

Making the case for MACH



Co-created with

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The pace of technology adoption is staggering.

Sixteen years after the introduction of the iPhone, over three-quarters of people in advanced economies own a smartphone¹. Nine years ago the Amazon Echo made its debut, now almost three quarters of US households have a smart speaker². Customers are becoming digitally fluent at breakneck speed and, to speak to these customers, companies are expected to master new technologies as quickly as they come to market.

It's like the Tour de France switched to the Grand Prix in the middle of the race, and everyone now has to turn their bike into a formula one race car.

Companies have to embrace new technologies to even stay in the middle of the pack. Pulling ahead requires more than adopting a few one-off tools, but transitioning to a model that supports continued, rapid evolution of digital business.

For many enterprise organizations, this transition is frustrated by a complicated network of outdated legacy tools that make it hard enough to deliver a status quo experience — let alone an innovative one.

“MACH matters because business is technology ... You have to harness the power of technology to make your business function. You can't ignore the change in technology, you can't ignore the innovations that are out there, because your competitors will be, other brands will be, scale-up startups will be. People will be stepping into your

space and doing things in a more innovative way. So you have to care about technology, and you have to care about what technology can do for your business,” says Niall Edwards, MACH Alliance Advisory Board Member & Vice-President of Marketing & Channels Technology, the LEGO group, explaining why the company decided to move off legacy platforms to a modern architecture.

Modernizing an enterprise architecture is not only a chance to use the current market leading software, but an opportunity to make future evolution a lot less painful.

MACH (microservices, API-first, cloud-native SaaS, headless) are the design principles behind modern enterprise technology. Built to integrate easily, these technologies are helping companies like the Lego group untangle and step off their legacy tools.

With a modular design, MACH solutions give businesses the freedom to choose from the best tools on the market today and provide a structure that makes it easy to add, replace, or remove technologies in the future. This composable and swappable architecture means that enterprises are essentially facing their last major replatforming effort and, instead, can continuously evolve their ecosystem piece by piece on a daily basis.

Because in the technology race, when you've turned your bike into a racecar, the transformation to rocket will have begun.

MACH technologies support a swappable enterprise tech stack in which every component is pluggable, scalable, replaceable, and can be continuously improved through agile development to meet evolving business requirements.



Microservices

Individual pieces of business functionality that are independently developed, deployed, and managed.



API-First

Built with APIs from the ground up. All functionality is exposed through an API.



Cloud-Native SaaS

Software-as-a-Service that leverages the full capabilities of the cloud, beyond storage and hosting, including elastic scaling of highly available resources. Functionality is updated automatically, no manual effort required.



Headless

Front-end presentation is completely decoupled from back-end logic. Designed to be channel, programming language, and framework agnostic.

The Rise of MACH

“There are three drivers generally for companies adopting this architecture, either you have a need for speed to react to the market, you need greater channel and GTM flexibility, or you need better and more integrated omni-channel business processes.”

- **Casper Rasmussen**
President, MACH Alliance



Expanding Digital Needs

These needs arise as companies expand their digital business. New channels and services need to get to market quickly, previously siloed data needs to be connected to power the experiences on these channels which, in turn, need to be delivered at scale.

These channels are also no longer limited to customer acquisition. Digital is becoming increasingly important across the customer lifecycle, and post-purchase interactions are moving beyond the web and towards apps and voice interactions.

For companies still on legacy platforms, new initiatives require a custom integration with their existing platform. Creating a network of dependencies duct-

taped together one at a time. Time and expense of upgrades remains a top concern according to MACH Alliance research 2022³. 82% of IT leaders say infrastructure is keeping up with customer demands, but less than half are satisfied with their ability to deliver customer experience (CX) improvements at speed.

Additionally, 42% of respondents cited resistance to change as the main reason preventing a move to MACH. While cycle of release issues and on-premises costs remain a huge burden for organizations, they rank lowest among the drivers. Instead, speed, privacy and ever improving customer experience needs come out top.

“What happens with the monolith structure is that you struggle to keep pace with the change of new frontend experiences that become available. When your backend and frontend are one and the same, it makes it difficult to safely release as much code as you’re ready to put into production because you can’t tell where a button change on the frontend might affect a price upload on the backend.

“We couldn’t get good ideas live because we were so focused on solving problems. The MACH approach allows for easy, incremental change without huge investment or big decision making or a major change in the way people do their work.”

- Dylan Valade

MACH Alliance Ambassador & Head of Global E-Commerce Technology, Puma Group

“Part of the reason we went for this architectural pattern is that we don’t want to ever go through a major replatforming again. If a few years down the line, something emerges that is far and above what we have, we want to be able to adopt it without the barriers of the past.

For the last ten years, unstitching technologies has been too big an effort and cost. The new architectural approach represented by headless provides Burberry more flexibility in evolving in the future.”

- Giles Smith

Former Director of Digital Technology, Burberry who has since moved to Selfridges

No All-In-One Platform

When digital was a narrower part of business it made sense for many companies to have a core platform, like a commerce or content management platform, that did the majority of the heavy lifting. As digital business expands, the spectrum of functionality is wider than any single platform could master, and expanding every week.

