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Digitization Drives the Need for

APPLICATION STRENGTHENING

WHITE PAPER

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INTRODUCTION: DIGITAL TRANSFORMATION IS RESHAPING IT

The IT industry has gone through several waves of evolution since the mainframe was intro-duced back in the 1960s. The industry has moved from mainframes to mini-computing to the client/server era and, most recently, to the Internet age. Today, the industry sits on the precipice of another major transition—digital transformation is reshaping the business landscape faster than ever before.

Before the digital era, it took decades to disrupt an industry. For example, Walmart revolution-ized the retail industry, but its impact took about 30 years to be realized. Today, companies that are considered digital natives—such as Uber, Square, Tesla and Amazon—have disrupted their in-dustries in fewer than five years. Consider Uber's effect on what was once a highly capital-intensive industry, as taxi companies would need to buy cars, obtain medallions or permits, train drivers and invest in the infrastructure to support the business. Today, Uber has made it possible for anyone to become a driver. More importantly, Uber has continued to evolve the business, as people can now book helicopters in Dubai, motorcycles in Singapore and cars with bike racks in Portland, Oregon, by using the company's services.

The impact of digital transformation can best be understood by looking at the Standard & Poor's (S&P's) 500 Index, which measures the health of the U.S. economy. Exhibit 1 shows that in 1960, businesses stayed on the S&P 500 Index for about 60 years. This number was cut by about 50% in 1980, and it will be cut in half again by 2025. Based on this data and inter-views with economists, ZK Research predicts that 75% of the S&P 500 Index will turn over in

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Zeus Kerravala is the founder and principal analyst with ZK Research. Kerravala provides tactical advice and strategic guidance to help his clients in both the current business climate and the long term. He delivers research and insight to the following constituents: end-user IT and network managers; vendors of IT hardware, software and services; and members of the financial community looking to invest in the companies that he covers.
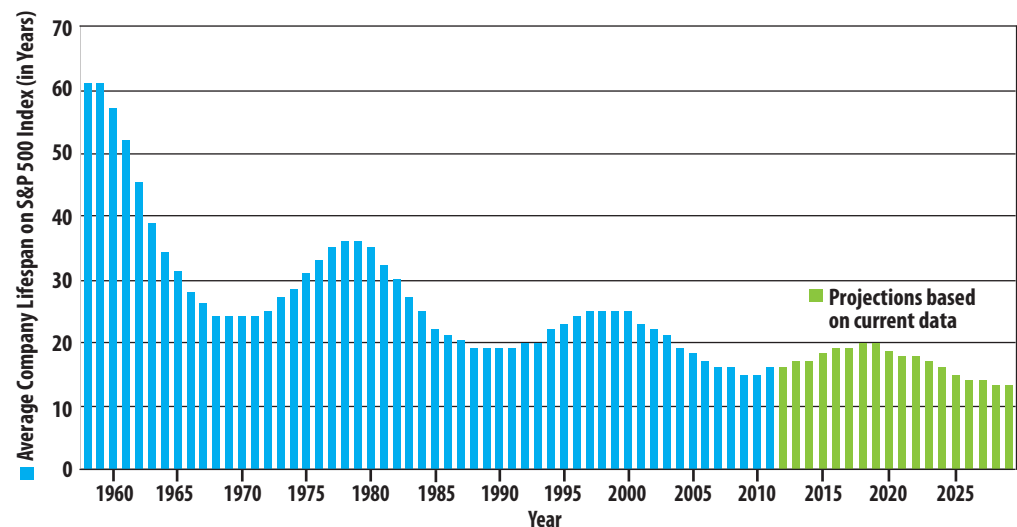
Exhibit 1: Digitization Accelerates Business Churn

Note: Each data point represents a rolling 7-year average of the average lifespan.

Innosight, Richard N. Foster, Standard & Poor's

Digitization is possible today because several technologies have matured and have come together at the same time, enabling this transition.

the next 10 years. This means a business recognized as a market leader today will no longer be in that position 10 years from now.

Digitization enables this change, and it must be at the top of every business and IT leader's priority list. Organizations that embrace digitization will leapfrog the competition and become market leaders; those that do not will struggle to survive, and many of them will go out of business.

