SOLIDWORKS

3DEXPERIENCE®

ONE PLATFORM. EVERY ROLE. BETTER PRODUCTS, FASTER.

How the **3D**EXPERIENCE Platform Transforms Product Development Collaboration Across Every Function

White Paper



DASSAULT SYSTEMES

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INTRODUCTION: THE COLLABORATION GAP THAT'S COSTING YOU

Every product development organization faces the same core challenge. It's not a shortage of talented engineers, designers, or machinists. It's not a lack of ideas. It's the invisible friction between them.

Files sit in email threads. Versions multiply on shared drives. A designer works from a revision that the simulation engineer hasn't seen yet. A machinist gets a drawing that doesn't reflect the last-minute geometry change. A manager walks into an executive meeting without knowing whether the team is on track or behind — because the last status update is three days old and the project has moved on.



This isn't a process failure. It's a systems failure. And it's happening across the product development industry at a scale most organizations can't afford to ignore.

Tech Clarity research puts a number on it: Sixty percent of product development teams cite engineering-to-manufacturing handoffs as one of their biggest bottlenecks. The same research shows that 65% of respondents point to miscommunication between design and manufacturing as a leading source of delays. And teams without a formal collaboration solution report significantly lower confidence in their ability to secure data and gather feedback.

The cost shows up in late products, costly rework, missed market windows, and teams that spend more time managing information than creating it.

This white paper is about solving that problem — not theoretically, but practically, role by role, workflow by workflow.

The **3D**EXPERIENCE® platform is a connected product development environment that brings people, data, processes, and decisions into one place. It's built on the tools that engineers already know — SOLIDWORKS® CAD, SOLIDWORKS Electrical, and simulation and manufacturing applications — and it extends them into a shared, cloud-native platform that keeps every role aligned from concept through production.

What you'll find in the chapters ahead:

- How each role experiences the platform differently — and why that specificity matters
- Where the biggest collaboration failures happen and how the platform closes those gaps
- Real examples from real companies that have made the shift and measured the results
- Practical insights you can bring back to your own organization

Whether you're a manager trying to lead a distributed team, an executive setting strategy, a designer fighting version chaos, a simulation engineer whose results aren't making it to the right people fast enough, an electrical engineer working in a mechanical silo, or a machinist waiting for engineering to answer a question — this platform was built to make your work better.

Let's start with the foundation.

CHAPTER 1: WHAT THE 3DEXPERIENCE PLATFORM ACTUALLY DOES

What You'll Learn

By the end of this chapter, you'll understand what the **3D**EXPERIENCE platform is, how it differs from traditional disconnected toolchains, and why a connected environment matters for every role in product development.

The Problem With Disconnected Tools

Most product development teams don't suffer from a lack of software. They suffer from too much of it, and not enough connection between it.

A designer uses SOLIDWORKS CAD. A simulation engineer runs analyses in a separate environment. An electrical engineer works in a schematic tool that doesn't talk to the mechanical model. A machinist receives a PDF or a DXF™. A manager tracks progress in a spreadsheet. A project coordinator sends status updates via email.

Each of these tools does its job. But none of them talk to each other reliably, and the result is a product development process riddled with handoff errors, stale data, and invisible delays.

When a designer updates a model, does the simulation engineer automatically see the change? When a component is obsoleted by the supply chain team, does the designer know before they finalize a bill of materials? When a manager approves a change request, does everyone downstream know what was decided and why?

In a disconnected environment, the answer to all three questions is usually sometimes, rarely, and it depends on who remembered to send the email.

That's the collaboration gap — the one that the **3D**EXPERIENCE platform was built to close.

A platform, Not Just Software

The **3D**EXPERIENCE platform isn't a single application. It's a connected environment that integrates design, simulation, manufacturing, collaboration, and project management into one shared space.

At its core, the platform provides:

- **A single source of truth.** Every model, document, simulation result, approval, and change record lives in one place. There's no question about which version is current because there's only one authoritative version. Every role sees the same data.
- **Role-based access and dashboards.** The platform doesn't show everyone everything. It shows each person what they need, organized around their work. A manager sees project dashboards and approval queues. A designer sees model revisions and team comments. A machinist sees the current manufacturing model and attached notes.
- **Connected workflows.** Tasks, approvals, changes, and decisions flow through structured processes. When a simulation engineer posts results, the designer is notified. When a change is requested, it triggers a review. When a machinist marks up a concern, the engineer sees it in context — attached to the actual geometry, not buried in an email.
- **Cloud-native collaboration.** The platform runs in the cloud, which means the team can access it from anywhere — the office, the airport, a supplier's facility, or a remote lab. This isn't just a convenience feature. It's what makes distributed, global, and multisite teams genuinely possible.
- **Lifecycle management.** Every component has a lifecycle — active, in revision, obsolete. The platform tracks that lifecycle for every part, assembly, and document, so teams always know the status of what they're working with.

How It Connects to What You Already Use

One of the most common concerns about adopting a platform is disruption. Engineers don't want to abandon the tools they know. And they shouldn't have to.

The **3D**EXPERIENCE platform is built to work with SOLIDWORKS — the CAD environment that millions of engineers and designers already use every day. SOLIDWORKS Design, SOLIDWORKS Electrical, SOLIDWORKS Simulation, and SOLIDWORKS Manufacturing solutions are all available as roles within the platform, meaning they connect directly to the shared data environment without requiring separate imports, exports, or file transfers.

When a designer saves a model in SOLIDWORKS Design, it's available on the platform. When a simulation engineer runs an analysis, the results attach to the same product structure the designer is working from. When a machinist needs the latest geometry, they access it directly — not a copy someone emailed yesterday.

This connection is what makes the platform more than a tool upgrade. It's a workflow upgrade.

The Shift: From Reactive to Connected

The fundamental shift the platform enables isn't technical. It's operational.

In a disconnected environment, teams are reactive. They discover problems late because information travels slowly. They make decisions based on stale data because the current version isn't accessible. They spend time searching for answers that should be visible.

In a connected environment, teams are proactive. Problems are caught early because everyone is working from the same data. Decisions happen faster because the context is already there. People spend less time managing information and more time improving the product.

That shift — from disconnected to connected — is what every chapter in this white paper is about. And it looks different for every role.