Instead of trying to be a jack of all trades, modern software vendors are becoming masters of a specific area and are partnering with other leading tools. According to the Gartner Apply the Principles Behind the Future of Applications to Digital Commerce report:

“Where Is the Composable Commerce Architecture of PBCs [Packaged Business Capabilities] Emerging? Loose alliances of best-of-breed vendors appearing such as JAMstack (JavaScript, APIs, and Markup) and, in digital commerce specifically, MACH (Microservices, APIs, Cloud and Headless). The key difference between this new approach to building a commerce portfolio and previous iterations of digital architecture is that there is no single “core” platform — all vendors play together in the composable application, and the end-to-end customer journey would fail without them.

At the same time, they are relatively pluggable and replaceable, preventing vendor lock-in for a given capability.⁴

Giles Smith, Selfridges’s Head of Digital Technology, speaking when he was at Burberry between 2017 and 2022, says that the freedom to choose the best platforms for each functionality was a key driver behind the company’s move to MACH.

“If we had to choose a monolith that was a solid nine out of ten on commerce, but a seven out of ten on search and content, we would have been limiting ourselves. We wanted to be able to pick the best platform for each of those capabilities. We didn’t have to compromise by going for a single platform that locked us into some strengths and some weaknesses.”

This ability to add the best solution for the experience you want to deliver is felt in any industry where digital ambitions are surpassing the capabilities of a single platform. The MACH Alliance has seen this in enterprises across media, gaming, B2B, hospitality, services and more.

Built to Evolve

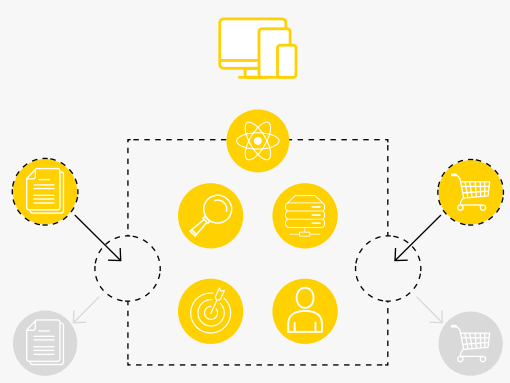
Designed to play nice with others, MACH technologies create a framework of future flexibility that lets companies evolve at their own pace. Jasmin Guthmann, VP MACH Alliance and head of corporate communications at Contentstack explains why companies like Contentstack are focusing on designing products that are extensible.

“Companies are modernizing their approach to digital in stages. They need to be able to access new technology and tools now, while transitioning their stack over time. Modern software needs to integrate not only with other new technologies, but also with legacy tools to make the wider digital transformation as smooth as possible.”

Going MACH doesn't mean that a company has to completely re-engineer their architecture all at once, and most enterprises step off legacy bit by bit.



Evolve with MACH



Your company can keep itself market-leading at all times by switching outdated tools and channels with updated new ones that are easy to integrate with the API ecosystem.

Benefits of MACH Technologies

Why enterprise companies are adopting microservices, API-first, cloud-native SaaS, and headless technologies.

Modular Design	Benefits	Fits companies that
<p>Designed to easily integrate, MACH tools are easy to add in and take out of your stack</p>	<ul style="list-style-type: none"> • No vendor lock in • Select best fit solutions for each domain, instead of one large platform that works “ok” for multiple domains • Evolve stack overtime, without large replatforming effort 	<ul style="list-style-type: none"> • Have an existing architecture that contains multiple systems • Have across departmental digital strategy
Freedom to Innovate		
<p>Natively built with modern development tools and frameworks, MACH solutions are highly flexible and adaptable to unique needs</p>	<ul style="list-style-type: none"> • Work with the architecture, language, and framework you prefer • Leverage out of the box features of platforms without being limited to them • Design unique customer experiences 	<ul style="list-style-type: none"> • Have access to proficient development talent, in-house or via a partner • Need digital to be a competitive differentiator
Modern Architecture		
<p>MACH technologies fully leverage the latest advancements in cloud and API design</p>	<ul style="list-style-type: none"> • Create highly performant, fast, and available experiences at scale • Access cloud capabilities such as auto-scaling and geo-redundancy • Continuous rolling upgrades of SaaS solutions, no manual effort required 	<ul style="list-style-type: none"> • Experience peaks that need scalable infrastructure, such as holidays or live events • Have a substantial percentage of business success dependent on digital • Have a global customer market

Is Your Organization Ready for MACH?

“MACH is not a silver bullet for everyone. If you can't take use of its benefits now or in the future, then you just get the drawbacks of complexity.”

- Casper Rasmussen



Just as you wouldn't wire up an entire smart home if the end goal was to use an app to turn off the lights, you wouldn't create a full MACH architecture if all you needed was a pretty website.

You can gain the benefits from these modern platforms without having to go fully MACH and, for many companies, starting with a single platform is all that is needed.

Going fully MACH is most beneficial for enterprises who have digital ambitions beyond the capability of legacy tools, already feel slowed down by their current infrastructure, or spend too much time and budget in keeping the current system running with upgrades etc. If competitors are rolling out new customer experiences far faster, talent is frustrated (or leaving) because they can't do their job successfully with outdated tools, and new initiatives are shelved because of the effort needed to rewire the system — it might be the right time to go fully MACH.

Making this transition requires just as much organizational change as technology change, and companies need to ensure they are ready for this new modular way of working.

