COLLABORATIVE DESIGN

Altium

1. DESIGNING IN PERFECT HARMONY

2. BUILDING A BETTER SYSTEM

3. CROSSING THE ECAD/MCAD BRIDGE

4. TRUE ECAD/MCAD COLLABORATION WITH IDX

1 Designing in Perfect Harmony

Designing in Perfect Harmony

True collaboration requires a set of capable tools, which are characterized by some notable features: visibility, differencing, and merging.

•Visibility into each design area can help prevent team members from stepping on each other's toes.

•Collaboration doesn't work unless the changes made by each designer are compared and previous iterations of the project, to see how the design has developed.

•The final step to true collaboration is merging the changes made by each designer into a single master copy.

Designing in Perfect Harmony

Work can be done between people in different locations, across different pieces of software, or even in entirely different organizations.

•**PCB** - It's common to see a situation where multiple designers are working together to layout and route the same board at the same time.

•**SCH/PCB** - Collaboration across the schematic and PCB is an essential part of the design flow. It represents multiple designers working on the same project. The difference is that this type of collaboration happens across two domains, even though they are usually part of the same software package.

•**ECAD/MCAD** -This type of collaboration also takes place across two domains, but is usually achieved by two different software packages.

•**Supply Chain** - The ultimate form of collaboration happens across several different domains, and across multiple organizations.

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Building a Better System

Building a Better System

A well-organized core structure provides the foundation for seamless collaboration. A version control system knows about trunks, branches, merges, and tags.

•In a version control system, development is organized into a main line called the trunk, with parallel lines stemming from that called branches. Branches can either be merged back into the trunk, or discarded, and certain milestone revisions can be tagged.

•Designers independently make changes to their own version of a project. Collaboration software provides the tools to help designers avoid stepping on each others' toes and efficiently make decisions about conflict resolution.

•Version control is a good foundation for collaboration, but there are ways to implement an even better structure. It keeps the revision history of items in these domains separate, whereas a true data management system can span all domains required to bring a product to market..

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3 **Crossing the ECAD/MCAD Bridge**

Crossing the ECAD/MCAD Bridge

ECAD/MCAD collaboration, between the electrical and mechanical design domains, is particularly important as PCBs become smaller and more densely populated. Having a good bidirectional interface between the two domains is a game changer.

•**STEP (Standard for The Exchange of Product model data)** - STEP models can be used for PCBs, components, mechanical assemblies/housings, and any other design files which may be collaborated on by multiple designers using different programs.

•**IDF (Intermediate Data Format) -** IDF is good for preliminary mechanical clearance checking, since component and board heights are recorded and transferred with the file.

•**Other Solutions for Electrical/Mechanical Interfacing –**

Native 3D PCB Editing – Including tools within ECAD software for mechanical design, or at least alignment, placement, and export of 3D mechanical models, allows much of the work to be done in a single software package.

ECAD/MCAD Collaboration Tools and Formats - Using a more robust design data transfer system, these tools allow much more comprehensive bidirectional design, visibility and conflict resolution, as well as more complete integration with each native software interface.

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4 **True ECAD/MCAD Collaboration with IDX**

ECAD/MCAD Collaboration with IDX

ECAD/MCAD collaboration gives designers visibility into incremental changes, allowing them to design simultaneously.

- **Native ECAD/MCAD Collaboration** - There's nothing better than being able to use a single software tool for all electrical and mechanical design.

- **Third-Party Applications -** There are a number of external tools that can directly plug in to electrical and mechanical CAD packages, providing a better gateway between the two programs.

- **Neutral File Formats** - Neutral file formats exist outside of each design domain. They don't require a direct interface to either software environment, thus avoiding time-consuming connection troubleshooting issues.

Leading to IDX

The IDX format is like a grab bag of the best features pulled from other collaborative ECAD/MCAD formats, with the added benefit of enabling true collaboration.

•**IDX baseline file** - At the beginning a board design, start the process by exporting a baseline file.

•**Import into a mechanical environment** - The baseline file exported from the electrical side will be imported in a mechanical tool.

