

dataPARC



Digital Transformation in Pulp & Paper

A Step-By-Step Guide to Achieving Data-Driven
Excellence in the Pulp & Paper Industry

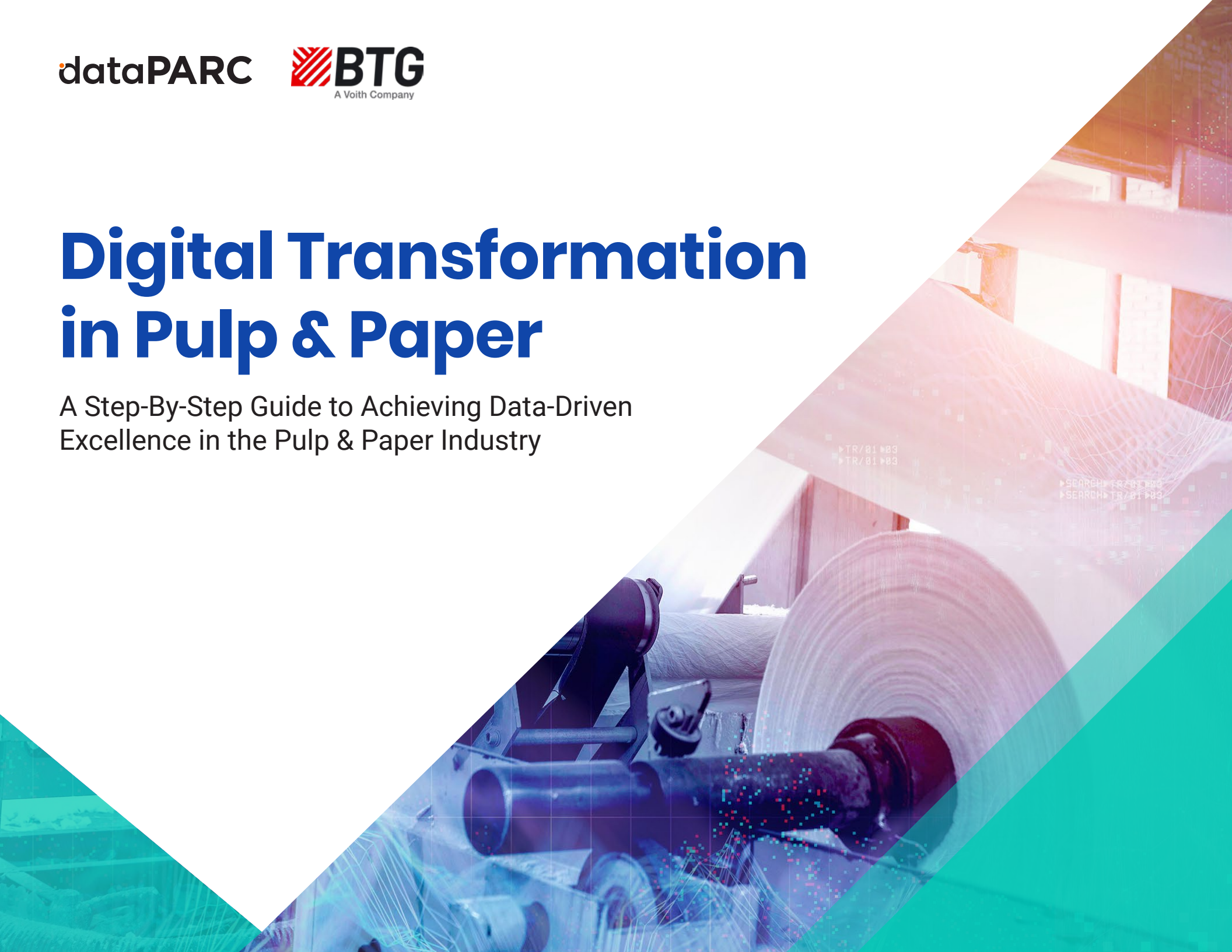


Table Of Contents

Introduction	3
Stage 1: No Data, No Time	4
Stage 2: Some Data, Still Little Time	6
Stage 3: Reflective Decision-Making	8
Stage 4: Data-Driven Culture	11
Stage 5: Data-Driven Is In The DNA	15
Conclusion	18

Introductory Statement & Overview

The Digital Transformation – everyone and everything is a part of it. 20th century breakthroughs in technology allowed for the ever-evolving computers that we now depend upon so totally, we rarely give them a second thought.