Digital Maturity

Modern technologies let companies move quickly, but leveraging this speed requires moving from a traditional to a modern mindset. One of the key principles of adopting composable architectures is understanding that this isn't just a tech decision, it's a mindset shift in your organization, and incentive structures might have to change or you may have to empower people to make different levels of decisions than they have access to now. You may have to empower them to work differently.

Project to Product

Alongside a culture of fast feedback and iteration, switching to MACH means looking at each initiative as a full product, rather than a one-off project. Each product has a multidisciplinary team that is responsible for the full life cycle — planning, design, implementation, launch, value measurement, improvement, maintenance, and retirement.

Products can range in granularity, from a mobile site to a single API, and have discrete capabilities and business value attached to them. Teams continuously test, evaluate, and improve the product based on this business value. Whereas projects have a clear end date and focus on delivering to requirements, products

have evolving roadmaps and focus on delivering functionality and measurable value add.

This is a long term strategy that favors testing and gradual improvement over time.

Early Adoption

Working with cutting-edge technologies brings the opportunity to roll out customer experiences far ahead of the competition. While leading the pack down a new digital road lets you pull ahead in the experience race, it also means driving on a course not fully marked yet.

"I should have had a lot more faith," says Edwards, emphasizing the importance of the growing community in which others share their challenges and experiences. "We were doing something that seemed crazy. Loads of people told us it was stupid. Why would the LEGO group buy a platform that's not been used in that scale before? And I was doubtful, and I shouldn't have been. It was the right thing to do. So stick with your convictions."

New technologies can be a powerful differentiator, but if technology is not a current priority for the organization it will be hard to get the mandates needed to hire the right teams, to iteratively develop, and to be trusted to know when the reward is worth the risk.

“The question is, what are you leaving on the table by not changing? ... It’s happening at mainstream brands now,” says Neha Sampat, CEO Contentstack. “We’ve gone from early adopter to at least early majority in adoption. If they don’t make a change, they’re going to be left behind.”

A New Type of Partnership

When you are behind the wheel of your car you may feel in control but, in reality, you are trusting the people who designed the engine, brakes, airbags, etc to get you safely where you’re going. As a system gains complexity, it’s less about control and more about reliability.⁵

This level of reliance, combined with the support you will need as an early adopter, makes it important to select highly collaborative, transparent vendors.

One important point to consider with this new architectural approach is that it forces organizations to change the way they buy software. “If you can understand how to break your organization up into pieces that fit into the MACH principles, you can adopt this architecture. If you have noticed that you’re not deploying faster than weekly, but are already at a weekly cadence, you’re probably ready. If you have applications that are failing, or are constantly down with no one to support them, then it’s time to throw those away and you’re ready now because what you have doesn’t work and it’s time to let it go.”

- **Dylan Valade**

“Your users, your customers, your consumers, your shoppers, whoever it might be, are actually getting the service that they need, because you’re building it in a way that suits them, rather than the way a vendor thought ... Fundamentally, it means you’ve got a business that’s more flexible, that you’re more in control of, and you can deliver what your customer needs.”

- **Niall Edwards**

Brand Alignment

When technology touches every part of the organization, making a big shift means getting a spectrum of stakeholders on board. Every department won't speak the language of APIs and cloud, but everyone has an interest in the brand.

"We've been around for a hundred years, so when we talk about transformation it's in terms of what we need to do to ensure our business is around for the next hundred years." explains Bob Howland, MACH Alliance Advisory Board Member & Chief Digital Officer at Dawn Foods, the leading bakery ingredient manufacturer, supplier, and distributor. "What does our company and operating model need to look like to do that? How do we engage with our customers now and in the future? How are our customers engaging in their day to day lives and what do we need to do to meet them where they are?"

"We wanted a single interface that could work for internal teams and customers, which meant we needed to control that experience ourselves," says Howland, explaining why the Dawn team decided to build their own custom front-end to work with their API-led stack. "We needed to be able to react to their needs and their evolving ways of working."

"We built our solution to be modular so we could replace underlying APIs without ever having to replatform. In the future we could replace our front-end without having a major rehaul of everything else, because the underlying API structures are all the same."

Dawn Foods doesn't see digital as the end game but as part of a continuing process of adapting their business to meet customer needs and to continue to lead the industry. "Our company is known as an innovator in the bakery ingredients space, people recognize us for our cutting edge products. We have a track record of knowing where the industry needs to go and taking it there," explains Howland.

Evaluating MACH Solutions



Identify Your Core Criteria

Moving to MACH gives enterprises the freedom to design an architecture around their specific business needs. The core tenets of that design, where the focus makes the most business sense, will differ for every enterprise company.

This can make evaluating new technologies complicated. When your architecture is custom to your business, there is no standard industry RFP. Not to mention that once you open the possibility of using any best-of-breed solution, you also open the door to the ever-growing Pandora's box of enterprise software.

"These platforms are selling a different notion," says Edwards. "They're not selling a platform or capabilities, they're selling a way of doing something, and we needed to fill in the gaps. So actually, what we did was, we did our RFP based on principles. We did it based on fit — how does your organization and our organization come together?"

Aligning on core criteria early, and making them a mantra throughout the process, makes it easier to make unified decisions along the way. As well as enable teams to make independent decisions that are cohesive with the overall architecture.

Include multidisciplinary teams

Aligning on these core criteria requires input from every department that will be impacted by the new solutions. For one well known luxury retailer, this meant that platform decisions were made by a cross section of engineers, content managers, merchandisers, and architects. This early collaboration helped the overall program run smoothly at every stage.

