

The Rise of the Digital Factory





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Why enterprise teams are transforming to deliver digital products

THE MARKET HAS SHIFTED GEARS

There is a seismic shift happening in how enterprises create websites and other digital products. To create a competitive advantage, they need to move from project-focused iteration to innovation and continuous deployment.

This white paper covers how companies are adapting to this shift by creating digital factories. You'll learn about:

1. The digital factory model
2. How companies are building digital factories
3. Key lessons from the digital factory transformation

Today's customers expect to have a contextual experience throughout their relationship lifecycle with a company or brand. To achieve those experiences in an omni-channel world, organizations are creating more software than ever before, and are becoming digital product companies in the process.

The digital product umbrella includes much more than just pieces of software—spanning everything from websites to apps to wearables to digital signage to customer touchpoints that haven't been invented yet.

As customers expect these kinds of interactions, companies must enable their enterprise to achieve it. TELUS, Scotiabank, Lloyds Banking Group and many other enterprises are recognizing that they

generate the greatest amount of competitive advantage when they unite their formerly siloed tech, IT, developer, business and marketing departments into fast-moving, cross-disciplinary digital teams.

Digital products are now core components of businesses, brands, markets and customer value. Companies are moving to provide employees and teams with the modern tools to create these experiences for customers and to create best-in-class digital products. Now, even marketing teams need developers.

The digital factory concept is about cross-functional collaboration—even co-location—and reusable architectures. This shift to prioritizing software means companies need to reevaluate how their teams, processes and technologies interact.

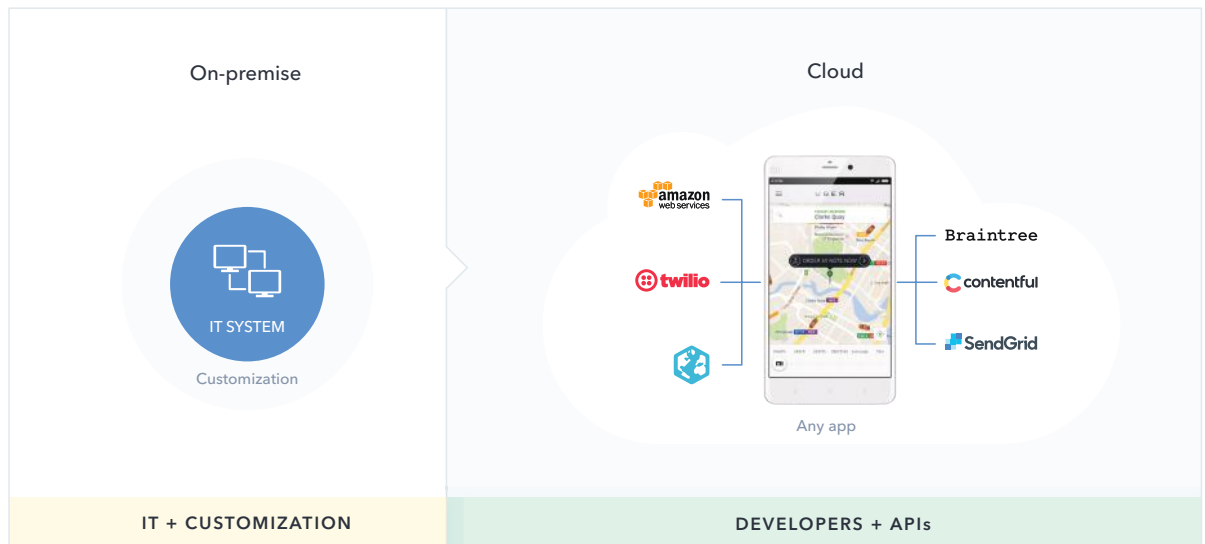
Companies are standardizing the common architecture in which these experiences are built so they can spin up a new experience for whatever channel, persona or surface comes next.

The future of how websites and apps are built is all about stacks, not one-size-fits-all solutions. Companies can pick and choose the best service for each need, rather than buying a monolith that solves 80% of key needs, but requires some painful adjustment or customization for the other 20%.