Key Takeaways: Chapter 1

- Disconnected tools create handoff failures, stale data, and invisible delays that slow every role down.
- The **3D**EXPERIENCE platform connects design, simulation, manufacturing, collaboration, and project management in one environment.
- A single source of truth means every role sees the same current data — no version confusion, no missing context.
- The platform integrates with SOLIDWORKS tools that engineers already use, so adoption doesn't mean starting over.
- The shift from disconnected to connected moves teams from reactive firefighting to proactive, informed decisions.

CHAPTER 2: THE MANAGER — LEADING WITH VISIBILITY, NOT GUESSWORK

What You'll Learn

This chapter explores how the **3D**EXPERIENCE platform transforms the manager's experience — from chasing status updates and managing information chaos to leading with real-time visibility, confident decisions, and team alignment.



The Manager's Real Day

A manager's calendar is a plan. A manager's actual day is something else.

The calendar shows a design review, a supplier call, a project checkpoint, and maybe a flight to a customer site. But the day is actually shaped by a designer who needs approval to proceed, a simulation flag that's just come in, a customer escalation, a change request waiting for sign-off, and an executive asking for a status update while the manager is already at the airport.

In a disconnected environment, this is chaos. Information is scattered across emails, spreadsheets, shared drives, presentation decks, and meeting notes. By the time the manager gets an update from the team, it may already be outdated. By the time they compile a status report for the executive, they've spent an hour gathering data that should have been visible in seconds.

The **3D**EXPERIENCE platform changes this. Not by removing complexity — product development is genuinely complex — but by making that complexity visible, organized, and manageable.

Starting the Day With a Pulse, Not an Inbox

The manager's day on the platform starts not with email, but with a dashboard.

In seconds, the manager can see active projects, open tasks, pending approvals, delayed actions, design maturity, open issues, and key project indicators. One project is on track. Another needs attention. A change request is waiting. A simulation result posted overnight is flagged for review.

This isn't a status view. It's a decision context.

The manager immediately knows what needs action, who owns it, and whether it affects a milestone. Instead of spending the first hour of the day collecting updates, they start the day by setting priorities.

Migma Packtron, a global packaging solutions company, experienced exactly this kind of shift. The company used SOLIDWORKS and the **3D**EXPERIENCE platform to improve collaboration and data management across product development and manufacturing.

Director Nitin Raut noted that the combination enables teams to "plan, execute, and monitor project status in real time," sharing tasks, defining deliverables, managing dependencies, and tracking milestones from anywhere.

The result: a 30% reduction in design cycles and a 20% faster time to market. That kind of improvement starts with a morning dashboard that replaces an hour of status-chasing.



Managing the Team: From Status Meeting to Strategic Direction

Engineering teams move fast — or they should. Designers update models, simulation engineers validate performance, manufacturing reviews producibility, and quality checks documentation. All of this happens in parallel, and a manager needs to understand the state of play without attending every meeting or chasing every team member.

In a traditional workflow, the weekly status meeting exists to answer one question: "Where are we?" The manager collects updates, synthesizes them, and tries to identify blockers. By the time they do, the blockers may have already caused delays.

On the **3D**EXPERIENCE platform, task ownership, due dates, progress, and dependencies are already visible. The status meeting can skip the information-gathering phase entirely. The conversation starts at the point that matters: priorities, blockers, and decisions.

Instead of asking, "Where are we on the bracket redesign?" the manager already knows the bracket is complete, but simulation validation is still open. The conversation becomes: "Simulation is in the gate right now. Let's make sure that's resourced for today so it doesn't hold up the design review."

That's not a small change in meeting dynamics. It's a shift from informational to directional — and it changes how effectively a team operates day-to-day.

Dexai Robotics experienced this firsthand. As the company grew its product development team and moved from R&D into commercial deployment, it added the **3D**EXPERIENCE platform for collaboration, PDM, and PLM capabilities to its SOLIDWORKS environment. The result was increased design visibility, optimized design time, and a team that could scale without losing coordination.



Making Decisions at Design Reviews

The design review is where technical decisions and business consequences intersect. Designers care about performance. Manufacturing cares about producibility. Simulation cares about validation. Quality cares about compliance. The manager has to hold all of those perspectives at once and drive to a decision.

Without a connected platform, the review depends on screenshots, exports, separate file versions, and meeting notes that may or may not reflect the current state of the design. The team may not even be certain they're all looking at the same revision.

On the **3D**EXPERIENCE platform, everyone in the review sees the same product definition — the current model, markups, simulation results, manufacturing feedback, and quality notes, all connected to the same product structure.

A concern surfaces around a component. Simulation shows a stress concentration. Manufacturing flags a tooling concern with one of the design alternatives. The team compares options with full context and reaches a decision.

The manager captures that decision, assigns follow-up actions, and records everything directly in the platform. The review produces more than discussion notes — it produces a traceable decision record that every downstream team can see.

Responding to Urgent Issues Without Losing Control

Every product development program has its urgent moments. A test reveals unexpected vibration. A supplier flags a component risk. A customer escalates a concern. These issues don't wait for a scheduled checkpoint.

In a disconnected process, the manager's first challenge is just gathering context: Which version was tested? Which component is affected? Who owns it? Has the simulation been reviewed? Will manufacturing be impacted?

On the platform, that context is already attached to the issue. The affected component, revision history, responsible team members, comments, and related tasks are all connected. The manager can act immediately — assigning the designer to review geometry, the simulation engineer to validate the vibration scenario, manufacturing to check tooling impact, and quality to monitor documentation requirements.

The issue goes from being buried in an email thread to being tracked, owned, and moving in minutes.

Staying Informed Without Becoming a Bottleneck

A healthy management style empowers the team. That's difficult when staying informed requires attending every meeting or waiting for someone to send an update.

The **3D**EXPERIENCE platform keeps the manager in the loop through dashboards, notifications, collaborative spaces, and task updates — without pulling them into every conversation. They can review activity, comment when needed, approve when appropriate, and let the team continue.

This matters especially when the manager is traveling. At the airport, waiting to board, the manager opens the platform on a mobile device. Simulation has posted preliminary results. Manufacturing has confirmed that the change won't significantly affect tooling. A change approval is waiting.

The manager reviews the connected context, adds a comment, approves the next step, and keeps the team moving — before his flight leaves the gate.



Preparing an Executive Update That Actually Reflects Reality

Executives don't need technical details. They need to know whether the program is healthy, whether milestones can still be met, and what risks are on the horizon.