Setting up this collaborative culture, where everyone trusts they are working towards the shared goals, also leads to quality feedback down the road.

Evaluate Hands On

MACH Alliance member companies agree that the best way to uncover the cloud-credentials of a solution is to ask open-ended questions. As you get into discussion around versioning, scaling, and availability you'll quickly start to see patterns around cloud maturity.

"What we've seen work well is simply asking to have a look at the documentation of the APIs that vendors claim to have." says Markus Tillmann, Executive Vice President at Mindcurv. "You'll see some people raising their eyebrows because their documentation is spread all over the place. They say they are API-first but in fact have very few APIs that they offer as API-first."

A highly recommended approach is to use an advanced use case as a proof of concept. This allows you to evaluate how the software supports your actual business processes and helps you see under the hood of the solution.

Compose for the Best of Build & Buy

“Composable architecture gives companies the best of both worlds. An overarching question you need to consider when thinking about build versus buy is what are the consequences of buying? If you are looking at a digitally differentiating capability, will buying a commoditized solution truly accelerate your competitive edge? Will you be able to extend the solution to add differentiating features later on? What does the licensing model look like? Does it lock you in or do you pay for only what you use and have the freedom to replace the solution if you want?

If you can say yes to that, then you should probably buy it, and focus on building the capabilities that differentiate your offer.”

- **Casper Rasmussen**

“In general we see that back-end capabilities, the SaaS platforms, as ones to buy. It’s not exclusive, but that’s the way we lean. Our front end is custom built by us. The view is that we will differentiate ourself through our custom website, personalization, and customer data so we own those capabilities ourself.”

- **Giles Smith**

From MACH Alliance discussions with the companies leading in composable, they advise that you don’t reinvent the wheel. There is no need to create custom functionality if it is already available from a third party. Focus customization on the areas of the business that are unique to you and your service offering.



Common MACH Criteria

Decoupled

Services have less dependencies on one another and are independently deployable and scalable. Changes can safely be made on one service without affecting the others, making it easier to test, develop and implement custom features.

WHAT TO LOOK FOR:

- Is functionality available in discrete, individual pieces or do you have to use the entire application?

Cloud-Native

Software is hosted and managed by the vendor, as a SaaS or PaaS. Able to leverage cloud beyond storage and hosting.

WHAT TO LOOK FOR:

- Platform updates should happen automatically, if there is manual work, or license fees, required for versions and upgrades it's likely a managed service model.
- Functionality should be available over a URL or other form of API. You should not have to download the software and run it yourself.

“When you make the choice to adopt something ‘as-a- service’ you’re trading a degree of ownership and flexibility for convenience, speed, and business results. You move to the cloud and you give up control of your servers, you don’t configure them anymore, but you gain the ability to do work faster and cheaper in the cloud.”

“There’s a huge difference between developing a system and adding APIs compared to building a true, API-first platform when the APIs are created alongside – not after – development. Contentstack takes a MACH approach from the ground up, so there is nothing in our management console, nothing in the product UI, nothing in the back end that you can’t address equally through the API.”

- Neha Sampat

Natively Headless and API Enabled

Back-end logic is completely separated from presentation, enabling use of any touchpoint. APIs give access to every function within the platform and work with all front-end frameworks.

WHAT TO LOOK FOR:

- If there is a presentation layer that has been “decoupled” with APIs, this is a sign that it is API-added, not API-first.
- There should be software development kits (SDKs) for a variety of front-end providers, mobile apps, and traditional application programming languages.

Modular Implementation

Ability to easily integrate with other technologies. Supports incremental implementation and evolution, as opposed to a Big Bang launch.

WHAT TO LOOK FOR:

- Are integrations with your critical solutions built into the product, available as a how-to-guide, or in the same class of technologies the vendor has experience integrating with?
- What are examples of early prototypes clients have gotten to market quickly? How did these prototypes mature over time?

Agility and Extensibility

Seamless, transparent and regular platform updates.
Supports a CI/CD approach.

WHAT TO LOOK FOR:

- How frequent are new features, how are they released, and how do you receive them?
- How is backwards compatibility handled? Is there a clear versioning method in place for APIs?

Scalability

Scale resources automatically for peaks and flash events. Fully elastic consumption maintains optimal performance at the lowest possible cost.

WHAT TO LOOK FOR:

- Are there performance statistics available from a recent event, such as the holiday season or a large live event?
- Is there documentation on caching, webhooks, and containerization?

Stability

Reliable service and uptime regardless of updates, traffic, and special events.

WHAT TO LOOK FOR:

- Is the vendor transparent about availability and performance? For instance, providing a publicly available status and availability monitoring.
- How do you access customer support, when is that support available, and does it come with an extra cost?

Strategic Alignment

Vendor is a partner who understands and supports your business needs and goals. There is a highly collaborative and transparent relationship.

WHAT TO LOOK FOR:

- Read customer reviews and ask to speak with reference customers.
- What is a recent feature that was added based on a customer suggestion?
- Does their feature road map support your strategy?

Documentation

Easy-to-use, searchable, self-help knowledge database. Clear and up to date API documentation, SDKs, and how-to-guides.

WHAT TO LOOK FOR:

- Test the quality of vendor's documentation with a hands-on evaluation, or hackathon, focusing on a real business need.

