

THE PLM DEPLOYMENT HANDBOOK: PLANNING AND DRIVING DIGITAL TRANSFORMATION

LIFECYCLE  INSIGHTS



EXECUTIVE OVERVIEW



Products are *more* complex. Suppliers are *more* globally distributed. Disruptive competitors *continue* to emerge. None of these issues are new, but each is a source of significant chaos for companies. These issues have run rampant for years, and will likely continue to do so for the foreseeable future.

Companies, however, aren't reacting as they have in the past. Their efforts to change are coalescing around a single, overriding super-initiative: Digital Transformation. It spans many other sub-initiatives that are smaller in scale and scope. Yet, there are overarching themes: define and manage a single definition of the product, execute and automate digital processes.

Product Lifecycle Management (PLM) is a crucial enabler for Digital Transformation initiatives. PLM powers the complete, digital definition of a product across engineering domains and functional departments. It drives and automates digital processes within and across companies. It is a fundamental building block to Digital Transformation.

This report explains how to plan and deploy PLM in support of a Digital Transformation effort in the following sections.



Aligning and Planning addresses how to build alignment across the company for Digital Transformation initiatives and PLM adoption.



This report guides executives on how to deploy PLM in support of Digital Transformation initiatives.



Deploying and Evangelizing addresses scoping, planning, and implementing the first stage of the initiative, making users successful, and capturing the deployment to share with the rest of the company.



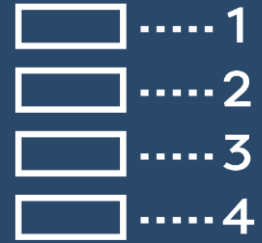
Expanding and Supporting explains how to grow the initiative beyond the first deployment, maintaining alignment across the company and sponsoring executives, integrating with other functional systems, and supporting ongoing success with users.



Summary and Recommendations recounts the significant takeaways from this report and recommends how organizations should move forward with Digital Transformation and PLM deployment.

Digital Transformation represents a promising new approach to quell the chaos companies face in product development today. This report shows how to do it with PLM.

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ALIGNMENT AND PLANNING



Digital Transformation initiatives take many forms. They can manifest as defining and managing a complete digital product definition as the Digital Thread. They can involve communicating sensor data from remote assets to the Internet of Things (IoT) as part of a product-as-a-service strategy. They can entail delivery of digital work instructions through Augmented Reality mediums as part of the next generation of manufacturing or service. In each of these cases, PLM systems play a crucial role and enable the definition, management, tracking, and communication of vital product information.

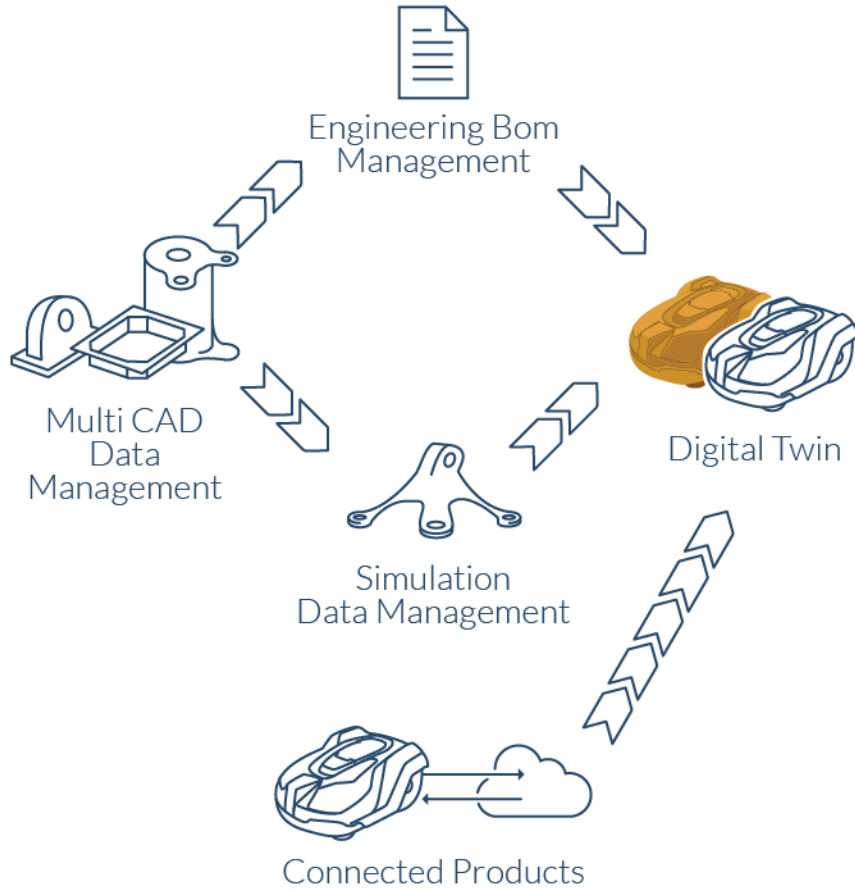
One of the most critical steps of a Digital Transformation initiative occurs long before the installation of any software. During this phase, product development executives gather stakeholders from across the company to drive alignment behind the effort.



