DIGITAL TRANSFORMATION

IN AEC AND REAL ESTATE

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2019 Edition

DIGITAL TRANSFORMATION CONTENTS

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Introduction

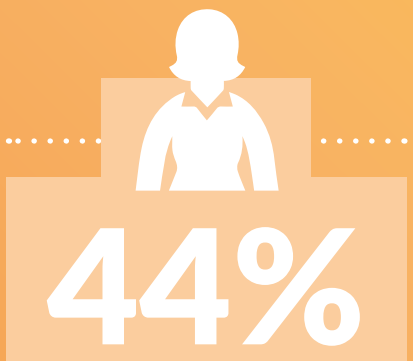
Digital Transformation
What Is Digital Transformation?

Digital transformation is one of the most overhyped and overused technology terms today. The message is repeated in almost every article, presentation or study related to achieving competitive advantage and relevance in the digital world: digital transformation is imperative. The question is, *what does that mean?*

Many use the term to describe the modernization of legacy systems, the rethinking of operating models and the migration to the cloud. However, the truth is that digital transformation doesn't come out of a box and isn't a one-size-fits-all solution. The process of digital transformation is bigger than the technology alone; it is an ongoing process that needs to be incorporated into the culture of an organization.

What is Digital Transformation

Digital transformation is the core involvement of digital technology throughout all areas of an organization. It is a profound rethinking of how a business uses technology, people and processes. The resulting transformation becomes a fundamental change to how the business operates and delivers value to its customers.



44%

of companies have already moved to a 'digital first' approach for customer experience

IDG State of Digital Business Transformation Report

Digital Transformation
Why Does Digital Transformation Matter?

There can be many reasons why an organization embarks on digital transformation. The most likely of these is survival, they need to evolve to stay relevant. New technology is constantly disrupting marketplaces, creating both new opportunities and new competition.

Meanwhile, emerging technologies have caused customer expectations to grow exponentially. To gain any competitive advantage, companies need to learn to merge technology with strategy, while ensuring customer experience is at its core.

What Does Digital Transformation Mean for Businesses?
Digital transformation is driven by the simple desire to make work better for everyone, from employees to customers. A key part of digital transformation is understanding what technology can help a business achieve. That doesn't mean doing the same things as before, only faster. It means adapting processes to make the most of technology investments.

Digital transformation allows businesses to reconsider everything, including processes, departmental structures and ways of working. It can help remove barriers between teams and increase efficiencies. Organizations who leverage digital transformation are able to streamline production, build better workplaces for their employees and improve their overall customer experience. Over a third of companies (31%) already have a digital transformation programme in place, with 31% looking to launch imminently. There is no doubt that many businesses, across many industries, are realizing its importance.

What Is Driving Digital Transformation?

In the past, Digital Transformation was something some companies may have thought that they could choose to pursue, or not to pursue. However, in 2019, it is a survival issue; transform and grow, or risk financial and market share loses. The business world is littered with examples of companies that didn't evolve and suffered significantly because of that inaction.

While Digital transformation offers companies the opportunity to implement internal operating efficiencies, much of the case for change is coming from customer expectations. Several key areas are driving digital transformation:

90%

of consumers expect to be able to access an online portal for customer service.*Microsoft

Improving the Customer Experience

People have adopted digital technology into their personal lives, and expect businesses to be able to deliver using these channels - customers want personalized experiences. For decades "putting the customer first" has been a central ethos for many companies, but how that is being achieved is changing. Improving customer experience isn't just about customer service; it's about improving every customer interaction; for example, how sales pitch for new business, marketing messaging, the buying process, and after-sales. Using Digital Transformation as an opportunity to improve privacy and data protection not only protects firms against breaking new regulatory conditions, but also offers customers comfort.

44%

the increase in spending on AI in 2019 over 2018 (total spend = $35.8 billion)

Utilizing Data & New Technology

Digital technology impacts every area of an organization; harnessing digital technologies means increased speed to market, improved profitability, and operational efficiency. Cloud-based innovations and increased bandwidth from cloud services enable you to get more from your data, be more agile, and reduce cumbersome IT architecture. As networks become more reliable, speeds improve, and latency lowers, accessibility to cloud-based services improves. Artificial Intelligence (AI) will continue to develop and be used more widely for a variety of applications.

56%

number of CEOs who said digital improvements led to revenue growth. *Gartner

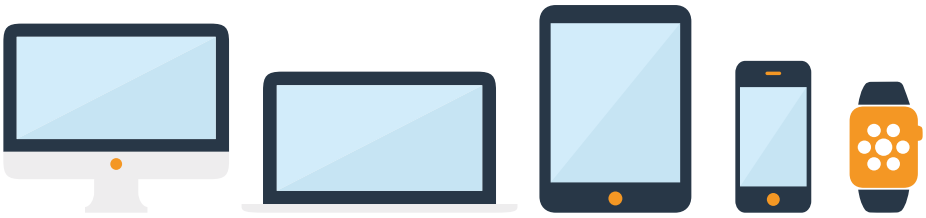
Beating the Competition & Driving Growth

A digitized business is agile. It delivers more value to customers, operates more efficiently, and delivers increased revenue. However, most importantly, it can fight for new business on improved terms against the competition, and fend off increased pressure from the disruption caused by start-ups.

Martech
What Is Martech?

In its simplest form, Martech is the combination of marketing and technology. It's any type of marketing that takes place in a digital environment or is tracked with digital systems. This includes technology marketers use to reach potential customers, technology that allows for automation of tasks, and technology that enables marketers to measure the effectiveness of their campaigns.

Martec Technology has forced marketing to change from a one-way push of marketing messages to a two-way conversation with customer engagement being key. With digital technology so ingrained in our day-to-day lives customers demand a different type of relationship with brands. This relationship is powered by technology and allows for a seamless and personalised customer experience.



As well as the ability to nurture customers and create personalised interactions technology makes these exchanges truly measurable. Through agile practices, marketers are able to test, measure and optimise their campaigns. With this increased ability to source and nurture not only prospective customers but the most valuable customers, Martech offers a fantastic opportunity to drive new business. Companies need to embrace the technology on offer to make the most out of their marketing spends, to gain more customers, and to increase profits.

How Does Martech Fit Into Digital Transformation?

Martech incorporates technology that streamlines the process of digital transformation. There are many types of marketing technology that marketers can utilise; the following are a few examples key to enabling digital transformation:

Customer relationship management: with changing consumer demand in mind the ability to retain detailed information on customer interactions and preferences is vital. The use of customer relationship management (CRM) systems forms an integral part of Martech and digital transformation.

Advertising technology: such as search engine optimisation (SEO) which allows marketers to to ensure they can be found amongst all the competition. SEO tools help determine the best keywords and phrases for organic search.

Conversion technology: to embrace digital transformation as a continually evolving philosophy organizations need to be able to test, learn and adjust constantly. Analytic tools enable marketers to access metrics that they would not be able to gain otherwise.