Without a connected platform, preparing that update is a research project — pulling from emails, spreadsheets, and meeting notes that may be days old. The result is often hedged, uncertain, and delivered with low confidence.

On the platform, the manager can review current project status, open changes, issue severity, design maturity, and upcoming milestones in minutes. The update is grounded in current, connected data.

"We found a vibration concern during validation. The affected component has been reviewed. A change is approved for validation. Simulation and manufacturing checks are in progress. There's a possible schedule risk, and the team has a recovery plan."

That's a credible, confident update — not because the manager has better instincts, but because the platform gives them better information.

Key Takeaways: Chapter 2

- The platform dashboard replaces the status-gathering hour at the start of a manager's day with immediate, current visibility.
- Team meetings shift from information-collecting to priority-setting when task ownership and progress are already visible.
- Design reviews produce traceable decision records, not just discussion notes.
- Urgent issues become managed processes because context — the right version, the right owners, the related tasks — is already connected.
- Managers stay informed through dashboards and notifications without attending every meeting or creating a bottleneck.
- Executive updates are confident and credible because they're grounded in real-time, connected data.

CHAPTER 3: THE EXECUTIVE — CONNECTING STRATEGY TO EXECUTION

What You'll Learn

This chapter shows how the **3D**EXPERIENCE platform provides executives with a clear, connected view of the entire business — so they can lead with confidence. You'll learn how role-based dashboards reveal the pulse of the business, how a single source of truth changes leadership decisions, and how the platform supports growth planning, governance, and risk visibility across every function.



The Executive's Real Day

A CEO's job isn't about running the spreadsheet. It's about reading the business and acting before the moment passes. Yet too many leaders spend their mornings reconciling conflicting reports instead of making the calls that move the company forward.

Consider Sarah, the CEO of a growing manufacturing company. Several hundred people work across engineering, manufacturing, quality, operations, sales, support, and supply chain. On most mornings, the first hour used to disappear into overnight reports that were already outdated. The **3D**EXPERIENCE platform changes how she leads — not by adding more data, but by connecting it.

7:00 AM: Reading the Pulse of the Business

Sarah opens a dashboard. In a few minutes, she sees sales opportunities, product development status, manufacturing performance, supplier issues, customer escalations, and launch milestones. The point isn't the volume of data. It's how everything connects.

A role-based dashboard filters the noise and surfaces what an executive actually needs to know: whether programs are healthy, whether milestones can still be met, and what risks sit on the horizon. This matters because the quality of a leader's first decision sets the tone for the day. When the picture is current and complete, you stop reacting to yesterday and start shaping tomorrow.

8:30 AM: Aligning Leadership Around One Truth

Leadership meetings often stall on the same problem. Sales has one number, operations has another, and engineering has a third. The first half of the meeting turns into a debate over whose data is right.

When every function works from a single source of truth, that debate disappears. Sarah's leadership team spends its time discussing the decision in front of them, not arguing about which version of reality to trust. The conversation shifts from "What does the data say?" to "What should we do about it?"

The implication is straightforward. Aligned data means faster alignment on action. A connected business platform doesn't just store information; it provides every leader with a trusted, shared view so the team can move as one.

10:00 AM: Evaluating Growth in Context

Growth decisions carry real consequences. Take on too much, and you strain the organization. Move too slowly, and you cede ground to competitors. The hard part is judging capacity before you commit.

On the platform, Sarah evaluates a new opportunity against engineering capacity, manufacturing readiness, supplier commitments, and customer schedules, all in one place. Growth stops being a guess and becomes a strategy. She can see whether the business can absorb the work, or whether saying yes today means missing a commitment next quarter.

Innovation follows the same logic. When Sarah weighs which programs deserve funding, she sees how each one aligns with strategy and where it stands in the pipeline. Ideas become projects. Projects become products. Products become revenue. The connected view keeps that chain visible from start to finish.



1:00 PM: Turning Disruption Into Manageable Risk

A key supplier signals a delay. In a disconnected organization, this triggers a scramble of phone calls and guesswork. The first question is usually the wrong one: "What happened?"

With a connected platform, Sarah asks a better question: "What does this affect?" She traces the delay through affected programs, customer commitments, and downstream milestones in real time. The disruption is still real, but it's now a managed risk rather than a crisis. She can weigh options, redirect resources, and communicate clearly because she can see the full impact at once.

That's the difference between reactive firefighting and proactive leadership. Visibility across the business turns surprises into decisions you can actually make.

2:30 PM: Governing Without Slowing Down

Executives carry responsibility for compliance, quality, and risk. The tension is familiar: too little governance invites missed approvals and quality escapes, while too much governance buries the team in process.

The platform keeps decisions traceable. Approvals are documented, changes are visible, and every significant decision leaves a traceable decision record. Sarah can demonstrate that the business runs with discipline without forcing her teams to fill out another form. This is how you balance agility and discipline, governing the work without standing in its way.

4:00 PM: Staying Connected on the Move

Leadership doesn't pause when you leave the building. Traveling to meet a customer, Sarah still reviews milestones, resolves an open issue, and approves a request from her phone. The same trusted information follows her wherever she works.

The advantage of the cloud is that it's secure and allows the business to access its data from anywhere. Vaison Sport, a motorsport design team, described this same advantage in its own work: "The advantage of the cloud is that it's secure and offers access to our files wherever we are in the world." For executives who spend real time on the road, that means decisions don't wait for your return.

5:30 PM: Looking Forward, Not Back

By the end of the day, Sarah has spent her time making decisions rather than seeking information. The platform didn't add any additional reports or meetings. It simply enabled her to make better decisions, execute faster, and gain greater confidence.

This is what changes for engineering and manufacturing teams, too. When leadership decides more quickly and clearly, the organization moves faster. The same connected environment that helped Migma Packtron cut design cycles by 30% and reach market 20% faster is the one Sarah uses to set direction. Strategy and execution finally align.

Key Takeaways: Chapter 3

- Role-based dashboards give executives a current, connected view of the whole business in minutes, not hours.
- A single source of truth ends data debates so leadership teams can align on action faster.
- Evaluating growth and innovation in context turns risky bets into informed strategy.
- A connected business platform reframes disruptions from "What happened?" to "What does this affect?" to make risk manageable.

- Traceable decision records support governance and compliance without slowing the team down.
- Cloud access keeps executives connected and decisive while traveling.
- Leadership decides with confidence, helping the entire organization build better products, faster.

