

A 3D grid of dark teal cubes is arranged on a teal background. The cubes are stacked in a way that creates a sense of depth and perspective, with some cubes appearing to float above others. The overall aesthetic is modern and technical.

Audience: Technical decision makers

Microservices:

A paradigm shift for fast-growing e-commerce businesses

Management Summary

Speed is today's leading competitive differentiator: Facing changing customer demands, the rise of the mobile web and ever shorter innovation cycles, merchants need to make sure to have both an organizational as well as a technical structure that allows for agility and speed. Monolithic e-commerce applications, which still drive most of the biggest retailers' sites worldwide, are bottlenecks for innovation.

Companies such as *Amazon*, *eBay*, *Netflix*, *Google* and *Uber* already rely on an architectural principle called Microservices: Small services which are individually developed, deployed and managed and which communicate via standardized APIs.

Instead of having one monolithic application containing all business logic, a flexible network of Microservices handles all complexity. Developers can work on small functional chunks rather than having to understand many millions of lines of code, resulting in better quality as well as easier testing and adapting.

Using examples by *Zalando*, *The Gilt Groupe* and *REWE*, we will show how retailers benefit from switching to Microservices and give some practical guidance regarding the evaluation and introduction of this methodology.



1 Centralized teams and monoliths are everywhere

Back in 2002, Jeff Bezos, CEO of Amazon issued a mandate that would have enormous repercussions for the company's future: He requested that all teams be required to expose their data and functionality through service interfaces and only communicate through these¹. Also, these services had to be set up in a way that they could be used by external developers. As a result, the company built an infrastructure that would allow them to scale their online retail business as well as provide a hugely successful platform to third-party developers and businesses.

In the digital age, fast-growing, fast-moving corporations need to find both an organizational and a technological structure that allows for agility and speed. However, to date only the most driven businesses have managed to implement such changes.

When it comes to team set-up, e-commerce IT departments traditionally follow a centralized structure with experts organized around technology tiers. So in practice, a database professional might work on checkout in one week, and on product search in another - both two completely separate parts of the application. Such a jack-of-all-trades approach usually does not allow deep and specialized knowledge to evolve and often gives way to mediocrity. Also, if a project requires the involvement of experts across several technology tiers, the result is a massive communications overhead.

According to *Conway's law*², communication paths in an organization have a direct impact on the technical infrastructure. In other words, if a centralized team structure prevails, this will also result in a centralized application. So, not surprisingly, a vast majority of e-commerce sites today are based on monolithic software applications. They share a common code-base and have centralized storage and messaging.

When the first e-commerce systems were launched at the turn of the century, they inherited the monolithic paradigm of contemporary software, such as ERP solutions. They were designed and structured in a way that followed the *zeitgeist* and reflected the technological status quo of the time. Most people accessed the Internet through CRT monitors, and mobile web usage seemed light years away. Also the capability to connect systems via standardized APIs - something we very much take for granted today - was not available as yet. As a result, infrastructure components had to be created from scratch and added to the core of commerce solutions - where they still are today creating considerable technical debts.

Successively, e-commerce software developed into monolithic, full-stack suites, assuming some ERP functionality as well as other parts of the business logic such as WCMS or CRM.





About commercetools

commercetools revolutionizes the enterprise commerce platform market by combining the flexibility of an on-premise solution with the speed of SaaS. Following a unique API-first approach that radically reduces complexity, the platform enables large businesses to deliver engaging shopping experiences across all channels and drive innovation.

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