

Innovate Faster and More Cost-Effectively with Cloud-Native Application Development



Introduction

How could your organization become more agile while driving down costs? Boost the return on its investment in IT? Innovate faster?

Over the past five years, we've seen a dramatic evolution of the toolsets available to develop modern applications—mainly due to the proliferation of the cloud. Innovative new approaches have emerged that deliver great flexibility and cost efficiency—for example using Docker containers and managing them at scale with Kubernetes clusters. And it's now easier than ever for even well-established firms to become nimbler by using a DevOps methodology and agile development frameworks such as Scrum in the cloud.

It's clear to us that more investment is now focused on innovation in the cloud than on traditional on-premises software. And exciting new capabilities such as AI, blockchain, and chatbots all benefit from being delivered through cloud environments. Using the cloud, they can now also be deployed by more organizations more easily and at lower risk.

As this trend gathers pace, could now be the right time for you to consider how your organization could benefit from shifting some of its application development into the cloud?



In this briefing paper, you'll discover how cloud-native application development can help you:

- Reduce the time to market for new projects
- Boost agility and responsiveness to demand
- Innovate and create value faster
- Improve the return on your investment in IT
- Manage operations and data security efficiently

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2 Boost Agility and Responsiveness to Change

3 Innovate and Create Value

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5 Improve Management, Security and Compliance

1 Shorten Time to Market

How can cloud-native application development help you get new projects completed faster? How does it shorten your organization's time to market for new products and services?

Finish new projects faster

In traditional on-premises application development, deploying an application for testing first and then moving it into production could all too often be a lengthy process. Simply setting up the testing and development environment could take the operations team days or longer. Each round of testing would involve the same extended process, creating a major drag on software release cycles.

"Cloud-native tools with testing and life cycle support built in help you iterate much faster. You can reduce your turnaround time from weeks to days or even hours."

Sten Vesterli, Independent Consultant and former Oracle ACE Director





Over the past decade, some firms have aimed the DevOps methodology at this problem. Those with the know-how to implement on-premises automation with continuous integration and continuous development (CI/CD) have been able to significantly speed up their testing and deployment process.

So, is all now well? In a word, no.

On-premises automation techniques have remained out of reach of many firms, proving too complex and time-consuming to justify implementing.

Cloud-based application development offers an answer to this problem because it comes with a toolset that makes it much easier for firms to benefit from a DevOps approach. For example, it provides developers with specific cloud-

native tools to support automation and CI/CD, and eliminate unnecessary drag from software development life cycles.

In effect, the cloud lowers the bar to adopting automation and a DevOps approach to software development.

Increase developer productivity

Containers play a key part in making it easier and faster for developers to write and release software faster. They encapsulate applications so those applications always run in the same way without requiring operations teams to provision environments for them. And compared to traditional virtual machines, they achieve this goal with much less overhead and complexity.

“Containers are a breakthrough because they streamline how you build, package, and deploy software.”

Luis Weir, Chief Architect, Capgemini UK

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“There’s a trend for firms to use Docker containers because they’re easy to deploy, scale, and maintain. You just create an image of your application and then give it to another developer. He gives one command on his terminal and has the Docker image up and running. He can then start developing with it immediately instead of having to do all the installation and configuration.”

Richard Olrichs, Oracle ACE Director

In particular, Docker containers have become extremely popular for software development.

As Richard Olrichs, Oracle ACE Director explains, “There’s a trend for firms to use Docker containers because they’re easy to deploy, scale, and maintain. You just create an image of your application and then give it to another developer. He gives one command on his terminal and has the Docker image up and running. He can then start developing with it immediately instead of having to do all the installation and configuration.”

Build functionality faster

Microservices can yield another source of time savings—this time through architectural innovation.

In contrast to traditional monolithic application development, in a microservices architecture,

applications are built up of many small, lightweight components. These microservices components each have a specific, bounded scope and use APIs to communicate with other microservices. All work in harmony to deliver the required business capabilities.

With this approach, developers can build microservices using the programming languages most suited to the functions they will provide. And because they can choose the best language for each task, they can develop functionality faster.

As a result, this polyglot development approach—with different microservices written in different programming languages—can also help shorten your time to market.

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2 Boost Agility and Responsiveness to Change

How can your organization respond to unpredictable and fluctuating demand for its services in a way that's both agile and cost effective? A microservices architecture can help on both these counts.