CHAPTER 4: THE DESIGNER — BUILDING THE RIGHT VERSION, EVERY TIME

What You'll Learn

This chapter covers how the **3D**EXPERIENCE platform transforms the designer's workflow from version chaos, data anxiety, and collaboration barriers to a connected environment where design work is faster, more collaborative, and always grounded in the right data.

The File Problem That Never Goes Away

Ask any designer who has spent more than a few years in product development to describe their biggest frustration. Chances are, file management is near the top.

It starts early in a career. Projects live on individual workstations. Collaboration means walking to someone's desk with a USB drive, or sending a compressed file via email that bounces back because it's too large. One day, a hard drive fails. Years of work are gone, or the restoration process takes days and costs more than anyone wants to admit.

Network storage helps, but also introduces new problems. Without systematic organization, files get overwritten, accidentally deleted, or saved under names that don't clearly indicate their revision status. "Which version is this?" becomes a daily question, and the answer is never guaranteed.

This isn't a niche problem. Most studies indicate that about a third of product development teams have no formal collaboration solution — and those teams reported significantly lower satisfaction with their ability to secure data and gather feedback. The loss of productivity, the rework, the missed deadlines — they all trace back to the same fundamental failure: Data isn't managed, it's just stored.



What a Connected Design Environment Looks Like

On the **3D**EXPERIENCE platform, the designer opens a single dashboard. Active projects are visible. Real-time notifications show that a manufacturing engineer has commented on a tolerance, a quality specialist has approved a material spec, and a simulation analyst has completed a new FEA run.

The designer opens the model in SOLIDWORKS Design. The comments and feedback are there, attached to the geometry they reference. No separate email to search. No separate document to cross-reference. No uncertainty about which version the comments were made on.

One company described this transition frankly. Before the platform, file sharing via Google Drive™ and Pack and Go was "time-consuming and burdensome" and "prone to human error and counter to collaboration." After adopting the **3D**EXPERIENCE platform, they could fast-track collaboration by providing instant access to data uploaded by multiple users — without a top-level assembly organizer required to keep things synchronized. The team worked from multiple locations and stayed perfectly aligned.

The Single Source of Truth

The foundational value for the designer or engineer isn't any specific feature. It's the principle of a single source of truth.

There is one model. It's the authoritative version. Everyone with access sees the same thing. When it's updated, the update is visible to everyone. When comments are added, they stay attached to the model. When a revision is approved, the history is preserved and traceable.

This eliminates the anxiety that shadows every designer who has worked without it: Am I working on the right version? Will my changes be overwritten? Is manufacturing looking at what I sent last week or what I saved yesterday?

The Center for Advanced Design experienced this shift firsthand. Co-founder Marc McCauley described the result:

"The ability to take a product from concept through production all from within the same cloud-based environment is naturally more efficient." The company achieved a 60% reduction in design time and a 20% cut to product development time.

That kind of improvement doesn't come from faster CAD tools alone. It comes from removing the friction that slows every design decision when data isn't trusted.

Scalable From Day One

One of the hesitations designers and design managers face when considering a new platform is complexity. They assume that a more capable system requires more setup, more training, and more disruption.

The **3D**EXPERIENCE platform is built to scale with the team's needs. A company can start with cloud-native storage and core SOLIDWORKS CAD, then add formal revision management, serialized part numbering, simulation, and advanced collaboration capabilities as the team grows and the workflow demands it.

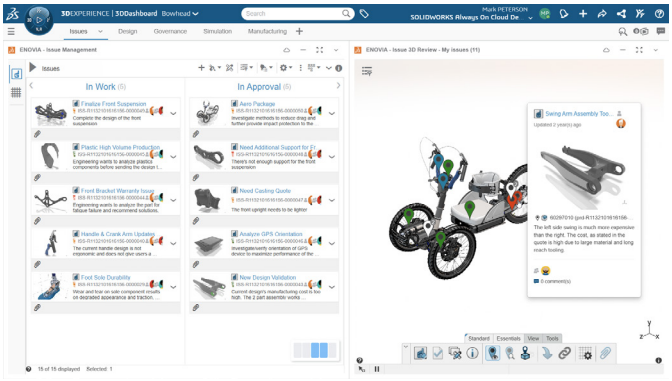
This isn't a theoretical promise. SmartFlyer, developing electric vertical takeoff and landing aircraft, uses the platform's cloud-based capabilities to coordinate distributed teams without heavy server investments. CEO Rolf Stuber described the outcome: "We don't have to worry about software updates, data mirroring, or data backups, but can fully focus on the development of the SmartFlyer."

For designers, that freedom is significant. Time spent managing infrastructure, chasing backups, or resolving version conflicts is time not spent on the product. The platform removes those distractions so the designer can focus on what they do best.

Collaboration Without the Friction

Design is collaborative by nature. A model isn't finished until it's been reviewed by simulation, manufacturing, quality, and sometimes, the customer. In a disconnected workflow, that review process is slow — emails go out, responses trickle in, and feedback isn't always clear about which feature or dimension it references.

On the platform, collaboration happens in context. Reviewers can mark up the 3D model directly, add comments tied to specific geometry and ask questions that the designer can see and respond to within the same environment. No translation required. No risk of feedback applying to last week's revision.



This kind of in-context collaboration also shortens the feedback cycle. Instead of waiting for a scheduled review meeting, feedback can flow as work progresses. Designers can address concerns earlier — before they become expensive to fix.

Vaison Sport uses the platform's cloud PLM services to enable multiple designers to work collaboratively on the same project simultaneously. Design lead Matthieu Parent described the core advantage: "For us, the advantage of the cloud is that it's secure and offers access to our files wherever we are in the world. We always have our files at hand."

The Mental Load of a Managed Environment

One problem that is harder to quantify but easy to recognize for any designer who has experienced it is the mental load of working without confidence in your data.

When you're not sure which version you're on, a small part of your focus is always on that uncertainty. When you know a hard drive failure could cost you a month of work, a small part of your attention is on managing risk. When feedback is scattered across emails, and you're not sure you've seen all of it, a small part of your energy is on tracking that down.

The platform removes that load. Data is secured automatically. The current version is always clear. Feedback is attached and visible. That freed-up mental bandwidth goes back to the design work itself — and better-focused designers build better products.

