Digital Transformation is Changing the PAPER & PACKAGING INDUSTRY
# Digital Transformation is Changing the Paper & Packaging Industry

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**ACRONYM QUICK REFERENCE**

[lnsresearch.com](http://lnsresearch.com)
SECTION 1

Executive Summary
Executive Summary

While digitalization has an impact on every form of industry today, paper is one that likely experiences a threat more than almost any other. The impetus to pursue Digital Transformation in the paper and packaging industries needs to be an imperative as the risk of being left behind is greater than in other industries. It requires forethought, planning, focus on Operational Excellence and an understanding of how People, Process, and Technology combine to create new business models, opportunities and an environment in which the next generation of workers will be capable and enthusiastic about coming to work.

The paper and packaging industry is in the midst of changes on multiple fronts.

- While there have always been specialized and more profitable niches in the space, much of the paper and the packaging industry have behaved as commodity product producers.
- An emphasis on recycling, not only of paper but other materials used in packaging as well.
- Although energy costs today are lower than they were a few years ago, concerns and pressure continue around reducing greenhouse gas, carbon footprint and the use of chemicals.

When you couple these challenges with the overall economic pressures and slowing global growth the paper industry must do something differently if it is to avoid becoming the next sunset industry.

Technologies like Mobility, Cloud, the Industrial Internet of Things (IIoT) and Big Data & Analytics have driven the demand for paper down, but they have provided the tools the industry needs to transform itself into a more customer focused and responsive model. The growth of online commerce, mass customization and the development of new materials and production methods like 3D printing (additive manufacturing) all are creating tremendous opportunities in the packaging side of the industry.
Executive Summary (Cont.)

Envisioning, creating and managing Digital Transformation in any industry can prove challenging, but it is an effort the paper and packaging sector needs to undertake. Having a framework to guide the effort is essential. To be successful, paper and packaging companies need to:

- Identify the business case for change with clear goals for transformation
- Create a culture that is adaptive and flexible
- Focus on continuous improvement leading to Operational Excellence
- Build partnerships with suppliers that result in an architecture that supports the business goals

This eBook will provide readers in the paper or packaging industry with a template to guide them along the path to Digital Transformation. Specifically, you will gain a perspective on:

- What is driving the paper and packaging industries today
- What is Digital Transformation in context of the paper and packaging industry
- How should a paper or packaging company set its strategic objectives as they relate to Digital Transformation
- How should a paper or packaging company define Operational Excellence in the context of their strategic objectives
- How can a paper or packaging company create an Operational Architecture to pave the way for Digital Transformation
- How are other paper and packaging companies building the business case for investment
SECTION 2

Research Demographics
Research Demographics

The data presented in this eBook is gathered from several ongoing surveys LNS Research conducts and was collected throughout 2015 to the middle of 2016. LNS Research deploys a social research model where our online format English language surveys are open to the general public. Companies participate in LNS Research surveys to gain access to the LNS Research library, meaning survey participants are research consumers as well. Each respondent is followed up with by multiple email and phone calls and each response is reviewed by an LNS Research analyst for accuracy. For this report, the number of respondents to the questions ranges from several hundred to several dozen depending on the specific question. The sample size is generally indicated on each chart.

In general, the paper and packaging industry responses align with the overall industry responses which represent several thousand respondents across a variety of industries split roughly equally between process and discrete manufacturers. Where the responses from the paper industry differ drastically from industry averages, the difference is discussed.
Research Demographics (Cont.)

RESPONSIBILITY

- Operations 22%
- Engineering 17%
- Quality 15%
- IT 12%
- Maintenance 6%
- SCM 6%
- Sustainability 4%
- R&D 3%
- Safety 2%
- Services 1%
- Compliance 1%
- Finance 1%
- Product Design 1%

PAPER/PACKAGING MAKEUP

Survey Respondents by

PAPER (N=75)
PACKAGING (N=119)
BOTH (N=11)
TOTAL POPULATION (N=183)
SECTION 3

Paper & Packaging Beyond 2020: Surviving the Challenges
An Industry Facing Many Changes

For an industry that has survived for over 2000 years, papermaking is facing some of its greatest challenges right now. Environmental issues, raw material supply and digitalization of all aspects of life are combining with critical labor shortages in some regions, energy cost and greenhouse gas issues in others, and a shift to alternative materials to create challenges. While the packaging side of the industry is looking at approximately 3% CAGR over the next five years, the printing or graphics side of the industry expects no growth despite global population increases coupled with a growing economic consumer class. The industry must adapt or face a very bleak future. The chart below which reflects the responses of 54 industry respondents, validates generalized industry reports from organizations like TAPPI, and regional groups representing the industry globally.

