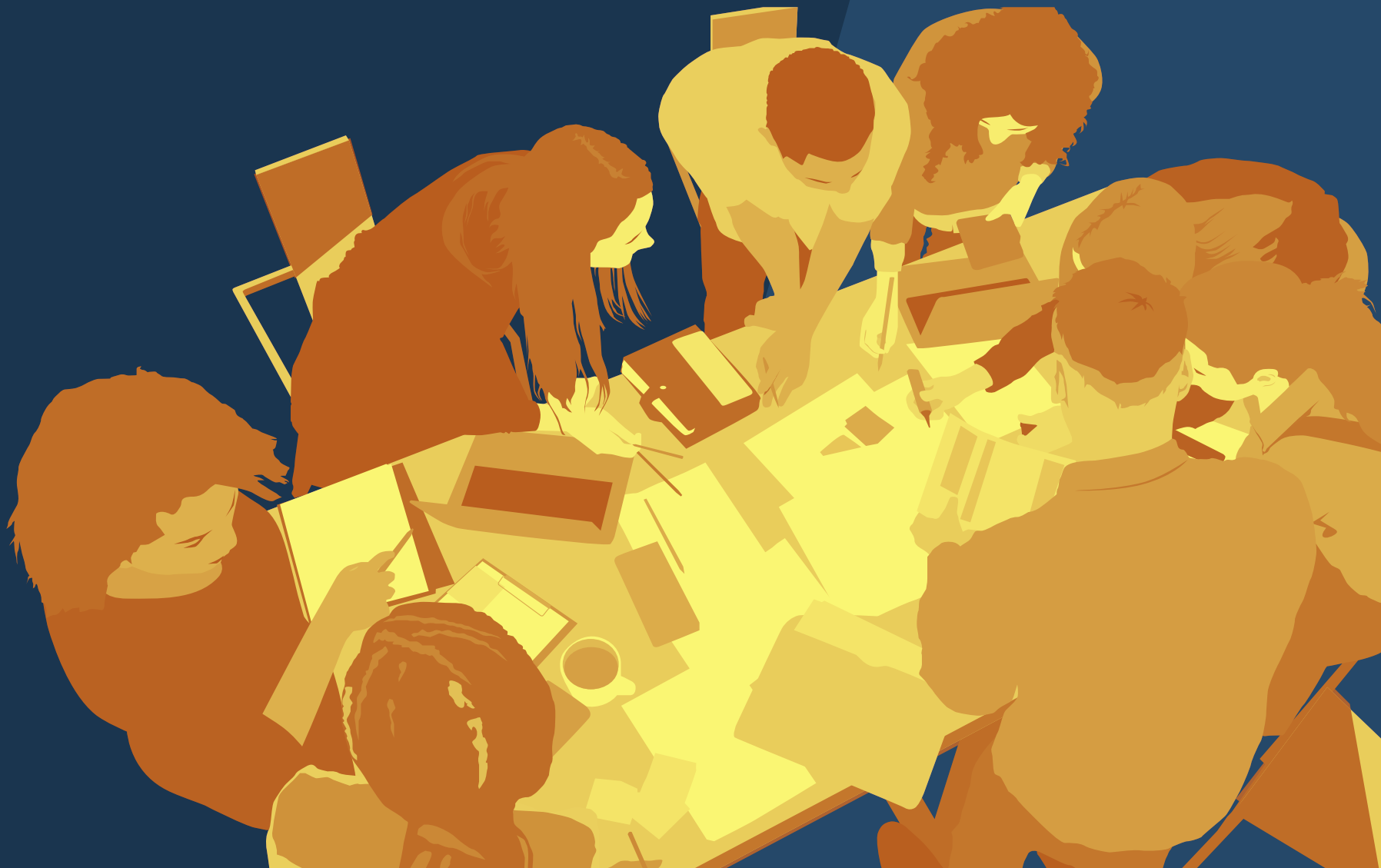


LIFECYCLE INSIGHTS

# BUILDING A BETTER STARTUP

Top tips to establish a solid, digital foundation for product development from the 2020 Startup Study



# UNCOVERING BEST PRACTICES THROUGH RESEARCH

Building a successful startup is hard, especially for hardware products. Apart from finding product-market fit, securing financing, and recruiting the right team, startups today face additional obstacles due to the “new normal.” These difficulties include adjusting to remote work, overcoming supply chain disruptions, and complying with environmental regulations. But, the current environment also provides many new opportunities for innovation.