NanoEcho uses SOLIDWORKS and the **3D**EXPERIENCE platform to build quality medical devices faster. For that team, the platform's revision management doesn't just improve efficiency — it streamlines regulatory compliance while ensuring data integrity across teams. In an environment where documentation errors can have serious consequences, that assurance is essential.

Key Takeaways: Chapter 4

- File version chaos is a systemic industry problem, not an individual failure — and it's costing teams time, rework, and market position.
- A single source of truth means designers always work from the current, authoritative model — with no uncertainty about versions.
- Cloud-native storage removes the IT burden, so teams focus on design instead of infrastructure.
- In-context collaboration speeds feedback cycles and keeps review comments tied to the right geometry.
- The platform scales with the team — start with core CAD and add capabilities as needed.
- Removing the mental load of data management frees designers to focus on innovation.

CHAPTER 5: THE SIMULATION ENGINEER — WHERE PHYSICS MEETS PRODUCT REALITY

What You'll Learn

This chapter covers how the **3D**EXPERIENCE platform supports the simulation engineer's workflow — from study setup and cross-functional integration to the organizational rigor that separates useful simulation from work that looks convincing but misleads.



A Discipline Built on Judgment

Simulation engineering is one of the most judgment-intensive disciplines in product development. It isn't about running software. It's about asking the right questions, setting up models that represent physical reality, and knowing the difference between a result that means something and one that looks plausible but is fundamentally wrong.

The consequences of getting it wrong can be severe. In medical devices, in aerospace, in any application where a product failure affects people directly, simulation isn't a shortcut — it's a safeguard. Every boundary condition matters. Every material property needs validation. Every assumption needs to be documented and defensible.

That's the context in which the simulation engineer starts their day. And it's why the platform isn't just a workflow convenience for this role — it's part of what makes rigorous simulation achievable in the real pace of a product development program.

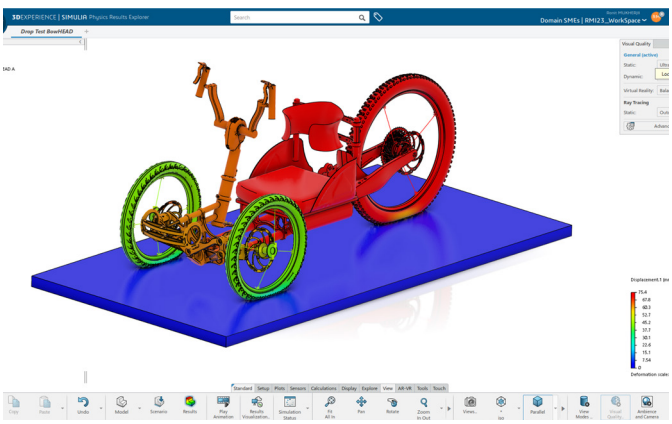
The Morning Dashboard: Knowing Where Everything Stands

The simulation engineer's day on the platform starts the same way the manager's does: with a dashboard.

But the view is different. Instead of project-level status, the simulation engineer sees active studies, customer engagements, technical requests from sales engineers or partners, content in progress, and incoming questions from teams that need help understanding how simulation fits into their validation workflow.

The platform provides immediate context without the information-gathering overhead. A sales engineer needs backup on a structural simulation pitch. A partner team is working through a nonlinear FEA problem. A medical device company needs guidance on simulation-based design validation. All of that is visible, connected and organized — not buried in an inbox.

Before platforms like this existed, that same morning would have started with fifteen emails, three different file locations, and genuine uncertainty about which version of any given model was current. The platform doesn't just organize the work — it changes how quickly the simulation engineer can respond and how effectively they can prioritize.



The Setup Is the Work

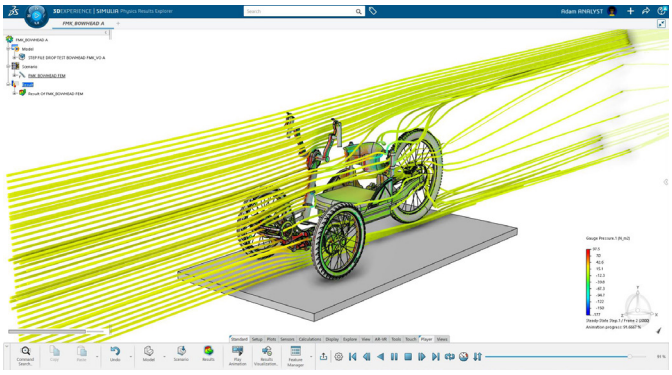
People outside the discipline sometimes picture simulation as entering some numbers and watching a colorful stress plot appear. The reality is that the setup is where almost all the intellectual work happens — and where almost all the failures occur.

A linear static analysis sounds simple. But every decision in the setup has consequences. How are real-world constraints represented mathematically? Which simplifications are valid and which will corrupt the results? What mesh density balances solve time against accuracy?

Too coarse a mesh and stress concentrations — the exact locations that tend to fail — don't show up. Too fine and the solve time is wasted on accuracy that wasn't needed. Every decision needs a reason, and a good simulation engineer knows that reason before they make it.

Nonlinear and dynamic analysis adds another layer. Contact between mating parts, large deformation in flexible components, and material behavior past yield are problems that require the engineer to manage the solver iteration process actively. Understanding when a solution is struggling to converge, knowing which solver settings to adjust, and recognizing when the model setup is the problem rather than the physics being genuinely complex — that's knowledge built over years of real problems.

CFD work brings its own demands. Flow simulations across electronics cooling, fluid delivery in medical devices, and aerodynamic studies in motorsport applications — each has specific setup requirements. What SOLIDWORKS Flow Simulation does well is keep the CAD geometry and the simulation environment tightly connected. When a designer changes a channel width, the simulation environment immediately reflects that change. There's no reimporting, no rebuilding mesh from scratch, and no redefining boundary conditions from the beginning.



With the SOLIDWORKS CFD Engineer role on the **3D**EXPERIENCE platform, that workflow improves further. The guided setup experience helps especially under deadline pressure. And cloud computing power removes the hardware constraint. The team isn't limited by what's under any single engineer's desk.