KEY DRIVERS OF CHANGE
- A “perfect storm” of market challenges—a particularly bad or critical state of affairs, arising from a number of negative and unpredictable factors
- Declining fiber availability, escalating energy costs
- Inability to attract capital investment
- Workforce turnover in a “sunset” industry

THE PATH FORWARD
- Address cost competitiveness
- Product diversification and growth
- Attract and retain future talent

Joe Nemeth, President & CEO | Catalyst Paper, May 2016
Efficiency Gains Will Drive Financial Results

The paper industry is under such strong economic pressure. Just under one-half (42% or 76 respondents) identified growing revenue as their top financial objective. Growing operating margins, expanding markets, cutting costs and improving the return on assets rounded out the top five responses (24%, 11%, 10% and 9% respectively). Operationally the top objective of those respondents was to improve manufacturing efficiency with 48% identifying it as the top objective. No other objective was even one-third as popular.

NORTH AMERICAN NEWSPRINT PRODUCTION HAS PLUNGED 55% IN THE LAST DECADE
SOURCE: United Nations FAO Database
Asset Performance Management is Critical

The paper industry is asset-intensive so **Asset Performance Management (APM)** is critical, and among asset-intensive companies "better operational performance" is the top reason to invest in APM and the paper industry is no different. What is different from manufacturing in general is the paper industry named increasing production capacity as their second most popular top driver a significant portion of the time.

The impediments to achieving their objectives vis-à-vis APM that the paper industry sees some variation from industry as a whole.
SECTION 4

Meeting Today’s Demands, Preparing for Tomorrow’s Success
Framework for Digital Transformation

Industrial companies today, including some in the paper and packaging sector, are pursuing Digital Transformation initiatives. What many companies are missing is a systematic approach to manage this transformation across all levels and functions of the organization. The LNS Research Digital Transformation Framework is designed to help industrial companies understand how to connect all of these simultaneous and interconnected initiatives.

STRATEGIC OBJECTIVES: At the highest level paper and packaging companies today need to be thinking about how new technologies, like the IIoT, can disrupt and transform products, value chain business processes, and connected service delivery. An example would be to enable customers real-time access to production data from the paper machines as product is being manufactured.

OPERATIONAL EXCELLENCE: People, processes, and technology are the underpinnings of Operational Excellence initiatives and these initiatives are typically owned by the senior-most business function leaders in the organization. Moving forward, manufacturing companies need to continue to evolve Operational Excellence initiatives to not only be the continuous improvement engine of the company but also the driving force for innovation.
OPERATIONAL ARCHITECTURE: Traditionally Enterprise Architecture has been owned by the IT organization. Separately, automation, corporate engineering, and/or advanced manufacturing (often now referred to as operational technology or OT) has been responsible for the rest of the technology architecture at the manufacturing facilities. With the emergence of IIoT, LNS Research recommends industrial companies adopt an Operational Architecture approach that applies the formalized rigor and process of Enterprise Architecture to the entire IT-OT stack. Industrial companies need to create supporting and collaborative groups that incorporate both IT and OT, and as the Chief Digital Officer emerges, the success of this new collaboration is a key part of their charter.

BUSINESS CASE DEVELOPMENT: Business case development initiatives are most successful when they are driven by deep subject matter experts that understand both the process and technology. Identifying these experts can be a challenge but often they are located in advanced manufacturing, hybrid IT/OT roles, are a leader within specific business functions, or are a technical individual supporting the organization. It is important industrial companies do not view technology investments as a one-off business case but rather as a business case journey that aligns with system architecture goals and supports long-term strategic objectives.