Ease-of-Use

The solution is equally valuable for all users. Features, functionality, and UI are quickly adopted by both technical and business users.

WHAT TO LOOK FOR:

- Include a cross section of users in the evaluation process.
- Is there training available, live or on-demand, for all users of the product?

Moving to MACH

“One of the biggest challenges with commerce experiences built on monoliths is that you don’t have the same possibilities for creating an immersive standout customer experience as you do in a physical store. As a result, thousands of stores like yours are one click away. Arguably the biggest reason for moving to composable commerce is - what it isn’t. It’s not the web presence. It’s not the templating engine, build system, glue code, or runtime. Those pieces, and all the technical decisions behind them, remain entirely under your control so you can match the technology used on your site to your team and other projects. With a composable commerce stack, you are not bound by specific templates or checkout procedures and are free to customize the customer experience to your exact specifications.”

- **Chris Bach**

Board Member, MACH Alliance & Co-Founder, Netlify

“ A lot of times it’s not a direct mapping from an old school approach to this next generation approach, it’s how you think. If you’re adopting this new style it’s a different paradigm.”

- **Kelly Goetsch, Microservices for Modern Commerce[®]**

MACH Alliance Chairperson & Chief Strategy Officer, commercetools



Sourcing Strategy

Moving to a MACH architecture requires finding the talent and expertise to support the new approach, and it should be understood early on where both of these will come from.

For instance, certain roles will only be needed for the initial shift, while others will be needed for the long term evolution of the platform. It may be helpful early on to bring on an external implementation partner with MACH experience. They can source the talent needed to get the ball rolling, help design and implement a solid foundation, and be an information resource for your long-term team.

Vendor partners are also good to leverage early in the processes. Offering a product designed for modern digital business, these companies usually have experience with finding solutions to unique requests. Having vendors work directly with your team also means that real business cases can be used for training and education.

Choose the Granularity

“It’s easy to get carried away with creating many different services.” says Sampat, “You’ve got to follow a good design methodology about understanding what constitutes a service. One key to that is Domain Driven Design, which is understanding the boundaries of each service. So you’re not adding unnecessary complexity to the application.”

A recent Gartner report discusses the method of designing around business capabilities:

“The future of applications includes the creation and integration of packaged business capabilities (PBCs), which are software components that represent a well-defined business capability, recognizable as such by a business user. A PBC consists of a bounded collection comprising a data schema and a set of services, APIs and event channels. Well-implemented PBCs are functionally complete to ensure autonomy with no critical external dependencies and no need for direct external access to their data. The creation, adoption and integration of PBCs enables assembly of custom application experiences and is a foundation of a “composable enterprise.”⁶

Decide up front just how “micro” you want your microservices to be to keep complexity in check.

Map Service Interaction

Having multiple platforms working in tandem means extra consideration for how the services interact. Document what service owns which bit of data, as well as processes around considerations like caching, image delivery, static and dynamic delivery, plugins, libraries, and workflow.

Organizing this information early, such as in an internal wiki, will help solve issues quickly.

Decouple Your Front End

A common first step for many organizations making the transition to MACH, is to decouple the front end. That can be as simple as leaving what you have in place and API-enabling the back end. This won’t bring immediate benefits to the customer experience, but is a relatively simple way to lay the foundations for MACH.

Decoupling early gives businesses the agility to make changes to the front end quickly while updating the bigger back-end changes at a more moderate pace. Decoupled services ensure the future-proof aspects of the software. Merchants can flexibly align the system to their current business needs by adding and removing 3rd party services without worrying that today’s decisions will backfire tomorrow. They are never doomed to one particular tech vendor. Instead, they can cherry-pick from the best ones in the particular niche.

Since the frontend and backend work separately, there is a much lower risk of errors when implementing any modifications. Changes in one layer do not affect the elements of the other. It makes the whole system much more flexible, as frontend and backend specialists can work independently of each other; frontend devs can implement quick updates, and backends’ constantly take care of the system stability.

Once decoupled, you now have the facility to replace what that front end is connected to, service-by-service.

Prototype for an Early Win

Chris Bach of Netlify advises to get a Proof of Concept into the wild ASAP. “The traditional way of adopting new software is building it out, porting the content over, and then - years later - flipping the switch and going live. By then, so much has gone into it that it seems daunting to go anywhere. However, one of the most significant benefits of going composable is that you can do so gradually. For example, using Netlify, teams can proxy to your legacy app or your new page

for every visitor without any performance loss. You can quickly slice out a page and publish a new project within weeks. Many teams spin up proof of concepts in weeks: PrettyLitter was able to get a proof of concept up in less than three weeks, and Sennheiser was able to get a production-ready proof of concept up in less than eleven weeks.”