Even before the advent of microprocessors and supercomputers, there were certain notable scientists, academics and inventors who helped lay the groundwork for the technology that has since drastically reshaped every facet of modern life.

In the past few years, customers in manufacturing process industries have become dependent beneficiaries of digital technology. Digital technology allows for greater efficiency, consistency, faster solutions and results, less- downtime and greater overall profitability.

What is Digital Transformation?

Digital Transformation, simply put, is transformation and automation of tasks that are normally manual in nature into a digital solution. In your home, think automatic temperature control rather than manual or sensor-controlled lights. In your operations think digital solutions such as replacing cumbersome mathematical equations done manually in an excel spreadsheet to reports and the corresponding analysis automatically generated. Think digitization that will evolve at each stage of the digital transformation, making operations more streamlined and data collection automated and seamless.

Also think about automated manufacturing such as sensors or controls. Turning away from the analog days of the past, in digital transformation we embrace automation and digitization of components in operations resulting in greater accuracy and consistency.



Where Is My Plant on the Digital Transformation Journey?

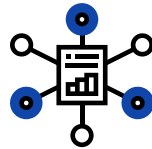


Stage 1 Decision Making

No Time, No Data

Decisions are driven by "the way it's always been done."

Lots of manual operations and limited or no automation.

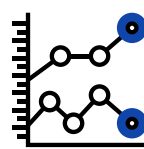


Stage 2 Decision Making

Some Data, Still Little Time

Digital transformation enablement has begun. Reactive decision making is still driven by hunch.

Plant has automation & mainly manual data, little to no historian usage for decision making.

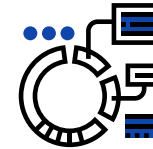


Stage 3 Decision Making

Reflective Decision Making

Begins to change the data driven culture. Having data easily available creates more time for analysis.

Historian usage exists, but not fully utilized. Many data silos exist.

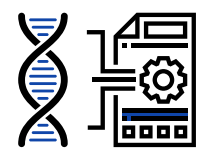


Stage 4 Decision Making

Data-Driven Culture

Proactive decision making is embraced, yet many decisions are still reactive. Confidence in data is growing.

Digital data is growing, data silos continue.



Stage 5 Decision Making

Data-Driven Is In The DNA

Proactive and predictive decision making is widespread.

Universal data platform - data from all sources.

Digital Transformation

Stage 1



Stage one is an early stage. If you are in stage one you likely utilize manual operations and have a limited or no PLC or DCS. In the early stages of the spectrum are the Stage 1 customers, still looking to modernize their control systems from analog to digital. There are opportunities at this end, but the primary focus should be identifying the right solutions (PLC upgrades, additional sensors/instruments, etc.) and topics like AR (Augmented Reality) and ML (Machine Learning) should be a longer-term vision.



1 Optimizing Operations

When you are in stage 1 it isn't hard to make small changes towards digitizing your operations.

A good first step would be implementing an electronic collection of your manual data. A source we recommend is an application like dataPARC's MDE. Data we are referring to would include operations data comprising of sources like LIMS, MES and other process and analytical data.

Purchasing state of the art equipment or automating your operations would also be steps you could take toward digitization. Inexpensive sensors would also allow for more automated control over functions and contribute to more consistency in the workflow, resulting in less downtime enhanced performance.

Implementing an electronic collection of your manual data and sensors are steps toward automation and digitization in stage 1 of the digital transformation.



Key Considerations

What small changes can you make to digitize operations?

Can you easily add sensors? Talk with your team about how that can be done.

How can you convert manual to digital data? What sources of data do you have?

Create a plan, internally and or using vendor help, to digitize your data.

What is your budget for purchasing or upgrading equipment?

Has your budget changed since COVID? Decide what resources are available.

Digital Transformation

Stage 2



If you are in stage two, your digital efforts are just getting off the ground. Your plant has a PLC or DCS, but does not have a historian. You also likely still have many functions that require manual data.



2 Optimizing Operations

One of the best ways to optimize your operations at stage 2 of your digital transformation is to add a historian.

A historian for those not familiar refers to a complementary set of time-series database applications that are developed for operational process data. Historian software is often embedded or used in conjunction with standard DCS and PLC control systems to provide enhanced data capture, validation, compression, and aggregation capabilities. Historians contribute to functions such as supervisory control, performance monitoring, quality assurance, and, more recently, machine learning applications which can learn from vast quantities of historical data.

