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WHITE PAPER

BUILDING AN INTELLIGENT ORGANIZATION

HOW DIGITAL TRANSFORMATION IS CRITICAL TO AN ORGANIZATION'S ABILITY TO THINK AND ACT

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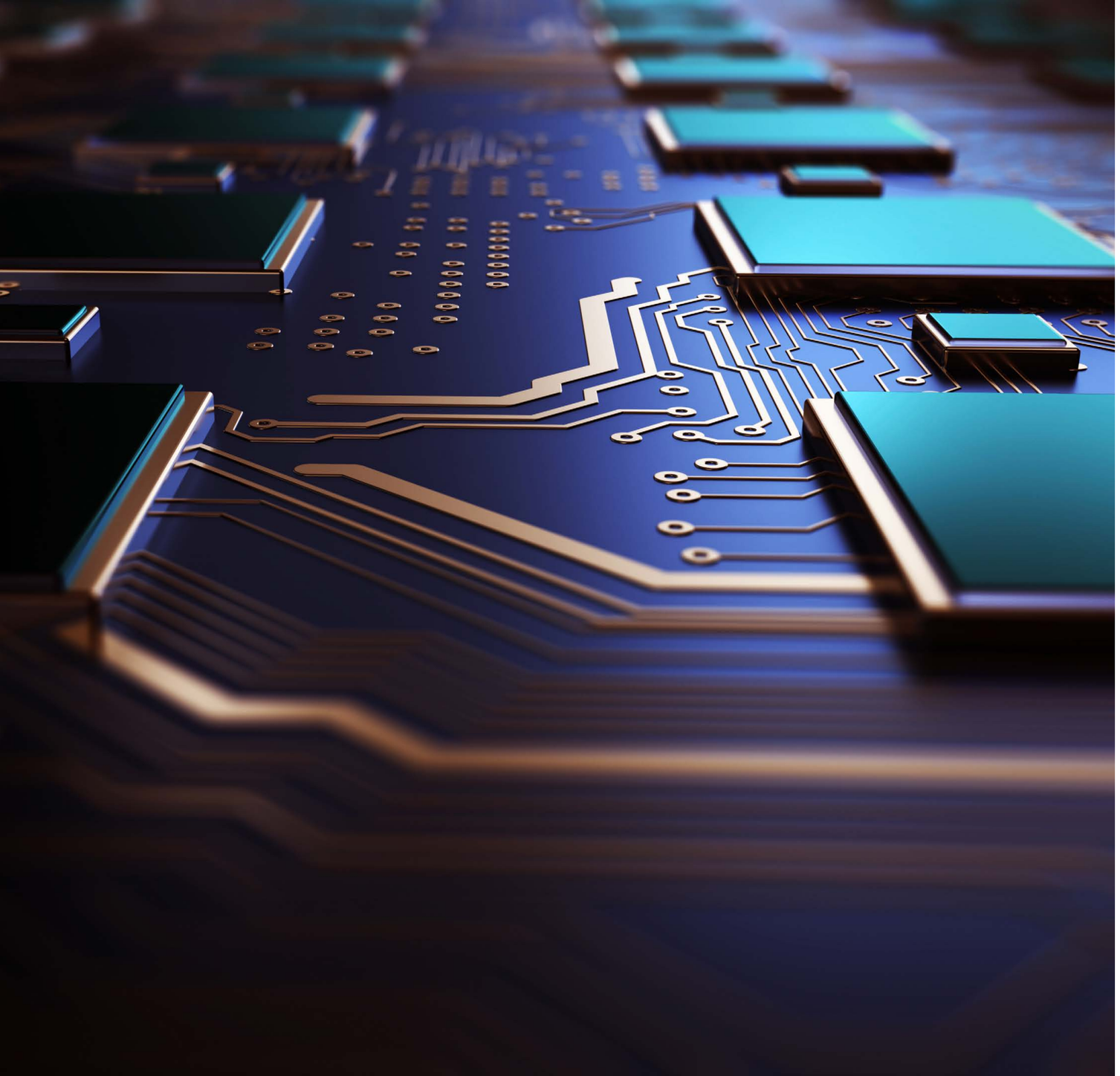
“Organizational Intelligence” describes the ways organizations acquire, create, and apply knowledge. In the mid-20th century, sociologist Harold L. Wilensky used the term to create a framework to understand and improve organizational behavior.

