



Tuning up the high-frequency enterprise

AWS Perspectives

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Why do some businesses achieve unparalleled speed and agility using the cloud, while others struggle to adapt?



Phil Potloff,
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the answers.

While nine out of ten companies are engaged in some kind of digital transformation, only one in six feel they are being bold enough¹. A key goal for many is to become what Amazon Web Services (AWS) terms a ‘high-frequency’ enterprise—one where technology is a true enabler of continuous improvement and business value generation, letting you deliver changes to applications, products and services at the breakneck speeds your business (and customers) increasingly demand.

One person who knows better than most how organizations can achieve that goal is Phil Potloff, Head of Enterprise Strategy at AWS. Before joining the company, Potloff oversaw a successful digital transformation at leading US automobile search portal Edmunds.com. Since then, along with a team of fellow cloud-savvy former CIOs and CTOs, he has helped more than 2,000 AWS customer organizations fine-tune their cloud strategies.

Over time, the team has identified a number of negative organizational patterns (‘antipatterns’) that commonly limit an organization’s ability to maximize the benefits of cloud migration, as well as what they need to do to transform into true high-frequency enterprises. And when Potloff says high-frequency, he means it. **“Organizations that made the transition to high-frequency practices like DevOps and the cloud are delivering changes at speeds on average 46 times faster,^{2”}** he told an audience of senior executives at the AWS Summit in London in 2019.

References:

- 1 Bughin, Jacques, and Nicholas van Zeebroeck. “The Best Response to Digital Disruption.” McKinsey & Company, 9 May 2017, www.mckinsey.com.
- 2 Puppet.com 2018 State of DevOps Report. <https://puppet.com/resources/white-paper/state-of-devops-report>.

So why are so many enterprises stuck in 'low frequency' mode?

Typically, they have what Potloff calls “a mountain of technical debt”—years of accrued workarounds and shortcuts in existing systems and applications that were never addressed. This is compounded by outdated models of security, risk, and compliance that fail to build in processes to discover performance issues or vulnerabilities early in the development process when they are less costly to resolve.

And when they do decide to change, they typically embark on a big, long-term transformation project. **“Businesses often have a grand vision that sets out their strategic roadmap for the next, say, five years. But they often match that with ‘big execution’ in IT.** Before anyone writes a line of code, they spend months pre-planning, trying to map out every step along the way,” said Potloff.

Far from de-risking change projects, this approach actually puts organizations at greater risk. “Projects grow larger and more unwieldy as everyone realizes this is the company’s big vision and expands its scope by adding in more requirements.

And when you work for months or years on a project without customers seeing anything, and with the pace of innovation increasing, it becomes a big gamble that it is still what they want once it’s finally delivered. There’s also a greater chance of security risks or application instabilities creeping in,” said Potloff.

In order to try to control those risks, organizations put in place processes such as periodic integration and security evaluations. “These checkpoints tend to be manual, so they typically act as gates that slow things down,” said Potloff.

But when projects fall behind deadlines (as they invariably do when you have all these gates and lumbering processes), there’s then a mad rush towards the end to ensure launch deadlines aren’t missed. “It’s during these ‘launch heroics’ that organizations really pile on technical debt. They are forced in the final stages to make **compromises in architecture and scope that have far reaching downstream consequences for the long-term agility and stability of the project** just to get it out the door,” said Potloff.

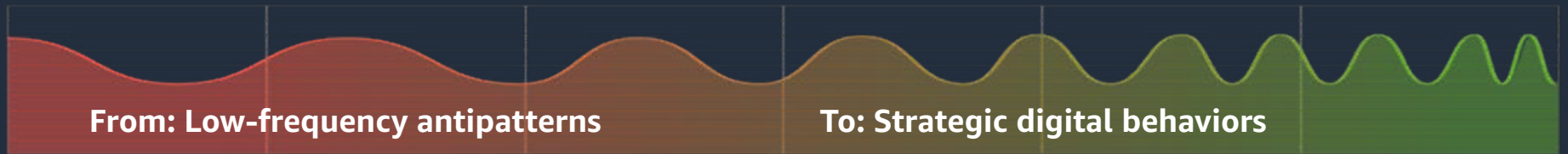
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Many enterprises have a mountain of technical debt—accrued workarounds and shortcuts in existing systems and applications.



Hitting Escape Velocity

To get out of this low-frequency mode, enterprises must identify the antipatterns holding them back and work to develop replacement behaviours that mirror those of the most successful digitally transformed businesses. Potloff's team has identified seven of the most common strategic shifts needed.



From: Low-frequency antipatterns

To: Strategic digital behaviors

Big bets that languish



Smaller batch size and frequency of releases

Protecting the core business



Continuous refactoring and improvement

HiPPO*-based decisions



Data-driven decisions that are tested and measured

Business and IT silos



Teams that span business and technology

Large feature sets and systems sprawl



Constant re-prioritization and validation for relevance

Software and processes that aren't nimble



Shorter lead time from idea to implementation

Planning for best case operating state



Assuming attack and failure

** HiPPO-based decision making is when the highest paid person's opinion matters most*

So how do you go about making this shift in practice?

Potloff says there are four key areas to focus on in order to enable these strategic shifts.

1

Break up the work The first is to move from monolithic systems and processes to agile microservices. “You want to **deliver value more frequently by reducing the size of your deliverables and transforming continuously,**” said Potloff.