The goal of the Lifecycle Insights 2020 Startup Study is to uncover approaches and practices that can increase the chances of success. This survey-based eBook documents the biggest challenges that startups face today and recommends solutions that startup leaders can put in place to drive success.

One key recommendation from the study is that startups should focus on building their business on a solid, digital foundation. Digital product development tools are now easy to access. Implementing them enhances communication among the different engineering disciplines needed to develop complex products. The startups who use them have a distinct advantage over slower-moving competitors.

## 2020 Startup Study

-  74% Are seeking profitability for the first time
-  73% Employ less than 25 people
- \$ 80% Of respondents' companies only financially compensate half of their employees
-  Many regions around the world serving many different discrete manufacturing industries

# PROBLEMS IN THE SHIFT TO SMART, CONNECTED PRODUCTS

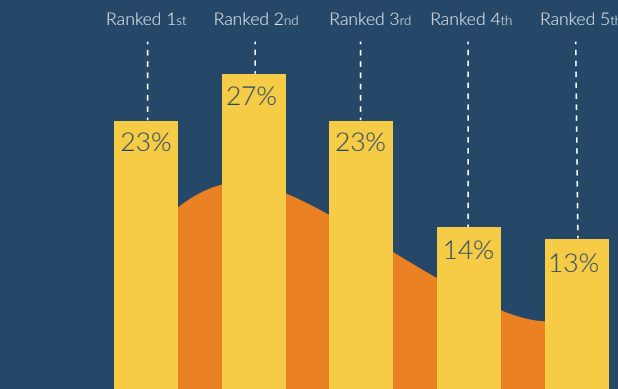
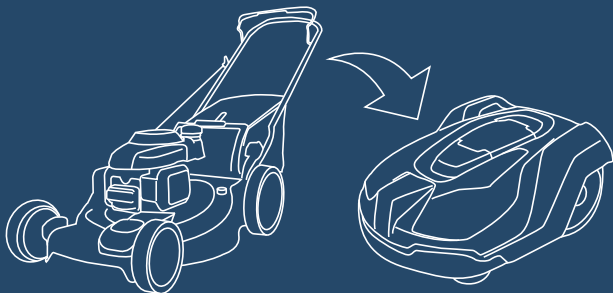
Startups have always been at the forefront of novel approaches to product development. They are usually the first to bring innovative and even disruptive new products to the market. Their limited budgets and fast-paced environments foster ingenious approaches. Yet, there are certain trends that push startups today to rethink the way they operate and the functionality they implement in development.

The biggest trend that forces startups to modify their development processes is the increasing customer demand for smart and connected products.

This demand takes different forms in different industries. It includes a broad swath of product functionality such as ubiquitous connectivity, the Internet of Things (IoT), and autonomous or assisted capabilities.

Developing smart products presents new hurdles for companies of any size. Many organizations have to expand their competencies beyond mechanical design. This means including other engineering domains, such as electronics, electrical distribution systems, embedded systems, software, and IoT. Getting engineers from different disciplines to work together and create a single integrated system can be onerous.

The shift from traditional, mechanical products to smart, connected ones, ranked as the top challenge in development.



# DEVELOPMENT ISSUES THAT ADD COMPLEXITY

The increasing demand for smart and connected products is not the only factor that forces startups to adapt. There are many other trends that demand their attention.

Eco-friendly requirements, regulations, and incentives are pushing companies to rethink both their design processes and the entire lifecycles of their products. Supply chain disruptions and trade wars are shaking up the way companies across the globe collaborate and how they procure components and assets. The globalization of markets, customers, and suppliers also creates new constraints and opportunities for startups. New service-based or by-the-hour business models are gaining traction with startups, as they are more appealing to their investors.