The key to using Martech is for businesses to ensure they have the right combination of technology that is able to work well together. This combination of technology is known as a tech stack and includes Digital Asset Management, Enterprise Resource Planning and Customer Relationship Management to name but a few. As well as having the right combination of technology, for organizations to get the best from Martech, they need to ensure they have the digital strategies in place to harness them; this is where digital transformation comes into play.

Artificial Intelligence
What Is Artificial Intelligence?

Artificial intelligence (AI) is a part of computer science that focuses on the creation of intelligent machines. These machines aim to work and react like humans with respect to things such as speech recognition, learning, planning and problem-solving. The goal is for the computers to carry out tasks traditionally done by people.

Machines can only act like humans if they have a considerable amount of information relating to the world around them. AI needs to have access to objects, categories, properties and the relations between all of them to implement knowledge engineering. Knowledge engineering allows machines to use common sense, reason and problem solve. In this way AI computers are able to perceive the world and collect data, understand the data they've collected, act independently and learn and adapt over time.

How AI Forms A Vital Part of Martech and Digital Transformation

AI is one of the most significant trends that is influencing Martech. AI will be able to help marketers make sense of all their data and will help businesses work smarter and more efficiently. It offers the potential to shift business strategy to a truly customer-centric model.

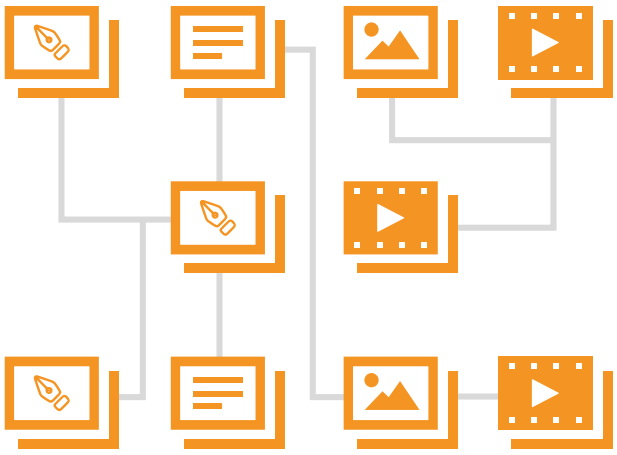
AI is already a key driver of digital transformation across a wide range of industries. Many organizations have already started to use AI technologies to enable them to automate information capture and processing. The increased efficiency offered by AI technology allows humans to focus on dealing with more ambiguous information, challenging cases and disgruntled customers. The symbiosis that is developing between man and machine is a business transformation in its own right and is at the core of digital transformation.

What truly ties AI to Martech and digital transformation is its future potential. Although currently used predominantly for automation and time saving, AI could offer so much more than process efficiency. It has the potential to convert customer information and communications into relationships and actionable data. As AI moves forward, it will become even smarter allowing it to be able to understand vast amounts of data in order to make decisions that improve outcomes and customer experiences. It is predicted that AI will be one of the most significant digital business disruptions moving forward and will be fundamental to helping organizations reach their transformation goals.

Digital Asset Management

The digital landscape is constantly growing and evolving. We expect to be able to interact with businesses at our convenience, products and services need to be both engaging and accessible, and internal teams need to work efficiently. What this means for businesses is that the volume and use of their digital assets is greater than ever.

These digital assets include all types of digital files, everything from graphics to images and videos. It takes a considerable amount of internal resource to manage the volume of digital assets, especially within organizations that rely heavily on images and videos. Keeping digital assets organised and accessible is fundamental.



Digital Asset Management (DAM) systems are a marketing technology tool that allow organizations to store and organise their digital assets. Making assets accessible to employees and customers is ultimately what gives them intrinsic value. However, digital asset management solutions are more than simple repositories. It's essential that assets are stored and shared but more than that they need to be organised and searchable so that they can be used appropriately. A big part of DAM is the management of the digital asset lifecycle, from creation to preservation.

Digital Asset Management CONT...

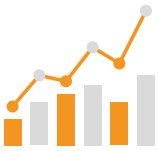
DAM solutions offer the following benefits to organizations; together these benefits can create significant value:

Controlled access:
Governance allows for consistency and correct usage of digital assets by the correct people within an organization. It offers a very much needed level of security.

Structured metadata creation:
This allows every asset to be tagged with relevant information. Keywords enable users to quickly refine searches using standard search terms and fields give users unique information for each file.

Automated processing:
DAM systems not only store master files but can convert files to different sizes and formats. This makes the process of repurposing assets much more accessible and saves valuable time and money.

Facilitated sharing:
Efficient workflows allow assets to be shared seamlessly within teams regardless of location. Users have the most up-to-date versions of assets at their fingertips at all times.



Enhanced analytics:
Provide insight into both the performance of your assets and the DAM system itself.

DAM is a crucial system to enable businesses to harness digital technologies. An organization that is embracing digital transformation will be evolving in such a way that more and more digital assets are created. The possibilities that Martech and AI have to offer in terms of creating an immense amount of actionable data makes the storage and management of digital assets fundamental to their success.

Digital Transformation in AEC and Real Estate

The Global Business Trend of Digital Transformation

Digital transformation is a global trend. Technology is integrated into every aspect of our lives and is transforming the ways in which businesses operate. Digital innovation is transforming every economy and marketplace and is forcing a reinvention of the way business is done across all industries. There are four principal megatrends that are making a huge impact on businesses:

Cloud: cloud-based solutions deliver unlimited capacity, business agility, and lower costs. The time to market advantages are hard to beat. The cloud has revamped IT departments but has much more to offer such as collaboration and the ease of deployment of services.

Big data: technological advancements have hugely increased the opportunities for collecting data with mobile and wearable technology. Organizations can generate business insight in real time and use the results to develop new products and services.

Mobile: many employees now work with smartphones and tablets and a change in IT infrastructure has allowed employees to use their own devices. Meanwhile, mobile applications have been developed for both employees and customers to provide a more user-friendly, customer-centric experience. Mobile technology allows access to be independent of location which optimizes employee time and increases productivity.

Social technologies: social networks allow businesses to create personalized dialogues and to better understand their customers. These technologies also offer opportunities for enhancing recruitment and for streamlining communication with employees and collaboration with partners.

It is the convergence of these megatrends alongside a plethora of other digital technologies that is forcing change. Each of these trends in its own right has the opportunity to transform businesses, but those who adopt integrated solutions will see the greatest impact.

By embracing digital transformation, organizations are able to develop collaborative and innovative cultures that have the potential to vastly improve productivity and efficiency. The opportunities the megatrends present allow organizations to develop new business models, create new revenue streams and enhance customer experiences. However, investing money alone isn't sufficient to reap the rewards that new technology can offer. Companies need to focus on their core business capabilities and transform these with the right technology to differentiate and compete within the marketplace.

What Are the Strategic Objectives Of Digital Transformation?

It goes without saying that technology is one of the principal forces behind digital transformation. Implementing new technology promises optimized business operations and a quicker route to market. New technologies create opportunities for businesses to completely change the marketplace.

