

Holistic PLM and Organizational Change

TriStar helps manufacturing companies leverage product development technology to transform business processes to achieve strategic objectives. TriStar partners with companies to optimize product development in the following technology areas:

- **Enterprise Product Data Management:** Manage engineering content (CAD, Parts, BOMs, Documents) in an Integrated Design Environment with a closed loop, quality driven change management. Includes heterogeneous CAD Data Mgt (e.g., Creo, Catia, NX, Mentor, Cadence).
- **Optimized Change Management:** Improve and transform change management from local/domain level to the extended, cross-functional enterprise.
- **Enterprise Product Lifecycle Management (PLM):** Full lifecycle support from Requirements to Retirement integrating cross functional product development content in a single source of truth. Optimize the integration of engineering content for upstream and downstream exchange and synchronization.

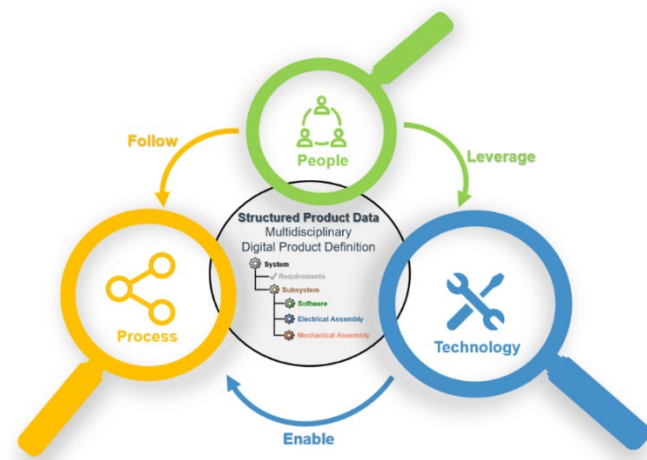
Current State

While process and tool maturity vary widely across organizations and industries, TriStar has observed key characteristics of the current state which hinder excellence. These include:

- Disconnected silos of product data.
- Reliance on drawing centric product development.
- Ineffective IT integrations impacting data asynchronization.
- Lack of an integrated product development process architecture.
- Sub-optimized change management processes and systems.
- Inability to integrate engineering disciplines in an interconnected collaboration environment.
- Inadequate definition of an Enterprise Data Model.
- Failure to effectively plan organizational change.

Why organizations struggle with technology change

Managing change in globally dispersed organizations is difficult. Extending that change across cross functional processes and domains increases the technical challenge and risk. TriStar believes that organizations fail because they lack a comprehensive strategy to manage change across **People**, **Process** and **Technology**.



TriStar has identified some key reasons organizations fail in technology implementation:

- Failure to understand the true nature and span of PLM (leads to underestimated scope, effort, org change).
- Organizations assume current data models and processes will somehow effectively deliver PLM.
- Understanding that data modelling and process optimization are linked, not independent.
- Not preparing the organization for the cultural impacts and changes that will be required to achieve PLM.
- Failure to develop cross functional Subject Matter Experts (SMEs) for relevant technology functionality.
- Perception that independent silos of data is more efficient than a single source.
- Unwillingness to adapt existing business processes, *especially ineffective ones*, to PLM.
- Lack of organizational understanding of the gaps and inefficiencies in current methods and tools.
- Lack of documented and measured processes.
- Inadequate cross functional governance.
- Failure to accurately identify ROI opportunities.
- Poor Process Quality and Data Quality.
- Incomplete understanding of failure modes and root cause of inefficiencies.

Organizational Change with TriStar

TriStar has identified key best practices and implementation approaches which significantly reduce the risk of failure and increase the likelihood of successful enterprise-wide Organizational Change Management (OCM).

People Leverage Technology

Technology Enables Processes

People Follow Processes

Holistic PLM & OCM With TriStar

Successful PLM implementation requires a holistic organizational approach which accounts for change across multiple spectrums.



TriStar believes this holistic strategy is built upon the following foundational pillars:

- **Product Development Strategy**
- **Business Process Change**
- **Program Management**
- **Technical Management**

Product Development Strategy

Successful PLM is predicated upon a well-documented, agreed and communicated business strategy for product development. This ensures that the organization has clear direction on goals, objectives, and strategies to drive competitive market and product differentiation.

Aligning PLM with Strategic Objectives

One key best practice is to ensure that technology solutions are directly aligned with, and supportive of, organizational strategic objectives. Establishing this “connection” provides a foundation for organizational change management because employee awareness and adoption is facilitated when users understand how PLM can enable growth.

Align PLM solution with strategic objectives.

