

VIEWPOINT

The Importance of PLM as a Critical Component of Digital Transformation

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In today's fast changing world, technology is advancing at a rate where humans are struggling to keep in tune with the music. Big data, ubiquitous 5G internet, mobile, cloud services, IoT, AI, VR, ML, the list goes on and on. There is no doubt that the rate of change has accelerated in recent years. For the first time in my career, it feels like technology is way out ahead of a company's ability to adapt to the changes it will bring, and many will get caught flat footed. This acceleration in the rate of change is being caused by several technology waves that are overlapping. These advancements are changing the way we work, consume products, and provide services to customers. Technology advancements will continue to come at us, so just making a single change is not going to be enough to ensure success. An innovation-centric environment, coupled with a continuous improvement mindset that includes associated system upgrades, will be required to keep pace. Organizations must begin to organize their continuous response, both internally and externally, to grow and sustain a vibrant business in the future.

Information technology must mature alongside the internal culture changes to appropriately manage this new level of complexity that exists when you evolve a product continuously and provide an eco-system that compliments that product.

Advancements in technology will only gain momentum, so "Digital transformation," which is the response to these advancements, is here to stay. Products are becoming more complex as ubiquitous connectivity and data availability enables products to evolve and not remain static. Devices today are often paired with a complementary set of subscription-based services that are based on software functionality at the device level as well as connectivity to a larger eco-system at the enterprise level. Take a doorbell as a simple example. You buy a device in addition to a monitoring service to make that device more useful. Software enabled apps are used to enhance the devices functionality, provide services, direct customers to additional products, and create new ways to engage through the app. This model, in my opinion, is the product pattern of the future but will not naturally occur within existing systems that were designed to create and support discrete products 10-20 years ago. This new pattern of product-based services and evolving software functionality requires information systems that fully support the entire development lifecycle and the devices' associated eco-system. Information technology must mature alongside the internal culture change to appropriately manage this new level of complexity that exists when you evolve a product

continuously and provide an eco-system that compliments that product.

To transform a company to meet these challenges, leaders must understand that digital transformation comes in two halves, customer facing innovation of products and services, and internal standardization to deal with the complexity and speed required to compete. These two halves are analogous to the ancient Chinese philosophy of yin and yang. Each represents seemingly contrary forces that are complimentary by nature. An engineer may never appreciate the need for information systems and standard process, but those processes can facilitate the rapid transformation of valuable ideas into successful, high-quality products and services. Innovation without execution is just a dream, or worse a nightmare, when execution errors negatively impact the market acceptance of a product and the reputation of the company. Innovation cannot come to fruition without the appropriate level of process structure and automation, especially when handed today's complexities and fast-moving pace of change.

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To reach their full potential, digital transformation programs must address both the customer-facing implications of digital as well as the internal organizational and operational ones. Managing the evolution of an enterprise ecosystem will become just as important as learning how to out innovate your competitors in the marketplace. A properly digitized internal working environment will enable speed and agility under constantly changing conditions.

For the remainder of this discussion, I want to focus in on the internal aspects of digital transformation, or what it takes to become "digitized." Digital excellence is not just installing new tools and forcing people to use them. There are many elements to address when creating a sustainable, automated, process backbone and a culture of continuous improvement. Any one of these areas, if sub optimized, can impact the effectiveness of an internal transformation and cause waste, inefficiencies, and discourage the culture from making the required changes.

The key elements of a sustainable internal transformation are;

1. **Creating a culture of continuous improvement, ensuring your knowledge workers are happy and engaged people.**

While speaking with Toyota, a pioneer in continuous improvement and lean philosophy, they stated that “internal digital transformation is 80% process and people enabled by 20% supportive technology deployment”. Ensuring processes are lean and continuously challenged should be the starting point for becoming digitized. People that understand why change is required, feel engaged and are energized about change, are the cornerstone of continuous improvement. This has nothing to do with technology. Never has and never will. People and processes run your business and decisions are made based on data. Technology just helps environments become more consistent, efficient, and automated over time. Future proof your business by dedicating the time and energy required to engage your most important asset.

2. **Understanding how users will interact with applications as they execute the process.**

Providing the proper levels of automation plays a major role in forming an efficient work environment. A well implemented interface contributes to the happiness of the workers that use it every day. Sometimes the in-application interface fits the bill, but there are times where a particular job requires more advanced thinking about how people will interact with the system when doing their job. Things like the number of clicks, or how you access a drawing, might change if you are viewing one vs 50 parts per change order. These are the things that interface design must account for. The proper levels of understanding should naturally flow from truly comprehending the process steps executed by people that are doing the work.