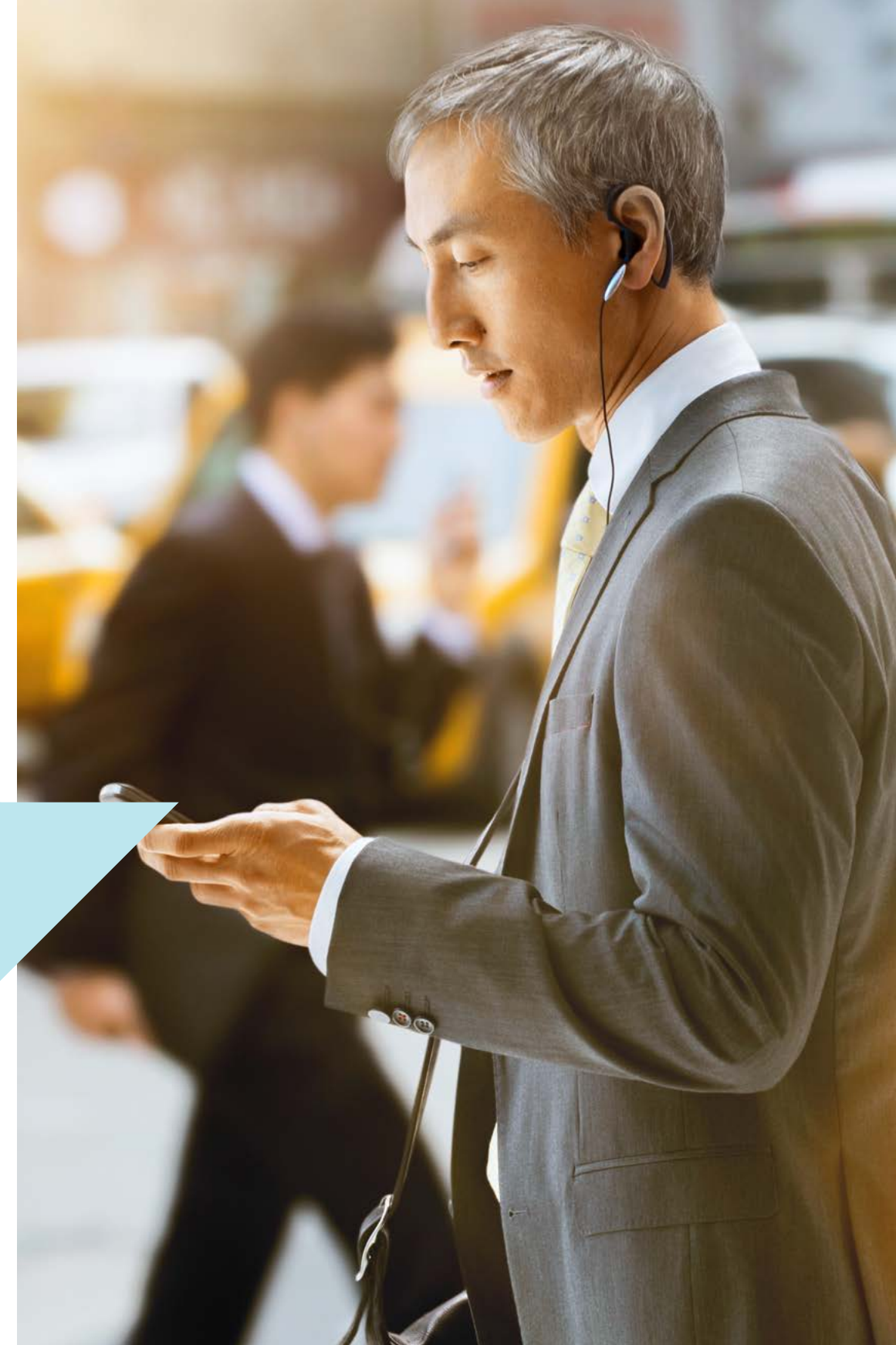
Respond to a changing market more easily

With a traditional monolithic application architecture, even making small functionality tweaks necessitates retesting and deploying the whole application. This is typically a lengthy process and it makes it hard for organizations to respond quickly to market changes.

Because a microservices architecture consists of loosely coupled independent elements, it's much easier to add new functionality. You can simply modify or add individual microservices to add functionality without having to redeploy the whole application. This process is much faster and lets you be much more responsive to market demand.

"To innovate quickly, it helps if things are small. And that's where the microservices approach is useful."