This section details activities before any software installation or training. It focuses on building alignment amongst initiative stakeholders.

DEFINE A LONG-TERM VISION

Executive leaders must paint a long-term vision of how the organization will run after deploying a PLM system to support a Digital Transformation initiative. Traditionally, organizations approach such an effort without sufficiently preparing their user base. Some send invitations to attend training on the new software but fail to explain how the change would advance the organization's long-term vision and specific goals.



Few will expect a wholesale transformation of product development overnight. Everyone, however, will want to understand the end state of such an effort.

Figure 1: Define a long-term vision for Digital Transformation that realized through several smaller, intermediate steps.

If users don't understand big-picture benefits or why change is occurring, they have no vested interest in doing the heavy lifting that accompanies transformation. Also, most of the change management work comes on top of their regular responsibilities. Without a clear picture of how the PLM system advances the company's position, users may not put in extra work while they come up to speed.

To get the user base over this hump, the implementation team and stakeholder group must share their vision at a company meeting. Once they clearly articulate the plan—for example, "We are embracing Digital Transformation and PLM to shorten development cycles and to release this innovation to market before competitors"—

management must reinforce the mandate through continuous communications to the enterprise, both electronically and live.

DRIVE INITIAL BUY-IN

As with most enterprise software implementations, a PLM deployment in support of Digital Transformation requires the involvement of many stakeholders and owners. Each has a role and set of responsibilities, which means their interests are not only different but often at odds.



This PLM initiative owner is responsible for deploying a PLM solution in support of a broader strategy. Their focus isn't just the technology. It is about realizing value from the overall initiative.



Responsible for advancing the initiative to realize long-term vision.

Objective is to realize tangible value from the initiative.

Initiative Owner



Accountable for the ongoing operation of a functional department.

Objective is to run the functional department within given constraints.

Functional Owner



Duties include the fiscally responsible spend of budgets and cash flow management.

Goal is to measure the Return-on-Investment (ROI) of any initiative or technology investment against objective criteria.

Economic Owner



Responsible for ensuring all approved IT solutions are secure, functional, and compliant.

Duties include the roll-out of the PLM system and all the related technical challenges.

Technical Owner

Figure 2: Different owners participating in Digital Transformation initiatives have different interests.

It is no easy task to align various constituencies behind a Digital Transformation effort. It requires building a coalition of owners to help navigate the changes necessary to deploy PLM effectively. Simultaneously, they must evolve the program, so it stays relevant for the

business. Here is a look at the different constituencies that are crucial to building an effective PLM coalition.

The Initiative Owner's Interests

- Assigned responsibility for the initiative by the sponsoring executive, covering technological, organizational, and cultural issues.
- Objective is to realize the value from the initiative as envisioned by the sponsoring executive.
- Comes from a background of successfully executing projects and, potentially, driving other transformational efforts for one or more executives.
- Views PLM not as a singular technology investment but rather as a transformative technology and change management program that ensures the company meets distinct goals.
- Reputation rides on the success or failure of the initiative and PLM.
- Engage by providing business objectives that are clearly defined and transparent to the entire organization.