SOLUTION SELECTION: Often companies view Digital Transformation upside down, starting with solution selection, which then drives all other portions of the framework and as with solution selection, it is important to put the activities within the context of the broader initiatives. Solution selection is never successful in a vacuum, and when it is done in such a fashion, change management becomes an insurmountable challenge and adoption wanes.

INDUSTRIAL COMPANIES need to create collaborative groups that incorporate IT and OT; as the Chief Digital Officer emerges, the success of this new collaboration is a key part of his/her charter.
A New Model for Operational Architecture

In moving to a new model of Operational Architecture, companies need to move to an expanded scope of Enterprise Architecture. This expanded scope should account for managing "things" across the value chain of suppliers, internal operations, customers, and products as well as an application and analytics environment that spans cloud/on-premise and time-series/structured/unstructured data types. Upon careful inspection, this expanded model should also incorporate the main components of the IIoT Platform: connectivity, Cloud, Big Data analytics, and application development.

This expanded scope is also too broad to go the right level of detail for making meaningful architectural decisions across the enterprise. LNS Research recommends a three-level approach, where at Level 1 the entire scope is encompassed and at the next level (level 2) of detail, specific elements of the high-level architecture should be explored. For example, an organization’s Level 2 Operational Architecture for structured data analytics and apps would largely map to the traditional scope of enterprise applications.

When building this architecture, LNS Research recommends not focusing on the traditional applications of ERP, PLM, MES, SCM, and CRM, but instead focus on the functional areas and map these to the corporate systems/management systems/value chain systems used across execution/planning/analytics. Then the different applications can be mapped to this model, not vice versa.

LEVEL 1 Operational Architecture

LEVEL 2 Operational Architecture
LNS Research recommends taking a relatively generic IT view of what Big Data is and then applying the definition to the industrial space. One definition that has received broad acceptance is the 3 v’s of Big Data:

**VOLUME**  **VELOCITY**  **VARIETY**

The industrial space has typically had to deal with large volumes and velocity of data. A heavily instrumented paper machine can produce several hundred gigabytes of data per reel. All of this data has been relatively well-structured process data stored as time series, reel scan or transactional data stored as structured data in enterprise applications and historians.

With the advent of the IIoT, companies will also need to deal with unstructured data in the form of new machine-generated, sensor, video, GIS, the Internet, and other forms of data. As all of these data types come together, companies will truly have to deal with Big Data, which will bring together a whole new set of analytics opportunities and challenges.

Traditionally analytics has been viewed as a linear progression of:
- Descriptive: metrics and scorecards for OEE, OTD, scrap, MTTF
- Diagnostic: reliability engineering, quality engineering, root cause analysis
- Predictive and Prescriptive: modeling and simulation, statistical process control, advanced process control
Digital Transformation Requires More Than Old Analytical Approaches

Big Data has already created a powerful new approach to analytics in areas outside of manufacturing, and now it is manufacturing’s turn to benefit from these advances by applying them to production processes. The most important aspect of this approach is the concept of machine learning applied to Big Data which allows companies to address issues that they were unable to previously, and may not even have known they had. So while the IIoT is a critical source of the data, it is the analytics that will create the value from this information, in multiple ways.
What New Business Models in Paper & Packaging Will Look Like

Unlike industries where the products themselves are becoming smart and connected such as the automotive and aerospace industries or even the consumer electronics sector, paper and packaging products will see Digital Transformation take place in the manufacturing, customer relationship and supply chain processes more than in the products themselves.

One key trend the industry can expect to see is the shift away from capital and into capacity. The cost of a paper making facility can easily top $1 Billion, and a packaging plant can be in the hundreds of millions of dollars. As machinery suppliers and constructors start to leverage Digital Transformation themselves they will begin to offer paper makers the ability to buy production capacity instead of investing massive amounts of capital in building new facilities. At a minimum, and as a transitory step, smarter assets will make it far easier for paper companies to demand machine reliability and uptime guarantees and performance guarantees from their suppliers. This improved reliability will lower their cost of production and allow them to produce higher quality products.