- Identify how PLM supports strategic goals such as:
 - Reduce the cost of product development.
 - Improve resource utilization.
 - Identify and penetrate new markets.
 - Optimize Service to drive revenue.

Correlate strategic objectives to business initiatives.

- Identify key business initiatives which support/enable strategic objectives. Business initiatives include:
 - Enable global product development.
 - Streamline product development processes across regions and groups.
 - Optimize Change Management capabilities.
 - Digitize engineering to manufacturing information transfer/sync.
 - Leverage “follow-the-sun” Development.

Identify impacted business processes & maturity.

- Identify the product development processes which are impacted/affected by the implementation, such as:
 - Mechanical Design.
 - Electrical Design.
 - Manufacturing Process Management.
 - Change Management.
- Identify the current process “as-is” maturity state as well as future “to-be” goals for the organization.

Deploy tools supporting Continuous Improvement

- Configure & deploy technology solutions enabling value and achievement of strategic objectives.
- Leverage and exploit industry best practices.

The outcome is an aligned and agreed strategy for business transformation which has been validated by cross-functional constituents.

Establish the PLM Organization & Reporting

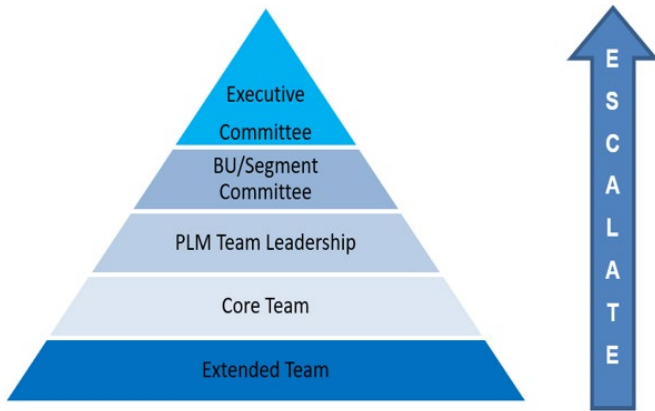
Once the technology has been aligned with business objectives, the next best practice is setting up an enterprise-wide, cross functional Team with organizational reporting, support, and governance.

Top Down Direction & Bottom Up Support

A key characteristic of successful PLM is top down and bottom up support of the strategic initiative. Organizational evangelists at all levels of the business need to be aware, informed, and supportive of the initiative. Providing consistent communication and messaging will ensure that the value proposition and anticipated benefits are understood and cascaded across cross functional stakeholders and groups.

Organization, Governance and Reporting

PLM projects should be organized and executed using well defined teams and organizations which are structured for reporting and execution. A typical Enterprise PLM Organization Structure is shown below:



- **Executive Steering Committee:** CxO Leadership Steering. (E.g., CTO, CIO, CFO, etc.)
- **Business Unit/Segment Committee:** VP Level Leadership at the BU/Segment. (E.g., VPs for impacted domains such as Eng VP, Mfg VP, Quality VP, etc.)
- **PLM Team Leadership:** Sometimes referred to as 3-in-a-Box PLM Leadership. (IT Lead, PMO Lead and Business Transformation Lead)
- **Core Team:** Cross-Functional Team of business process owners as Change Agents and Process Workstream Owners. May span Engineering, Mfg & Service.
- **Extended Team:** Extended membership of cross-functional SMEs with deep domain knowledge in impacted areas.

Formalize Organizational Change Management

Organizational Change Management is an approach and strategy focused on helping companies prepare, adopt, and implement fundamental and radical change in organizational behaviors spanning culture, policies, procedures, technology, and day-to-day work practices. TriStar believes that effective OCM is a best practice of organizations who succeed in deploying enterprise PLM because it drives focus on all elements of change across tools, processes, and people. The OCM lifecycle can be summarized as follows:

Identify the Change Network

- Cross-functional business leaders as Change Agents.
- Business Process owners and key SMEs.
- PLM Team/Organization.

Prepare for Change

- Develop a Communication Plan which details the schedule for Change Events (demos, Lunch-n-Learn, Newsletters (online and physical)), recurring meetings on status and planning.
- PLM website with content, FAQs, including virtual PLM system access for UI/UX interaction.
- Coordination with Business Process Owners to synchronize tool, process, and user change.
- Executive leadership support as vocal champions evangelizing PLM across business.

Implement the Change

- Develop a Detailed Learning & Adoption Coordination Plan required to deliver role-based user training.
- Early interaction with PLM UI/UX and System Demos.
- “Blended” Training and Adoption delivered using multiple platforms and tailored by Role and Process.
- Training Content developed by business process owners and/or SMEs.
- Virtual Training for the majority with classroom training for SMEs and process owners.