Digitally native companies have revamped existing industries by providing an exceptional instantaneous customer experience. With the advent of these new or adapted companies comes the rise in consumer expectations. People have adapted to digital technology being at the centre of their lives and, as such, they expect businesses to be able to deliver products and services through these channels and at their convenience. More than this, customers want to receive outstanding experiences. It's no longer the case that industries work in silos, once a customer has experienced an exceptional level of service, they will expect the same everywhere.

Although digital technologies are the primary driving force behind transformation, successful adoption of these technologies requires a sound strategy.
Digital transformation involves more than merely implementing technology to solve individual problems. The process of transformation is a fundamental change in the way a business operates. Strategic objectives outline what a successful transformation means for an organization. These objectives will include the following aspects:

Providing an exceptional end-to-end customer experience.

Optimizing business operations.

Incorporating new business models, products and services.

Improving differentiation.

Getting to market faster and more effectively.

Reducing costs and growing revenues.

What does digital transformation mean to AEC and Real Estate?

Digital transformation is a global trend but, although some industries have been immediately impacted, others, such as architecture, engineering and construction (AEC) and Real Estate, are only now starting to feel the full extent to which their business will need to adapt.

The AEC and Real Estate industries aren't new to technological change with the adoption of 2D and 3D computer-aided design and now Building Information Modelling (BIM) and the Internet of Things (IoT). Technology offers new a change in the design process by using new materials and collaborative working practices. The process of digital transformation provides these industries design opportunities that will enable them to face the challenge of urbanization and sustainability. Transformation means more than creating more efficient services; it means improving project outcomes to continuously improve the impact on users, communities and the environment.

The opportunities for enhanced customer experience within AEC and Real Estate are enormous. Most businesses will already use 3D models during design stages, but the potential of virtual reality, augmented reality and holographic representations will allow customers to actually see the end result and to be fully engaged with projects before any building has begun. Within Real Estate the same technology can be used to offer virtual showings to prospective customers. Meanwhile, intelligent systems are allowing a lot of processes to be made more customer-centric with the rise in digital listings, online scheduling and digitized application processes. Although these technologies won't be taken on by all firms in the short-term, they will all need to forecast and plan for a future where they become commonplace.

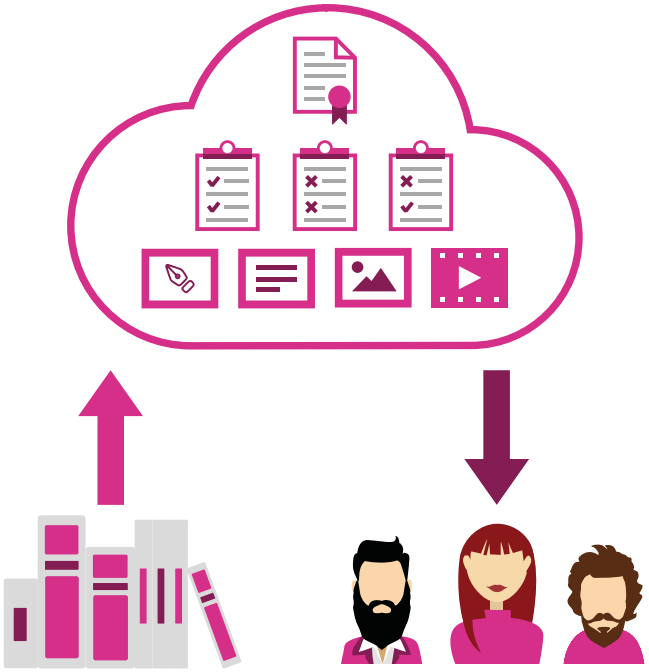
Digital transformation also offers AEC and Real Estate the opportunity to enhance their processes, data and connectivity. Cloud-based software offers opportunities to solve fundamental challenges such as project efficiency and meaningful and actionable data analysis.

As well as needing to embrace digital transformation AEC and Real Estate have the potential to promote change across other industries. Workplaces are changing with more remote workers and flexible arrangements. Offices will always be needed, but they are required to be more fluid and engaging and to encourage collaboration. Organizations can be encouraged to invest in business infrastructure which will allow them to redesign existing spaces to align with new business models. This has the potential to create a high-performance working environment, increasing both productivity and profit.

Business objectives of Digital Transformation Within AEC and Real Estate

Digital disruption is in the early stages within AEC and Real Estate but with the scale of change that is on the horizon objectives need to be set and strategy clear to ensure successful implementation of a transformative culture.

Short term objectives will be to digitize processes that are currently predominantly paper-based or spreadsheet-driven. This can cover everything from planning to construction safety. Moving forward the strategy will be to incorporate digital plans and specification as they are developed. Businesses will need to embrace new technology as it comes online to keep up with competition and compete with digital disruption.



One of the current priorities of digital strategy is Business Information Modelling (BIM). BIM allows physical and functional characteristics of buildings to be represented digitally. This enables employees, clients and stakeholders to make informed decisions throughout the build process, from initial planning to construction and even long-term maintenance.

The top business objectives of digital transformation strategy:

Drive lower costs:
For example business process efficiencies provide a holistic view, which can lower costs during design and construction stages and throughout the entire lifespan of build assets.

Increase productivity:
Resulting in a reduction in time from inception to completion.

Facilitate collaborative working:
Having a shared view and understanding by all stakeholders ensures all parties feel a shared ownership of projects.

Improve customer satisfaction:
By providing an exceptional customer experience and also being able to reduce costs due to streamlined working, fewer delays, and greater certainty of outputs.

Embrace culture change:
New ways of thinking and working support creativity and technical innovation.

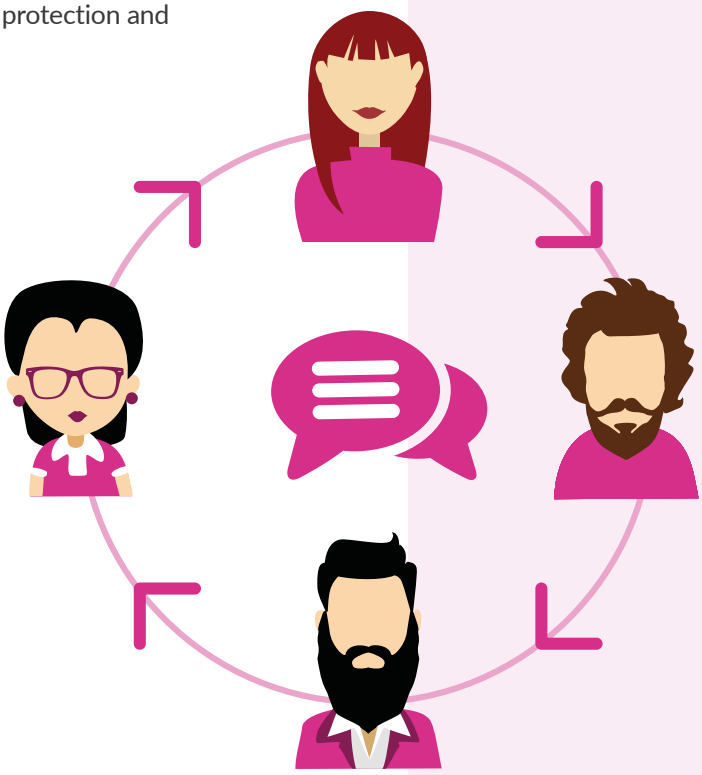
Challenges of Digital Transformation Within AEC and Real Estate

The digital transformation of any industry is not without its challenges. All industries need to work hard to avoid issues such as increased wealth inequality, concerns regarding personal privacy and security, and a generational divide.