[More details on Sennheiser’s migration](#)

Step Off the Monolith

Bach outlines the different approaches to moving to composable:

1. Start by just chopping off the head. If you are on a monolith from a provider that offers a headless version such as Shopify or BigCommerce, you can start by simply decoupling the frontend. For example, PrettyLitter, a large D2C retailer, kept their monolithic install of Shopify, including the checkout experience, but decoupled the frontend. In a few weeks, they were able to build and deploy a headless proof of concept that increased conversions by 10%. Having success with the approach, they progressively broke out other portions of their backend monolith, using Cloudinary for images, Contentful for content, and additional services to optimize the checkout and post-sell customer experience. Today, they mostly use Shopify for only the order management component of the solution.
2. Dip into composable from the get-go. It may make sense for your team to adopt multiple composable elements at once. For example, flaconi, one of Germany’s leading online beauty retailers, used commercetools for product information, order management, and the transactional layer and commercetools Frontend (formerly Frontastic) for decoupled frontend layer, but also used the best-of-breed services for search (Algolia) and CMS (Contentful). Hilding Anders, a leading sleep retailer in 40+ countries, continued to leverage BigCommerce for their checkout and some commerce capabilities while adding more advanced capabilities like personalization from Uniform and content via a CMS (Contentful).
3. Go full composable. Going “full composable” isn’t generally an option from the get-go. It requires a high level of digital maturity, significant resources, and large scale. But it can be done: Salling Group, the largest retailer in Denmark, has come close with a centralized digital team of more than one hundred members focused on building and sharing packages of functionality using best-of-breed technologies and customer data that are used and reused across multiple brands.

While the exact steps will differ for every company, a key principle is to stop feeding the monolith. The monolith should, with each new functionality, become increasingly dependent on the services.

In her guide to breaking up a monolith, Zhamak Dehghani gives the following example:
“Consider in a retail online system, where ‘buy’ and ‘promotions’ are core capabilities. ‘Buy’ uses ‘promotions’ during the checkout process to offer the customers the best promotions that they qualify for, given the items they are buying. If we need to decide which of these two capabilities to decouple next, I

suggest to start with decoupling ‘promotions’ first and then ‘buy’. Because in this order we reduce the dependencies back to the monolith. In this order ‘buy’ first remains locked in the monolith with a dependency out to the new ‘promotions’ microservice.”⁷

This also means that new features and functionalities should be implemented as services. Performing a one-off “quick fix” by adding something new to the monolith is just moving the goal post further away. The following readings offer a more in-depth look at technical strategies to step off legacy tools.

Additional reading

Blueprint Architecture for Modern Commerce

Commercetools

Diagrams and details of two potential headless commerce architectures.

How to Break a Monolith Into Microservices

Zhamak Dehghani

A step by step look at how to choose what, and how much, to decouple.

flaconi's Experience Architecture

flaconi, one of Germany's leading online retailers for self-care products founded in 2011 has seen unprecedented business growth as well as growing customer expectations. It's legacy architecture was in-house developed and required a lot of customization. It was clear they had to change and while they considered three options including maintaining their systems in-house and an all-in-one suite approach, it was clear only a combination of best of breed composable solutions would align with their needs and the way they wanted to operate and scale in the future.

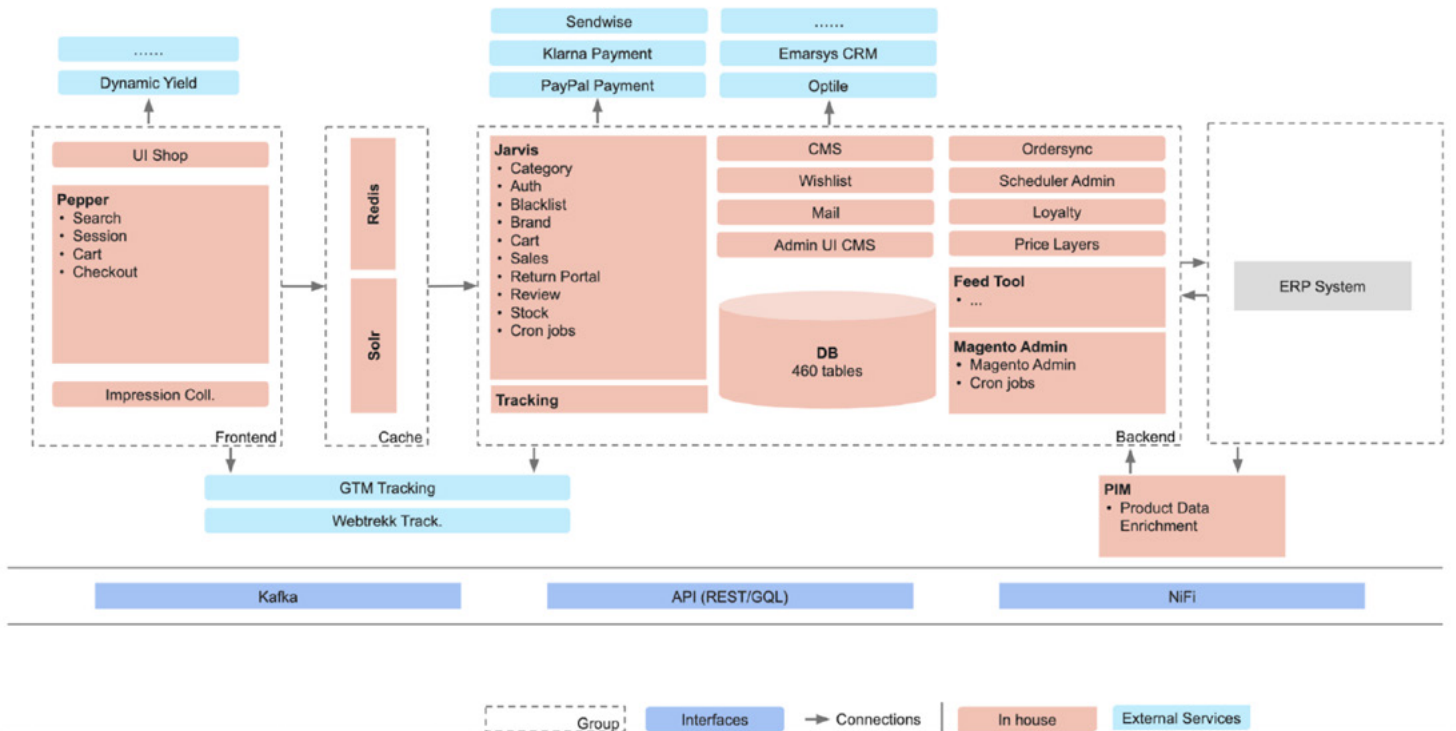
"Our journey to composable started by setting up milestones that translated into some critical action steps," says Adeel Younas, Head of Engineering, at flaconi.