Even in a connected society, fostering organizational intelligence can be a difficult task. Organizations are composed of many individuals with different backgrounds, roles, and expertise. These individuals need to work together to obtain and create knowledge that the organization can use to oversee its operations and innovate. In other words, knowledge has to be communicated and shared effectively for an organization to succeed.

Data has revolutionized organizational intelligence. And in today’s fast-paced and 24/7 business environment the right architecture, infrastructure and analytics are the keys to strong organizational intelligence.



When c-suite executives were recently surveyed about what AI-powered solutions have the largest impact on their businesses, the top responses included virtual personal assistants (31%), automated data analysts (29%), automated communications (28%), and predictive analytics (26%).

All of these solutions were designed to streamline one thing: the acquisition, creation, and communication of organizational knowledge. In the coming years, technologies will become increasingly interactive and easy to use. Any employee will be able to access and use the entirety of the organization's knowledge.

Despite these incredible advances, many organizations—from large corporations to SMEs—have a difficult time modernizing their data practices. Getting started is often especially hard, since leaders have to navigate an expansive, ever-changing technology landscape.

Nevertheless, the writing is on the wall. Modernizing data technology is necessary for companies to succeed in the future.

In this white paper, we will discuss why digital transformation is critical for organizational intelligence and focus on how these technologies can fundamentally change the way your business thinks. In addition, we will explore the challenges, opportunities, and growth potential of new and emerging data technologies.

THE FORMATION OF INTELLIGENCE

Intelligence is notoriously difficult to define

We think we know what traits an intelligent individual might have. We tend to call people intelligent when they have large amounts of knowledge, can reason about complex problems, perceive the world in new ways, or create moving pieces of art. These traits don't seem to have much in common, but there must be a reason we are grouping them.

If we think of intelligence as a process instead of a trait, then its definition becomes clearer.

Psychologists and philosophers use the Data-Information-Knowledge-Wisdom (DIKW) pyramid (shown below) to describe the different ways we know things.

- Clear visibility into current performance
- Fast turnaround on any data-based analyses executives want to run
- Confidence that it could comply with data privacy laws and regulations (like GDPR and CCPA) that apply to the other company's customers

Psychologists and philosophers use the Data-Information-Knowledge-Wisdom (DIKW) pyramid (shown to the right) to describe the different ways we know things.

Data

The appreciation and application of the frameworks we use to understand the world

Information

Transforming repeated observations into generalizable facts

Knowledge

Connecting the dots to create a framework to understand the relationship between the facts that define the world

Wisdom

Observations about the world

While the pyramid is mostly used to describe the forms of knowledge, it is also a convenient way to describe the formation of intelligence. Intelligence begins with raw information we get from our senses of sight, touch, hearing, and so on.

Knowledge is the framework we use to understand why we observe what we do. For instance, we understand gravity to cause thing to fall towards the earth. Wisdom is the appreciation (and sometimes skepticism) of knowledge: It is knowing that there is no consensus on how to reconcile contemporary theories of gravity with quantum mechanics, and also knowing that it isn't exactly relevant to deciding whether bungie jumping is worth the risk.

This definition of intelligence, however, is mostly used to describe the ways individuals think and learn. However, organizations of all sizes, from families to whole government departments, learn and think too. If we can better understand intelligence at the organizational level, we can make organizations smarter and further their success.

"To ensure employees can efficiently search, find, and utilize the knowledge available to them across the organization, businesses need a unified and efficient knowledge solution—from capturing knowledge to effectively discovering or sharing it throughout the organization."

Building Organizational Intelligence with Connected Thinking, Microsoft

HOW ORGANIZATIONS THINK

Organizations are made up of individuals thinking and working together to accomplish a common goal.