Other steps in stage 2 could include implementation of internal groups to lead the digitization, helping with organizational buy-in, and downtime tracking. One application to implement at stage 2 could be a LIMS (Lab Information Management System) When implemented and integrated with a data visualization solution, a LIMS systems allows the lab data to be shared digitally with multiple users within an organization quickly rather than waiting on manual data from sources such as manual logs and excel spreadsheets. [An example of a LIMS can be viewed here.](#)

Key Considerations

What are your company's internal resources and how can you leverage them?

What are the financial and personnel resources you can use to advance your operations forward?

Are there areas of the plant that can be automated quickly?

What parts of the plant will be easily automated and what areas will pose more challenges? Decide and come up with a plan.

How will new systems integrate in the future?

Consider new systems you may implement later. How will these systems integrate will current solutions? Will they be completely replaced or complement current systems?



Digital Transformation

Stage 3



In stage 3, things are really starting to transform digitally. Stage 3 is where the IT/OT convergence begins to take place.



3 Optimizing Operations

At this stage, your plant may be ready from a cultural standpoint but lacks the software tools.

You may have a small historian that is not heavily used or other homegrown tools, but you are able to see the vision of what is needed to go forward.

During stage 3 you may also have internal conversations about hosting. You may decide to internally host your historian or you may decide to utilize the cloud for the historian and other essential applications. As a group, your team needs to decide where you would like to be digitally and come up with a road map of what that looks like. To become more digitized, part of your plan may be to engage vendors or to tackle internally or a combination of using both resources.

As a group your organization also needs to decide what systems and applications will be the standard going forward and come to an agreement about the plan and the steps that will need to be taken to achieve that plan.



Key Considerations

Where does your plant aspire to be from an IT perspective?

Think about where you ultimately want to be digitally and create a plan.

Will you take on this work internally or engage vendors?

Can your team handle the tasks internally or will you need to research and engage vendors?

Will legacy systems be replaced or leveraged?

Will the systems you currently use still be relevant or need to be completely replaced?

Will the selected solutions bridge existing systems or require a rip and replace approach?

Are your current solutions complementary to new ones or will they become obsolete?

Digital Transformation

Stage 4



Beginning to digitize harmoniously describes stage four. At stage four, your plant is mature in its use of data. You have a historian with most of the data coming in. You likely have a variety of systems for LIMS, manual data, etc. The culture is there to embrace data for decision-making, but the site lacks the right software to bring the data together.

If you are in stage 4, the core digital systems are in place. Combining data sources within the plant and across the enterprise is key. Culture change is also very important. Standardization and collaboration across the enterprise ensures consistent and accurate data sharing.



4 Optimizing Operations

Having an easy way to utilize data analysis and visualization is absolutely essential at stage 4.

Centralized monitoring and support provides enterprise accessibility while streamlining operations. Creating common asset models while performing advanced analysis between various assets reinforces plant consistency and efficiency. [You can find info on advanced data modeling here.](#)



Key Considerations

How will your company handle multiple system standards?

As you start to incorporate multiple sites, one must decide how to handle situations where there are multiple systems standards used. For example, half of the plants have the OSI PI Historian, and the other half have the Aspen IP.21 data Historian. Your company can migrate everything to a common Historian vendor, which could be a lot of work and has significant risk.

Another option is your company could choose a visualization and analysis platform that integrates with the existing Historian systems, standardize at the visualization layer and provide flexibility site to site, creating corporate uniformity and site flexibility.

How will you integrate data from multiple sites?

A company could choose to implement centralized data systems, like a single enterprise-wide historian. The advantage of Enterprise-wide data is that the data is more easily accessible.

The tradeoff could be application performance when accessing data across the Intranet or Internet, depending on the chosen technology. Another option is to select data analysis applications that can easily connect to the existing infrastructure. This option has the advantage of leveraging existing investments, having the least effort to get started, and delivers the best performance to the local plant site.

One downside is that data integrity between sites could exist, and a lot of work may be required to process the data before performing analysis. There is also a 3rd option that provides a hybrid approach and looks to achieve the best of the previous two.

Digital Transformation Use Case – Catalyst Paper

Catalyst, like many pulp & paper organizations needed to run their operations seamlessly, share data, reduce troubleshooting time and minimize downtime. Previous systems were clunky, frustrating and not intuitive or easy to use. Catalyst also needed to easily share data enterprise wide and receive essential notifications. Quality tracking and root cause analysis were lagging as they had no way to easily compare process and quality data.