Want more background on how companies streamline their digital product timelines to beat their competition to market? [Check out our white paper here.](#)



How we build software has changed. Now companies are building on top of specialized cloud services instead of reinventing each component.



Sometimes, a customization option doesn't exist.

Why primitive-style services instead of monoliths? These services can be chosen based on how well they accomplish a specific task, whereas monolithic software forces teams into committed, long-term technical decisions. By their nature, primitives are more flexible tools because they can focus on perfecting core competencies, rather than playing catch-up with technology and trying to add feature upon feature into an already bloated offering.

Thanks to the cloud, it's easier to decouple services and deploy software continuously through using a stack of primitives. So, if companies are fundamentally changing the way they approach building and shipping software, it stands to reason that they should run their organizations differently too.

"...the end of SaaS as we've known it could be coming if modern tools make it easier for companies to build software themselves."

Ron Miller, TechCrunch

THE DIGITAL FACTORY SOLUTION

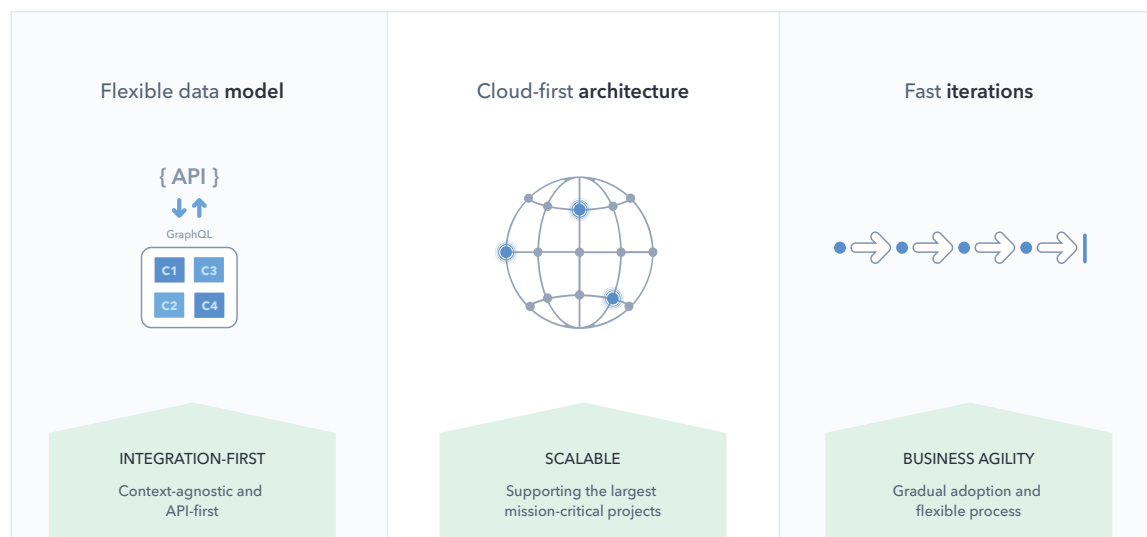
The concept of a digital factory arises from the demand for shipping new digital products faster. Companies that fail to do so risk being disrupted and losing market share, or even the entire business. Agile digital teams enable organizations to react to threats and be the first to pursue new opportunities.

All companies are now, by necessity, digital companies. For example, even Nike doesn't see itself as just a shoe company. "Nike's chairman and CEO, Mark Parker, and its CFO, Andy Campion, together said the words 'digital' or 'digitally' 69 times during a conference call announcing the company's most recent quarterly results." This was a 39 percent increase over the mentions of digital in the previous quarter's call.

By inventing new ways to blend digital and retail, Nike is undergoing a dynamic shift within its organization to deliver more digital products. Many forward-thinking companies are following suit. In a discussion between TELUS Digital's Shawn Mandel and DisruptTV host Ray Wang, they agreed that the primary goal is ultimately to get new digital products and digital experiences from POC to P&L as fast as possible.



Contentful is disrupting the legacy CMS market. Our content infrastructure enables programmable content across any channel.



Cloud-based software stacks are part of that speed to market solution. When digital teams can outsource a large part of their needs to an ecosystem of purpose-built services, they can spend more time focusing on their company's core business value. That way, teams can move faster and have greater impact.