Like individuals, they collect data, turn it into information, create knowledge from information, and apply knowledge to better the organization. For instance, an insurance provider might have customer data, notice an uptick in enrollments among millennials, know that younger individuals carry minor risk, and engage in a campaign to attract more millennial clients.

In other words, organizational intelligence is the sum of the data, information, knowledge, and wisdom (DIKW) of its individuals, databases, and reports.

The key difference between organizational and individual intelligence lies here: Organizational intelligence relies on the ability to transfer DIKW between individuals. The inability to internally transfer, communicate, or explain observations can easily prevent organizations from capitalizing on the DIKW at their disposal. In other words, the flow of DIKW is critical to an organization's success.

There are also large short-term and long-term ramifications to poor organizational intelligence. In the long run, if an organization fails to get smarter, it will lose its ability to innovate and competitors that better understand the shifting landscape will take over.

THE FLOW OF INFORMATION

The internal transfer of data and information is particularly challenging for organizations. While knowledge and wisdom can be communicated through presentations and reports, you can't exactly hand a colleague a spreadsheet and expect them to understand its relevance to the organization.

It's difficult to share data and information for two reasons:

- Data and information are low-level observations. They are unlikely to be meaningful to stakeholders without some sort of interpretation.
- There is far too much data and information for people to reasonably evaluate, remember and analyze.

For that reason, experts and specialized tools are needed to help an organization oversee the internal sharing of data and information.

Streamlining the flow of data and information is critical to the success of an organization. Poor internal sharing hinders an organization's ability to think. The organization cannot act as a unit if its members use different data sets or missing information. This state is analogous to cognitive dissonance in individuals—it's hard to think straight if we feel unsure as a result of conflicting or missing information.

For example, non-standardized data (low-quality data) make it difficult for analysts to draw and combine datasets.

Not knowing where data is stored or what it represents can interrupt analyst workflows and even render the data useless. Gartner estimates that organizations lose around 13 million dollars in revenue every year from the downstream effects of this inability to share and use data. This figure is expected to increase given the exponential growth of data.

Issues with data and information sharing can cascade to business performance. An Association for Intelligent Information Management (AIIM) survey found that business performance correlated with digital transformation progress. In other words, successful companies have already begun their digital transformation journey.

CREATING KNOWLEDGE & PRACTICING WISDOM

Organizations create knowledge when people put their heads together to come up with solutions.

It happens when individuals share the knowledge and insights that they acquired through research and analysis. Wisdom, on the other hand, is the combined experience of people in the organization. An organization practices wisdom, when individuals share and study the organization's previous mistakes to better apply their knowledge in the future.

As noted earlier, knowledge and wisdom are entirely dependent on the flow of data and information within an organization. An organization can't think straight or act confidently if its members can't agree on the reliability of the organization's information.

There are several ways an organization can facilitate the creation of knowledge and cultivate wisdom, but three are of chief importance:

A SHARED VISION

Individuals need to be working towards the same goals to act as a team

A CULTURE OF TRUST

New ideas should be encouraged and all stakeholders should actively share their previous experiences

CLEAR RULES OF CONDUCT FOR COLLABORATION

With the right organizational structure, it becomes easy for individuals to work together

At this point in the process, organizational culture has a larger impact on the formation of organizational intelligence. Changing an organizational culture requires a multi-pronged approach that involves leadership styles, technology, and work expectations.

