



Startup Best Practices

eBook

 KEYSIGHT

Startup Best Practices

The semiconductor industry is experiencing a significant amount of enterprise and innovation. Many engineers are venturing out to start their own companies. Despite facing time-to-market and funding pressures, these startups are sprinting to reach new milestones. Seemingly everyone is racing to design the next chip or IP that will change the world.

This eBook makes the case that by adopting best practices and methodologies early, you can lay the foundation for a dependable and efficient design team. While taking the time to develop and implement best practices may seem like a luxury, it can make all the difference. Implementing best practices from the start will pay dividends as your team grows and tapeout pressures increase.



Contents





CHAPTER 1

Best Practices



Best Practices

Best practices are any conventions, rules, or processes that help design teams collaborate better, work more efficiently, avoid mistakes, and improve quality.

Best practices may include the following:

- Naming conventions
- Data storage and backup conventions and processes
- Design flows and handoffs
- Design management tools and methodology
- Issue tracking and other collaboration tools
- Project and schedule management





CHAPTER 2

Adopt Best Practices from the Start



Adopt Best Practices from the Start

Design teams need a common “language” to communicate and collaborate effectively. When design teams understand and agree to similar conventions and methodologies, this leads to greater productivity. It also becomes easier to identify and fix issues.

In most startups, the core team migrates from a previous company. As a result, they already understand best practices and can quickly adapt to a new startup environment. For teams that are small and close-knit, reaching consensus is fast and easy. But eventually, teams must hire engineers with different backgrounds — increasing the time and effort it takes to gain alignment.

Handing a new hire a design guide will help them understand guidelines and expectations. Conversely, waiting to implement best practices down the road may create confusion and cause you to revisit existing design work.

Documenting and sharing best practices is a great way to help optimize the onboarding process by bringing team members up to speed more efficiently. New engineers can quickly and easily learn about key design components and existing processes and conventions.



CHAPTER 3

Design Management and Other Collaboration Tools



CHAPTER 3

Design Management and Other Collaboration Tools

Design management, issue tracking, and other collaboration software are now essential tools for design teams. This is because design teams need to hire the best global talent. Most design teams — even small ones — operate across different time zones. Collaboration tools are critical for keeping distributed teams in sync.

Because startups often try to conserve cash and minimize capital spending, they limit their buying to only the most essential tools. As they grow, teams typically implement issue tracking systems like Jira and messaging platforms like Slack. However, it is important to ensure that a design data management system and methodology are in place from day one.