Lucas Jellema, CTO at AMIS, Oracle ACE Director and Oracle Developer Champion



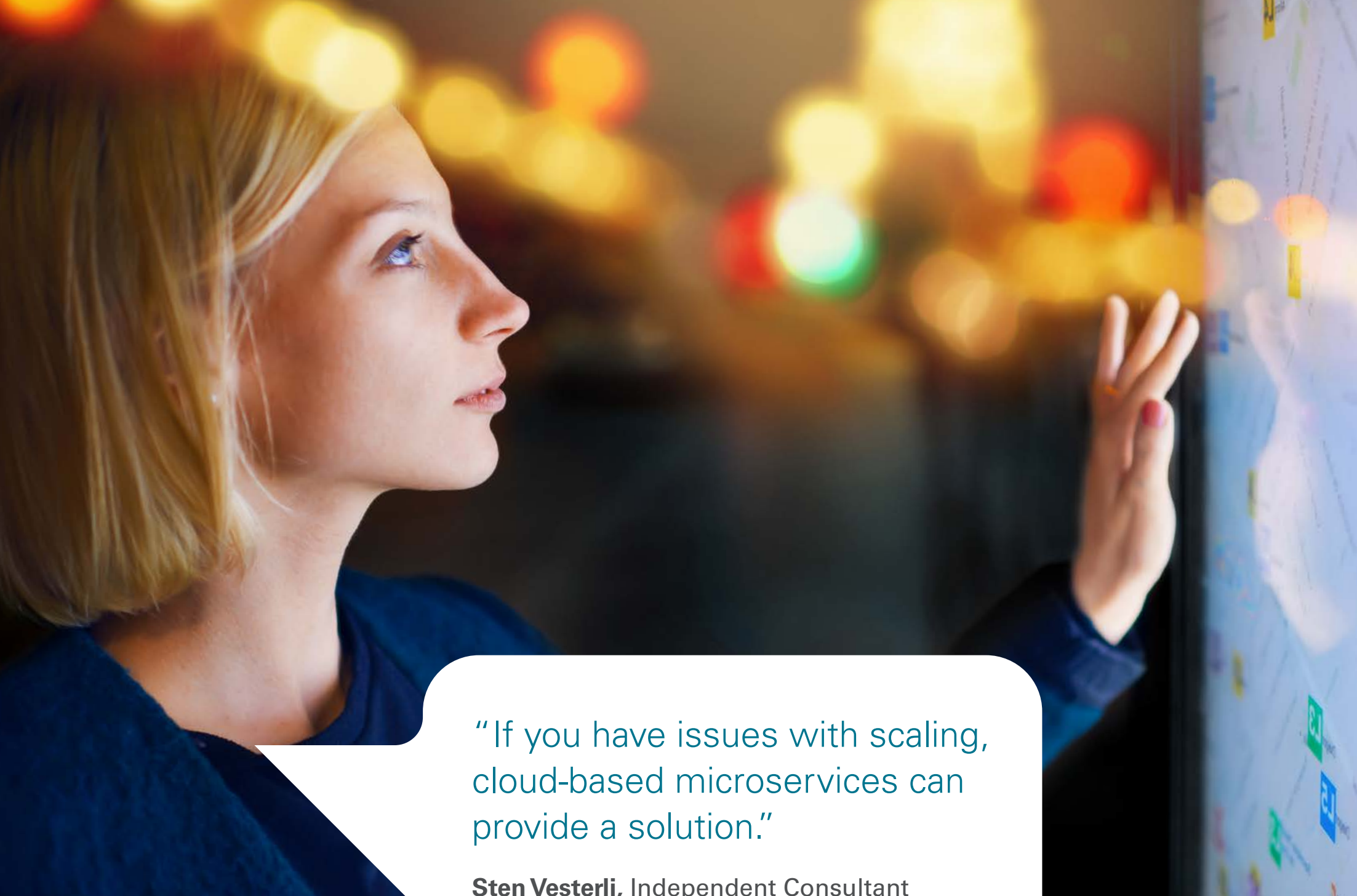
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“If you have issues with scaling, cloud-based microservices can provide a solution.”

Sten Vesterli, Independent Consultant and former Oracle ACE Director

Scale services cost-effectively

Does your organization experience significant fluctuations in demand for its services?

If so, use of the cloud can make it easier to meet those peaks cost-effectively and deliver a better experience to your customers. It lets you easily scale the compute resources available to your application according to real-time demand. As Richard Olrichs notes, “If there’s too much load on the system, you simply spin up another container.”

And with a microservices architecture you can do this even more flexibly and cost-effectively as you only need to deploy additional capacity to the individual microservice experiencing the peak in demand—rather than to the entire application.

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How can adopting cloud-native application development help your firm innovate and generate additional business value?

Focus on innovating rather than infrastructure

Is building and managing your own IT infrastructure consuming resources that could be better invested in developing software that delivers value to your customers?

When you shift application development to the cloud you can do so on top of robust infrastructure and computing platforms obtained on a service basis—infrastructure as a service (IaaS) and platform as a service (PaaS). Rather than worrying about how to solve technology problems at an infrastructure or platform level, your developers can focus on solving business problems at an application level.