Organization Before Accuracy

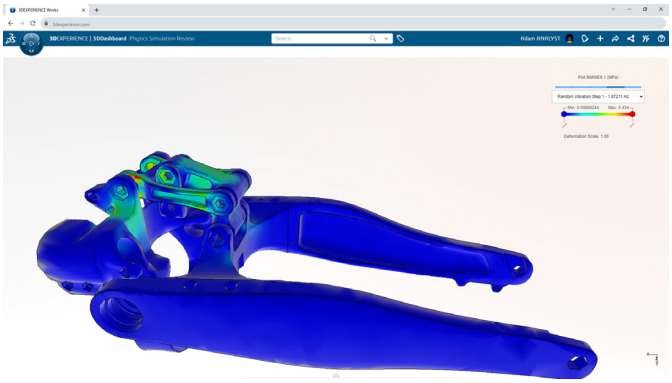
Here's what the job description doesn't say, but absolutely should: Before a single solver iteration runs, the simulation engineer has to be ruthlessly organized.

Are units consistent throughout the study? Do material properties come from a validated source, or did someone paste in a number from a datasheet without tracking its origin? Do the fixtures actually represent how the part lives in the real world, or were they over-constrained because it was easier? Is the load applied to the right face, the right direction, and the right magnitude? Has a mesh convergence study been run, or is the default mesh being used without verification?

These aren't edge cases. These are the questions that separate a simulation that means something from a simulation that looks convincing but quietly delivers wrong answers.

The platform supports this organizational discipline. Studies can be named, structured, and annotated so that six months later, or when someone else picks up the file, the intent is still clear. What was the load case? What was being validated? What was the conclusion and why?

A simulation study without a documented context is almost as dangerous as no simulation at all. The platform makes that documentation feel natural rather than an afterthought, because everything is tied to the same product structure and history.



When Simulation Results Reach the Right People

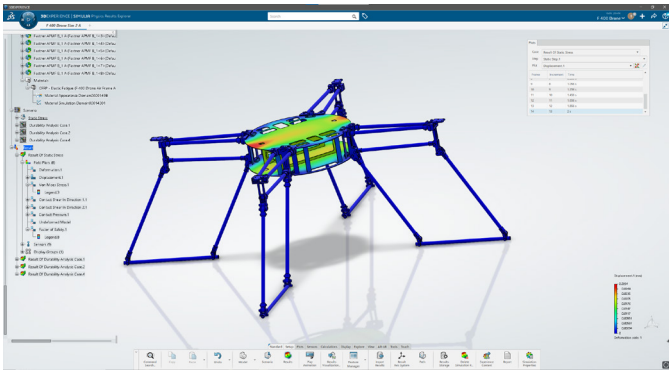
A simulation result that stays in the simulation engineer's folder hasn't delivered its value. The value only appears when the right person sees it at the right moment—the designer who needs to adjust a geometry, the manager who's about to approve a change, the quality team checking documentation.

In a disconnected environment, simulation results travel by email or shared drive. The designer may not see them until they've already moved on. The manager may be working from the summary in a meeting presentation rather than the actual result.

On the platform, simulation results are attached to the product structure. When a study completes, it's visible to the team — the designer, the manager, manufacturing, quality — in context.

The result is linked to the model revision it analyzed, the load case it addressed, and the design decision it was meant to inform.

This is what makes simulation a genuine part of the development process rather than a validation step that happens after decisions have already been made. And it's why the simulation engineer's work compounds in value when it runs through a connected platform.



Plastics, FEA, CFD: One Platform, Many Disciplines

A comprehensive simulation workflow doesn't end with structural analysis. Injection molding simulation, for example, is a discipline that can save enormous costs if it runs early enough in the design process. Analyzing how molten material fills a mold cavity, where weld lines form, whether sink marks will appear on a cosmetic surface, and whether the gate location sets up manufacturing for problems — all of this happens before a dollar is spent on tooling.

SOLIDWORKS Plastics, available as part of the platform workflow, brings this capability into the same connected environment as the rest of the design and simulation tools. The designer and the simulation engineer work from the same model. Results feed back into the design process. Manufacturing can see the simulation output before the mold is ever cut.

That kind of early, connected simulation is what changes the cost curve of product development. It catches problems when they're cheap to fix rather than after tooling has been committed.

Key Takeaways: Chapter 5

- Simulation is a judgment-intensive discipline where the setup determines whether results mean anything.
- The platform dashboard gives the simulation engineer immediate context across all active engagements without inbox-based overhead.
- SOLIDWORKS CAD integration means simulation environments pick up design changes directly, without reimporting or rebuilding.
- Cloud computing removes hardware constraints, making serious analysis accessible to teams of any size.

- Organizational discipline — documented load cases, validated material data, traceable studies — is what makes simulation defensible.
- Simulation results attached to the product structure reach the right people at the right moment, making simulation part of the decision process rather than a validation afterthought.

CHAPTER 6: THE ELECTRICAL ENGINEER — CLOSING THE ECAD-MCAD DIVIDE

What You'll Learn

This chapter explores how the **3D**EXPERIENCE platform addresses one of product development's most persistent structural gaps — the disconnect between electrical and mechanical design — and what better ECAD-MCAD collaboration means for the quality and speed of the end product.

Two Teams, One Product, Zero Connection



In most product development organizations, electrical and mechanical design happen in separate worlds.

Mechanical engineers build the enclosure, the structure and the moving parts. Electrical engineers design circuits, wiring and control systems. These two disciplines create a single product, but they typically work in separate tools, on separate timelines and in separate silos. Electrical designers are often not brought into the process until the mechanical design is nearly complete—at which point the wiring harness doesn't fit the enclosure, the duct ratios are wrong, and the wire lengths are off.

This isn't just inefficient, it's expensive. Rework at the integration stage costs far more than catching mismatches early. And the mismatches are almost inevitable when the two disciplines don't share a common environment.

Tech Clarity research puts this in sharp relief: Top-performing product development teams are 2.1 times more likely than others to rely on a single vendor for both electrical and mechanical design solutions. The data is clear — unified tools simplify collaboration and improve results. Yet many organizations persist with disconnected toolchains and sequential rather than concurrent design.