However, primitives are only part of the larger digital transition. The holistic solution to the need for rapid and constant recalibration? Build a digital factory that connects—even co-locates—developers, designers, content creators and other strategic digital contributors. Agility comes from breaking down the silos to get synergy from the unique combination of people, processes and technology.

WHAT MAKES A DIGITAL FACTORY?

In the old way of doing things, it would take a long time to make a monolith solution work to specifically tackle the creation of each new digital product. The digital factory model, on the other hand, promotes flexibility and mobility above all, and helps companies stay competitive. Thanks to solution stacks, teams can choose the right tools for each job.

According to Will Hancock, Senior Technical Delivery Manager at AKQA, building a stack with

best-in-class services enables businesses move quickly, experiment, and build new products: "One of the biggest factors in ensuring success for our clients is the velocity at which we can iterate, pivot or even change direction entirely."

The digital factory provides a useful framework by which digital teams can effectively combine their skills with the new digital stack. Multiple teams and business units can each use only what they need for their particular products. Continuous deployment is possible thanks to modular, services-oriented architecture—breaking everything into small pieces means you can move a lot faster and not break things.

"[The digital factory] approach enables large organizations to incubate a new digital culture and operating model while allowing the broader business to touch and feel the change and see the power of a new way of working."

"Scaling a transformative culture through a digital factory," McKinsey and Company



EXPERIMENT, OUTRUN AND OUTPERFORM

The rise of service-based architecture also means that iterative development is the norm, enabling teams to confidently ship constant updates and improvements. The key to rapid product diversification is experimentation: An experimentation-focused strategy helps create and maintain a competitive advantage because it encourages innovation.

While the word “experimentation” may set off risk alarms, it’s actually beneficial in the long run to invest time in exploration as long as teams can build faster. A well-functioning digital factory ensures that the cost per experiment is low in terms of both money and developer time. In the older traditional model, certainty would arrive long after opportunity left.

The digital factory model enables teams to change directions quickly and position companies as leaders of emerging markets and new channels. This agility helps to mitigate risk, whereas the risks associated with purchasing monolithic systems are increasing, with vendor lock-in and massive customizations presenting a real risk that a business could be saddled with a system that is no longer competitive.

Experimentation has value at more than just a tactical level. Not only does it help attract and

retain engineering talent, but also a company that supports experimentation through an agile digital factory can achieve organizational alignment at a cultural level. This means creating a safe and supportive space that encourages teams to fail fast, ask questions constantly and be fearless.

HOW DO YOU BUILD A DIGITAL FACTORY?

Every factory needs power. But what powers a digital factory?

Content.

All digital experiences have content at the core. Unfortunately, when companies began to shift away from monoliths and towards a more curated stack of assorted services, content got left behind.

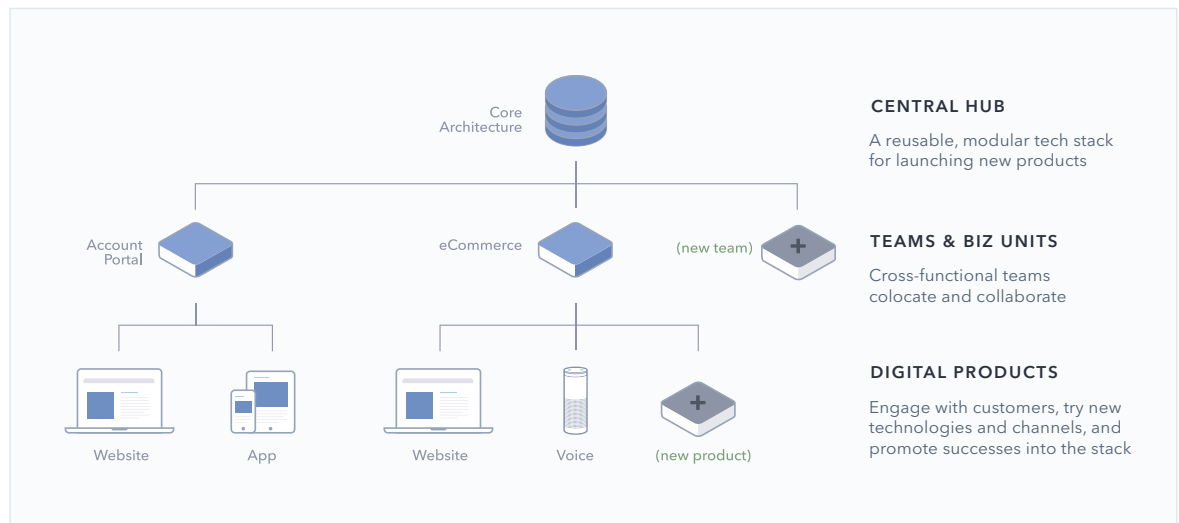
Traditional CMSes don’t fit the new digital factory model because they require an extra layer of development to enable content creators and designers to modify content, killing the benefits of agile, in-parallel development. With a traditional CMS, teams are forced to shove their content into inflexible frameworks. Content is painful to both migrate and reuse—it becomes trapped behind the high walls of a monolithic system that comingles content and code, making both almost impossible to use in other contexts.