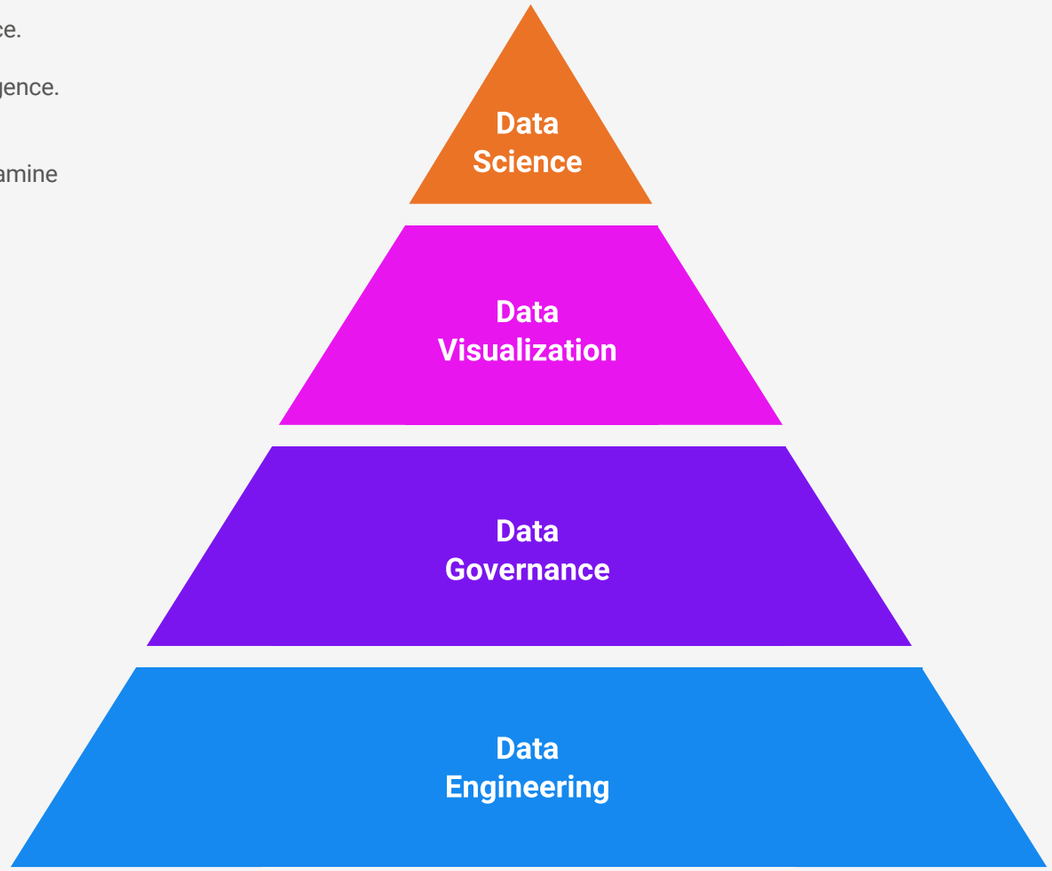
CREATE A BETTER CUSTOMER EXPERIENCE

Data and analytics technology exists to support every part of organizational intelligence from data to wisdom. These tools help share, manipulate, and analyze all steps of the process of forming intelligence.

In many ways, the electronic data lifecycle corresponds directly to the DIKW model of organizational intelligence.

In other words, data and analytics play an enormous—and ever-growing—role in fostering organizational intelligence.

Many businesses don't realize that legacy systems are not simply an inconvenience, but seriously hinder an organization's ability to think. However, before moving forward with this argument, it is worthwhile to briefly examine how electronic data is transformed into organizational action.



AN OVERVIEW OF THE DATA LIFECYCLE

The data lifecycle consists of four domains: data engineering, data governance, data visualization, and data science. At each stage, observations are analyzed and aggregated to create a new unit of analysis.

1

REVENUE FROM CROSS-SELLING

Data Engineering builds systems that manage and integrate enterprise-wide data. Its primary goal is to make data more actionable and valuable by transforming data into a standard format, integrating it with other relevant data, and sharing it with key stakeholders.

Overall, it makes data accessible, getting it ready to be transformed into meaningful information for an organization's business intelligence and analytical efforts.

Organizations can immediately derive value from Data Engineering—it improves collaboration between departments, saves time on preparation and analysis, reduces errors using automation, and delivers more valuable data as a result of the centralized system.

2

REVENUE FROM UPSELLING

Data Governance is the management of information to streamline the creation of knowledge. In its essence, it is a collection of policies, standards, and quality control processes to make an organization's information transparent, by cataloging where it's stored, who it's shared with, and how it should be used.