For the AEC and Real Estate industries, the major challenge is the cost of investing in new technology. The majority of new technologies come with significant price tags that can act as barriers to reaping the rewards that the technologies can offer. The cost often includes more than the technology itself as staff will need to be trained and upskilled to be competent in its use. The other demand on people is the culture change required. Companies need to have strong leadership that truly champions change and ensures it is embedded and understood across the business.

Another challenge facing the Real Estate industry is due to the fact that buildings are difficult to quickly or cost-effectively change. Many space occupiers are not motivated to change and will just stick with their existing circumstances. Meanwhile, AEC and Real Estate firms are having to rethink how they manage data. Due to the collaborative nature of these industries data protection and privacy is a principal concern.

Transformation isn't an easy process to adopt. Not only is a significant investment needed up front but an ongoing investment is required long term to keep up with rapidly developing technology. Companies in the AEC and Real Estate industries often have tight margins, heavy workloads and targets to constantly source new business. These needs don't go away with transformation, and so a careful balance needs to be met for technology to be integrated successfully. Creating the right organisational and transformational culture is essential to enabling digital transformation within AEC and Real Estate to be successful.



MARTECH

The Global Trend of Martech In Business

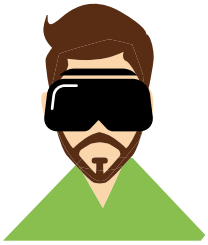
Martech is the combination of marketing and technology which now dominates the way marketers work. It encompasses a vast array of tools, platforms, processes and applications that are used to market products and services. Digital technology has created numerous marketing channels, all of which are truly measurable. These channels include things such as social media marketing, email marketing and content marketing. The software available allows for automation of processes, measurement of campaigns, and analysis of results.

Martech's focus is very much data-driven, it allows data to be collected, analyzed, presented and managed. Research methodology for delivering marketing campaigns is much more nuanced than for traditional marketing. Traditional marketing focuses on sending out marketing messages to large volumes in the hope of reaching target audiences. These campaigns will inevitably reach people who aren't the intended audience and, as such, aren't interested in the product or service. Martech enables marketers to reach their intended audiences more directly so efforts are much more targeted and those who receive their campaigns are much more likely to convert. In addition to this, campaigns often feel much more native and less intrusive than traditional marketing channels.

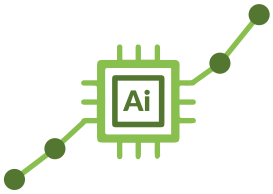
Martech is growing rapidly and is now used by all modern marketers with an abundance of tools at their fingertips. As technology is now so ingrained in our day to day lives, it's hard for marketers to ignore the opportunities. Martech is an incredibly diverse field covering everything from software to hardware and augmented reality to artificial intelligence. What's more, the field is constantly evolving. What's interesting to businesses is that a lot of the technology is available to everyone without high costs or need for technical knowledge.

New technology is being developed every day, offering marketers even more opportunities. These are the latest trends that are changing the game once again for businesses:

Natural language processing:
Computers are able to understand what is said in terms of words and also context. It offers opportunities to more accurately power sentiment analysis tools or to personalise content.



Augmented and virtual reality:
Marketers can add extra layers to customer experiences at events and showcase their products in a real-world environment.



Artificial intelligence with big data:
With the increase in the volume of data marketers can collect, artificial intelligence is allowing insights to be made that have previously not been possible.

The Importance of Martech In AEC and Real Estate

The explosion of Martech and its associated solutions has made marketing much more sophisticated and diverse for the AEC and Real Estate industries. Due to the project-centric nature of these industries, improved workflows and a connection between all of the information and assets is vital. The rise in cloud-based Software as a Service (SaaS) has added to the choices available, and companies are having to try to find which blend of technologies is optimum for them at a cost that they can afford.

Customer relationship management (CRM) software is a must for AEC and Real Estate companies with substantial client databases that need to be managed. However, there are now even more tools at their fingertips for managing their digital assets. Martech enables them to manage the whole sales funnel, automate their marketing and lead nurturing, and improve their knowledge management.

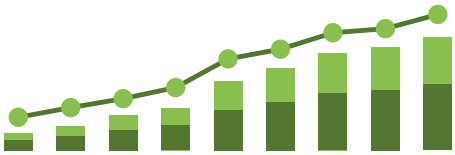
With so many tools available companies need to not only decide which ones are right for them but to choose solutions that will work well together. If there are incompatibility issues, then the technologies can end up working against businesses creating more problems than solutions. Getting the right tech stack is fundamental to the success of martech.

The Benefits of an Integrated Tech Stack

A successful tech stack will comprise of technology that integrates seamlessly. Some key benefits result from choosing the right blend of technologies:

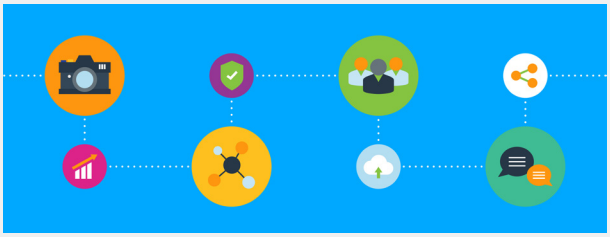
Improve project focus:
For project-based companies within the AEC and Real Estate industries having a tech stack that organizes and connects project details with relevant visual assets enables focus to stay on individual projects.

Target and nurture leads:
Project-based content can be better personalized which improves sales conversion rates and overall win rates.



Measure return on investment (ROI):
Having the right combination of technology enables businesses to see the whole picture of their sales and marketing efforts.

Increase efficiency:
The right tech stack helps remove inefficiencies in processes and ways of working, allowing teams to focus their efforts on business development.



What does a winning tech stack look like?
Here's your guide to the ultimate tech stack for AEC and Real Estate.

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Tech Stacks For AEC and Real Estate

Most AEC and Real Estate companies will agree that enterprise resource planning (ERP) and CRM are critical to their business needs. However, there are now many other technologies that are becoming equally as powerful to increase efficiency. The following tech stack is an optimum combination to empower the potential of technology within AEC and Real Estate:

Digital asset management: a central repository for the storage, organization and management of a companies digital assets.

Enterprise resource planning: a system for managing, integrating and automating business processes

Customer relationship management: a system providing in-depth insight into a businesses' customer base, allowing for improved customer relationships.

Knowledge management: a platform to enable internal knowledge sharing across the history of projects.

Website content management systems (CMS): a system to simplify the process of managing website content.

Marketing automation: a system that can automate targeted marketing messages to high-potential leads.

Analytics: tools to measure how well a website is performing, allowing marketers to continually improve their site's online experience.