The functional owner is responsible for ensuring that their department fulfills their responsibility. They are often suspicious of new initiatives because, done wrong, it can be disruptive and undermine productivity. These leaders have deadlines to meet despite the deployment of the new initiative.

The Functional Owner's Interests

- Accountable for the ongoing operation of a functional department or business unit such as engineering or service and support
- Objective is to run the functional department within the constraints given by managing executives. For example, engineering must develop designs that satisfy requirements within a given schedule. Service must keep first-time resolution rates for service calls above a specific percentage.
- Interests are not in PLM as a software solution but rather in the operational improvements it offers. Sometimes sees transformational changes and PLM as a disruptive risk to the operation of their functional department.

- Can be won over by delivering demonstrable proof points of PLM's value for targeted business cases central to their charter. These owners can quickly transform from PLM skeptics to formidable proponents who help establish global support for the program.
- Identify relevant, high-value use cases that can serve as early pilot projects and deliver tangible benefits.

The Economic Owner's Interests

- Duties include the fiscally responsible spend of budgets and management of cash flow.
- Goal is to measure the Return-on-Investment (ROI) of any initiative or technology investment against objective criteria, offering guidance to product development executives.
- Best way to engage is to clearly and precisely define the ROI of the initiative, preferably in hard costs, in stages corresponding to immediate, first year, and multi-year goals.



The economic owner is responsible for ensuring that any organizational monetary investment provides a financial return within a given timeframe. These leaders often are not interested in productivity gains or other soft benefits. Every investment must yield a hard-monetary return.

The Technical Owner's Interests

- Responsible for ensuring all approved IT solutions are secure, functional, and compliant with data governance and compliance requirements.
- Duties also include PLM system roll-out and all the related technical challenges, most notably security and integration.
- Desires standardization, consolidation, and minimization of the number of IT systems and applications deployed within the company.

PREPARE FOR TOUGH DECISIONS

Many agree to a process change when things are running smoothly, but what happens when the changes seem too cumbersome or lead to steps detrimental to productivity?

One way or another, conflicts arise at some stage of a Digital Transformation initiative. Whether it's mediating the outcome of proposed process changes, figuring out what to do when a project runs late, or settling on how to manage governance, all constituencies need a forum through which they negotiate. A clear path to resolving conflicts between owners prepares executive leadership for tough choices when that day arrives.



The technical owner is responsible for Information Technology solutions within the company or functional department. Their concerns lie in disrupting existing IT ecosystems, securely protecting intellectual property, and more. They can be cautious of PLM initiatives because it introduces another software solution into the ecosystem. These leaders often are trying to reduce the number of software solutions used by the company, not increase them.

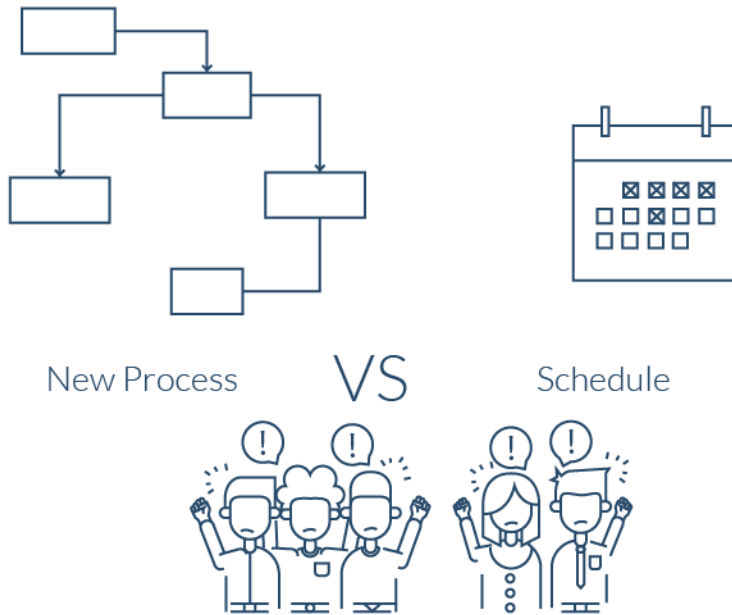


Figure 3: Define a means to resolve conflict between the interests of the initiative and those of other owners.