“Cloud platforms let you go directly to solving business problems rather than having to solve the technology aspects first.”

Thanassis Stathopoulos, Director,
Technology, Nodalpoint Systems



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“Help your developers focus their time and energy on those areas that really enable your firm to differentiate itself.”

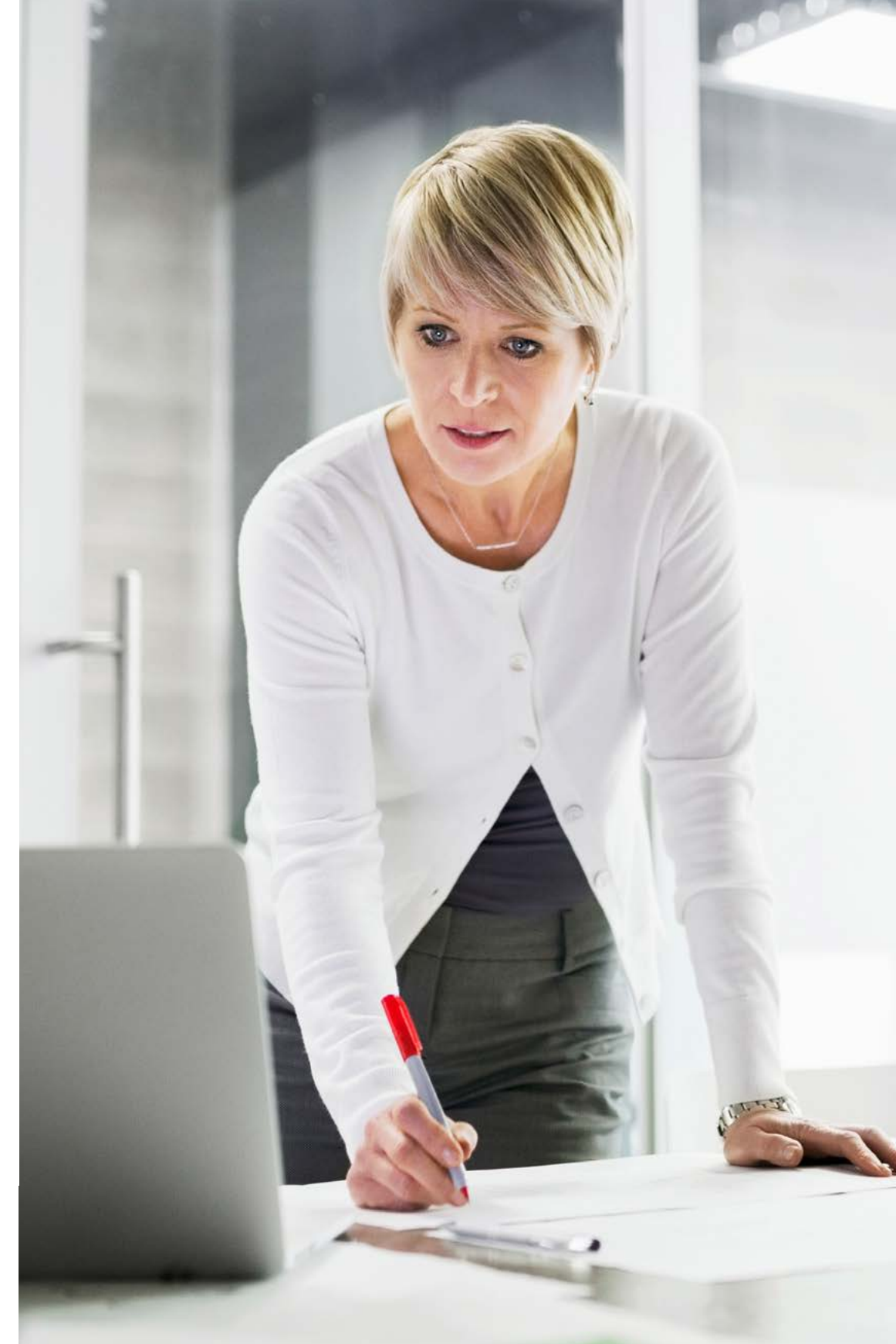
Lucas Jellema, CTO at AMIS, Oracle ACE Director and Oracle Developer Champion

As an added bonus, using the cloud lets you access capabilities that might otherwise be out of reach. Lucas Jellema notes, “Cloud-native application development gives you access to sophisticated and vast compute resources at the infrastructure level and functionally rich platforms for application development. These kinds of resources and functionality would otherwise only be available for firms able to invest a lot of money upfront and willing to be patient while waiting to see results.”