This recommended tech stack enables companies to effectively share data and assets and ensure a streamlined and efficient workflow. OpenAsset's tech stack white paper gives an in-depth view to this tech stack and how the successful integration of its components can deliver outstanding results.

Artificial Intelligence

The Impact of Artificial Intelligence in business and on martech

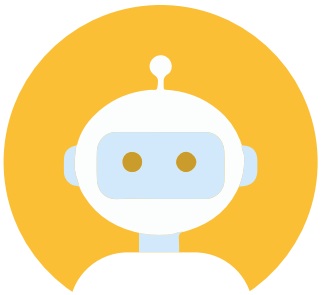
Businesses may undergo a Digital Transformation either because they have been slow to adopt new technologies and now lag behind their competitors, or because a disruptive technology reshapes the digital landscape requiring all companies to come up to speed.

In the case of Artificial Intelligence (AI), many businesses may find that both scenarios apply, as the complexity and novelty of the technology has proven a significant barrier towards adoption. However, by leveraging their existing expertise and by focussing upon the applications that are relevant to their industry, even small companies have been able to take meaningful steps towards incorporating AI technology into their Digital Transformation.

The technology underpinning AI has taken significant steps forward in a short space of time. The rise of cloud computing has made available the vast data sets necessary for machine learning. By creating models of data that mirror the neural networks of the human brain, computer scientists have been able develop the increasingly sophisticated algorithms that power AI.

The launch of AI services from tech giants including Google, Amazon, Microsoft and IBM has enabled companies to benefit from their extensive research and development efforts without the prohibitive costs. These services can be incorporated by companies into their existing tech stacks, although they require significant development to create classifier sets that are relevant to the companies that adopt them.

Accompanying the rise of cloud computing, Natural Language Processing (NLP) has enabled computers to analyse the imperfect way in which people communicate. With access to enormous volumes of data, AI services can begin to grasp the semantic nuances that are necessary for everyday interactions. Alongside the automation of processes and workflows, it is this ability of AI to convey emotional intelligence that is of great value to companies deploying Martech services.



NLP is at the heart of the chatbots we encounter in help centres or customer feedback services. AI enables automated systems to become more intuitive in their responses, and therefore more helpful for customers. Crucially, the tone of their address can be adapted to suit a variety of situations, delivering an improved user experience and even helping to diffuse difficult situations with unhappy customers.

The importance of AI to AEC and Real Estate business strategies

In a survey of over 2,000 global executives, 82% of respondents reported that AI will have a positive impact on their industry in the future*.

While enthusiasm for AI runs high, the data and infrastructure management necessary for its success often falls short. In addition to grasping the technical challenges of AI adoption, businesses must develop strategies for incorporating AI across their company over time. Because AI depends upon systems that are interconnected, a piecemeal adoption will significantly limit the usefulness of the technology.

Data is at the heart of a successful AI strategy, and increasingly Architecture, Engineering and Construction (AEC), and Real Estate firms have begun to adjust the way they collect, store and process data. Industry-wide sharing of big data is leading to increased collaboration between teams and the breaking down of silo structures within organisations. However, data use within the AEC and Real Estate industries remains largely unregulated, requiring a degree of consensus about best practices and necessitating increased investment in and awareness of cyber-security. There is also a growing understanding that as buildings become increasingly embedded with technology, data such as energy consumption and maintenance information can be accessed and perceived directly in the built environment, instead of living in spreadsheets.

What does AI mean for Architecture

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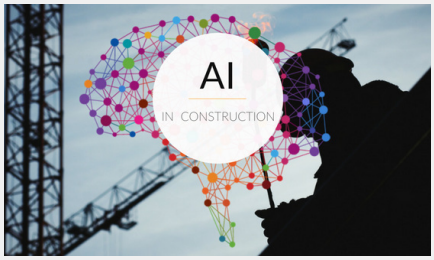

What does AI mean for Construction

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What does AI mean for Real Estate

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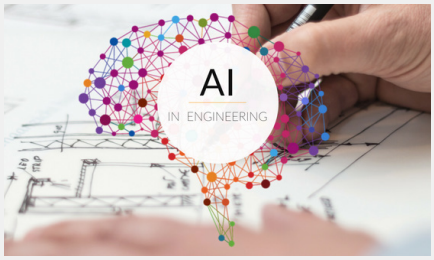
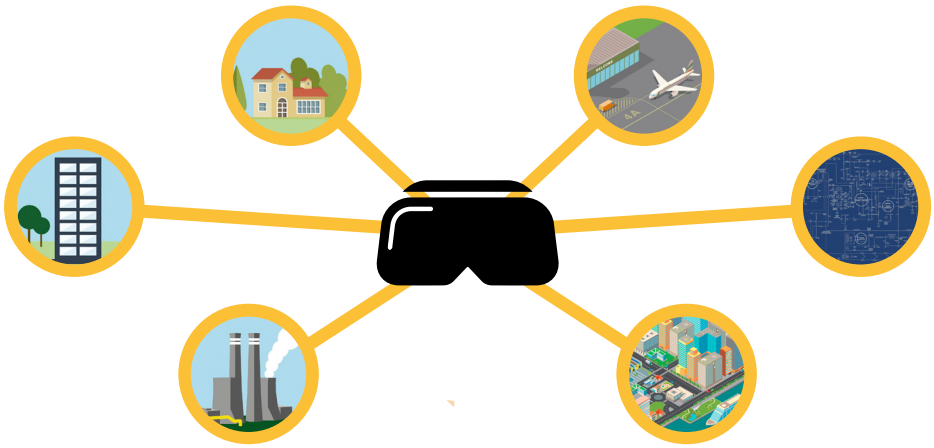