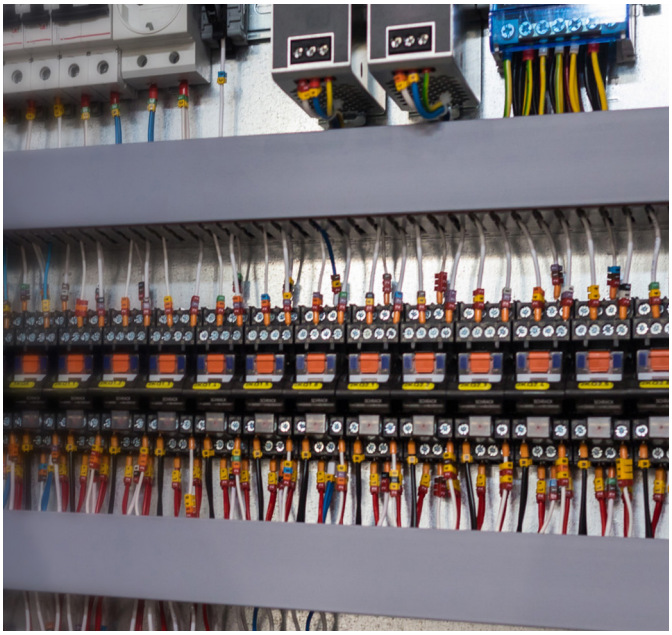
The Case for Concurrent ECAD-MCAD Design

The traditional argument for keeping electrical and mechanical design separate is specialization. Each discipline has its own tools, file formats, and workflow. Bringing them together, the reasoning goes, adds complexity.

But the cost of that separation is visible in every product development program where electrical and mechanical teams collide at the integration stage. Harness routing that doesn't fit the available space. Cable lengths that are too short or too long. Duct fill ratios that create airflow problems. Strain reliefs that are placed without awareness of mechanical load paths.

The **3D**EXPERIENCE platform connects SOLIDWORKS Electrical — the tool electrical designers use for schematic and harness design — with SOLIDWORKS Design and the CATIA® design suite used for mechanical geometry. Two-dimensional manufacturer data from SOLIDWORKS Electrical links directly to three-dimensional models. Electrical and mechanical teams work from the same connected product structure.

This means that when the mechanical geometry changes, the electrical engineer can see the impact on harness routing. When the electrical engineer adds a connector, the mechanical engineer sees it in the context of the enclosure. Decisions that previously happened in isolation and collided at integration now happen with awareness of each other's work.



Communication That Reaches Everyone

One of the underappreciated benefits of a connected platform is what it does for team communication — not just between electrical and mechanical, but across the entire organization.

Chat messages, emails, and phone calls are disconnected forms of communication. They reach the person they're sent to. They don't attach to the product, the revision, or the decision they reference. And they're invisible to anyone not included in the original message.

The **3D**EXPERIENCE platform provides conversations and communities that serve as a single source of truth for the entire team — including functions not typically involved in engineering, like manufacturing, logistics, and marketing. Important files, images, and notes can be shared in the same secure environment. Teams can ask questions, exchange ideas, and create surveys without leaving the platform.

This matters beyond communication efficiency. Tech Clarity research found that 84% of respondents who frequently exchanged design data found that frequency helped them avoid design conflicts. Less frequent data sharing led to more problems. Consistent, platform-based communication keeps teams aligned, breaks design silos, and reduces the rework that accumulates when electrical and mechanical teams discover conflicts late.

Component Lifecycle and Obsolescence Management

Electrical engineering involves a particular challenge that isn't as prominent in mechanical design: component obsolescence.

Electronic components go end-of-life. Manufacturers discontinue parts. Supply chains shift. A component that was specified in the original design may not be available when production ramps up — or may be discontinued mid-production life cycle.

Managing this traditionally means maintaining spreadsheets that track component status, end-of-life dates, and replacement alternatives. These spreadsheets are static, prone to version errors, and invisible to teams that aren't directly managing them. A designer might specify a component that's already been flagged for obsolescence simply because that information wasn't accessible in the design environment.

The **3D**EXPERIENCE platform addresses this with integrated lifecycle management tools. Every component has a tracked lifecycle — active, in revision, end-of-life, or obsolete. That information is accessible from within the design environment, so the electrical engineer designing a new board knows the status of every component they're considering before it's committed to a BOM.

When a component reaches end-of-life, the platform supports identifying and evaluating replacements across every project that uses that component — regardless of where those projects run. The right information reaches the right people at the right time.

What Better ECAD-MCAD Collaboration Produces

The benefits of closing the ECAD-MCAD divide aren't abstract. They show up in concrete outcomes:

Correct form, fit, and function. When electrical and mechanical design happen in a shared environment, connectors fit the enclosure, harnesses route through available space, and the integrated product works as intended.

Correct fill duct ratios. Airflow management in electronics-heavy products depends on accurate duct ratios. When harness geometry is visible to mechanical designers and enclosure geometry is visible to electrical designers, these ratios can be validated before manufacturing.

Accurate wire lengths. Wire lengths derived from 3D routing in the actual mechanical context are accurate. Wire lengths estimated from 2D schematics without mechanical context are not — and the difference shows up as waste in manufacturing.

Fewer integration surprises. Every electrical-mechanical design collision caught during concurrent design is one that isn't discovered during prototyping or, worse, production.

Key Takeaways: Chapter 6

- Electrical and mechanical design typically happen in separate silos — and the integration failures that result are expensive and predictable.
- Top-performing teams are 2.1 times more likely to use a single vendor for both electrical and mechanical design.
- The platform links SOLIDWORKS Electrical 2D schematic data directly to SOLIDWORKS Design and CATIA 3D models.
- Platform-based communication reaches the entire team — not just the direct recipients of an email — and frequent data exchange reduces design conflicts.
- Component lifecycle management in the platform gives electrical engineers visibility into obsolescence status from within their design environment.
- Concurrent ECAD-MCAD design produces more accurate harnesses, better duct ratios, correct wire lengths and far fewer integration surprises.



CHAPTER 7: THE MACHINIST—WHEN THE SHOP FLOOR CONNECTS TO ENGINEERING

What You'll Learn

This chapter examines how the **3D**EXPERIENCE platform bridges the gap between engineering and the machine shop — reducing delays, eliminating version confusion, and giving machinists the tools to communicate directly with engineers in context.



Thirty Years at the End of the Line

Manufacturing has transformed dramatically over the past three decades. The machines are more precise, the software is more capable, and the go-to-market timeline has compressed significantly.

But one problem has remained stubbornly constant: the handoff from engineering to the shop floor.