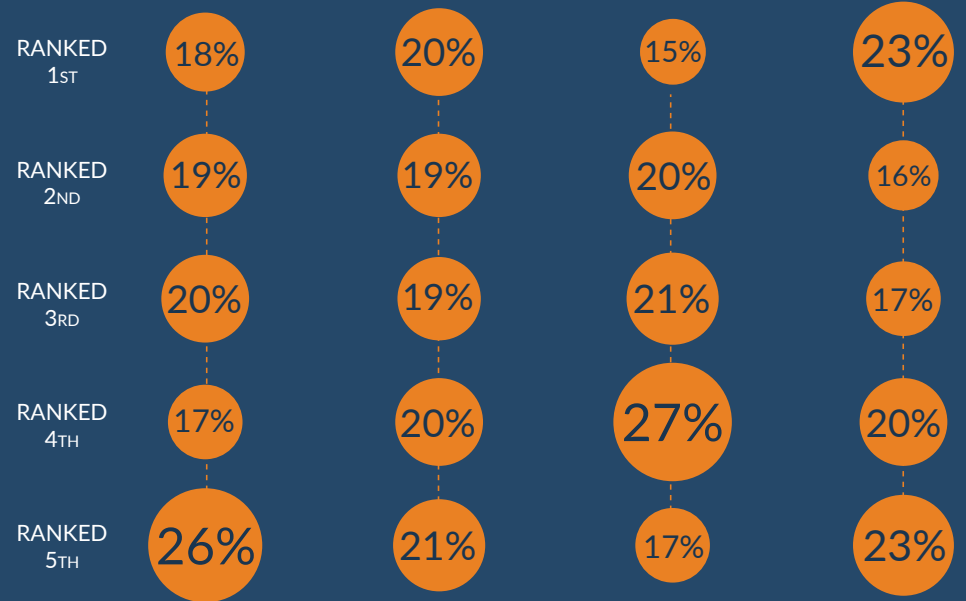
Notably, while some of these trends are relevant to more startups, there is no single change driver that applies to every startup. Each company faces a complex mix of constraints that is unique to its situation.

Eco-friendly requirements, regulations, and incentives (CO2 limits and taxes, government regulations, etc.)

Supply chain disruption (trade wars and tariffs, pandemics, etc.)

Globalization (customers/markets, suppliers, regulations all vary dramatically from region to region around the world.)

New business models (products-as-a-service, mobility-as-a-service, power-by-the-hour, etc.)