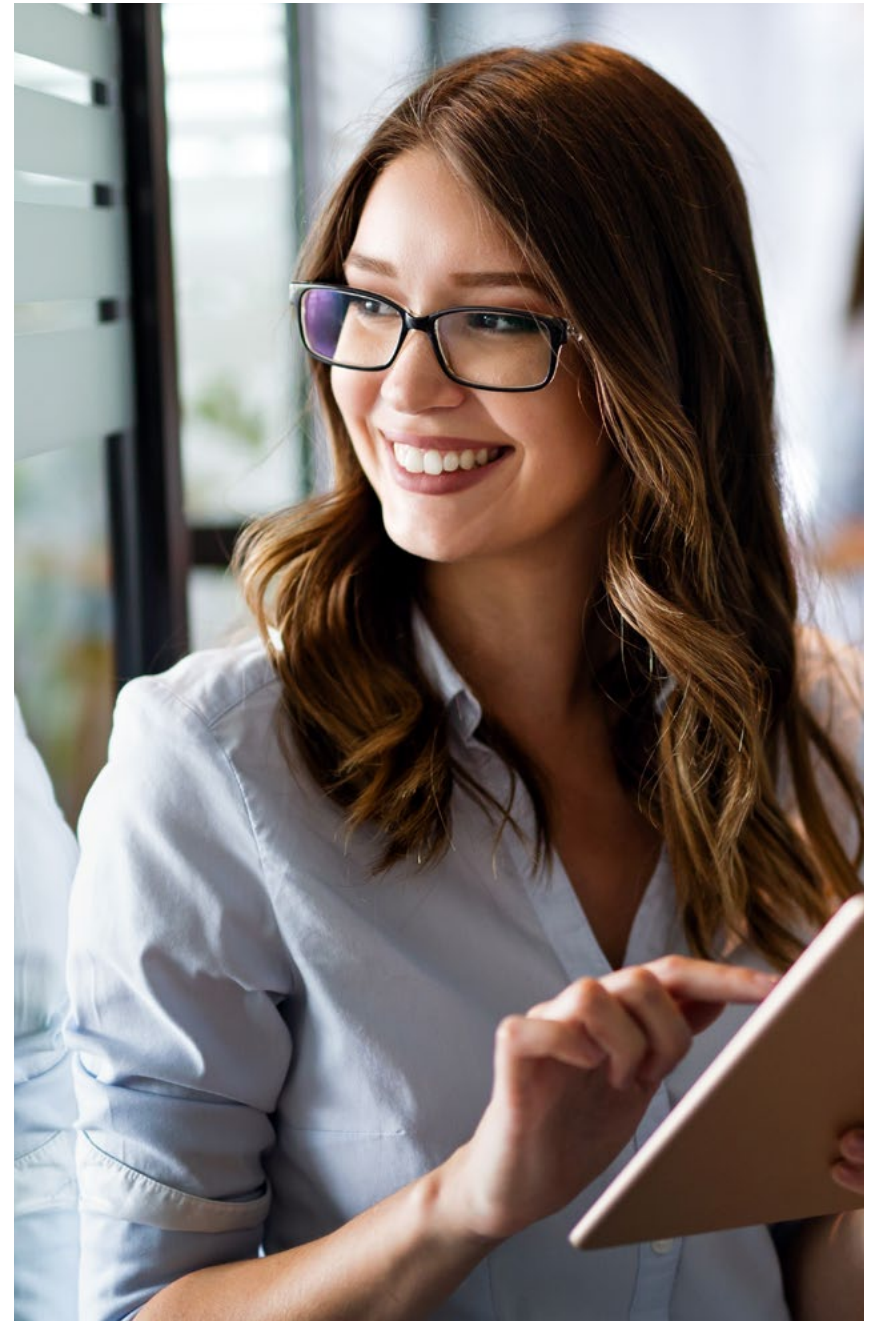
Best practices to consider

The value of a startup is in its people and IP. Therefore, teams need to manage valuable IP in a safe and secure manner. Using ad-hoc methods like shared design libraries and naming conventions as a substitute for revision control can lead to data loss and unpredictable results.

Design teams must be super efficient, even when working across separate locations. Using a design management system can help keep everyone coordinated and avoid accidentally overwriting or losing design changes.

A startup is likely to change course several times as market requirements or technologies evolve. The design team needs to stay agile to change course or try alternatives efficiently.

Startup design teams must often navigate uncharted waters. For every few steps forward, you may have to take a step or two back. Design management systems give teams the flexibility required to control data revisions and track changes. This is critical during a situation like a tapeout when designers work long hours. With a design management system, you can identify and correct mistakes quickly and easily.



New hires can create a workspace and instantly access design data without having to sit through excessive training or comb through design libraries. Additionally, working in a private workspace enables revision control. This eliminates the risk of overwriting or deleting changes.

Large customers are often demanding. To meet the demands of their customers, startups must be nimble, adapting quickly to changing conditions and requests. Design teams must leverage a design management system to develop, manage, and maintain multiple variants of the same chip or IP.

If there is a design modification, being able to refer back to a previous production design to see all IP revisions can help prevent usage of an incorrect IP. This helps avoid cost overruns, which is important for lean startups operating on tight budgets.

These are some of the reasons why most new startups choose to immediately adopt a design management system along with design, debug, and verification tools.

“Throughout the design process, we have used the Keysight Design Data Management (SOS) revision control tool to back out of a change that did not work out or to retrieve an accidentally deleted database. Without automated revision control, we would have lost work which would have impacted our schedule greatly.”

Steve Chin
Efinix, Inc. Director IC Engineering



CHAPTER 4

Keep It Simple



Keep It Simple

Engineers who found new startups often come to the table with mature design methodologies. While such methodologies work for large companies, they can often be overkill for small, agile startups. When developing your methodology, learn from your previous experience, but adapt it to the new reality. Keep methodologies as simple as possible to meet your needs. Having a simple and clear set of rules improves compliance.

When selecting a design management system or any other collaboration tool, make sure that it is simple to set up, administer, and use. A startup often cannot afford a full-time CAD or IT engineer. Since it typically falls to a lead engineer to pick up this task, it is best to minimize his or her time with CAD and IT-related tasks.

When choosing a design management system





CHAPTER 5

IT Considerations



IT Considerations

A design engineer's work is resource and storage intensive. Designs are generally large, user workspaces take up considerable storage, and verification tasks require insatiable amounts of computing power. To optimize valuable engineering time, you must dig deeper into your IT budget — not only for the capital expenditure but also for the IT resources needed to manage and configure your compute, file servers, and network.

You need reliable network storage to circumvent downtime and data loss resulting from a disk crash. NetApp and DELL EMC network storage servers are high-performance and very reliable but come at a cost. Optimizing the use of this expensive resource is essential. User workspaces require substantial storage. The same user may have multiple workspaces, each having a full copy of the design. This adds up fast, especially as the team and project size grows. A software configuration management (SCM) system, such as GIT, SVN, or Perforce P4 can help manage software with small text files.

When a user creates a workspace, you get a full physical copy of all the files. However, a typical design project may have thousands of large files. Creating workspaces with a design management system running on top of a SCM backend can become prohibitively expensive over time, as each workspace has a full copy of the entire project.





Design management systems built for IC design recognize this problem and optimize for it. Workspaces have read-only links to shared caches. Using cache servers is essential for saving disk space. Every design has a need to archive large files which will eat up disk space if a read-only cache is not available.

“There is always a need to archive large files such as a revision of a tapeout GDS or simulation waveforms,” says Efinix, Inc. Director of IC Engineering Steve Chin. “Without a cache server, the hit on disk space will be massive if duplicated across all user work areas.”

This eliminates duplication and ensures that the only files receiving edits move into the user workspace as physical copies. In addition to increasing team productivity, this frees up storage space and reduces IT spending. The cloud enables startups to scale up quickly for peak verification time and scale down during the early design cycle. Some startups choose to operate exclusively in the cloud. Others choose a hybrid model where normal usage sits on-premises and peak usage runs in the cloud. In a hybrid model, the cloud acts as another design center.

You can run a design management cache server in the cloud. The cache server will only pull the changes since the last cache synchronization, optimizing the time to upload the changes to the cloud.

Startups by nature are risk-takers. But even the biggest risk-takers are vulnerable to data loss and downtime. With a reliable backup system, you can avoid experiencing storage malfunctions during a tapeout that can lead to irretrievable data loss.

CONCLUSION

Design best practices involving effective methodology and management serve as the foundation for successful projects and business outcomes. To help ensure and sustain your company's growth, make sure to institute design best practices from the very start.





Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.

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