What does AI mean for Engineering

READ ARTICLE

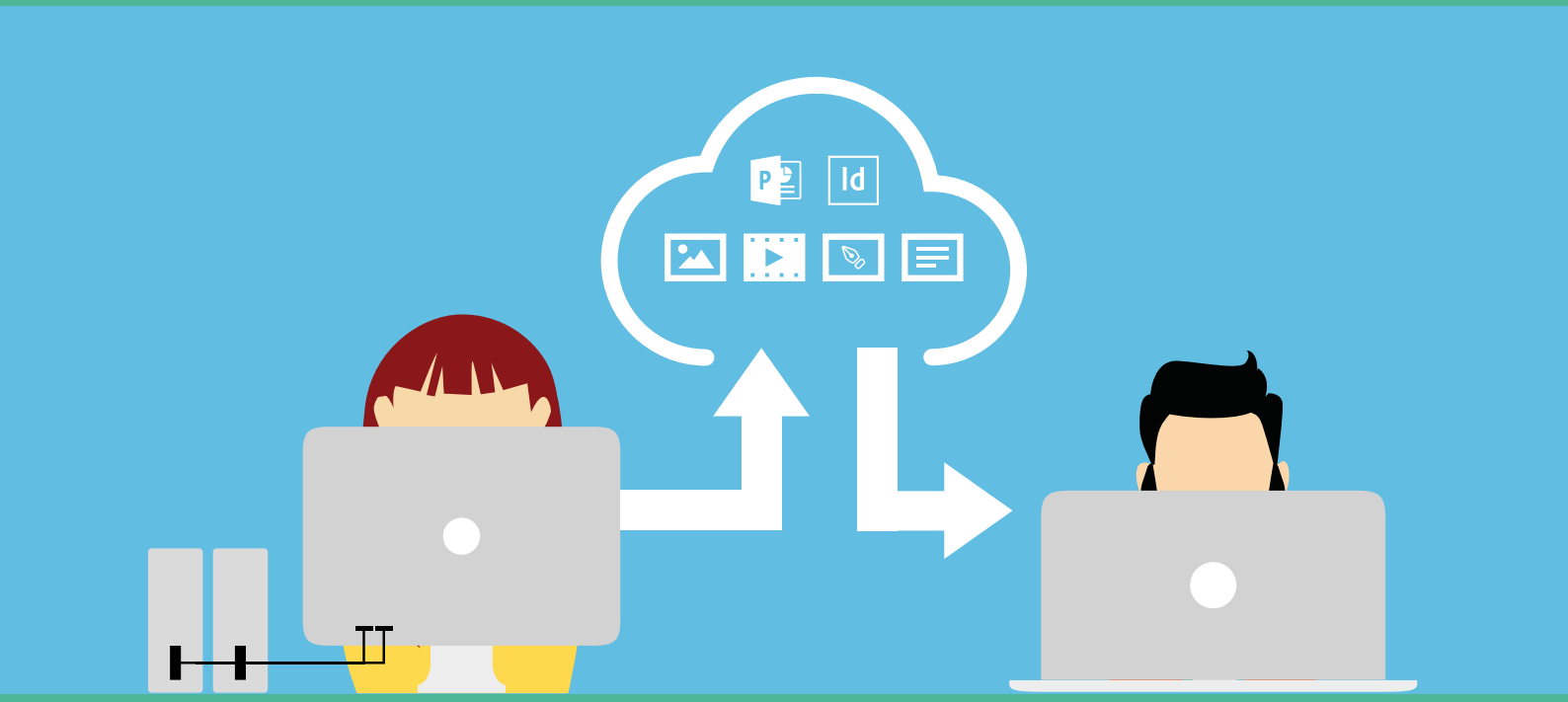
* MIT Technology Review survey commissioned by Pure Storage

One of the most innovative ways in which AEC and Real Estate firms have adopted AI technology is the way in which projects can be visualised to clients or team members. Using Augmented Reality (AR) devices like Microsoft's HoloLens, clients can walk around a construction site with an overlay of important information such as safety warnings or network infrastructure plans. Similarly, an architecture firm can now use Virtual Reality (VR) headsets to enable teams to perceive a digital model for a project in an immersive, virtual space. Changes to plans can be made quickly and cost-effectively, without the need to construct expensive and time-consuming physical models.



An important application of AI within the AEC industry that is in its early stages is the incorporation of this technology into the design and construction of climate-responsive architecture. Builders and architects are increasingly focused on reducing the energy consumption of buildings by creating structures that function in lockstep with the local environment, rather than against it. This is achieved by analysing data on regional weather patterns that account for seasonality and the intensity of sun, wind and rainfall. In regions affected by climate change, buildings will be exposed to an increasingly wider range of conditions and the data models will need to account for a greater degree of unpredictability. The increased accuracy and power that AI brings to data modelling will prove crucial in managing this risk.

* MIT Technology Review survey commissioned by Pure Storage



DAM

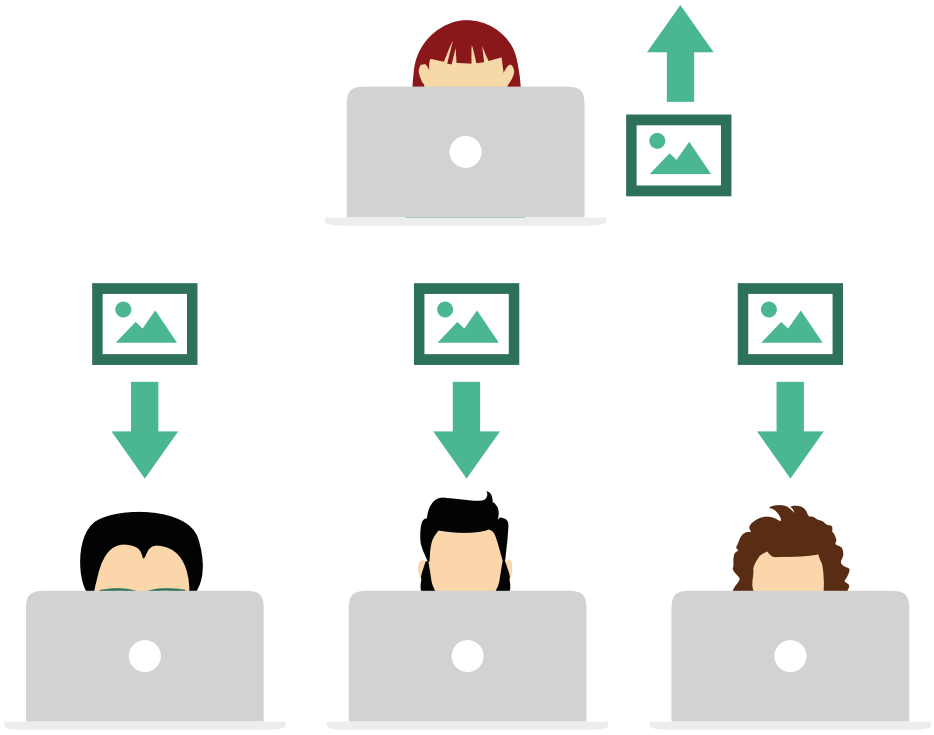
The impact of Digital Asset Management on Architecture, Engineering, Construction and Real Estate

Digital assets are any files that provide value to an organization. They may include photos, videos, PDFs and any other files that can be used to visualise your products and services. Storing these files on shared drives or networks can be problematic as irregularities in naming conventions, data migrations or labyrinthine folder structures often result in assets becoming lost, translating into a loss of potential revenue. Moreover, as companies grow in size, so too does the problem of storing and retrieving digital assets.

This is where Digital Asset Management (DAM) platforms like OpenAsset prove invaluable. By enabling users to efficiently tag files using a keyword structure, companies can ensure that any member of the organization can easily access and compare the best available visual assets. This is of particular value to Architecture, Engineering and Construction (AEC), and Real Estate companies not only due to the large volume of visual assets they are typically required to store, but also due to the project-oriented nature of their work. As well as simplifying the process of searching for assets, DAMs offer integrations with products such as InDesign and PowerPoint, which can streamline the creation of marketing or presentation materials.

While AEC and Real Estate companies all stand to benefit from a DAM implementation, the areas of particular value vary between industries. For an Architecture firm, the ability to visually communicate design concepts is crucial to winning new business. Professional photographers are often hired to take high quality images that will be used for years to come in promotional materials. Ensuring that these assets remain accessible as a firm grows and updates its network infrastructure is essential. Exploring these images by their location also provides a way of contextualising assets within the built environment.