As part of this preparation, it is essential to talk through hypothetical scenarios where conflict arises and to define how to resolve the issue. One of the best ways to facilitate discussion is through cross-functional committees or the PLM project steering team. Stakeholders who represent all constituencies provide input on the process, using the parameters of the forum to ensure discourse stays positive and to keep things moving forward. Once they agree upon routes to resolution for the different scenarios, the cross-functional committees can update everyone on potential outcomes, so there is transparency every step of the way.

DEPLOYING AND EVANGELIZING



A Digital Transformation initiative and the deployment of its PLM system can start almost anywhere within a company. Regardless of where it starts, PLM deployments must share several critical characteristics.

PLAN THE DEPLOYMENT

The first deployment of a Digital Transformation is critical. It represents the initial step towards achieving the executives' long-term vision. It sets the tone of pursuing and achieving tangible value to a range of stakeholders. Scoping this initial effort sets the stage for success or failure. Adhere to the following guidelines to achieve success.

- Target something valuable. The beginning effort should solve some real, tangible problem acknowledged by the Functional Owner.
- Scope the initial project tightly. Identify the minimum deployment that solves the problem. It is tempting to expand the scope of such efforts but maintain discipline. Keep it as tight as possible.
- Focus on achieving specific objectives. There will be surprises along the way, but the guide should be fulfilling the initial goals that solve the problem acknowledged by the Functional Owner. Follow that guide through to completion.
- Measure success with metrics. Plan which measures to track for ROI calculations with the Financial Owner.



This section describes how to deploy the first stage of the initiative, capture success, and share it with the rest of the company.

- Finish with an IT compliant deployment. When completed, the PLM deployment must meet all security, integration, and other requirements of the Technical Owner.

Engineering is a target-rich environment and logical origin for Digital Transformation initiatives. The following are specific examples of fictional organizations that provide insight into the correct scope, focus, and metrics of initial efforts. Note that this is not a comprehensive list.

- Multi-CAD Data Management: Migrate the management of models and drawings of three different Mechanical Computer-Aided Design (CAD) systems from desktops to a PLM system for a team of five engineers. Executives measure success through the reduction in the engineer's time spent manually managing design configurations and the increase in the number of design iterations explored.
- Tooling Design BOM Configuration Management: Manage the engineering configurations of BOMs for a team of seven tooling design engineers in a PLM system instead of using spreadsheets. Executives measure success through the reduction in manufacturing scrap and rework due to BOM errors.
- Variable Change Management Process: Deploy a change management process with multiple tracks of varying length meant to manage requests of differing complexity in a small business unit. Executives measure success is measured by reducing the time to resolve customer change requests by twenty-five percent and the average cost to execute a change order.

Each of these examples targets a specific problem, is tightly scoped, and has measures for success. All first deployments of PLM should mirror these traits.



Taking on too broad initiative increases the risk of failure. Start with a targeted small-scale effort and stick to the original scope. Follow that up with a second similarly sized effort. Incremental small-scaled steps lead towards the long-term vision.

ENABLE USERS

The success or failure of a Digital Transformation initiative and PLM rests upon the ability to get users behind the effort. Without their execution of process changes, organizations have little chance of realizing promised benefits or hitting critical business metrics. Initiative owners must take the following issues into account as they deploy PLM.



Figure 4: Enable users with these five support mechanisms.

A critical aspect to success is user training. Initiative owners must arm employees with the knowledge and skills they need to leverage PLM in their roles successfully. In most organizations, this occurs via a one-size-fits-all approach to training, which is ill-suited to efficient technology education. Because different roles use technology differently, instruction should be flexible enough to fit different use cases. Management should offer PLM training in multiple formats so users can opt for the method that best suits their learning style. This approach relies on a flexible set of materials delivered through a variety of mediums. Users can draw the right learning components from a library of training content tuned for their specific role and how they employ PLM in their job. In this approach, every role gets the most efficient training for their position through the most effective medium.