Good data governance helps organizations maintain consistent and trustworthy data that they rely upon to make critical decisions, in addition to helping them abide by regulatory standards. By making information across an organization clear and consistent, data governance makes it easy to derive value from information—in the form of informative data sets—and makes it easy for organizations to transform it into knowledge.

3

DATA VISUALIZATION

Computers have made possible the processing of large amounts of data at rapid speeds. Conversely, the human brain is not wired to think about numbers in the abstract.

Charts, graphs, and dashboards are great at boiling complex information into accessible insights. Data visualization universally conveys complicated concepts and helps identify ways to put these discoveries to good use.

In other words, data visualization generalizes information and provides an organization with the knowledge it needs to take action.

4

THE INTELLIGENCE PIPELINE

The four pillars of data and analytics—engineering, governance, visualization and data science—all come together to create an intelligence pipeline. Data is cleaned and prepped for analysis, cataloged, visualized and studied to generate new insights.

Data Engineering

Transform raw data into a format that is easy to use, and move it to the right location

Data Governance

Keep data reliable, secure, and information to maintain its value

Data Visualization

Translate data into a universally accessible representation to make important generalizations

Data Science

Examine data to expose hidden patterns, correlation, and other insights

Each of these four pillars is critical to organizational intelligence.

If any one of them fails, an organization will be hindered in its ability to think, learn, and grow. For instance, if a business lacks data visualization, non-technical leaders will not be able to provide adequate advice.

Without data governance, an organization will be able to find the data needed, much less make sense of what said data represents.

“To ensure employees can efficiently search, find, and utilize the knowledge available to them across the organization, businesses need a unified and efficient knowledge solution—from capturing knowledge to effectively discovering or sharing it throughout the organization.”

Building Organizational Intelligence with Connected Thinking, Microsoft

These four pillars all add value to data by transforming it into something more meaningful, whether it be a call to action or simply a better-organized dataset. They form the foundation of modern organizational intelligence. To ensure that an organization continues to learn and grow, it must be engaged in digital transformation.

DIGITAL TRANSFORMATION

Digital transformation is the process of modernizing the way an organization uses technology to advance its vision.

Most people think of digital transformation as the design and implementation of new IT systems, and while it is true that this is a critical component of digital transformation, for a digital transformation initiative to be successful it needs to originate from the top. In other words, digital transformation works best when it is led by an organization's management (or c-suite executives in the context of a business).

Digital transformation is an ongoing process. Organizations that succeed at digital transformation are constantly looking for new ways technology can streamline operations and improve the experience of all stakeholders, including customers and employees.

For instance, a logistics company might want to stay up-to-date with the latest tools spanning the data lifecycle to:

- Streamline customer service by creating an informative self-service portal to view orders, transactions, and rates
- Reduce shipping costs by leveraging machine learning to find the lowest cost routes and carriers
- Comply with evolving data privacy regulations by implementing strong policies to govern company data use
- Improve internal performance visibility by creating a data reporting pipeline with critical KPIs

Every digital transformation initiative not only requires the implementation of new platforms and software, but also the involvement of leaders and stakeholders.

Management is needed to determine the ways technology can have the largest impact on company operations. Stakeholders provide important feedback on how they want to use technology to make it easier for them to accomplish their tasks.

In summary, digital transformation is a process that can have a tremendous impact on an organization. Embracing digital transformation is critical to advancing any organization's vision and ensure its success in the future.

"Nearly two-thirds of CEOs and CFOs anticipate business model change, frequently due to digital transformation, and investors are encouraging that change. […] They are not just interested in data – which is now old news –they are interested in what you do with data through advanced analytics and artificial intelligence."

Mike Harris, EVP, Research & Advisory, Gartner

THE OBSTACLE: LEGACY SYSTEMS

Legacy systems are the biggest obstacle to embracing digital transformation.

These systems may have been in use by an organization for long periods. Its employees might be specifically trained to use these systems, and the up-front costs of digital transformation can seem expensive. Although they aren't perfect, leadership might claim legacy systems seem to get the job done.