The experimentation repeats itself, as it is a non-linear function.





A modern stack powers this agility. Reusable architecture enables teams to quickly release new products and experiment in new channels.



Traditional CMSes let content creators easily modify content, while developers pull their hair out because everything is either always breaking, or has to be customized into oblivion. The bottom line: Your old CMS doesn't play well with stacks. It wants to be a full stack unto itself.

Digital teams need a way to free themselves and their content. The solution? Content infrastructure that decouples the content backend from the presentation layer frontend, and lets both developer and content teams work in parallel.

As the pioneer of content infrastructure, Contentful is purpose-built for solving the pain points of traditional CMS, and it integrates smoothly into the existing agile stack.

MAKE CONTENT INFRASTRUCTURE THE BEATING HEART OF YOUR DIGITAL FACTORY

While it may be tempting to use the label, content infrastructure is not a CMS.

A better phrase is "content infrastructure," which reframes how digital teams store, structure and deploy their content, with access points for each person in the digital factory.

For example, with Contentful, developers access content infrastructure through code using the language of their choice, while content teams have access through an editor app that allows them to easily add or edit content. This allows teams to work in parallel, rather than being dependent on each other's workflows.

Content infrastructure is not just "a better CMS." It's about re-thinking the building blocks of your digital products, including both content and code.

"The future of innovation is democratizing development. It's not having more developers code, it's getting non-technical people [closer to the] code."

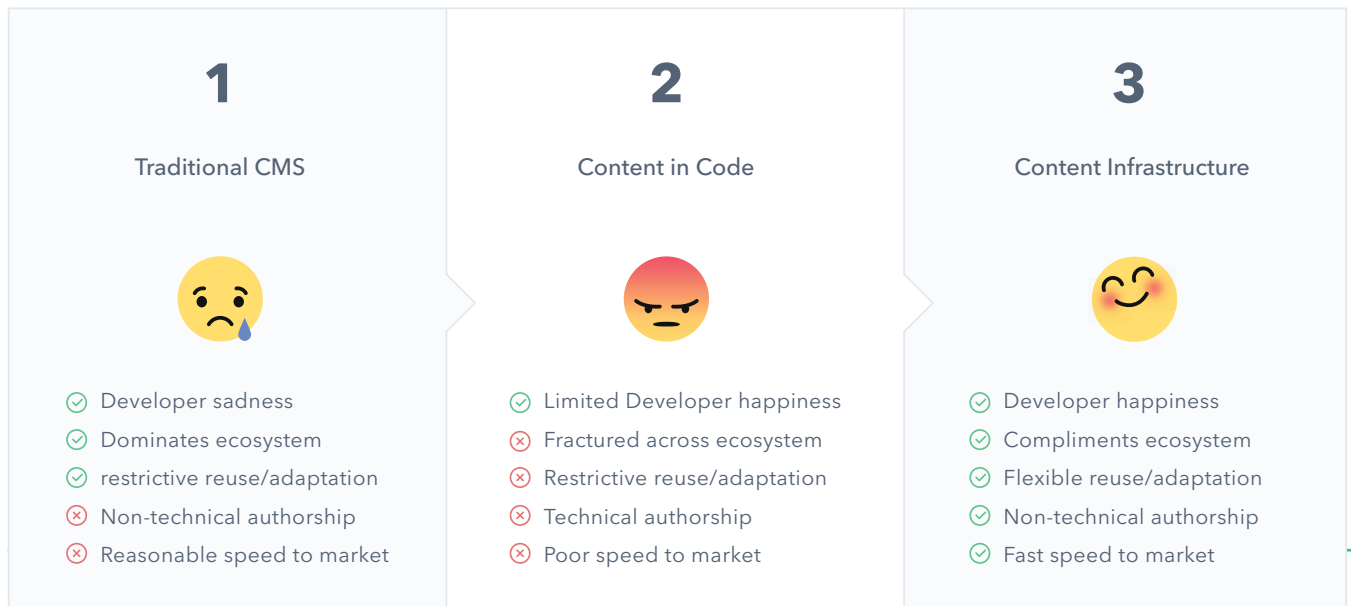
Michel Feaster, CEO and co-founder of Usermind