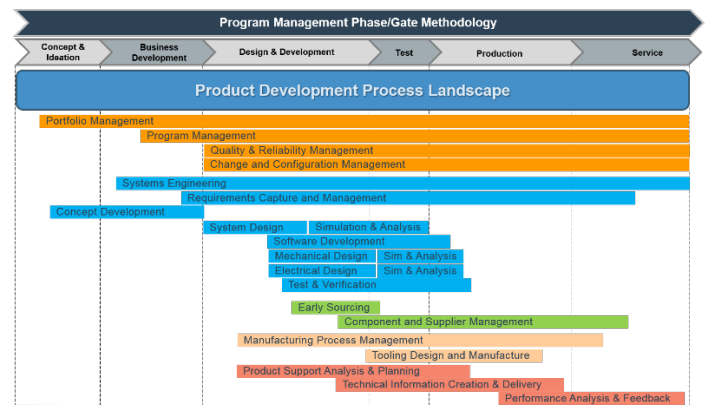
Support the Change

Leading organizations have well defined and formal processes for deploying, supporting, and securing enterprise PLM platforms. These processes support the initial deployment as well as the recurring updates/upgrades, including:

- Go Live support and hypercare.
- Long Term Help Desk Support with ticketing, triage, and reporting capabilities.
- System and performance monitoring including reporting/trending.
- Mechanism for system upgrade and refinement through enhancement requests, bug fixes, etc.

Business Process

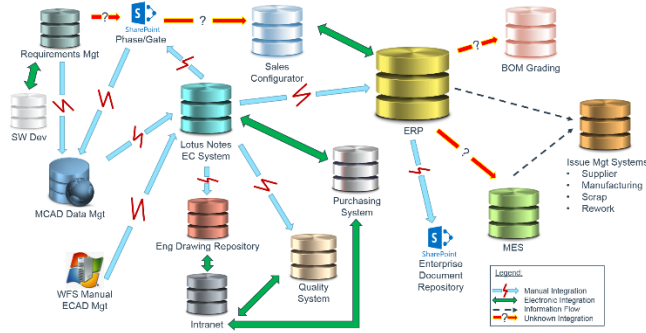
A key discriminator for successful PLM deployment is alignment and coordination across business process domains. Leading companies have documented policies for their operational business performance. These include cross-functional business processes such as Program Management, Mechanical Design, Electrical Design, Software Development, Change Management, Manufacturing Process Management, etc. Typically, these processes are documented as a Phase/Gate Product Development Process Landscape as shown below:



Organizations who excel in PLM deployment have documented business processes which are measured for continuous improvement.

Another key component of a successful PLM implementation is a foundational understanding of the current state information ecosystem which identifies data transfer/exchange and the degree to which these are achieved electronically vs manually. The following is a sample current state diagram which can be used to educate, inform, and gain consensus on the need for change and process optimization.

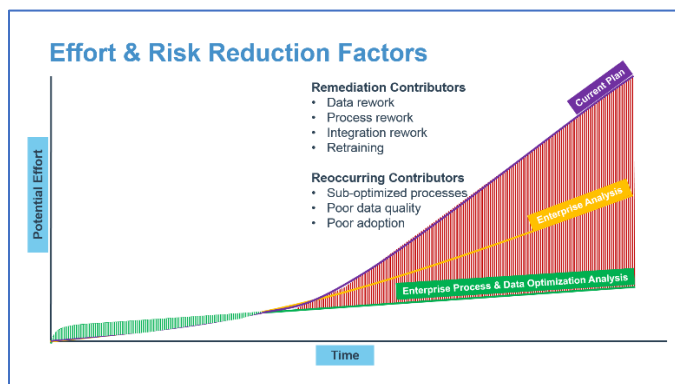
Current State Information Ecosystem



Extensive interaction with process owners is required to identify existing “as-is” business characteristics, analyze gaps/challenges/pain points and leverage that knowledge to derive a future state, “to-be” process definition. Ultimately, a key tenet of effective OCM is a well-planned, communicated and agreed business process change and rationalization strategy.