Users must not just know how to use a PLM solution. They must know how to use the technology in the context of their job. Users rarely gain such knowledge in one training class. It is an ongoing effort that requires reinforcement once the user returns to their daily tasks.

Achieving initiative success is dependent on a second important factor: supporting users' technical needs. To ensure there is no gap in applying PLM to daily tasks, organizations need to plan for continued support for the technology changes. With deadlines looming, employees can become impatient with new technology. One approach is to embed designated experts within the team to support and resolve questions about the initiative and the PLM system. Another approach is to rely on the PLM provider's technical support service. Such assistance points out how to use the solution properly. It also develops workarounds when users encounter technical problems. These two approaches work well in tandem. Embedded experts leverage technical support as extended resources to resolve user problems quickly and completely.

A third important aspect of success involves internal communication with users. Initiative Owners must communicate about the vision and benefits of technology changes throughout this phase of the program's lifecycle. Will PLM enable engineers to spend more time designing products instead of attending meetings? Will project managers encounter fewer fire drills? Can engineering organizations count on lower turnover? By reinforcing the key themes, employees are more likely to work through short-term difficulties knowing there will be long-term gains.



Many leaders in the company will be hesitant to sign up for an initiative. Such efforts are disruptive when done wrong. Start the initiative small, ensure its success, document the result, and communicate it broadly. This approach proves that deployments can provide value, addressing the concerns and objections of many owners.

CAPTURE AND SHARE SUCCESS

Successfully deploying the first stage of a Digital Transformation and PLM deployment is crucial. Communicating such a triumph is key to driving further alignment and expansion of the initiative. The best way to expand alignment for a Digital Transformation initiative and a PLM system is to showcase small, progressive, and continuous successes. Employ the following steps to capture and advocate an initial success.