This argument seems innocuous, but it relies on our cognitive biases. It relies on organizational inertia and the worry of losing costs already used to deploy the legacy systems.

But, as behavioral economists note, this thinking relies on our false beliefs. There is no guarantee that legacy systems will work in the future, and there is no reason to avoid adopting a better system simply to "derive value" from an investment that no longer produces enough value.

In fact, this position is also quite dangerous: Failing to confront problems associated with using antiquated or poorly-designed legacy systems threatens an organization's ability to leverage the combined knowledge and wisdom of its employees.

With technology only evolving at faster and faster paces, the divide between emerging platforms and legacy platforms continues to grow. The widening gap between legacy systems and cloud services requires IT executives to manage and maintain technology with diverse delivery capabilities. This internal technology disparity is unsustainable in the long term.

Aging back-office legacy systems can hinder the internal flow of information by requiring tedious manual data processing that slows the flow of important information or obscure certain important details.

This deficit can pose serious risks. Without quick access to detailed information on their operations, organizations are missing the knowledge they need to make intelligent decisions—from long-term strategies to hourly operational decisions. On a very basic level, organizations that use these aging systems are flying blind.

Additionally, many legacy systems are no longer compatible with modern technology, and cannot efficiently share data with newer tools.

As technology develops more rapidly, the prospect of a digital dark age increases. Data stored on legacy systems could eventually become unreadable and indecipherable. Aging hardware and software will fail as they struggle under the weight of the size and performance needs of modern data.

Leaders, therefore, need to consider whether a legacy system can be effectively modified to share information when deciding whether to modernize their data infrastructure.

While it seems natural to adopt tools to create a minimum viable product that meets their needs, companies can be left with multiple disconnected systems. Siloed systems mean more manual data processing and greater chances of introducing human error.

Executives need to think seriously about whether the large overhead costs of keeping those systems running outweigh the upfront investment in new technology. Legacy systems are both difficult to modify and expensive to maintain. It's time that companies acknowledge the cost of maintaining expensive legacy systems that carry higher costs over an extended period.

Overall, the inability to share information can have enormous negative ramifications on an organization.

Slow reporting speeds and inconsistent data prevent an organization from using the information to act quickly and confidently. Legacy systems leave organizations thinking far too slowly to succeed in today's market and cause leaders to lose confidence in their decisions.

Ultimately, leaders need to consider the fact that legacy systems can diminish organizational intelligence and think seriously about the appropriate strategy for addressing this issue.

STRATEGIES TO ACHIEVE DIGITAL TRANSFORMATION

Implementing a new platform is certainly challenging, but it is a necessary step to mitigate legacy risk, cultivate organizational intelligence, and grow your business.

To determine the right approach to digital modernization, business leaders should first consider which of the following three options best suits their organization: refreshing, reshape, or replacing legacy systems.

1

REFRESH

Implementing a new platform is certainly challenging, but it is a necessary step to mitigate legacy risk, cultivate organizational intelligence, and grow your business.

To determine the right approach to digital modernization, business leaders should first consider which of the following three options best suits their organization: refreshing, reshape, or replacing legacy systems.

2

RESHAPE

In most cases, refreshing is not the most cost-efficient opportunity. The better choice to reshape a system's architecture. Reshaping systems involve changing them just enough so that they can function in a different technology ecosystem.

The difficulty of reshaping an old system can vary.

Sometimes, the process can be easy. The core parts of the system can be deployed on modern infrastructure by altering or recompiling the application code. Other times, an organization will need to alter an application code to migrate it to a new architecture to fully exploit the new architecture's capabilities.

Let's look at an example of a company in a good position to take the reshape approach.

A business uses on-premises infrastructure to stores data in a relational database (like Oracle, SAP, etc.), extract data using ETL tools (like Informatica, Matillion, SSIS, etc.), and pipe the data downstream to update dashboards (like Tableau, PowerBI, etc.).