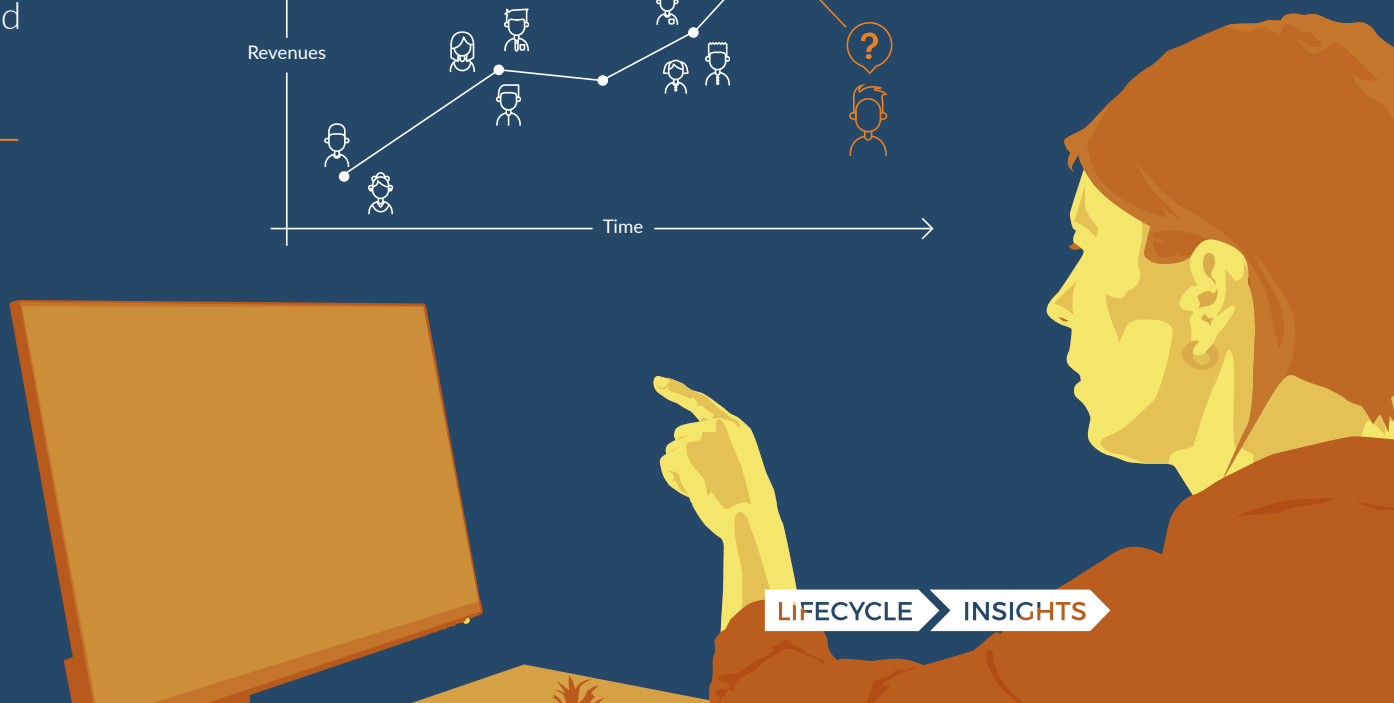
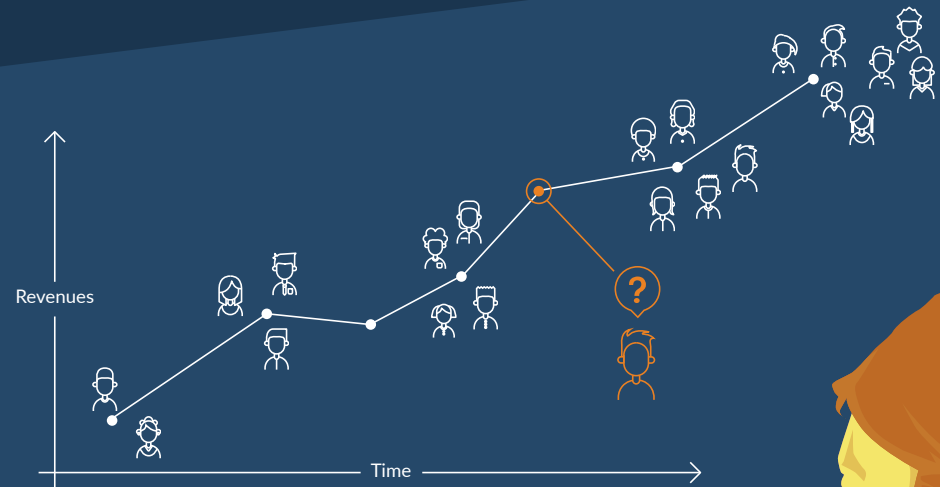
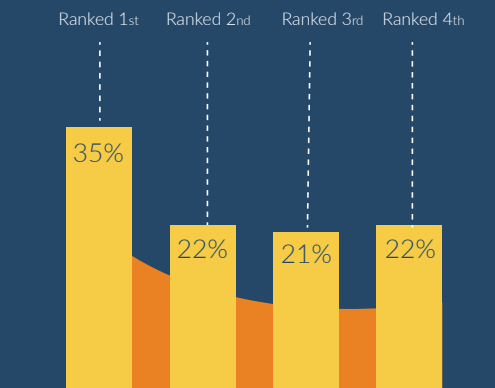
# MANAGING GROWING ORGANIZATIONAL COMPLEXITY

Outside trends are not the only forces that push startups to change their product development processes. Internal factors are also at play. The core difficulty for every startup is coordinating growth and managing the added organizational complexity as the company expands.

Onboarding additional contributors to a development process naturally adds complexity. The key challenge lies in aligning development activities among the growing number of contributors. Over time, startup leaders recognize the issues that manifest due to the added organizational complexity. So, they look for new processes, people, and technologies to help address them.

It is important to recognize how disruptive the introduction of such changes can be to an organization. Adjusting to new processes, roles, responsibilities, or technologies can undermine productivity until the entire company embraces the change. For this reason, startup leaders should seek solutions that provide a solid, digital foundation for product development as early as possible. Ideally, these tools should have capabilities that can grow with the company as the needs of the organization increase.

Managing the growth, coordination, and complexity ranked as a significant obstacle to continued startup success.



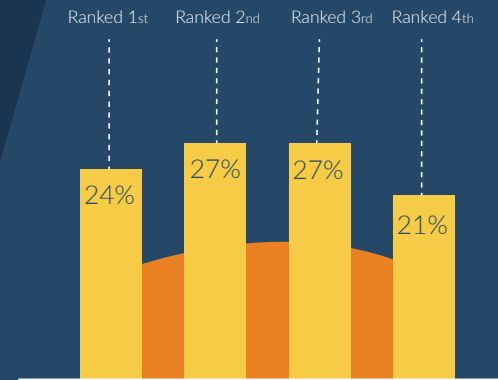
# DIFFICULTY KEEPING EVERYONE COORDINATED

The demand for smart and connected products pushes startups to incorporate embedded electronics, electrical systems, onboard software, and IoT connectivity into their products. To develop each subsystem, companies need engineers and designers with different domain expertise.