•**Incremental change XML file** - Changes made to the design will be recorded in a file, stored in the same location as the baseline file. Changes are tracked and comments are added to this file, and designers can choose to accept or discard any changes as they see fit.

•**Design cycle in full effect** - By tracking a design, it's simple to revert to an older version if something didn't work out along the way.
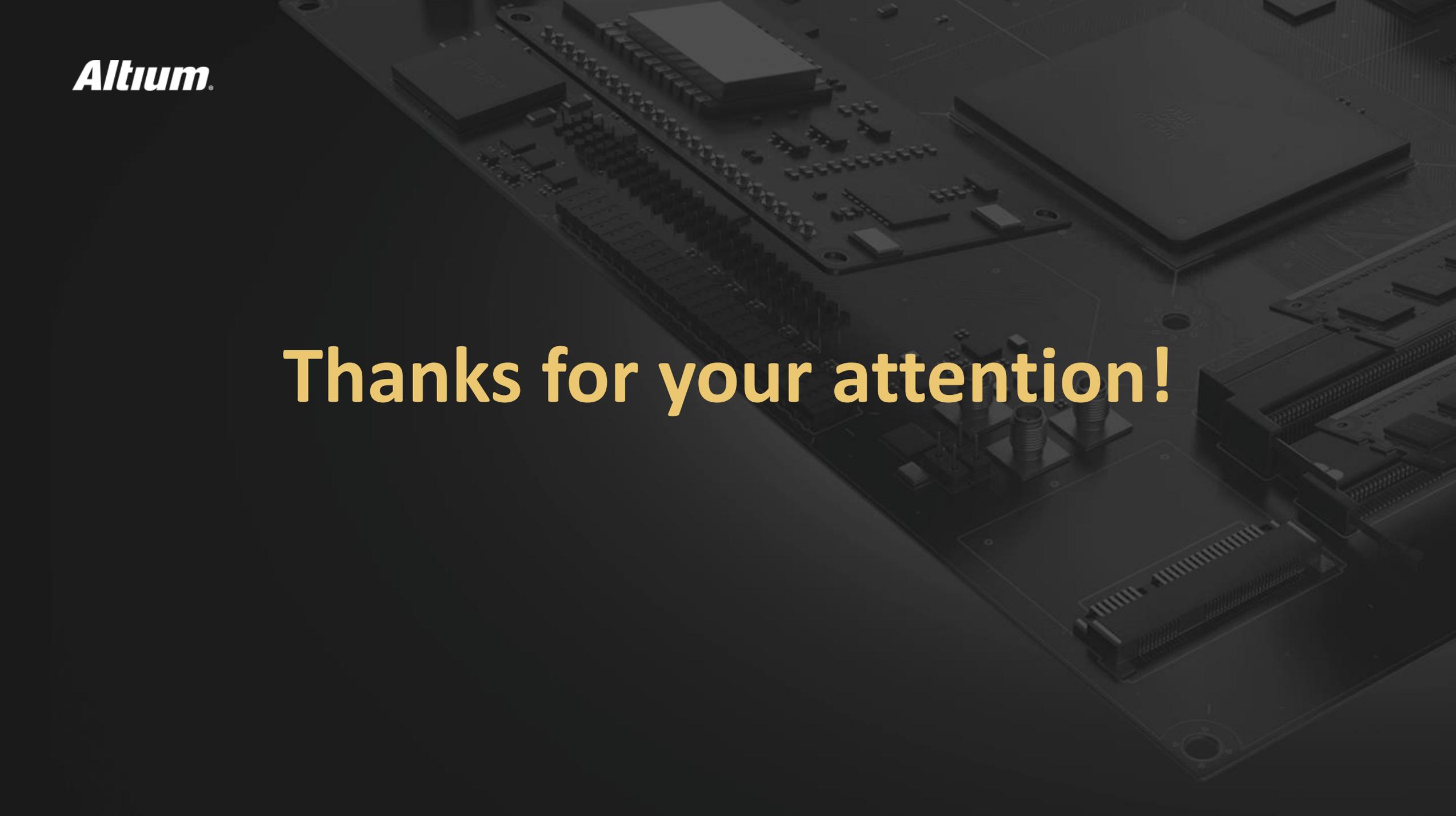
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