Engineering and Construction firms are required to generate large volumes of materials for bids. Due to the high costs and slim margins of these projects, the bidding process can be fiercely competitive and the ability to assemble high quality project images at speed can help to distinguish a company and demonstrate their expertise. As plans for pitches change, users can receive alerts to ensure they stay on target and meet deadlines. Storing assets in a centralised cloud-based system also offers companies insights into their data in real-time to increase the accuracy of revenue forecasts and data analysis.



Commercial and residential Real Estate companies operate in a fast-paced environment, requiring marketing collateral that is produced swiftly to suit a broad target audience. In addition to traditional marketing materials like brochures and presentations, firms must manage assets for promotional events such as building showcases and client evenings. Easy template creation speeds up the process of creating materials and since all assets are tagged and managed, organizations can ensure that all imagery is on-brand and that out of date assets are properly archived. Marketing managers can set permissions for images, reducing the risk of costly legal disputes that can arise from misused assets.

What does the introduction of AI in OpenAsset mean for AEC and Real Estate companies?

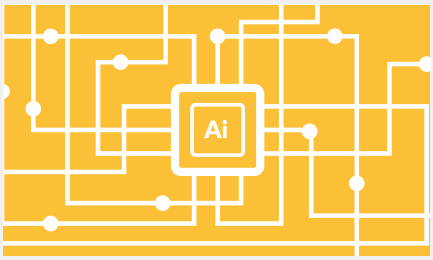
Artificial Intelligence (AI) is the application of algorithmic machine learning to large sets of data. In recent years, the technology underpinning AI software has taken significant steps forward and has progressed from a theoretical curiosity towards delivering tangible benefits for businesses. The application of AI that is of particular relevance to Digital Asset Management is image recognition, which is the process of identifying the contents of photos or videos and establishing their relationship to each other through an ontology.

Following an extensive period of research and development that continues today, OpenAsset will soon launch a number of AI-powered features that use image recognition to improve the quality of user searches. AI services such as Rekognition developed by Amazon Web Services are capable of using artificial neural networks to analyse images and offer predictions about their contents ranked by probability. By leveraging our expertise of how customers within the AEC and Real Estate industries tag their assets, we are developing a classifier (an advanced system of algorithms) that can respond to the particular requirements of images of the built environment.

In order to convert the output of the image recognition software into a meaningful search term, we are developing an extensive keyword ontology. It is perhaps helpful to think of an ontology as a web that maps the relationships between all information points in a network. By analysing the 15,000 keywords that our customers have used to tag their assets, we have created a classifier set of keywords that are frequently used by our customers.

In practice, this will enable users to tag images more efficiently and with greater consistency, ensuring image libraries are more searchable. As the AI technology improves, it may be possible to fully automate the process of tagging digital assets.

Another upcoming AI feature within OpenAsset is the ability to browse assets according to their visual similarity. This has become a widely adopted feature within image search engines such as Google and Bing, as well as on social platforms. Its value to users is that it offers a new way to discover assets indirectly by drawing connections between images that may otherwise have been overlooked. Users can explore images featuring comparable architectural styles, landscapes or which feature similar elements such as an atrium or a roof terrace.



Our journey through exploring AI and its impact on Digital Asset Management

READ ARTICLE

The role of Digital Asset Management in Digital Transformation

The function of Digital Asset Management within an organization is to facilitate the easy tagging of files in order to better organise libraries of digital assets. Using simple project and file keyword structures, file metadata is generated efficiently and with all files saved on the cloud and accessible through a browser, a DAM platform offers a scalable storage solution that can seamlessly fit into an existing tech stack and will grow with a business.

Companies that undergo Digital Transformation are typically seeking to enable greater collaboration and creativity throughout an organization by placing modern digital technologies at the heart of their processes and workflows. As a result, many of the objectives of Digital Transformation can be achieved through the implementation of a DAM platform.

Below are some of the key efficiencies that a DAM platform can bring to an organization:

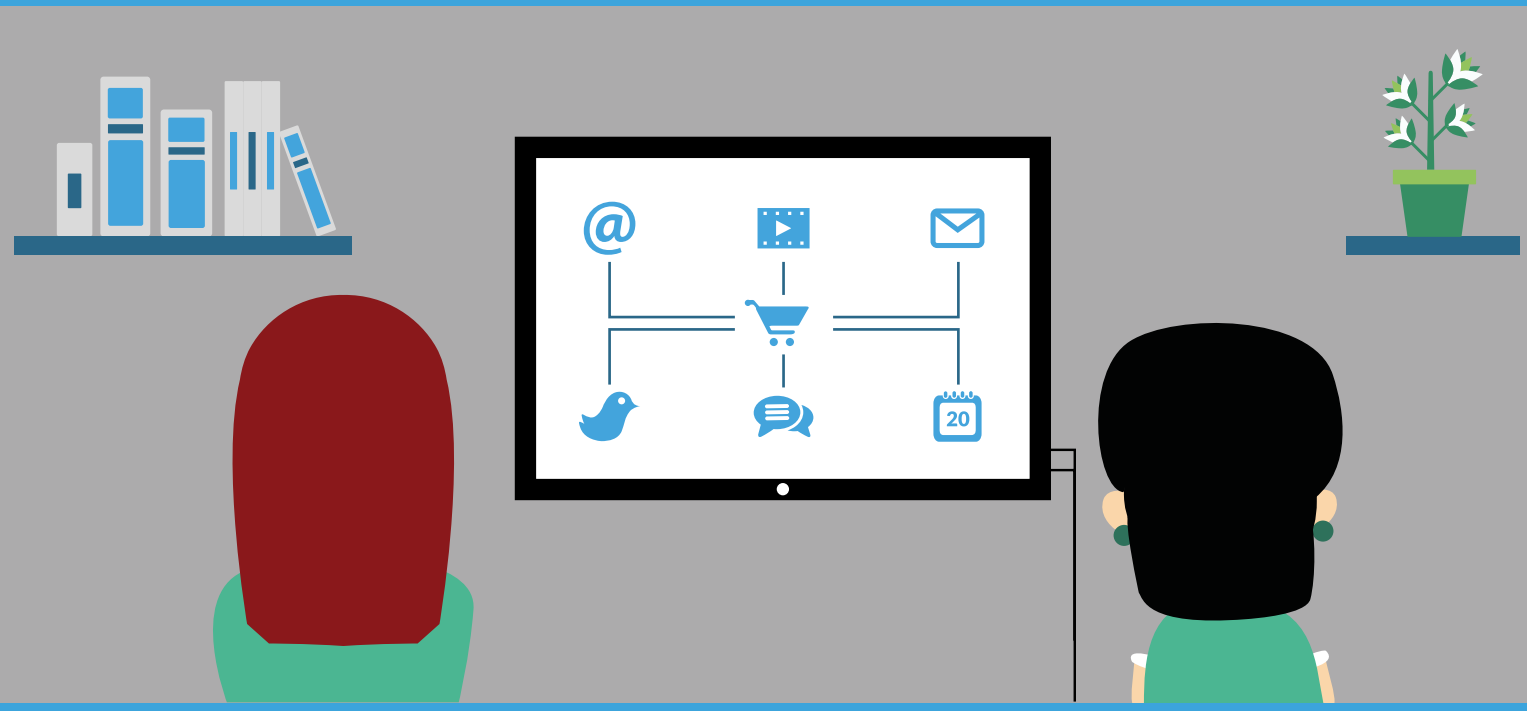
1. Taking advantage of software integrations, Marketing Managers can seamlessly produce presentation documents with the assurance that images are approved and appropriate for the brief

2. Bespoke templates in Word or PowerPoint enable any member of an organisation to create materials that are consistent with style guidelines

3. Image size presets reduce the amount of time spent resizing images, freeing up Graphic Design teams and keeping projects moving forward

4. Batch uploading of metadata enables keywords to be automatically assigned to groups of images, speeding up data processing

Ultimately, a DAM platform enables greater visibility of assets across an organization, with automated and streamlined workflows saving time that can be spent pursuing more creative and challenging projects.