Get more out of your developers’ time

How much of your software development does it make sense for you to do yourself? Given you have a limited amount of development resource available, how can you make best use of it?

One answer to those questions is to try extending the SaaS applications that give you 80 percent of what you need off the shelf, rather than developing applications from scratch. Invest your development time in creating the additional 20 percent. And do so in ways that enable your organization to differentiate itself through software. With this approach, you’ll typically get a much greater return on your developers’ time.



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“Experiment and test to see whether things like machine learning, blockchain or mobile extension work for your organization—without making large upfront investments.”

Lucas Jellema, CTO at AMIS, Oracle ACE Director and Oracle Developer Champion

Experiment faster, at lower cost

Cloud platforms let your firm trial ideas quickly and at lower cost to discover what kinds of new functionality could generate business value.

How?

They make it easier and cheaper for your organization to experiment with new services without suffering delays waiting for expensive new infrastructure to be provisioned. This means you can try out new technologies such as AI/machine learning, blockchain, or chatbots faster and at a much lower risk.

Low-code development environments are another approach that can help you innovate faster. These enable non-technical business users to experiment with finding solutions to business problems—without having to code or to wait until experienced software developers are available to help. They let the people who are closer to customers try out new ideas, and refine their thinking. Once you’ve determined that an idea has value to the business, then developer time can be booked in.

In short, cloud platforms help you innovate and create value, faster.

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How does adopting a cloud-native approach to application development boost your bottom line?

Reduce costs

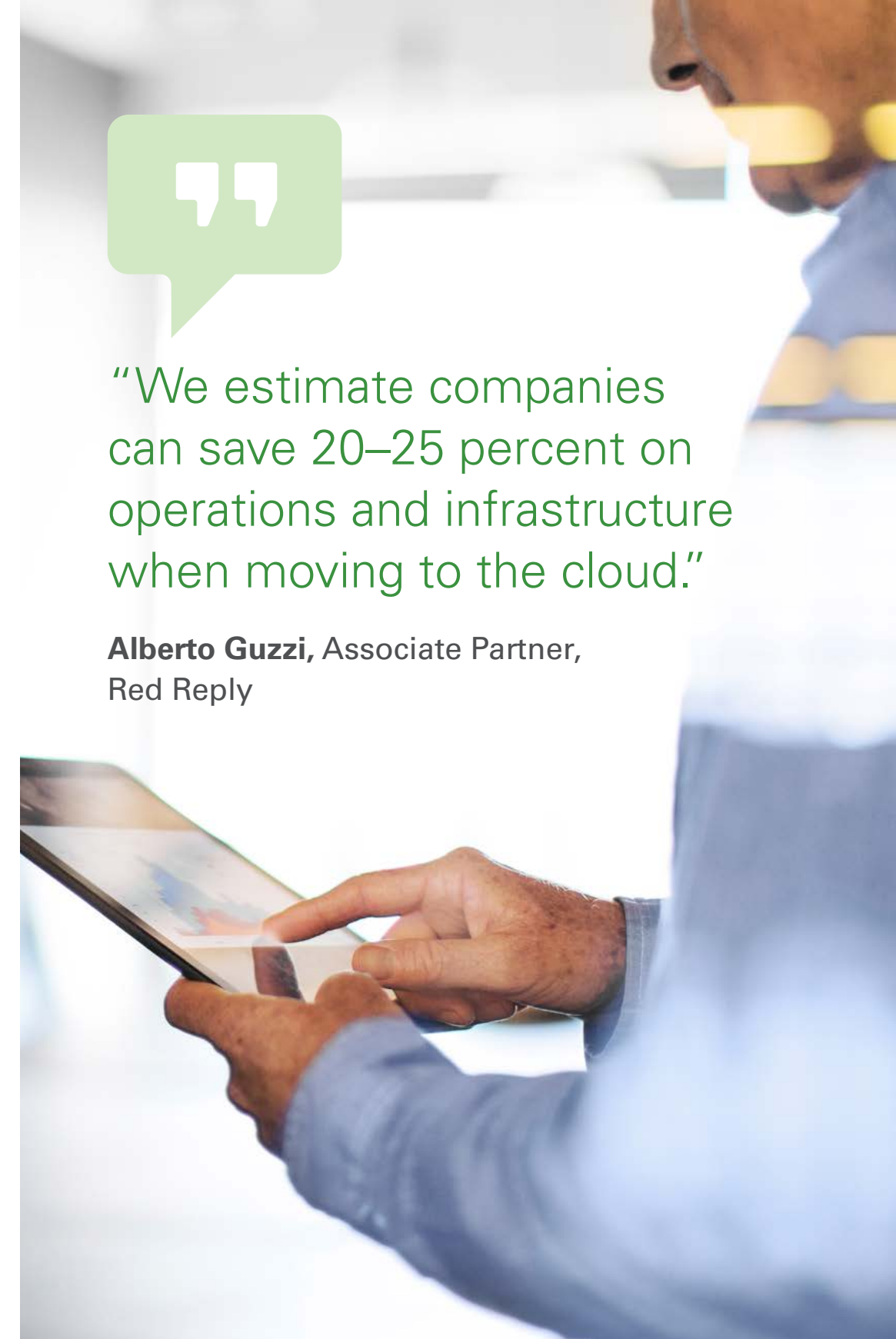
When developing in a traditional on-premises architecture, your costs include both one-off capex on physical hardware and licenses, as well as ongoing operations and maintenance costs. Simply provisioning hardware and software can absorb a lot of time, effort and budget long before projects can start to deliver business value. In addition, ongoing maintenance costs can prove a larger-than-expected drain on resources.