Customer service will also improve. With far better data handling capabilities, paper companies can provide far more detailed product quality information to customers ultimately allowing a printer to feed the exact profile of the web as it unrolls onto the press to the press controls to minimize breaks and printing problems. Similar types of information can be provided to converting operations as well, reducing waste, improving production volumes and speed, and ultimately lowering the converters cost. In an industry that has traditionally been thought of as more closely aligned to commodity production the ability to create added value with information becomes a true differentiating factor.

As machinery suppliers and constructors start to leverage Digital Transformation they will begin to offer paper makers the ability to buy production capacity instead of investing massive amounts of capital in building new facilities.
Digital Transformation: Taking Root in Paper, Packaging Still Lags, Both Need to Accelerate Efforts
Paper & Packaging Need to Invest

The paper and packaging industry is coming to grips with the technologies that are driving Digital Transformation but must accelerate its understanding of Digital Transformation and Smart Manufacturing to realize these new models.

INVESTMENT PLANS

The paper and packaging industry has an opportunity to look to other industries, learn from what they are doing, and alter their investment strategy to be more proactive.

Have You Started an IIoT Initiative?

IioT Investment Plans

- We expect to start investing in IoT technologies in the next 12 months but are still establishing the budget
- We do not expect to invest in IoT technologies in the foreseeable future
- We do not expect to invest in IoT technologies in the next 12 months
- We have made significant investment already and expect it to increase in the future
- We have established a budget for IoT technology investment in the next 12 months
- We have made significant investment already and expect it to stay the same for the foreseeable future
- We have made significant investment already and expect it to decrease in the future
**Value of IIoT is Waiting to be Captured**

**LEARN FROM OTHER INDUSTRIES**

Understanding where other companies expect value from IIoT investments could prove informative to the paper and packing industries. Not surprisingly today in the paper segment quality improvement and energy efficiency are the top two use cases while in packaging, remote monitoring also a top cross-industry use case, and asset reliability are the primary use cases. Looking out a year quality remains a top driver in paper, but production visibility takes on equal priority while in packaging production visibility and asset and materials tracking will be the leading use cases.

**IIoT Value Sources**

<table>
<thead>
<tr>
<th>Category</th>
<th>All Manufacturing Today</th>
<th>All Manufacturing 1 yr.</th>
<th>Packaging Today</th>
<th>Packaging 1 yr.</th>
<th>Paper Today</th>
<th>Paper 1 yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset &amp; Material tracking</td>
<td>30%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Asset Reliability</td>
<td>20%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Business Model Transformation</td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Customer access to information</td>
<td>0%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Improving environmental performance</td>
<td>0%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Improving safety</td>
<td>5%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Internet enabled products</td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Production Visibility</td>
<td>20%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Quality improvement</td>
<td>0%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Remote Monitoring</td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Supplier visibility</td>
<td>5%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Traceability &amp; Serialization</td>
<td>0%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Industry Needs to Prioritize Funding

**KNOWLEDGE IS POWER**

Funding is the biggest but not only obstacle to accelerating IIoT adoption and Digital Transformation in paper and packaging. So while industry is using IIoT technology to start the Digital Transformation efforts within their companies and know how they intend to use IIoT generated data going forward there are impediments that must be overcome. To accelerate the adoption of IIoT once funding is available the industry needs to put emphasis now on educating themselves as to the value the IIoT can generate and how to get started. Hopefully, education will also serve to address organizational cultural issues as well.

Obstacles to IIoT Investment
Cloud Technology is One Lower Cost Option

Another element of the Digital Transformation story is the adoption of Cloud-based solutions. Those paper companies that expect to derive benefit from Cloud deployment see mobility and lowering IT support effort as the key benefits while on the packaging side Total Cost of Ownership (TCO) and integration are seen as the greatest benefits. As with most other trends across the larger industrial sector, the benefits from Cloud are likely to come from a more diverse benefit set.

Cloud Impact

- Lower total cost of ownership for implementing manufacturing performance software
- Unburden IT from having to maintain servers and software updates
- Enable performance information on mobile devices
- Make it easier to compare performance information across multiple plants/facilities
- Speed the time it takes to implement manufacturing performance software
- Make it easier to integrate performance information across my different systems
Technology Is a Lever to Address Challenges

Technology is the underpinning of business applications; ultimately applications need to provide business value. The paper industry is one of those that is facing a greater labor turnover issue than most other industries so it is not surprising that key application investment decisions in paper are gravitating to talent acquisition and retention and knowledge management solutions. Big Data and Predictive Analytics and operational applications like Manufacturing Operations Management (MOM) and Enterprise Manufacturing Intelligence (EMI) also are going to be where the paper industry will be spending heavily. Spending in packaging more closely resembles the broader manufacturing world with Big Data and Predictive Analytics and traditional business systems spending and operational systems (MOM/EMI) spending rounding out the top three categories of investment.