"We assembled a small, dedicated project team that focused on composing our platform by selecting the best headless tools available in the market, including tool-example-1, tool-example-2, etc. In parallel with developing our features, we onboarded our business teams with the necessary skills to get them up to speed with the new platform."

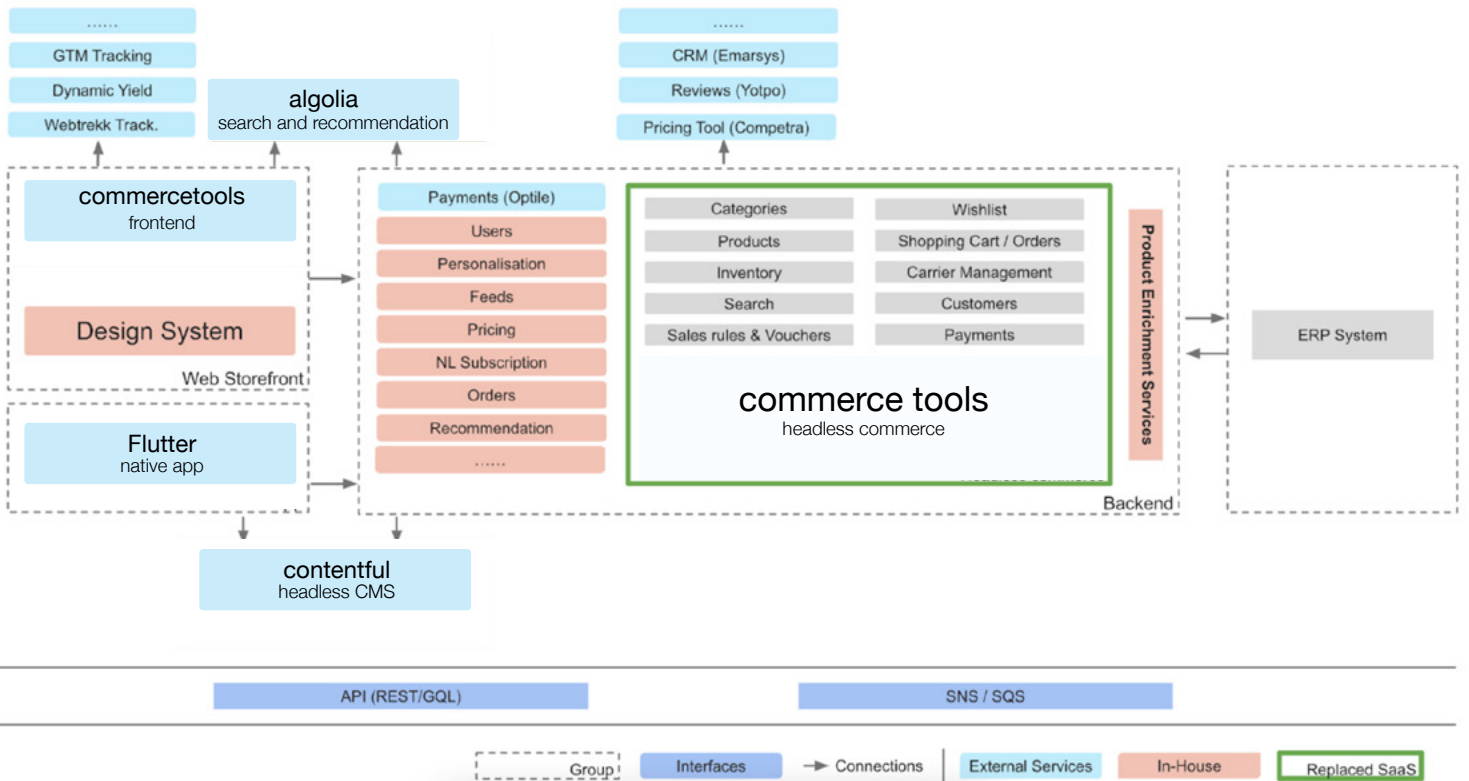
"This legacy architecture diagram has been trimmed down by about 50%. Everything in red was in house developed over time contributing to the challenges we were facing."

"With our new architecture, we have reduced in house development by 60% by replacing systems with best of breed, allowing us to focus on developing features for customers and not maintenance."