Business leaders, however, want an infrastructure that can scale more seamlessly. They want to use a cloud environment to take advantage of its scalability and explore other cloud-native features.

Using the reshape approach, the company will likely be able to continue using the same technologies but will take some modifications to successfully migrate its applications and databases to the cloud. Reshaping the architecture might involve changes to application logic, interfaces, data management, and system configuration.

Sometimes, the cumulative complexities of these changes may make it worthwhile to completely re-engineer its data systems. Still, the increased scalability and new features tremendously benefit the organization and provide quick ROI.

3

REPLACE

Completely replacing old software by building or purchasing new software is a highly viable strategy for modernization. This approach involves rebuilding or rewriting the application components from scratch or eliminating the former application components by adopting new architecture.

90% of the world's data is reportedly unstructured. Legacy systems cannot process unstructured data and might prevent businesses from achieving their desired outcomes.

With the rise of unstructured data in the last 2 – 3 years, the replacement approach might become the only option for some organizations.

New technologies that combine both structured and unstructured data are increasingly playing a vital role in the ability to get a 360-degree view of the organization. Machine learning and AI can leverage these new platforms—and especially cloud-native technologies—to improve forecasting, streamline business operations, or develop new products, providing a serious competitive edge.

Cloud-native technologies are becoming increasingly important tools for modern organizations, and the replace approach is often the best way to can guarantee solutions that capitalize on these powerful technologies and provide the greatest ROI.

FAIL FAST

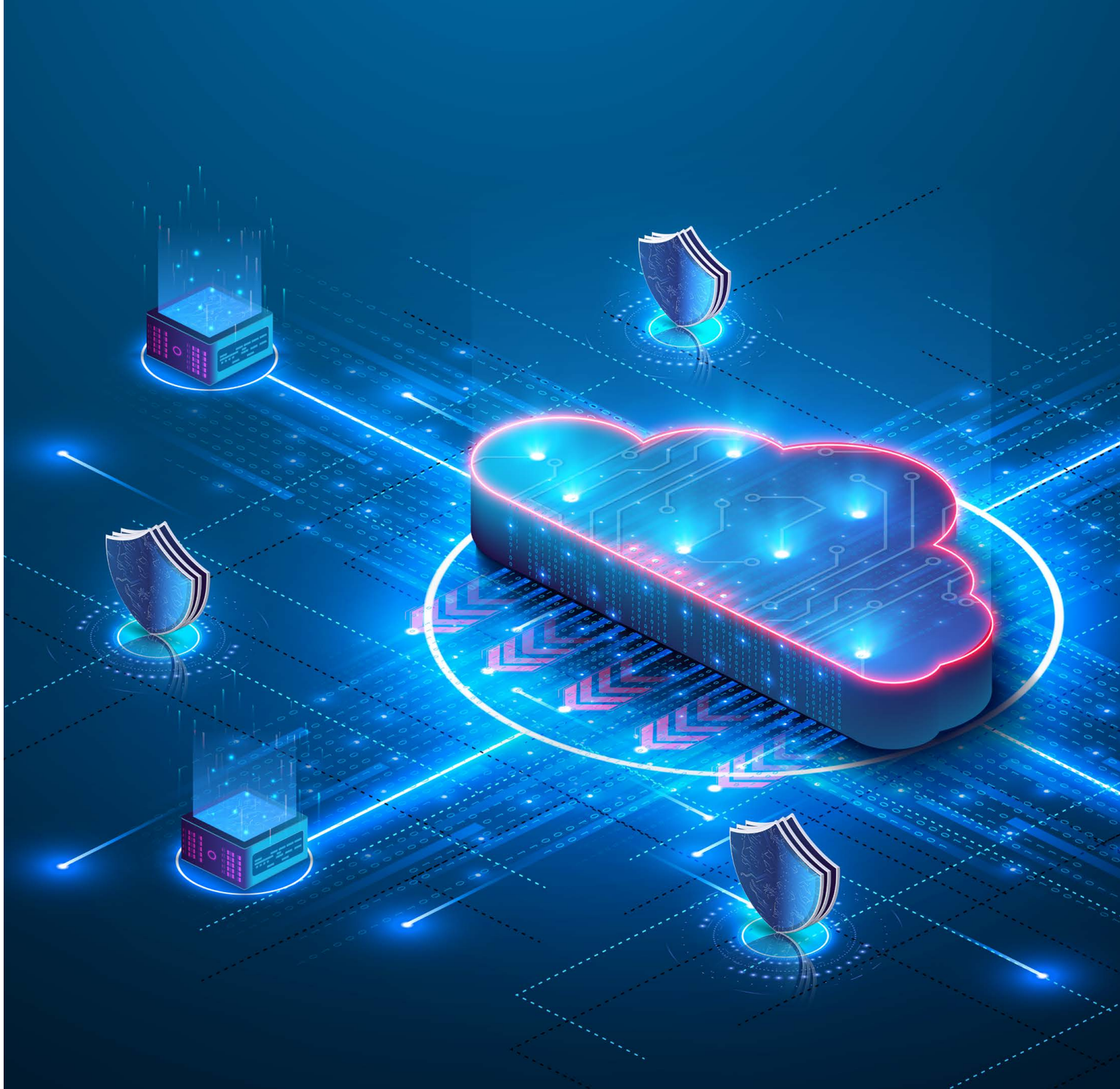
Given the increasing acceleration of emerging technologies, it is apparent that there will be a steep learning curve as enterprises migrate toward the cloud.