Technology Investment Plans

- Big Data & Predictive Analytics
- Business Systems like ERP/EAM, EHS, CRM, etc.
- Talent management & acquisition
- Operational systems like MES/MOM, EMI, etc.
- Knowledge management systems
Automation As An Enabler

Differences in how the paper industry operates explain many differences in its approach to Digital Transformation. The paper industry is one of the most automated industries there is today with the majority of manufacturing benefiting from automated data collection. This should make it easier to begin the Digital Transformation process for those companies. Unfortunately, some paper companies still rely on paper-based data collection, and at a higher percentage than most other forms of manufacturing. So while there are economic challenges, those companies that devise a mechanism to fund Digital Transformation are well positioned to make the move quickly and benefit the most.

Approach to Manufacturing

- The process is mostly automatic with operators setting up and controlling from a control room; data is collected automatically.
- The process requires operator setup and then is predominantly automatic with the operator recording actions on paper.
- The process is manual with operators recording their actions on computers/terminal.
- Operators serve as monitors, intervene only in abnormal situations.
- The process is manual with operators recording their actions on paper.
- We run "lights out" with no operators.
Defining Success
Paper Understands What Metrics Define Success

To better understand the value of actually pursuing Digital Transformation one need only look at how companies that have started deploying technologies like IIoT and Analytics perform compared to those that have not made investments in these enabling technologies. Given the relatively low adoption rates in both paper and even more so in packaging, most of the examples are individual cases, but the results these innovators are achieving closely parallels the results industry as a whole sees where there is a higher degree of correlation between investment and performance.

FOCUS ON QUALITY, EFFICIENCY & FINANCIAL METRICS TOP DRIVERS

The paper industry focuses on quality, efficiency, and financial metrics while the packaging sector focuses less on efficiency and more on inventory as a top driver along with the other two. This sets this industry apart from industry in general.

Metrics Focus

What types of manufacturing metrics does your company rely on for managing your operations?
**Focus on Customers is Key**

Both the paper and packaging sectors align with industry overall in that a focus on customer satisfaction is the key metric used to judge quality performance. In addition, the paper sector focuses more heavily on the cost of quality than industry as a whole. On time delivery is a key metric for the paper sector as well.

**Quality Metrics**

<table>
<thead>
<tr>
<th>Metric</th>
<th>Paper</th>
<th>Packaging</th>
<th>All Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer complaints</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of quality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First pass yield</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Products in compliance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defects per million</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier defect rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None of the above</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty accrual rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier charge backs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Key Metrics**

- **On-time delivery**
- **Overall equipment effectiveness**
- **Successful NPI**
Differences in Manufacturing Drive Different Focus Regarding Asset Performance

Paper manufacturing is essentially a continuous process, therefore a focus on reducing unplanned downtime is the key to success in that sector. On the packaging side, extending operational time by focusing on MTBF (mean time between failures), which is linked to OEE, is an important operational metric and is the top metric.

APM Metrics
Which APM metrics does your organization measure?
SECTION 7

Foundation for Digital Transformation is In Place but Action Lags
Faster Shift to IIoT Needed

The paper and packaging industry has the advantage when it comes to Digital Transformation in that it has far more automation and digital technology in place already than most other forms of manufacturing but because investment in technology refresh is lagging other industries it often may not be IIoT enabled. The industry needs to consider accelerating the adoption of IIoT in future purchases to maintain parity with other manufacturing segments.