3. **Having a thoughtful enterprise architecture and improvement roadmap that comprehends the nuances of the lifecycle, its components, and how fast the culture can adapt.**

The days of siloed functional applications and “sneaker net” based spreadsheet interfaces are gone. For those that might not appreciate the sneaker net, it was the network of hallways that carried information usually contained in a spreadsheet from one person’s desk to another person’s desk traversed in a hurried manner by a human wearing sneakers. Hard to believe that was how business was done when I

started. In today's connected world, legacy monolithic applications are giving way to a fully integrated lifecycle that includes an array of connected applications that span concept to customer. Lifecycle processes cut across functions and do not care about organizations or application boundaries like people do. Any digital transformation effort must address the entire lifecycle and comprehend where applications fit into that lifecycle and how they will be integrated to properly flow the data from end-to-end, eliminating spreadsheets and manual activities. To visualize the nuances in the lifecycle, I like to break up enterprise applications into four subgroups.

- **Inspirational Applications** support innovation, the creation, ideation, and redesign of products and services. Inspirational systems create the environment that supports innovation. These environments should be as lightweight as possible, best in class, and enable ubiquitous collaboration. Ideas should be easy to snare, share, and store. Search is critical, enabling research, recall, and important associations to be made. These building blocks are essential for innovation. Harmonizing the “inspirational” area is not so critical, but collaboration is essential and must be simple and easy to achieve. Harmonization can slowly occur as data is fed to downstream systems. ALM and PDM are transitional systems that span the divide between inspirational and operational, so some level of standardization is useful here to help drive consistency in the initial promotion process.
- **Operational Applications** support the process automation needs for the product lifecycle and control the flow of information from inspirational systems to transactional systems. Information needs to flow from inspirational systems to operational systems when deemed ready by the creators with the minimum amount of approval and fanfare. The PLM platform is a foundational operational system and will automate processes. Process automation will drive process standardization, deduplication of data and enable a culture of continuous improvement because it creates a foundation off which to build from. PLM also provides risk reduction for the enterprise by eliminating sources of off system work and local data silos. The focus of PLM should be on creating a cross functional environment that enables visibility for all, provides process consistency, allows the enrichment of engineering data, enables the right level of approvals, and is controlled. PLM is the core application in the Operational IT infrastructure, enabling process structure to take hold at the right time in the lifecycle. Focusing on the PLM system as a core operational element can create

momentum for change, drive harmonization, increase process maturity, and eventually drive efficiency across the entire lifecycle.

- **Transactional applications** support the ongoing management of manufacturing, quality, and service information which are more repetitive in nature. Things like ERP, MES, and IoT support the regular transaction of information as things are being built and operated. This information originates from the configuration-controlled PLM baselines and are unique to a particular device or build. These are especially important systems and receive enriched data from the upstream operational processes as the lifecycle progresses.
- **Informational Applications** include newly conceived data consolidation platforms, business intelligence tools, visualization, and anything that helps to consolidate information across applications and make sense of it. Any system that takes key data from any of the above systems and merges it together with other data to create opportunities to see a larger and more complete picture would be included here.

4. Finally, determine what physical infrastructure is required to maintain security and performance for the users wherever they need it.

As unsexy as this topic is, how infrastructure is managed can make or break any internal digital transformation. Poorly conceived infrastructure that does not fully support an integrated set of applications, can compromise security, destroy application performance, frustrate users, and grind any transformation effort to a halt. No matter if the decision is cloud, on-prem, or something in between a carefully architected, well designed infrastructure that is monitored and cultivated is just as critical as selecting the right applications and integrating them properly. Paying attention to infrastructure is critical to becoming fully digitized and maintaining an engaged culture by providing tools and processes that are responsive globally.

Because PLM is a critical component of the Operational space, it becomes the critical link between the Inspirational and the Transactional spaces. The fact that it bridges the gap is the main reason why a PLM application implementation can be so difficult to

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accomplish. The right amount of process weight must be applied at the right time in the process. There is also a degree of standardization that needs to occur to operate more effectively and consistently which adds to the cultural resistance to a PLM implementation. Selecting a platform that provides the features necessary to iterate towards a solution that provides the right amount of flexibility, at the right time, provided in the right way, can make the PLM journey successful. PLM can become the basis for lifecycle digitization in support of a broader corporate digital transformation. Based on my years of implementation experience, speaking, and chairing discussions at many PLM events it has become apparent to me that Aras Innovator brings a unique value proposition to the table.