Yelp, the online business directory, is one company managing this transition successfully. “Over 10 years of rapid growth, Yelp’s front-end and back-end environments had become a Python code monolith. So they’ve used AWS to break up their application into hundreds of microservices, which they’re separating out of the monolith application by application. These interact with what remains of the monolith until it is eventually no longer required at all,” said Potloff.

“For example, one of Yelp’s recent projects [migrated their subscription billing process](#) from the monolith to the cloud, using AWS serverless technologies AWS Lambda and AWS Step Functions to define the workflow. This allows them to run it faster with better observability and automated recoverability. And because it works with their existing monolith they’ve been able to deliver immediate value to the business,” said Potloff.

2

Invest in your workforce Working at high frequency also means your people have to learn to do things in a different way. “Successful high-frequency organizations over the past 15 years have adopted all of the key organizational and architectural paradigms that have emerged over that time—things like agile development, DevOps, RESTful services, Test Driven Development, real-time analytics and big data,” said Potloff.

Low-frequency enterprises, by contrast, have only adopted the macro technology shifts such as virtualization, IT service management, and perhaps a big data initiative. “But gaining the skills they need to become a high-frequency enterprise can be difficult, especially for companies that have outsourced their technical teams and are now trying to insource or work with partners,” said Potloff.



Few if any enterprises are going to hire their way out of this circumstance, so **the best solution is to invest in comprehensive training where employees see a real commitment by their leadership to support this shift.** Potloff cites US bank Capital One as [one company that did this successfully](#). “They created one of the most robust training programs I’ve seen—not just for the cloud, but for building and reskilling their culture. They put thousands of team members through the program – not just IT engineers, but project managers and business analysts, governance, financial management and security staff—as well as building tools and introducing mechanisms to allow these teams to work autonomously at their own pace,” said Potloff.

3

Automate your bureaucracy Manual processes are one of the biggest impediments to becoming a high-frequency enterprise. “You need to build guardrails, not gates,” said Potloff. In other words, **you need automated processes and mechanisms that protect your systems and de-risk change so that you are not putting limits on your ability to speed up the enterprise.** “That’s absolutely critical if you want to let lots of people operate independently at a high-frequency rate,” said Potloff.

Verizon is one example of a company that’s successfully done this. Although it had already adopted AWS as its preferred cloud provider and put in place a pipeline for continuous delivery, its security and compliance process for new infrastructure deployments did not yet match its other automated guardrails. “So they built a [secure provisioning system](#) for their cloud resources that automates the validation of configuration rules, deployment to a test environment, and final security checks in a production environment that are required prior to utilization. Essentially they’ve automated their security policies. That gives their product teams the ability to use cloud resources whenever they need them, rather than on some preset schedule. And it has enabled their security team to focus on building more functionality into these guardrails as opposed to running manual security checks.”

You should also standardize on reusable building blocks wherever possible. “In fact, you should be doing everything you can to reduce the complexity of your architecture,” said Potloff. “The question you need to ask your teams when making any architectural decision is whether it reduces your overall delivery cycle time. Trending towards zero days (or hours or minutes depending on your current capabilities) and not increasingly farther away from zero is what you should be aiming for in your capabilities, and that’s a measure you can use across your entire portfolio from ERP and BI systems to customer facing applications,” said Potloff.

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4

Build it in, don't bolt it on One blocker to your efforts to transform into a high-frequency organization is the fear that automating controls will result in poorer-quality testing and lackluster security. The challenge here is to build testing and security in by design, rather than trying to bolt them on. **“Building tests into your automated bureaucracy not only provides resilience and flexibility but also extends the notion of immutable, or self-healing, infrastructure,”** said Potloff.

That's because in the cloud, it's easy to replicate and redeploy systems. He cites [Travelex Wire](#) as an example of this embedded design. “When Travelex built their first cloud environment for this new digital international money-transfer service they wanted it to be their most secure platform to date. So they built an immutable cloud infrastructure based on Amazon ECS, a high-performance container orchestration service. Travelex's FCA-regulated service replaces containers used for money transfers every 24 hours and automatically redeploys them with new certificates to reduce their risk from compromised security credentials. And if something were to change from the predefined security controls of an application container during that short period, it is either quarantined or replaced with a new instance. The scalability and flexibility of the cloud makes this type of process much easier to accomplish than in your typical self-managed data center,” said Potloff.

And when you have the ability to continuously make small changes, it's also easier to roll them back, limiting the damage to your business if anything does go awry. “We talk about high-frequency delivery as reducing the blast radius for risk—because the impact of a change is much smaller and easier to recover from,” said Potloff.

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A new way to think about change

If enterprises are to succeed in making all the practical changes necessary, Potloff says they also need the right mindset. We tend to discuss change as a journey with a fixed start and end point—for example, moving from on-premises IT to the cloud, or changing an unskilled workforce into a skilled one.

He wants us to think about change in a different way: “Rather than conceiving it as going from point A to point B, think of it as a continuous journey. Think about building a continuous learning culture, constantly refactoring your systems, always trying to reduce your time to delivery.” Don’t think of your transformation as just a new project, but instead as [Verizon’s former CTO Mahmoud El Assir](#) describes it, “**a cultural shift...to continuously building the future.**”



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How today’s CXOs are thinking beyond tech in the digital age.

AWS Executive Insights

Perspectives on enabling cloud innovation and transformation through culture, talent, and leadership.

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