But when developing in a cloud-based architecture, you simply pay for what you need, scaling infrastructure based on demand—while benefiting from the greater economies of scale enjoyed by cloud providers. Ultimately, as Lucas Jellema notes, with serverless computing in particular, “You bring down the cost of compute resources to exactly what you use.”



“We estimate companies can save 20–25 percent on operations and infrastructure when moving to the cloud.”

Alberto Guzzi, Associate Partner,
Red Reply



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“The biggest financial benefits come from getting things to market faster.”

Sten Vesterli, Independent Consultant and former Oracle ACE Director

Boost developer productivity

According a study by Forrester, developers of on-premises software can waste as much of 15 percent of their time simply waiting for their operations teams to provision infrastructure for them. And because of this, some developers resort to provisioning their own infrastructure, which also then serves as a drag on their time.¹

When you switch to the cloud, you eliminate this inefficiency. You stop developer time from being wasted due to waiting for operations to provision infrastructure. You simplify and automate their environment needs. And you boost developer productivity as a result.

Increase revenues

Once your developers can focus on developing, they can release new functionality faster. Forrester estimates cloud infrastructure can shorten the software-development life cycle by as much as 30 percent. And by getting things to market faster, you can generate revenue sooner.

How much financial upside could you see from launching products faster? That will vary by industry, of course. Sten Vesterli notes, for example, that as a rule of thumb in the pharmaceutical industry, every day saved getting a drug to market after applying for a patent brings in US\$1 million in extra profit. If pharmaceutical companies can speed up data analysis from clinical trials using cloud infrastructure, the upsides can be huge.

¹ Forrester, *The Total Economic Impact™ of Oracle Java Cloud Service* (July 2017)

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Cloud-native application development solves many of the problems of traditional monolithic software development. But it comes with its own challenges. What are these and how can you overcome them?

