design cost is defined in engineering and the largest amount of complex data is also generated by your engineering team. So finding a solution to your ECAD data management pains, is not an IT project, is rather a strategic one that you need to implement today. Pressures from the customer demanding lower prices, faster deliveries, and more competitive products is not going to disappear tomorrow, if anything, it will only intensify. And the limited time you have to respond to BOM changes, expedite production to meet deadlines, meet quality and compliance, and communicate with suppliers, is only going to shrink.

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