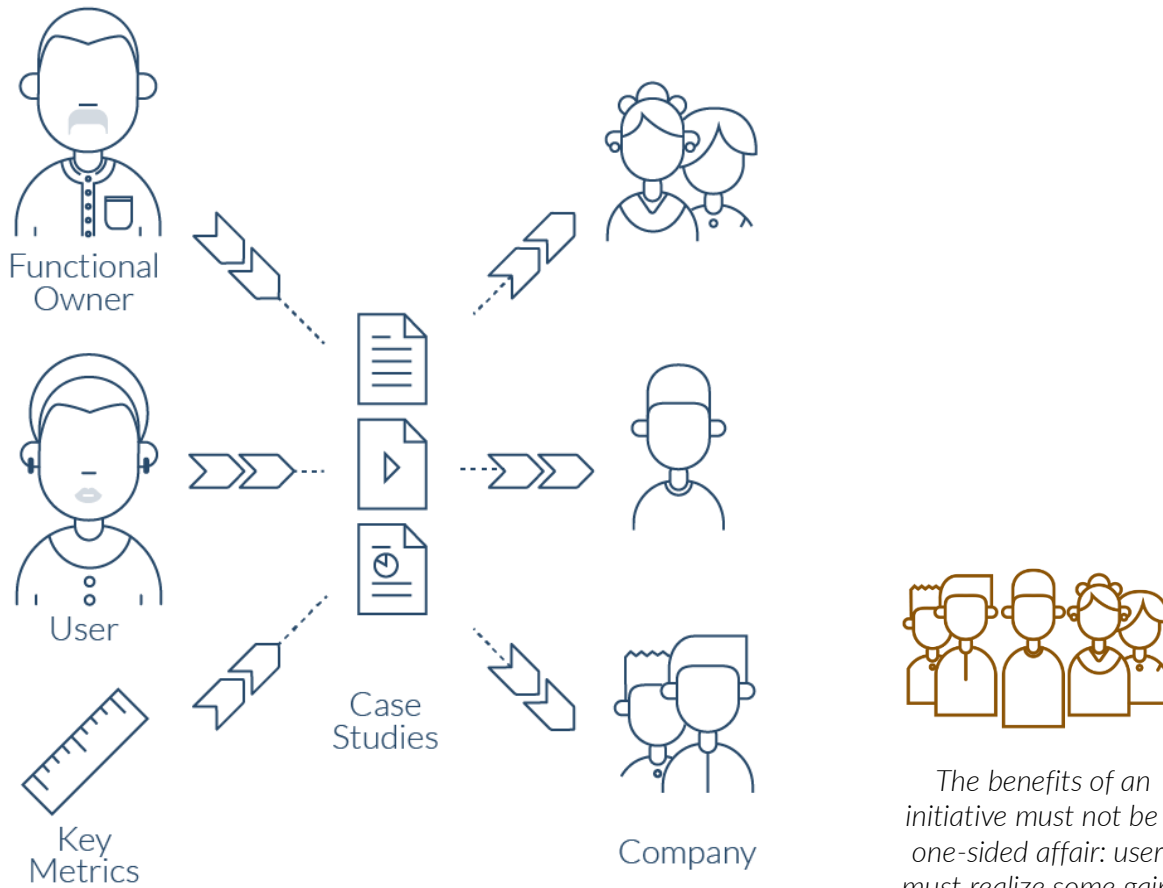


Figure 5: Document initiative successes and share them with the rest of the company.

The benefits of an initiative must not be a one-sided affair: users must realize some gains as well. Clearly communicate such benefits to users early and continuously throughout the deployment of the initiative.

- Capture the Functional Owner's viewpoint. Others must hear how they balanced getting up to speed on the initiative with ongoing deadlines and workloads.
- Capture the user's opinion. Others must understand how they navigated the new processes, training, and technologies as part of the change.
- Capture key, relevant improvements for the organization and the users. Functional Owners are interested in measurable gains for the department. Users are interested in the elimination of non-value added work and increased productivity.

- Document it in consumable forms. Publish these case studies in varying combinations of interviews, quotes, commentary, photos, diagrams, videos, and any other media. Different people consume information differently.

Once the initiative owner documents success, share the story with the rest of the organization. Employ a variety of communications tactics to push the case study out further to the ranks and attract the attention of larger groups. Mediums for the case studies can range from in-person Ted Talk-style presentations to email QA cases stories.

Note that each of these case studies can serve as a tool to drive alignment with another group. Over time, and with more success stories, the Digital Transformation initiative and PLM system will gain traction. Different Functional Owners will eventually seek out the technology as a potential fix for their own department's problems.



There will be a learning curve for any new process and technology associated with an initiative. When a department is pressured by a deadline, the leaders involved must already have a plan in place to determine if the change is temporarily set aside or the deadline is missed. Agreement on the course of action ahead of time is critical.

EXPANDING AND SUPPORTING



With an initial success complete, companies pursuing a Digital Transformation initiative can make progress towards that long-term vision through small, achievable projects. This expansion of PLM adoption requires movement into many different functional departments.

TAILOR BENEFITS

Deploying a Digital Transformation initiative and the process and technology change that comes with it can result in cultural pushback. Some see changes as disruptive to their day-to-day work. The goal is to switch this from a 'push' style of deployment to a 'pull' one where constituents seek out the change. Follow the pattern used for the initial implementation and repeat it with each new one.

- Plan the Deployment
- Enable Users
- Capture and Share Success

The key to expanding the initiative into new areas is tailoring benefits to Functional Owners and users. In each case, the measures for success change. Each Functional Owner has a different operational metric for their department. Each user runs different processes with diverse sets of skills and different goals. Customize each expansion effort accordingly.



This section focuses on how to expand the initiative beyond the first deployment.