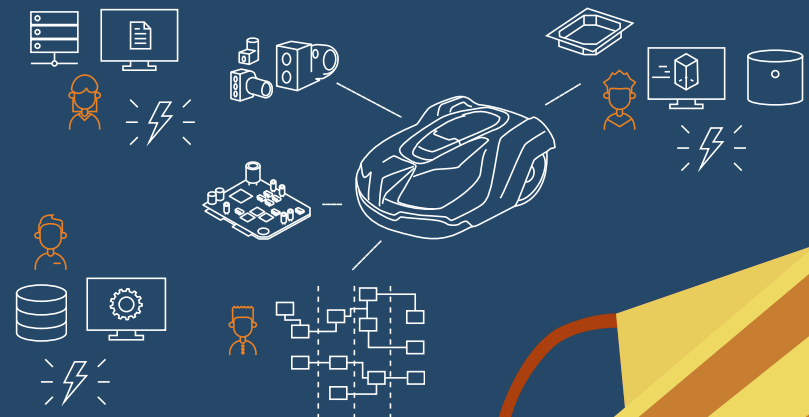
Coordinating the efforts of multidisciplinary teams introduces new friction. It is of utmost importance to make sure that everyone is on the same page throughout the development process, from initial concept to final delivery.

Traditionally, teams consist of contributors with similar backgrounds. Design data is passed on to other teams only when necessary and usually towards the end of the development process. This often results in significant integration issues close to the delivery date, which is when a startup can least afford it.

A progressive approach to tackling this issue is to maintain a comprehensive digital twin. Digital twins act as a single, unambiguous source of the truth. They are also a digital thread that tracks how design definitions change over time. By referring to these definitions, team members can coordinate their activities effectively and continuously throughout the development process.



Designing across engineering domains and getting systems to work is a serious difficulty



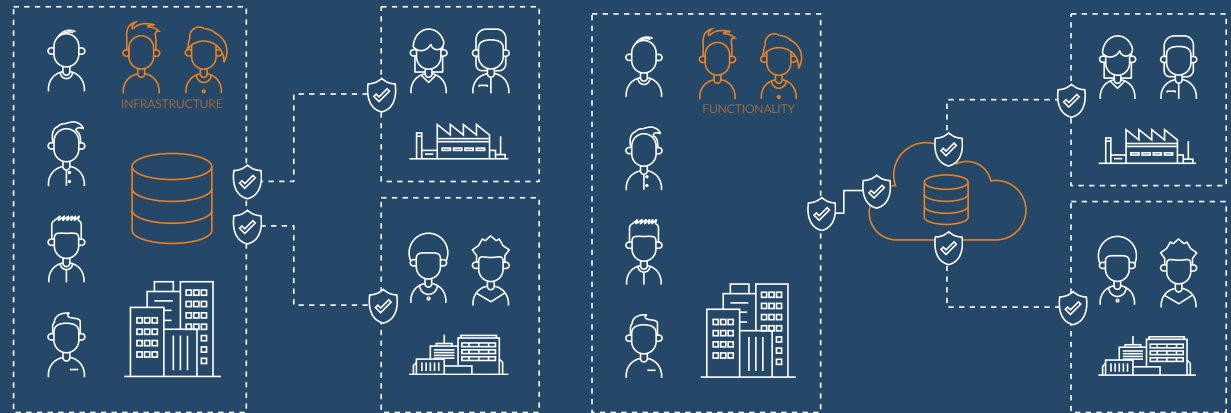
# CHALLENGES IN WORKING REMOTELY

Startups almost always begin on a shoestring budget. The findings show that 80% of the companies that participated in this study financially compensate only half of their employees. Startups commonly get going with far-flung contributors working out of their homes, and sometimes their garages. Startups must find a way to be productive while many contributors are working remotely.