Understanding Data and Process Quality

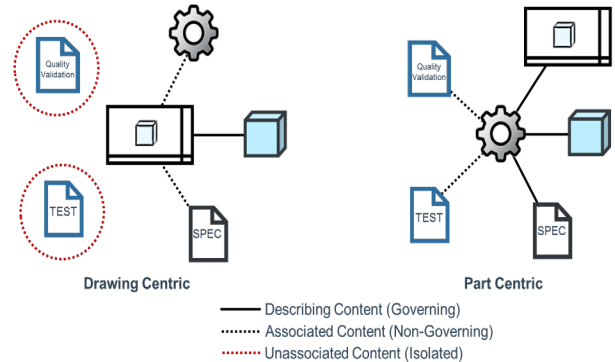
The degree to which an organization truly understands the current state of process and data quality is a key discriminator in PLM implementation success. TriStar has identified that early assessment and analysis of data and process quality has a dramatic impact on the risk of ineffective technology deployment. Organizations who perform an upfront Enterprise Process and Data Optimization Analysis will identify key roadblocks and challenges which ultimately reduces the risk of failure. These Organizations will see a reduction in the level of process and data remediation required as a prerequisite to successful PLM.



Data Modelling

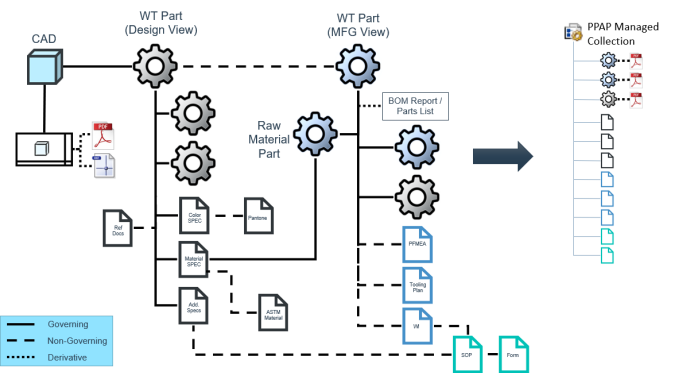
The Data Modeling exercise is a cross-functional activity to help Tristar resources determine the state of a company's data, what type of data should be managed in the PDM system and how should it be structure based on industry proven best practices. If a company is going to truly implement PLM, it must transition from a “drawing centric” philosophy to a “part centric” philosophy as shown:

WTPart Foundation – Drawing vs Part Centric



Once this has been established, the full data model shown below can be developed.

Complete Configuration Management



A few things to notice in the data model:

- Complete document management and correct linking to all objects.
- Correct Part subtyping is identified and can be incorporated as necessary in change management.
- Complete eBOM / mBOM definition. (mechanical, electrical & software)
- Modules are uniquely identified / typed to enable required rigor in change management.
- Manufacturing and supplier part numbers are properly incorporated.
- Configurability can be defined all the way to the documentation at the work center to enable complete automation to the route.

TriStar understands that a data model scales as a company scales in its PLM usage. The key is that proper data model definition mitigates risk as we move through the phases of implementation.

Program Management

Robust and mature processes for Program Management are critical to successful PLM deployment. Enterprise PLM deployment projects should be managed using best class program management processes and standards such as PMI and PMBoK-based processes/policies. Due to the technical complexity and substantial financial investment, robust Program Management processes must be employed to effectively manage the deployment including the following:

- Project schedule and issue management (Risks, Actions, Issues and Decisions).
- Budget/Cost and Financial tracking.
- Team and Resource management based on a well-defined and agreed RACI matrix.
- Reporting of Metrics and Key Performance Indicators (KPIs) measuring business value. This includes reports, meetings, and dashboards to visually track the progress of the implementation.
- Partner/Supplier Management to ensure all parties are aligned and synchronized.
- A comprehensive PLM Development methodology must be defined and agreed between all parties and should address

Requirements Definition, Design & Development, Systems/Functional Testing, User Acceptance Testing, Training & Adoption, Deployment Support, and long-term operational support.

- Formalized IT support based on industry standards such as ITIL to ensure the organizational support.

Technical Management

It is equally important that Technical resources are managed holistically in the context of the overall deployment. This typically addresses methods to ensure the PLM architecture, infrastructure and integration framework are based on best practices which are extended across the technical team. This includes:

- Technical Operations, Resources & Skills
- System/Software Development Approaches (Waterfall, Agile, Hybrid, etc.)
- Technical Integration Approach and Strategy (ESI, Middleware, REST, etc.)
- Testing & Quality Approach including all levels of testing (system, functional, integration, user).
- Technical Environments for development across test domains (e.g., Dev, Test, Staging, Prod)
- Software Provider Coordination to ensure that all technical development partners (Customer, Vendor, Partner, Supplier) are synchronized and integrated in the PLM deployment process.

Summary

The image below is a high level representation of the holistic and comprehensive features which exist in organizations who succeed deploying enterprise systems which change the way users work, evolve the tools and technology used to support product development and effectively manage process change and business transformation.