IIoT Enablement of Existing Automation

IIoT Enabled Automation
Automation is An Enabler

The paper and packaging industry needs to change its thinking. The industry has a few progressive thinkers when it comes to Digital Transformation, but the industry as a whole lags almost every other form of manufacturing when it comes to leveraging the technology in place or investing in new technology or tools. Packaging lags behind paper in developing architectures that will support Digital Transformation and allow for the integration of newer IIoT enabled devices but has shown a willingness to shift its thinking in the coming year. Fortunately, both sectors have accepted the need for supplier and customer access as well or more so than overall industry regarding external access. Adoption of smart devices like mobile devices and wearables is slightly behind industry overall and represents another area the industry must accelerate investment or fall behind.

External Access

What external connections can be made to your plant and by whom?

IIoT Architecture Adoption

<table>
<thead>
<tr>
<th>Description</th>
<th>All Manufacturing Today</th>
<th>All Manufacturing 1 yr.</th>
<th>Packaging Today</th>
<th>Packaging 1 yr.</th>
<th>Paper Today</th>
<th>Paper 1 yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primarily use of edge analytics, IIoT gateways, and Cloud with some use of traditional control and information system architecture</td>
<td>50%</td>
<td>40%</td>
<td>30%</td>
<td>20%</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>Exclusive use of edge analytics, IIoT gateways, and Cloud</td>
<td>40%</td>
<td>30%</td>
<td>20%</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Primarily through traditional control &amp; information architecture and some use of edge analytics, IIoT gateways, and Cloud</td>
<td>30%</td>
<td>20%</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
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<tr>
<td>Even split between traditional control &amp; information architecture and use of edge analytics, IIoT gateways, and Cloud</td>
<td>20%</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
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<tr>
<td>Through traditional control &amp; information architecture</td>
<td>10%</td>
<td>0%</td>
<td>0%</td>
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</tr>
</tbody>
</table>

0% 10% 20% 30% 40% 50% 60%
Mobility Already Accepted

**Mobile Devices**

![Bar chart showing mobile device usage across different industries.](image)

**Wearables**

![Bar chart showing wearable technology usage across different industries.](image)
Industry is Security Conscious

The paper industry has not unexpectedly proven to be more security conscious than the packaging sector suffering fewer breaches but is not as good as industry in general. As the paper industry moves into the digital era, it needs to pay greater attention to cyber security.

Security Breaches

Have you had any plant IT security breaches and if so from what source?
SECTION 8

Recommendations
Recommendations for the Paper & Packaging Industries

With a changing workforce, new alternatives in materials entering the market and an ever increasingly competitive commercial landscape paper and packaging companies need to start the pursuit of Digital Transformation. Five key steps they should take to secure their future in the digital world are:

Start now by defining how they want their business to look 5 to 10 years down the road. Digital Transformation is a journey that requires a vision. Setting strategic objectives that will transform the business is the first step.

Define success – know what Operational Excellence looks like. This means understanding what factors will drive customer satisfaction, enable maintenance of the ability to produce products in a sustainable fashion, and create the profits that shareholders will demand. It also means defining the metrics that measure success in these areas and ensuring that appropriate measurements are made and information shared.

Create an Operational Architecture that defines the technology people will use to support the business processes that create value. Paper companies need to make sure that existing technology is integrated into their architecture if it’s capable, and if not appropriate investments in the right technology occur. It is all about getting the right information to the right people at the right time – that hasn’t changed in over 30 years.

Select partners that share the Digital Transformation vision and can provide a platform upon which to build. While no single vendor can provide every element of technology needed to Digitally Transform a business there are numerous suppliers that understand the challenges and are moving away from selling products and instead delivering platforms upon which all parties including the paper companies can build the right solutions that enable those companies to meet their strategic objectives. When selecting a partner consider the following:

- How open is the platform? How many vendors support it?
- How extensible is the platform? Does it extend across OT and IT?
- How are industry specific requirements supported? Do specialized applications work with the platform?
- What is the history of innovation? Does the vendor have a track record of commitment to technological currency?

Technology is changing industry and time is running out. Digital Transformation is accelerating across all industries, and the paper and packaging industries are no exceptions. Early adopters in paper and packaging are showing that there are real, measurable benefits from leveraging technology. Those companies that have yet to pursue things like the IIoT, Cloud-based solution and Big Data with its associated Analytics risk falling so far behind the competition that they become the victims as consolidation and business model changes reshape paper and packaging.