Legacy architecture



New Architecture



Ecommerce MACH Architecture

API Orchestration/Back End for the Front End

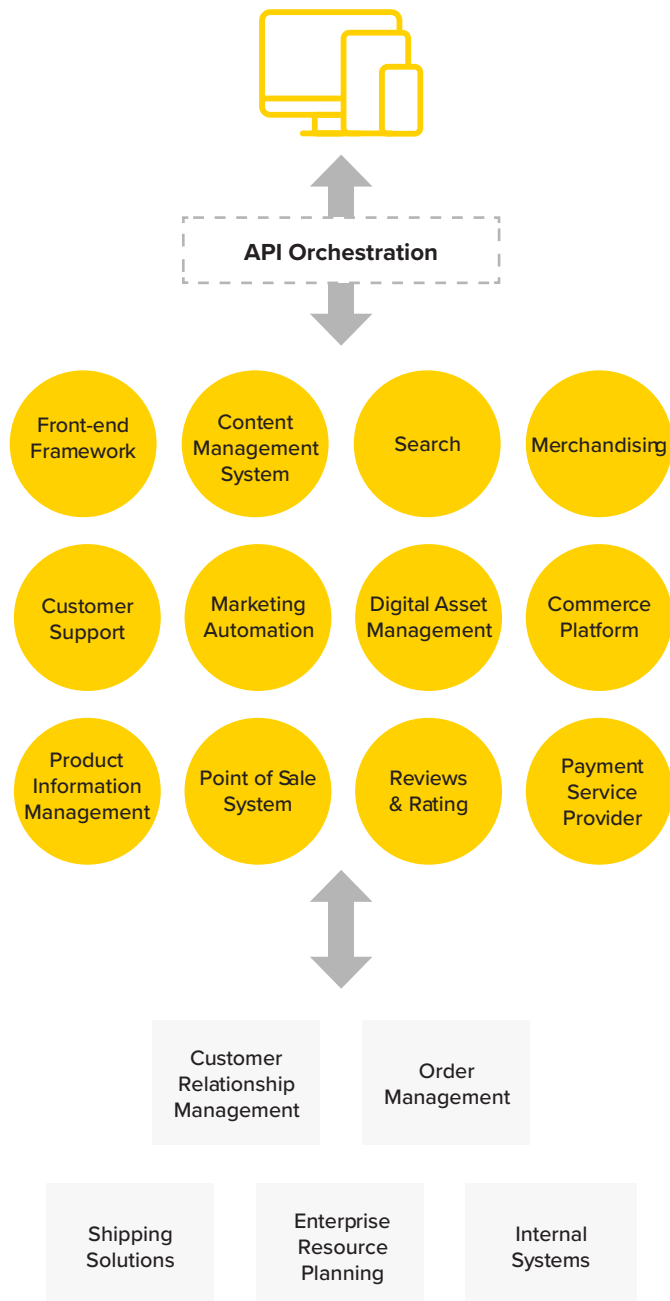
An API gateway that coordinates the experience services. This is the logic layer that determines what information will be given to the user. Usually fully owned by the enterprise.

MACH Experience Technologies

Agile, flexible tools that are focused on the external user experience. Loosely coupled, these tools pull in information and adapt their output to changing situations.

Business Data and Processes

Tools that focus on data and processes of the internal business. They prioritize consistency over agility and do not need to be as flexible as the experience technologies. How they integrate with and push information to MACH solutions is a way to differentiate the customer experience.



A full MACH architecture may not be for every company, yet.

Traditional platforms are more familiar for many organizations, and are relatively easy to deploy out of the box. On the outside, these platforms seem simple. However, on the inside they become more complex over time. Every new feature or dependency is duct-taped on one at a time, and this growing complexity slows down development year over year. Releasing new initiatives to market can take months, even years, or become too complicated to attempt at all.

MACH technologies, on the other hand, do take time and planning up front to map out and properly set up. The initial push is a more complex process than deploying a traditional platform but, once the structure is in place, MACH technologies make digital evolution simple. Their building block style of design means that releasing a new feature or creating a new dependency just requires clicking in a new block and can happen in weeks, days, or even hours.

This building block nature also means that companies can start using MACH in any corner of the business and transition over time. For many enterprises, starting with a single MACH technology can be and often is the catalyst for a wider change and digital maturity.

The digital experience race isn't going to slow down.

Rapid change — in consumer demands, business needs, the technology marketplace — is inevitable and enterprises tangling themselves up in legacy platforms are at a disadvantage to the nimble organizations that can quickly leverage new tools, features, and channels.

Speed gives the power to differentiate with digital. While every company in the race is tasked with changing their bike into a car, some need a race car and others an off- road powerhouse. Companies with an experience best adapted to their customers' needs are the ones who will win. MACH technologies let companies design their kit piece by piece and create an experience that sets them apart from the competition.

The speed, scale, and performance that MACH technologies offer, along with the ubiquitousness of cloud and APIs, lean towards a future where this type of modular design will be one of the common enterprise architecture patterns. Early adopters are paving the way for this to happen, exiting the replatforming loop, and securing their spot at the front of the digital experience race.

If you're looking to adopt a composable architecture, the MACH Alliance established certification standards that help identify vendors and integrators that embrace MACH philosophies and offer MACH-certified services. It's a good place to start!



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This whitepaper, originally developed by Contentstack titled “Break the Replatform Cycle with MACH Enterprise Architecture,” was updated and revisioned by The MACH Alliance in 2022 to include new case studies and industry perspectives from early adopters and those already well on their MACH journey. It delivers a practical guide to approaching and implementing MACH technologies for a modern enterprise experience.



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