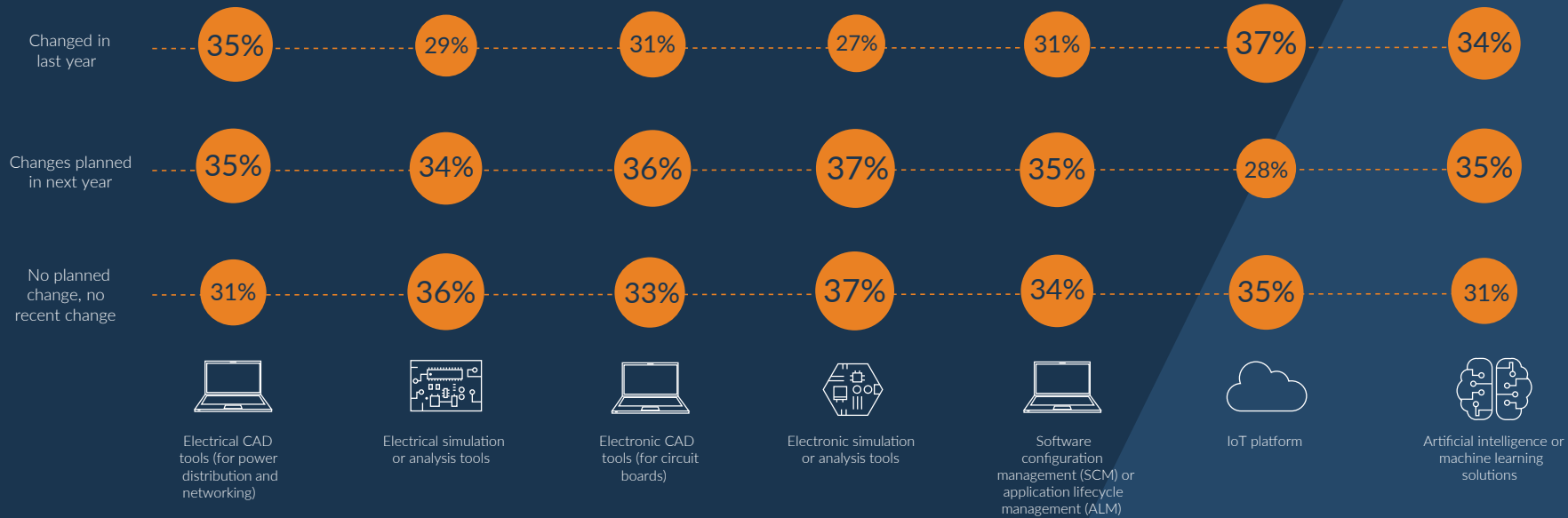
Traditionally, remote workers have to connect to the company's central servers through a VPN to get access to the design data.

However, the high cost of building and maintaining a central server infrastructure is out of reach (or out of scope) for many startups.

A new class of solutions has emerged that enables storing and sharing product development data in the cloud. These cloud-based solutions are appealing to startups: They allow everyone in the team to connect to the system and access the comprehensive digital twin from anywhere without the need for a large upfront investment.



# DISRUPTIVE CHANGE TO IT SYSTEMS



Startup companies must often modify their operations to keep pace with competitors. These modifications can be extremely disruptive to the development process. Startup leaders must invest in new tools to address the increasing complexity of their companies' processes and organization.

Smart companies will minimize the chance of future disruption by identifying and using a set of tools that can grow with the organization. This core IT ecosystem can act as a solid, digital foundation for product development that can be expanded as the company's needs increase.





# RECAP AND CONCLUSIONS

Startups face many new challenges today. This study shows that the most prominent trends that force startups to change and adapt are:

- the increasing customer demand for smart and connected products,
- eco-friendly regulations,
- supply chain disruptions,
- globalization, and
- the emergence of new business models.

To maximize their chances of success, startup leaders must also consider how to effectively tackle internal obstacles that affect the growth of their organizations. These include: managing larger teams with increased organizational complexity, fostering coordination across different engineering domains, and being productive while working remotely. Based on the finding of this research, Lifecycle Insights suggests the following to startup leaders:

- Build multidisciplinary design and engineering teams to address the increasing demand for smart and connected products and outcompete established competitors.
- Identify the unique set of external trends that affect your organization and internal challenges that can hinder growth. Adjust your strategy accordingly.
- Create a digital twin to keep everyone on the product development team on the same page and avoid unnecessary delays close to the release deadline.
- Consider cloud-based solutions to enhance collaboration of remote teams and avoid upfront expenses related to server infrastructure. Minimize disruptions by building a solid, digital foundation of product development tools that can scale with your company.