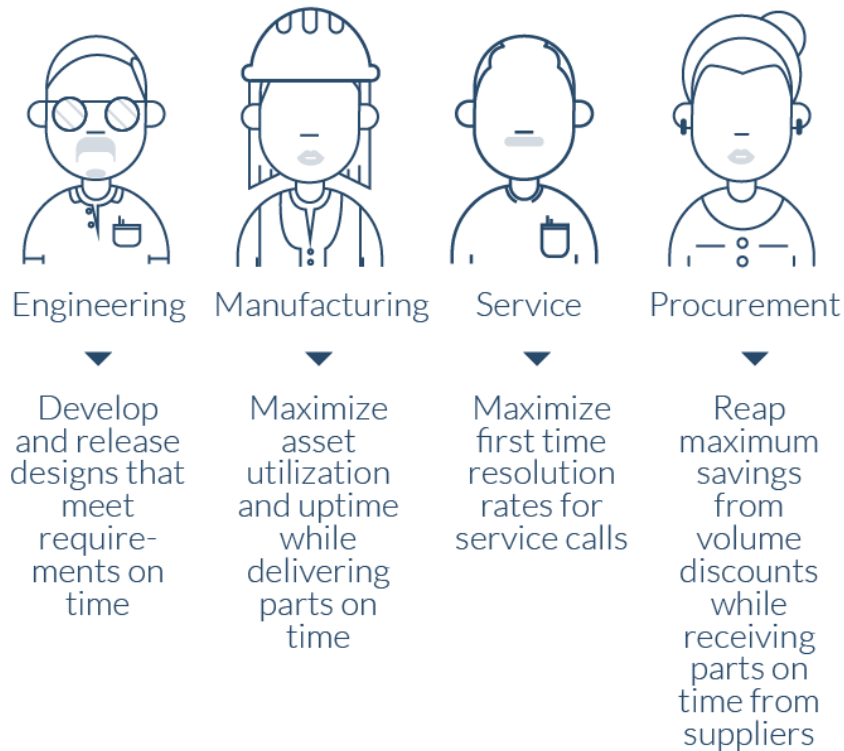


Figure 6: The functional owners of different departments will have different objectives. Tailor the goals of the initiative to match.



Deploying the initiative into different functional departments is not a one-size-fits-all endeavor. Each department wants to realize distinct benefits. The incremental deployment of the initiative to these departments must be tailored to achieve that goal.

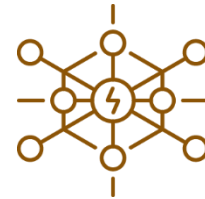
EVANGELIZE SUCCESS, MAINTAIN ALIGNMENT

Product development is a busy, hectic line of work. The long-term vision and progress of the initiative become jumbled in the minds of everyone, from the engineer the c-suite executives over time. As a result, it is essential to provide visibility into the initiative's progress. Share reminders of past successes and recent wins in case studies. The structure of these case studies should mirror that of the initial deployment. Incorporate the following.

- Capture the Functional Owner's viewpoint.
- Capture the user's opinion.
- Capture key, relevant improvements for the organization and the users.
- Document case studies in consumable forms.

Broadcasting progress towards the long-term vision is key to driving alignment across the company. However, it is equally important to maintain alignment with sponsor executives. Provide updates on progress on predefined schedules keeping the following top of mind.

- Share headway towards the realization of the long-term vision.
- Show a roadmap of the initiative's expansion into specific application in different functional departments.
- Present dashboards summarizing each deployment using the same layout. Note that the metrics, scope, and objectives will be different.
- Focus on organizational metrics, good or bad.
- Continue discussions around tough decisions, finding the right balance between initiative advancement and productivity of functional departments.



Digital Transformation initiatives require information from multiple enterprise systems. Deploy loosely coupled integrations or provide access through simple tools.

INTEGRATE FUNCTIONAL SYSTEMS

PLM is a crucial enabler for Digital Transformation initiatives. Yet, it is not the only enabler. The execution of development processes requires information from many different enterprise systems, ranging from Enterprise Resource and Planning (ERP), Supply Chain Management (SCM), Service Lifecycle Management (SLM), and an array of internal custom databases and spreadsheets.

Integration between these enterprise systems is a natural step in any Digital Transformation initiative. It reconciles conflicting data in different enterprise systems. It allows users to access a single system instead of many. All this information is critical to running product development quickly and accurately.

Initiative Owners must work with Technical Owners on such integrations. Each should keep the following in mind as they plan, build, and maintain integrations between enterprise systems.

- Identify the source of truth for each piece of data. Acknowledge the system housing that data as the system of record.
- Determine which other enterprise systems require that data. Minimize this to avoid unnecessary complexity. Consider tools that provide simple and easy access to this data.
- Employ light and simple integrations to share data between enterprise systems as necessary.