In the tech environment, failure is accepted and signifies participation in the tech industry. When transitioning from old legacy systems to newer cloud-based ones, failure must be fast, and the lessons learned through failure must be learned quickly.

Failing fast is a technique employed by technology teams wherein the objective is to deliver high-quality function by rapidly changing course when a new path doesn't work. The longer it takes to realize that a strategy is failing, the more resources are being wasted. Conversely, when a good strategy is quickly verified and acknowledged additional resources can be allocated more quickly to that strategy.

Developing enough of a strategy or idea to determine whether it's useful is the key to failing fast.

Enterprises should validate function with as little investment as possible to reduce risk. Failing fast must be encouraged by enterprise executives and should be integrated into an organization's culture. A workspace where teams are penalized for taking risks results in slow growth and lower quality output.



THE OBSTACLE: LEGACY SYSTEMS

Moving to the cloud may require work with a large infrastructure and hardware investment.

To validate how new platforms and devices will be affected by a redesign, consider first implementing as little of the new infrastructure as possible. By carefully building the platform part by part, rather than building it all at once, the team can test failures in the system and gauge where the failure is happening. Through rapid trial and error, enterprises can determine what is right for their organizations and adjust accordingly.

With the introduction of cloud-based platforms organizations now have the agility necessary to keep up with a fail-fast methodology. Enterprises use fewer resources on testing new platforms, as they pay only for what they need. The cloud is aiding organizations as they transition by reducing the costs and risks associated with traditional IT projects.

Innovation is not easy, but it is made easier by utilizing the cloud as a resource to scale up and down as testing requires without a large upfront investment.

CONCLUSION

For an organization to learn, it needs to obtain the right data and information. It also needs to find ways to make it easy for the individuals within it to put their heads together to make discoveries and design intelligent solutions. In addition, organizations can facilitate cooperation by establishing clear and consistent ways to communicate important data and information.

Embracing digital transformation is a critical component to fostering organizational intelligence, and its importance to organizational intelligence is only growing. Organizations will need to overcome the challenges posed by legacy systems and adopt the right transformation strategies to secure their futures.

Still, the right digital transformation strategy all but guarantees growth, and organizations should not be surprised if they see fast returns on their investment. With the right combination of leadership and technology, digital transformation is the way to make sure your organization continues to think and grow well into the future.

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APEXON IS A PURE-PLAY DIGITAL ENGINEERING SERVICES FIRM FOCUSED ON HELPING COMPANIES ACCELERATE THEIR DIGITAL INITIATIVES FROM STRATEGY AND PLANNING THROUGH EXECUTION.

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