I will explain my viewpoint.

First and foremost, Aras Innovator provides the type of flexibility and ease of configuration that enables an AGILE delivery process. The Agile approach engages the users continuously producing regular incremental changes in the working environment. Aras is built to make it fast and desirable to rapidly configure forms, processes steps, and even the data model itself. They encourage custom development of UIs where it makes sense, allowing implementation resources to truly customize the user experience. The ability to rapidly configure, try and change is the basis for a continuous improvement mindset and Aras Innovator supports this level of agility during implementation.

There is no holding back anything within Aras Innovator, it is truly open.

Aras as a company has always competed on functionality and not lock in which is unique in this industry. The database schema is easy to understand and allows developers to get at the data, extract it and easily integrate that data with other applications supporting the lifecycle. Ease of data access is extremely important when integrating information across the entire product lifecycle. This topic has

gotten some much needed attention as of late and should not be underestimated. There is no holding back anything within Aras Innovator, it is truly open. The data is your asset, so this platform is the one platform that allows you full control. This is what being “open” really means. As another benefit this “feature” can also be especially useful when you are attempting to combine or separate information during a merger/acquisition process or when divesting a portion of the business. Teams I have worked alongside have stood up new instances of Aras Innovator and separated data in weeks, needing no special resources or assistance to do so resulting in delivering to a timeline that blew away all others.

If you have been staying up on advancements at Aras, then you may have heard that the Aras team has spent recent effort moving the platform to the cloud. Aras has added cloud native services to Aras Innovator alongside the same full PLM functionality that we all know and love. This investment will allow companies to start fast with cloud-based IaaS and score some quick wins. This can provide momentum for PLM and launch the journey towards continuous improvement that much faster. Once the pilot system is good enough to be promoted to production, teams can choose to scale on prem or continue with the cloud. This gives companies practically infinite flexibility with respect to options by which to operate. When the cloud capability is combined with the Aras DevOps services, PLM teams can focus exclusively on users, processes, GUIs, and interfaces and not have to worry about managing the infrastructure or the associated IT environment. Performance in the cloud can scale as needed, allowing users to experience solid performance independent of the time of day, load, or geographic location. This is a huge step towards the future of computing and shows the Aras commitment to embracing change and overall sustainability of the platform.

Conclusion:

I have always joked that choosing a PLM application is like choosing a spouse. Do it carefully. There are many different choices, and some can be expensive and not deliver a long-term future. Aras has always offered a solid business partnership. They do this by practicing true risk sharing, allowing a try before you buy approach, and aligning costs to value better than most companies in this industry. The Aras team has shown the desire to continuously improve the Aras Innovator platform and factor in technology changes making it future proof. They guarantee upgrades allowing companies to retire technical debt on a regular basis evolving the platform and avoiding obsolescence. Like a good choice for a spouse, a good PLM partner can make your PLM journey much more rewarding and keep the family happy.

I hope the case has been made for digitizing the product lifecycle “concept to customer” by addressing the internal half of digital transformation and starting with PLM. I hope I was able to explain why PLM is an important element of an overall digital transformation strategy because of its operational position in the overall lifecycle. The time for taking hold of information at the enterprise level is upon us and the “shoot from the hip” improvement philosophy of the past will no longer sustain companies as technology rapidly advances and change becomes the norm. PLM can provide the foothold required to transform the entire lifecycle over time and become the basis of continuous operational improvement. A focused and curated lifecycle that houses the right data and provides it at the right time, will allow companies to realize their full digital potential in the marketplace. Having employees that are engaged and happy, working to make processes better and better, is the basis of continuous business improvement and critical to

surviving the digital wave. When engaged employees are supported by a set of continuously improved tools it creates an innovative environment that delivers quality to the marketplace time and time again.



David G. Sherburne is an independent consultant, writer, and speaker on the topics of Information Technology, Digital Transformation and Product Research and Development. David's unique experiences have covered the entire product lifecycle "concept to customer" including the associated information technology frameworks. These experiences give David the perspective required to help companies solve their digital transformation dilemmas.