Structured content is at the core of the digital factory. API-first content infrastructure turns content into components that can be reused across products, teams, and channels.

Why does that matter? Your content isn't tied up in data models defined by a CMS creator or specific programming languages. Everything can be powered from a single, agnostic content hub.

Content infrastructure also complements agile software delivery pipelines and product launch processes. While CMS can hinder processes, content infrastructure runs in the background and speeds up a digital factory's production by giving each member of the team power over their content or code.



THE DIGITAL FACTORY TRANSFORMATION: KEY LESSONS

Just as building a physical factory doesn't happen overnight, building a digital factory takes time and planning. Here are a few lessons to keep in mind:

- 1. Plan to lay the groundwork.** It takes investment in organizational change as well as the modern software stack to reach agile speed, and acceleration isn't linear. Involve stakeholders who will be part of the digital factory in its planning.
- 2. Think differently about software delivery.** No more big bets or releases—everything is focused on incremental and iterative change. This will require new expectations from

managers and a different approach to planning, with shorter cycles and benchmarks to enable mid-course corrections.

- 3. Experimentation is key.** Taking a modular approach means that you can “experiment” with your tech stack too, such as testing a variety of primitives. The experimentation mindset frees companies from the burden of procuring or building the “perfect platform,” and gives them the flexibility to focus on getting started. This change in perspective might require you to educate colleagues in finance or procurement about how a big contract with a software monolith can be riskier than smaller contracts with a variety of best-in-class services.



Transforming from a locked-in legacy CMS to flexible content infrastructure offers more benefits than simply cost.

- ⊗ On-premise / self hosted
- ⊗ Monoliths
- ⊗ All-in-one solutions
- ⊗ Rigid data model
- ⊗ Siloed content
- ⊗ Prescriptive tools
- ⊗ Content management

From: CMS

- ✓ Cloud-native
- ✓ Microservices
- ✓ Best-of-breed stacks
- ✓ Flexible, structured content
- ✓ Portable, reusable content
- ✓ Choose your own tools
- ✓ Content operations

To: Content Infrastructure

LOOKING AHEAD

The digital factory should be at the heart of future-oriented strategy for modern companies that seek to continuously deliver and iterate on digital products such as websites, apps and other experiences. This is driven by the adoption of bespoke services as part of the modern web stack, but its effects will be far-reaching in driving organizational and cultural change as companies shift to a more agile delivery model.

The adoption of content infrastructure as a key enabler of the digital factory will help people create, code and deploy content more rapidly and with greater relevance to the audience. And

because content infrastructure invites iteration and collaboration, the future will hold fresher, bolder and more interesting digital products because experimentation is enabled and encouraged.

The final takeaway: There is no single recipe to follow. Your digital factory must be shaped by your situation.

Building an optimized digital factory is an adaptive challenge. The factory can look beautiful and run well, but it will never be fully finished. Ultimately, the key is to stay dissatisfied with the status quo, and use that dissatisfaction to avoid stagnation and drive experimentation and innovation.