DIGITAL CULTURE

Why Technology and Culture are Equally Important for Success when it comes to Digital Transformation

Digital transformation represents a profound change in how a business operates, both internally and externally. Digital transformation is the coming together of people and technology; it impacts entire organizations, and everyone plays their part whether it be in planning, implementation, or adoption.

The IDG surveyed what 'digital business' means to organizations; the following three areas were found to be the most sought after:

- Enable worker productivity through tools such as mobile, data access and AI-assisted processes
- Ability to better manage business performance through data availability and visibility
- Meet customer experience expectations

Across any given company, this creates change, not just in process but also in mindset. It is not enough to introduce new technology and think "job done". Digital transformation is more than just the optimization of your tech or the introduction of new tech; it's the process of future-proofing the company as an agile service-led organization.

Promoting a Digital Culture

Promoting a digital culture is a vital part of implementing digital change; neglecting the cultural dimension risks the long-term success of your digital transformation hard work. Research has shown that a company with a strong digital culture contributes directly to the financial success of the company.

Digital culture, as part of digital transformation, means altering the working practices and workflows. Primarily this means:

Customer First
put the customer experience at the front of your business model, creating solutions for clients.

Quicker to action
in the future, opportunities won't wait for unwieldy decision making processes to finish.

Collaboration
no more silos or choke points; achieve goals through collaboration and shared resource.

Constant Evolution
evolve products and services, and reduce the need for large scale change projects in the future.

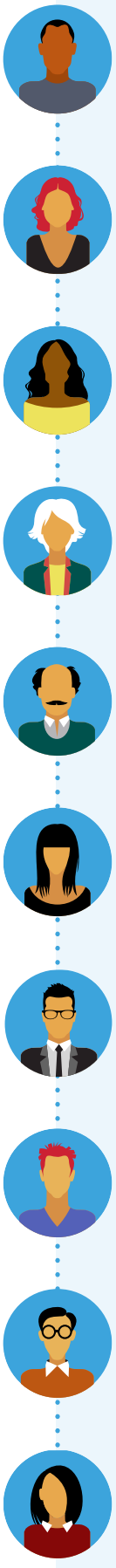
Fundamentally digital culture is about educating and empowering people to embrace and utilize the results of company-wide technology implementation. Culture defines the values and behaviours within an organization. When placing technology at the core of your operations, the human element is vital not only for instant results but also for long term sustainability.

Research shows that a third of companies are putting initiatives in place to update policies and working processes for the digital age. These modernizations allow companies to improve working conditions, attract new talent, and create an agile environment that can adapt to future operational needs. A digital culture places importance on:

- Collaboration
- Employee experience
- Difused decision-making
- Communication
- Transparency
- Company culture

However, promoting digital culture is not always plain sailing. As with any change, there will be a reluctance to adopt new working practices, maybe even outright hostility; in fact, recent research has shown that 26% of companies encounter resistance to change within their organization.

Communicating Change



It is vital that leaders understand the need to engage with employees throughout a digital transformation process. This means clear and transparent communication of goals and training for everyone in the company regardless of their role.

However, this engagement is not a single training session, a few emails, or an online compliance course - it's an ongoing process that to be embedded into the organization.

You can cultivate digital culture, and foster employee advocacy for change, with:

- **Regular communications** - emails, newsletters, channels in communication tools (such as MS Teams or Slack), internal communities, intranet, blogs.
- **Regular company 'town halls'**
- **Company webinars**
- **AMA ('Ask Me Anything') forums with company leaders**
- **Assigning digital champions**

Companies should look at creating a digital culture 'manifesto', and have clearly defined goals and strategies. If traditional structures and ways of working are going to change, people will need guiding principles to help steer them toward actions that align with what the business is looking to achieve.

So what should you be communicating to your employees? To start, people need to understand what is happening and why. In the modern working environment, employees will be used to the concept of new technology and upgrading systems, but digital transformation is different from 'digital optimization'. Employees need to understand that there will be significant changes to how they work, how to adapt to the reorientation, and ultimately, the purpose behind the change. A clear narrative is vital.

As employee empowerment and autonomy is at the forefront of digital culture, company leaders need to be evangelists for the change they are promoting. Leading by example will give employees the comfort and confidence to embrace the change - a path to follow. Behaviours can also be influenced by the introduction of recognition for work that aligns with the new company ethos.

Research into existing work practices should offer insight into what is holding employees back from performing to the best of their ability. Maybe there is unproductive day to day bureaucracy that is only continued with because "it has been what we've always done". However, rather than taking a 'Management Consultancy' route to fix problems, digital culture asks employees the question "what will make you more efficient?", and allows teams to influence their own destiny.

Leaders need to be aware that digital culture encourages a greater degree of risk-taking than traditional structures might accept. If responsibilities are delegated and employees encouraged to try new things, then management must be comfortable with a "fail fast and learn" approach. A part of digital culture is about improving the speed and agility of a company.

Digital Culture in AEC & Real Estate

In AEC and Real Estate, where building and maintaining long term client relationships is fundamental to business, the impact of digital transformation and digital culture will be significant. When you consider the volume of interactions an average employee working on a project may have with a client, there is a vast scope for the impact of improved and more well-connected technology. This highlights the importance of digital culture in ensuring adoption and application of core technology by all employees across the business.

In most cases, a strong leadership team is required to not only roll out complex digital transformation projects but also to evangelize the technology, and its value. Education and training are critical to minimize 'culture clash' which is the resistance or fear of adopting new technology in any given organization by employees. In most cases, being able to demonstrate the value of any new tool or service will help to make a convincing argument for adoption.

If you are considering adopting Digital Asset Management as part of your firm's digital transformation strategy and want to know more of the value and benefits DAM can bring to your company, you can contact us through our website via form or live chat.

About OpenAsset

OpenAsset is the number one digital asset management (DAM) solution for architecture, engineering, construction, and property services companies. It is delivered and supported by Axomic, which has a global presence with staff based in London and New York and clients ranging in size from 5 to 50,000 employees.

OpenAsset is specifically tailored to solve the image management needs of companies working in the built environment. Its development roadmap is guided by our client base of over 600 of the world's leading AEC companies.

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