Through their digital transformation, Catalyst implemented and utilized dataPARC data visualization software and was able to do the following with dataPARC's efficient, user-friendly tools:

Real-Time Dashboard - Real-time monitoring, intuitive interface, enterprise-wide data sharing for immediate visibility across entire organization

Root Cause Analysis (RCA) - dataPARC allows a clear look at historical data quickly to determine the real reason for issues based on data, not hunches

Downtime Tracking - Frontline staff can enter causes that are assessed by other staff for assessing and fixing most important issues

Quality Tracking - With dataPARC, Catalyst can design and access the data want to see quickly with easy overlay of process data with quality data

Remote Capabilities - Using windows remote app, staff could access plant equipment from home, saving time

Data Speed - Extremely fast access to critical data, averaging 3-10 seconds

Enterprise Access to Data - dataPARC's real time intuitive dashboard allows enterprise access to data

OEE - Downtime tracking gives accurate detailed, insight into OEE over long periods of time

Total Staff Buy-In - dataPARC's easy to use tools are utilized by everyone from operators to senior management



Digital Transformation

Stage 5



If you are in stage five, you are in a very sophisticated plant that has a well-developed strategy for data and decision support. You have settled on one major historian and have spent a lot of time and effort to transfer all data from other sources (LIMS, MES, ERP, etc.) into the historian and have a number of business systems pulling from the historian. Customers at Stage 5 are ready, from both an infrastructure and cultural perspective, for advanced topics like AR & ML. In stage 5 there should be continued use of Advanced data modeling and analytics and there may be opportunities for application consolidation.



5 Optimizing Operations

Getting to stage 5 is excellent and is a major accomplishment.

However far you've come, it's important to note that you aren't done. While it may feel you've made major digital strides, and you likely have, it's important to go back and look over your plan and digital solution again to continue to optimize operations.

Now that you are in stage 5 you can consider yourself digitally sophisticated and its important to keep improving and building on that sophistication. Advanced data modeling and analytics can be significant solutions. With data modeling you can often accurately predict outcomes, reducing downtime and bringing any roadblocks to light. Soft sensors are one way to accomplish that goal. [You can read more on this solution here.](#)



Key Considerations

Are there key sources of data still missing from the Historian?

Check all your sources of data and make sure they are connected to the historian. Is there a source you are overlooking?

Have your business requirements changed or evolved and how does your data platform fit into this?

What has changed in your business? Make sure that the solution you chose to digitize and manage your data is accomplishing your goals.

Are all the key user groups getting what they need?

People needing data within a plant can range from operator to engineer to plant manager. Are all roles getting the data they need in the way they need it? PARCview is a solution that can easily and intuitively be customized. [You can read more about PARCview here.](#)

5 Customer Spotlight

A Large Sustainable Pulp and Paper Manufacturer made the transition from Stage 4 to Stage 5.

A large sustainable pulp, paper and personal care manufacturer (SPPM) and a leading provider of fiber-based products including specialty and packaging papers, market pulp and absorbent hygiene products had approximately half a dozen mills that needed a reliable historian and visualization software package for their many data storing and reporting needs. Especially important to the SPPM was an environmental management system. Meeting EPA standards is essential to SPPM and they wanted to verify and certify the data reported.

SPPM's methods of storing and reporting data varied at different mill locations. Custom solutions were created at different mill sites, making standard reporting impossible. This posed a problem for the corporate headquarters, who needed to receive consistent information and reports. This lack of standardization also made reporting to the EPA challenging. Many of the reporting methods were facing obsolescence. With SPPM's growth, implementation of a standardized method was essential, especially in mandatory reporting and downtime tracking.

SPPM's Results

When the SPPM implemented dataPARC software in several of their locations, results were immediate. dataPARC's PARCview visualization software enabled the operators to receive and report information rapidly, reducing the need for manual data entry and eliminating reliance on individualized custom methods. Downtime tracking was also greatly improved. Because of such positive results, PARCview was installed at all SPPM mill sites across the US and Canada.



Wrap Up & Conclusion

Digital transformation in any form can make a large impact on your business. Whether it is a small change such as inexpensive sensors or a large enterprise-wide application, digital transformation enables organizations to operate more consistently and efficiently resulting in less downtime and greater profitability.

Need a partner to help? We are happy to consult with you to determine what steps are best for your digital transformation in your plant. Contact us today at sales@dataparc solutions or **360.944.3725** to schedule a consultation.



dataPARC

360.944.3725

sales@dataparcsolutions.com

www.dataparc.com