# Asking The Right Questions:
## Choosing a PCB Design System Checklist

Printed circuit boards are driving the electronics industry forward. As a PCB designer it is essential to assess your needs, both current and future, when choosing a PCB design system that is right for you. Although this may seem like a daunting task, we have compiled a list of necessary features available within CAD tools in order to develop a quick PCB Design System checklist to help aid you in your search. The following list should help guide your decision by assessing the benefits of various different functionalities and what types of questions should you ask yourself or your software provider before making a decision.

# Getting Started
## What Are Your Goals?

Ask yourself—what are you trying to achieve with your PCB Design System? To start, identify and document your goals.

ENTER YOUR GOALS

1.

2.

3.

Example Goals:

- Reduce/eliminate design re-spins due to uncaught design/manufacturing issues.

- Decrease design schedules by eliminating redundant tasks and automating non-core engineering activities (ex: creating libraries, design data management, etc).

- Manage increased design complexity with advanced PCB design, simulation, and analysis capabilities.

# 1. Core Capabilities

The objective is to design a working, manufacturable PCB in the time-frame allotted. When reviewing a PCB design system, consider the following:

☐ Does the system include schematic, PCB, and manufacturing outputs as one complete package?

☐ Is there a comprehensive set of capabilities designed to automate repetitive tasks and help intelligently guide you through the design process such as auto-interactive routing, design reuse, and dynamic shapes?

☐ Does the system support rules-based design through constraint management and checking? Is that system easy to setup, use, and understand?

# 2. Ease of Use

As with any new software, you as the user want to ensure that the program is intuitive and easy to use. It is important when choosing a PCB design system, that you will be able to quickly install and begin designing without numerous or ambiguous steps in the set up process.

☐ How quickly can I get the software up and running?

☐ How much training is needed to master the software?

☐ What tools are available to new users to help them get started?

☐ Is there an established user base already (as your team grows you can find people who already know your chosen CAD system)?

## 3. Performance & Accuracy

When designing PC boards for new and innovative technology you want to use cutting edge software. High-performance software that is fully equipped with the latest technology can make all the difference in your design. You will want software that is both free of bugs and works at great speeds to get your design done and to market quickly. Upon evaluating a design software's performance and accuracy, consider the following questions:

- ☐ Does the PCB design software take advantage of current computing trends like cloud, multi-threading, and 64-bit to ensure optimal performance?

- ☐ Is the system able to analyze design rules and update complex objects like shapes in real-time, providing instant feedback as to design status as you work?

## 4. Support

Support is key to success when learning a new design tool. Although you may or may not be familiar with the design environment, each CAD tool is different and requires at least a little bit of a learning curve. Before committing to a design software long-term, it is important to be aware of the different support and training options that are available and to what cost.

- ☐ Does the CAD vendor offer training classes? In today's connected world, support is often provided in both online and offline capacities. Training classes, tutorials, and step by step modules help individuals teach themselves at their own pace.

- ☐ What types of resources are available? Does the company offer white papers, datasheets, or infographics providing additional information to consumers? Also make sure that resources are being kept up to date to ensure reliability of information and company.

- ☐ Does the company offer online support services and/or phone support services?

## 5. Manufacturability

The ultimate goal at the end of the day is to make a design that is manufacturable—if your end design is unable to be manufactured it is useless. It is crucial the software you choose has real-time checks to ensure yield is to your needs in order to manufacturer the product. Following a Design for Manufacturability (DFM) process when designing a product will enable the manufacturing process.

- ☐ Does the software offer DFM settings? Are they comprehensive?

- ☐ Are there capabilities for Design Rule Checking (DRC)?

- ☐ Are you able to effectively specify different PCB design materials and types (ex: Rigid-Flex) to your manufacturer?

## 6. Simulation Capabilities

Simulation will allow you to virtually test how a circuit will perform against a series of scenarios prior to manufacturing the product. The ability to simulate the circuit in the early stages of design, when changes can be made efficiently and cost effectively, will ultimately reduce the number of design iterations and help the company to avoid costly rebuilds.

- ☐ Does the software provide simulation abilities with real time response?

- ☐ Are simulation and analysis capabilities integrated into the design flow allowing for automated rules generation and design guidance based on simulation results?

## 7. Libraries

Is the library comprehensive and robust? If libraries are comprehensive and robust, they have the potential to save the designers' hours of time building parts, allowing them more time to focus on the integrity of the design.

Are parts built with standards? Standards are an important aspect when assessing a PCB design tool. IPC standards are used worldwide as a way to standardize the assembly and production requirements of the electronics industry.

- ☐ How are libraries presented and maintained?

- ☐ Is it easy to find the parts you are looking for based on manufacturer or function of the part?

- ☐ Does the tool allow you to manage libraries efficiently? Libraries for different projects can quickly become overwhelming, organization is key to the success of library management.

## 8. Scalability

When choosing a new design platform, it is important to think long term. Although right now you may have very basic requirements for software, in the future your needs may change and require additional features. In order to plan for future growth of your company, it is essential to choose a design software that can handle a growing amount of work and/or ability to be enlarged to accommodate growth.

- ☐ What are your current design needs? Ideally you would like to purchase what you need now and have the ability to upgrade when necessary.

☐ How easy is it to add-on capabilities going forward? Will it require re-training, UI changes, and/or file migrations?

☐ How much of the PCB design process does your vendor support natively? Are they relying on non-integrated 3rd party options to cover functionality gaps?

## 9. Translating Legacy Data

A very important aspect to consider when switching PCB design software is the ability to transfer legacy data. If you have designed boards in other CAD software, you want to ensure that you will be able still utilize these legacy files in future designs. The process should be both intuitive and efficient.

☐ Are there translation options in the software to transfer legacy files?

☐ What is the process to transferring legacy files, how long will it take, and how reliable will it be?

## 10. Integration

Building a product is more than just designing a board. In PCB design it is becoming increasingly essential that the different CAD tools utilized in a company easily integrate with one another. When working on a PCB design you start with the schematic and move to PCB layout and mechanical design, when transferring the data from these different CAD tools you want to ensure that no integrity of the design is lost.

☐ How integrated is the PCB design environment you are considering? Can design changes be effectively communicated throughout the process?

☐ What types of collaboration features are available? How easy is it to collaborate with a team?

☐ Can you connect to external business systems like PLM, MRP, ERP easily and directly through the PCB application?

☐ Does the software provide open APIs to allow for customizations and deployment of unique processes within the software?

# Conclusion
## Other Considerations

While we all know that features are important, it's also important to be sure we don't make a solution choice on features alone. Since most companies will have similar feature sets, it's important to look at the big picture. Here are other questions that need to be considered before a final decision is made.

☐ What are my ultimate business goals and can this product help me to achieve them?

☐ Does this product offer an effective solution to my current and future needs?

☐ Is the company fairly stable? Will they be sustainable in the long-term

☐ How professional and knowledgeable is the staff? Can I see myself working with this company consistently?

## About EMA

EMA Design Automation is a trailblazer in product development solutions offering a complete range of EDA tools, product lifecycle management systems, services, training, and technical support. EMA is a Cadence® Channel Partner serving all of North America. EMA manufactures TimingDesigner®, CircuitSpace®, and a host of custom solutions to enhance the OrCAD products, and all are distributed through a worldwide network of value added resellers. EMA is a privately held corporation headquartered in Rochester, New York

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