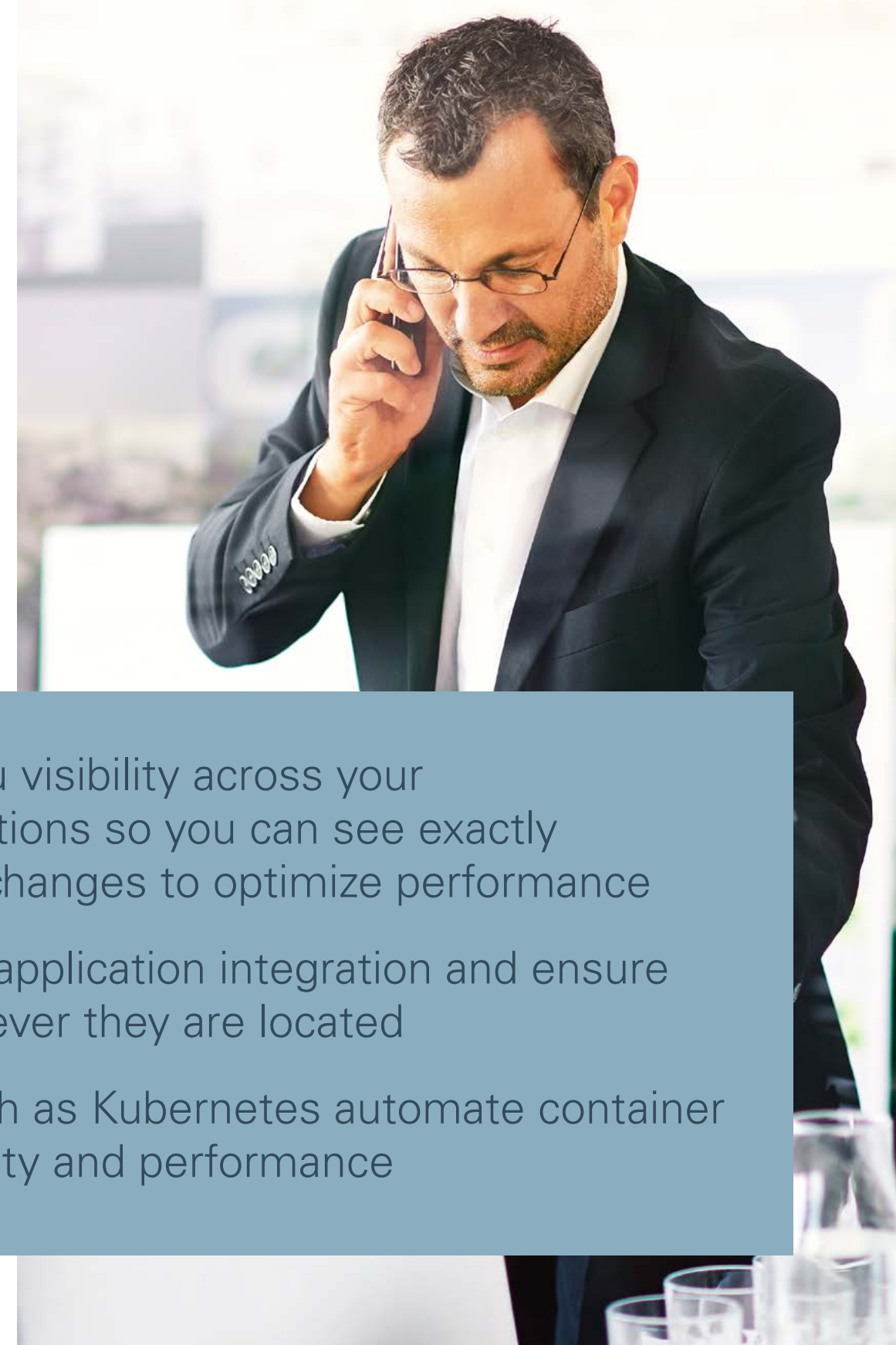
Improved visibility; improved performance

Lucas Jellema notes that “The IT landscapes we have now are complex, but in the transition to the cloud, they become even more so because of their hybrid nature. Having a complete view as to what’s going on is critical.”

How can you get visibility across both your cloud and on-premises infrastructure so you can manage it effectively?

Fortunately, there are now a range of options available to help you better manage cloud infrastructure:

- **Cloud management tools** give you visibility across your infrastructure, platform, and applications so you can see exactly where issues lie and quickly make changes to optimize performance
- **API management tools** automate application integration and ensure applications can be accessed wherever they are located
- **Container management tools** such as Kubernetes automate container deployment to ensure high availability and performance





“In the cloud, you need an overview or you can easily lose sight of what’s happening—especially in a microservices architecture.”

Sten Vesterli, Independent Consultant and former Oracle ACE Director

Smarter, more effective security

Your approach to IT security will, of course, evolve when using the cloud.

It must evolve to meet the tough challenges presented by a constantly changing threat landscape. And new techniques, in particular when deployed through the cloud, prove useful here as they offer you smarter ways to tackle the increasingly sophisticated approaches being adopted by hackers.

For example, data breaches often now arise from cyber attacks exploiting unpatched vulnerabilities and misconfigurations of software or hardware. Machine-learning-based review systems can help with detecting these kinds of threats. They learn behavior patterns and evaluate risk—across multiple threat vectors. And they can help to effectively

deliver continuous compliance, automated remediation, and adaptive response to security incidents.

But your approach to IT security must also evolve to meet the new challenges arising both from the faster pace of DevOps and from changes in the speed and ease with which business users are adopting new technologies—changes which are driving shadow IT’s insidious spread. How could it evolve? By, for example, shifting towards trend analysis and away from a snapshot view of IT, and by taking advantage of unified platforms for development, IT operations, and security operations.

Unified security and management platforms can also help to meet the increasingly stringent regulatory and compliance requirements—such as under the EU’s General Data Protection Regulation (GDPR)—which organizations must now face.