A machinist who started as an apprentice in 1994 and has worked at the intersection of engineering and manufacturing for nearly 30 years will tell you: Despite all the advances in engineering software, the fundamental challenge of communicating between engineering and the machine shop hasn't changed much. When there are hiccups in the process, the shop always absorbs the delay. The timeline at the end of the cycle is the one that gets compressed.

Tech Clarity research confirms this isn't unique to any one organization. Engineering-to-manufacturing handoffs are cited by 60% of product development teams as a significant bottleneck. And 65% of teams point to miscommunication between design and manufacturing as a leading source of delays.

The Daily Reality of a Disconnected Handoff

It's rare for a machinist to receive a part from engineering and have no follow-up questions.

Inside corners are a straightforward example. Milling a pocket always produces radii in the corners. If an engineer needs sharp corners, it can be done — but it requires different equipment, adds cost, and adds time. If the engineer doesn't know that, and the machinist doesn't have a quick way to flag it, the part either gets made wrong or the machinist leaves the floor to find the engineer, hope they're available, and walk through the part feature by feature.

Tolerances are another example. Modern CAD software makes it easy to specify dimensions to four or five decimal places. Machining to that tolerance is time-consuming and expensive. But without a direct line between the machinist and the engineer, the machinist either produces the part to spec and accepts the cost, or starts a lengthy back-and-forth to establish what tolerance actually matters.

In a disconnected environment, that back-and-forth means walking across a building, taking notes by hand, and returning to the shop — hoping nothing was missed and the engineer doesn't update the model before the machinist starts cutting.



Markup in Context: Talking to Engineering Without Leaving the Shop

The **3D**EXPERIENCE platform's Share and Markup capabilities change this dynamic entirely.

A machinist can mark up the actual engineering model in 3D — not a screenshot, not a PDF, not a printout, but the live model — with specific questions tied to specific features. The engineer sees those questions in context. When changes are made, they're reflected in the same model the machinist is working from.

This matters because it eliminates the communication errors that come from describing geometric features in words. "The inside corner on the lower pocket" means something different to the engineer than it does to the machinist if neither of them is looking at the same model at the same time. When the markup is attached to the geometry itself, the meaning is unambiguous.

It also means the machinist doesn't have to leave the shop to get answers. More time on the machine. Fewer interruptions to the production flow. And fewer misunderstandings that lead to a part being made to the wrong spec.

One Source of Truth in the Machine Shop

Version management is a persistent challenge for machinists. In a traditional workflow, the shop computer might have several versions of the same part saved at different points in the design process. When it's time to machine, the question is always: Which version is current?

Getting this wrong is costly. A part machined from a superseded model wastes material, machine time, and the machinist's time. Depending on the part, it can also have quality and safety implications.

On the **3D**EXPERIENCE platform, there is one model. It's the authoritative version. All notes, comments, revision history, and manufacturing context are attached to that file. Even the G-code generated for CNC machining attaches to the manufacturing record, ensuring the machinist always machines from the latest version.

This single source of truth removes a variable that has caused unnecessary stress and rework for machinists throughout the industry.

Key Takeaways: Chapter 7

- Engineering-to-manufacturing handoffs are a top bottleneck, affecting 60% of teams and driving delays, errors, and rework.
- Sixty-five percent of teams cite design-to-manufacturing miscommunication as a leading source of delays.
- The platform's 3D Share and Markup capability lets machinists annotate the live engineering model, tying questions directly to specific features.
- Machinists get answers without leaving the shop which means more time on the machine, fewer miscommunications.
- A single source of truth eliminates version confusion, so the machinist always works from the current model.
- G-code attaches directly to the CNC file, ensuring the latest validated version is always what gets machined.
- With less rework and less stress, machinists can trust the part coming off the machine is correct the first time.

CONCLUSION: ONE SOURCE OF TRUTH, EVERY ROLE, EVERY DAY

Product development has never been about a single person or a single tool. It's about a team of specialists — managers, designers, simulation engineers, electrical engineers, and machinists — working toward one goal: a better product, delivered faster. The challenge has always been the friction between them. Disconnected tools, scattered files, and slow handoffs don't just waste time. They cost market position.

The **3D**EXPERIENCE platform closes the gaps that hold teams back. It replaces version chaos with a single source of truth. It turns slow, error-prone handoffs into connected workflows. It gives every role the visibility, context, and confidence to do their best work, because everyone sees the same current data, at the same moment, in the same place.

What Connected Product Development Delivers

The proof shows up in the numbers and in the daily experience of the people doing the work:

- **Managers** lead with real-time visibility instead of stale status reports, turning urgent issues into managed processes.
- **Designers** build the right version every time, freed from the mental load of data management.
- **Simulation engineers** deliver results that reach the right people at the right moment, making analysis part of the decision instead of an afterthought.
- **Electrical engineers** close the ECAD-MCAD divide, catching integration problems before they become expensive surprises.
- **Machinists** mark up the live model and trust that every part comes off the machine correctly the first time.

Each role works better because the platform connects them. And when every role works better together, products reach the market faster — with fewer errors, less rework, and more room for the innovation that sets your company apart.



The Cost of Standing Still

The product development field keeps moving. Cloud computing, AI-assisted design, and global supply chains are raising expectations for speed and quality. Teams built on disconnected, file-based systems will keep absorbing the cost of friction: late products, missed windows, and rework that erodes margins. Teams built on a connected platform will move faster because the foundation supports them rather than fighting them.

The choice isn't whether your industry will change. It's whether your tools will keep pace. A connected environment isn't a luxury for the future. It's the practical foundation for competing today and leading tomorrow.

Take the Next Step With SOLIDWORKS and the 3DEXPERIENCE Platform

You've seen how the platform transforms the work of every role in product development. Now it's time to see what it can do for your team.

- **Explore the platform.** Visit SOLIDWORKS.com to discover how SOLIDWORKS and the **3D**EXPERIENCE platform connect your design, simulation, electrical, and manufacturing workflows in one environment.
- **Request a demo.** See the platform in action with your own workflows in mind. Talk to a SOLIDWORKS expert who can map the platform to your team's real challenges.
- **Start where you are.** You don't have to change everything at once. Begin with core CAD and cloud storage, then add capabilities as your team grows.

The teams already working on the **3D**EXPERIENCE platform aren't waiting for the future of product development. They're building it — faster, together, and with confidence. Your team can too.

Connect your people, your data, and your decisions. Build better products, faster. Get started with SOLIDWORKS and the 3DEXPERIENCE **platform today.**

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