Integration needs will change over time. Revisit and revise these integrations during each initiative expansion.

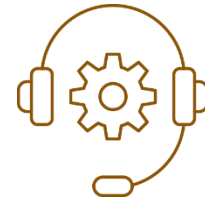
SUPPORT ONGOING USE

Deploying a Digital Transformation initiative requires short-term effort to help Functional Owners and users navigate process changes, skill upgrades, and use of new systems. However, there are long-term needs for ongoing support.

Development processes rarely remain the same. Over time, they evolve and shift, reacting to new pressures inside and outside an organization. As such, users need ongoing training as they expand their use of the PLM system. The templated one-size-fits-all approach is a poor fit here, given the small process adjustments over time. Instead, a progressive training approach is a better fit.

A progressive training approach relies on a flexible set of materials delivered through a variety of mediums. Users can draw the right learning components from a library of training content tuned for their specific role and how they employ PLM in their job. In this way, every individual involved in the adoption of PLM gets the most efficient training for their specific function through the most effective medium. No time is wasted, and retention is maximized.

Additionally, many PLM platforms know what functionality an employee is using, which provides the



No software solution is perfect. The key to success is addressing software flaws as soon as possible through workarounds or a fix. Resolving such issues is critical to continued alignment with the PLM initiative.

context to enable self-service delivery of relevant training content. It also takes the onus off the employee to track down necessary materials. Another good tactic is to supplement online electronic content with personal assistance from a mentor as part of a multi-faceted technical support program. Many companies also create forums where peers can share best practices and lessons learned from their PLM experiences.

SUMMARY AND RECOMMENDATIONS



Numerous disruptive issues continue to plague product development. Companies, though, are taking new action in response, adopting a single, overriding super-initiative: Digital Transformation. PLM is a crucial enabler to such efforts, powering the creation of a complete, digital definition of a product, and automating digital processes within and across companies. This report explains how to plan and deploy PLM in support of a Digital Transformation. The following is a summary of the report's takeaways and recommendations.

- Define a long-term vision for your company's Digital Transformation initiative and how PLM supports it. Share it in a company meeting to articulate the plan and objectives.
- A variety of stakeholders are involved in any Digital Transformation and PLM deployment, including Initiative Owners, Functional Owners, Economic Owners, and Technical Owners. Engage each based on their interests.
- At some point during the deployment, conflict will arise between the initiative's new policies, such as following a stringent new process, and the ongoing operation of functional departments, such as meeting deadlines. Talk through hypothetical scenarios and agree upon routes for resolution beforehand.
- Plan the deployment of the initiative's first stage based on the following guidelines: target something valuable, scope the initial project tightly, focus on achieving specific objectives, measure



The technical capabilities of PLM solutions are significant. However, driving alignment among owners and users is just as important. Pursuing a shared ownership model of an initiative is the best path to realizing value, both in the short and long term.

success with metrics, and finish with an IT compliant deployment.

- Users are the key to the implementation of any initiative. Employ a progressive training regimen to upgrade their skills. Enable quick resolution of issues with technical support. Continue to communicate the long-term vision and progress towards its realization.
- Document initiative successes as case studies in varied, consumable forms. Incorporate the Functional Owner's viewpoint, the user's opinion, and key, relevant improvements for the organization and users. Share those case studies with the rest of the company.
- Expand the initiative by following the same pattern of the first one, only tailor each expansion based on the Functional Owner and targeted process. Continue to capture and share successes as case studies.
- Maintain alignment with sponsor executives by providing distilled, high-level updates. Include progress towards the realization of the long-term vision and dashboards presenting metrics, scope, and objectives of each initiative stage.
- Processes deployed as part of the initiative often require information from a range of enterprise systems. Integrate these systems lightly and minimally, opting for tools that provide direct, simple, and easy instead where possible.
- Empower ongoing support of users with progressive training programs and technical support. This tactic bolsters against user's regression to depreciated processes.



Chad Jackson is the chief analyst and researcher at Lifecycle Insights, providing insights on a range of technology-led initiatives across mechanical, electrical, embedded software, system, and IoT engineering.

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