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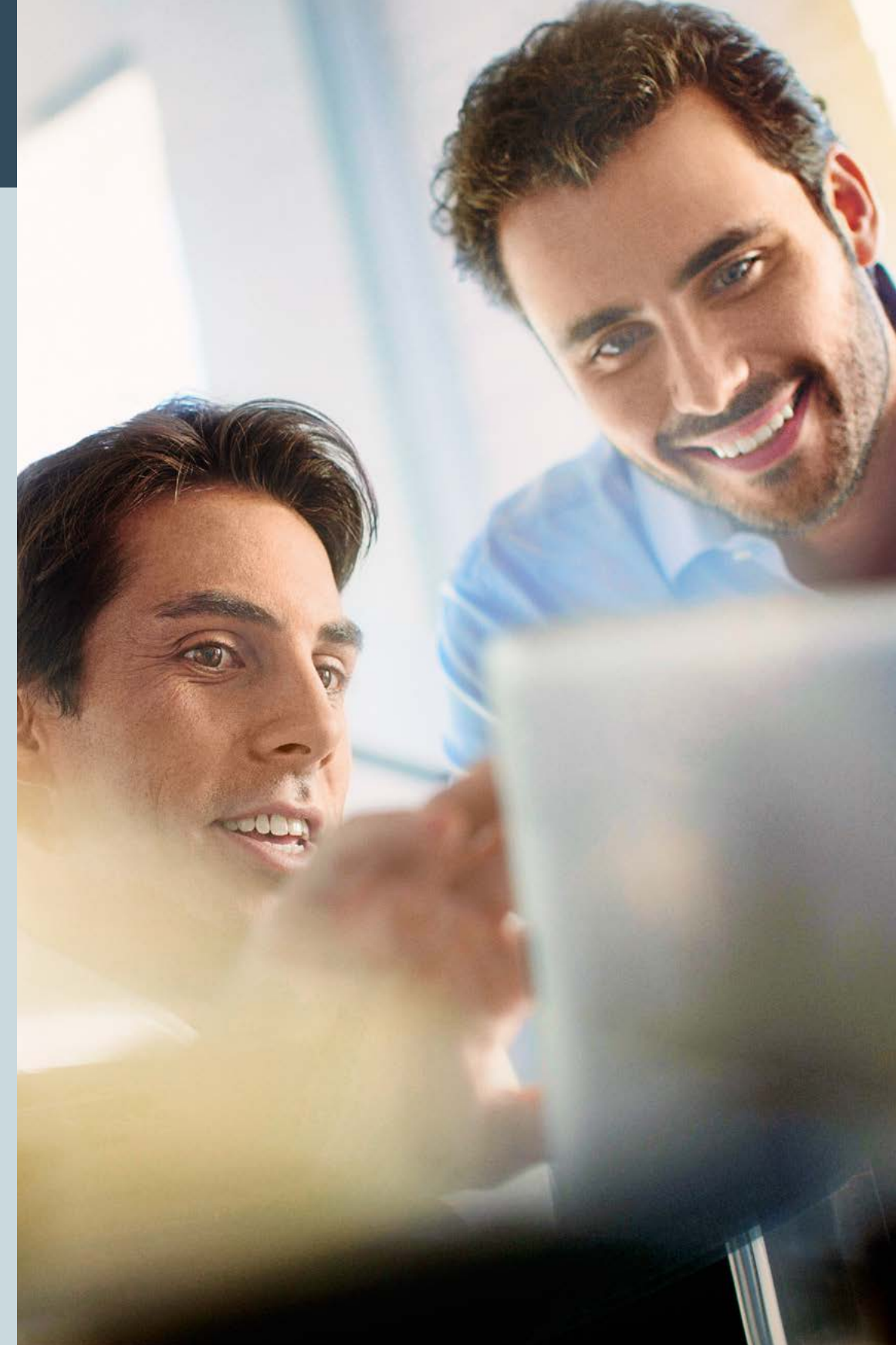
Show security's business value

Don't compliance departments and senior management still sometimes raise objections to cloud deployments, citing concerns around regulations and data security? Yes, they do. As these concerns are often misplaced, how can you overcome them?

A strategy advocated by Richard Olrichs is to first demonstrate the business value of the cloud proposition in a testing and development environment—without using real production data. Sten Vesterli agrees: "Test your cloud project in a closed environment without real data being exposed to customers. Prove the technology works. Show the cost savings. Then have the conversation with the compliance team about doing this in a compliant manner."

Often the issue with regulation of critical data turns out to be less about the use of cloud infrastructure and more about the geographic location of the underlying data centers. It's an easier conversation to have once you've shown the business value of using the cloud.

Concerns around security can also be allayed more easily once you have demonstrated how cloud can in fact strengthen your organization's security. For example, when combined with tools such as cloud access security brokers (CASBs)—that help automate maintenance of cloud-based security over time—public clouds can often prove more secure than on-premises data centers.



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Thomas Kurian, Oracle President
of Product Development

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