Digital transformation will have a profound impact on the IT department, as new technologies will be introduced to facilitate the transition to this new era of business. Digitization is possible today because several technologies have matured and have come together at the same time, enabling this transition:

Mobile devices: Client evolution has exploded in the past half-decade. What was once deemed impossible to do on a wireless device is now the norm. Web browsing, voice over IP, video conferencing and streaming media are common activities on mobile devices today because of the evolution of smartphones, tablets and web-optimized laptops. The growth of mobile devices will give rise to new, uniquely mobile applications that leverage contextual information to streamline business processes.

Cloud computing: IT managers have been experimenting with cloud computing for several years. The cloud is the norm today, and many businesses are building cloud-first strategies. In fact, ZK Research predicts that public cloud services will grow from $57.5 billion globally in 2015 to more than $134 billion in 2020 (Exhibit 2). Also, in the ZK Research 2015 Network Spending Survey, 82% of respondents reported they are planning to adopt a hybrid cloud strategy.

Internet of Things (IoT): The IoT connects physical devices, vehicles, sensors and other operational technology, enabling business process change, data collection and analytics. Harnessing the potential of a world where everything is connected will be a key differentiator for digital organizations.

Software-defined IT: Legacy IT infrastructure was managed on a box-by-box basis. If a change needed to be made to an application, each server, storage device, router and switch would need to be reconfigured manually. Software-defined IT extracts the control functions from the underlying infrastructure and enables IT to define business policies that can automate the provisioning and configuration of the underlying technology. This will streamline business processes and improve IT operations.

All of these new technologies enable businesses to become agile, dynamic organizations capable of adapting quickly to new opportunities in the digital era; however, new challenges will arise.

Exhibit 2: Cloud Services Explode in the Next Five Years
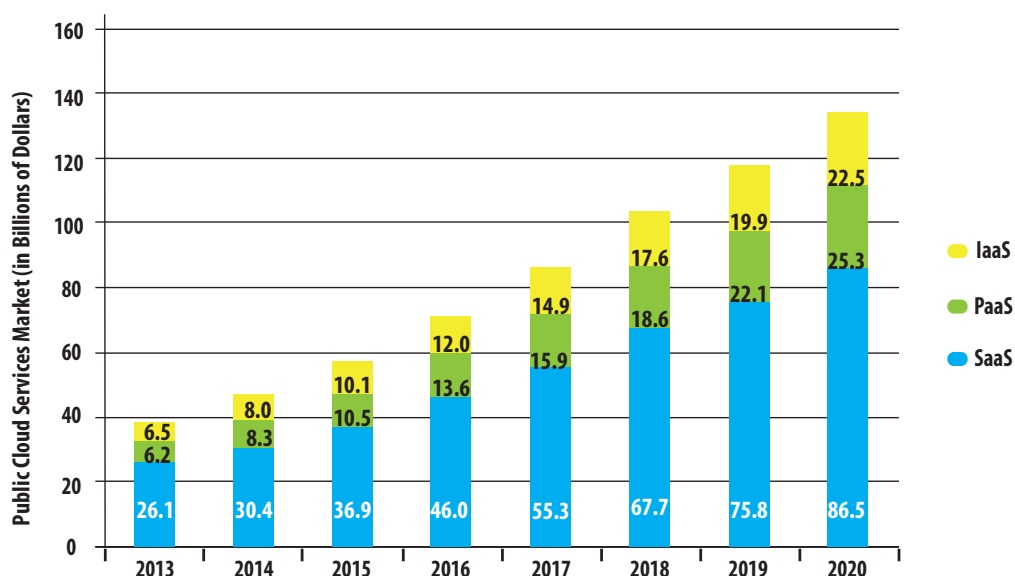
ZK Research 2016 Global Cloud Survey

It's critical that organizations understand what these issues are and know how to combat them to be a successful digital company.

SECTION II: NEW IT CHALLENGES CREATED BY DIGITIZATION

Legacy IT was optimized for performance but was highly inefficient. Each application had its own dedicated infrastructure, including network infrastructure, servers, storage and security tools. Although this arrangement offered great performance, infrastructure utilization was poor at best. Servers typically had an average utilization rate of about 25% and storage about 30%. Also, resources could not be shared from one application to another, so each application stack had to be managed independently. This process was slow and time consuming—evidenced by the fact that 83% of a company's IT budget is currently used to maintain the status quo, according to studies conducted by ZK Research. In a digital world, this must change.

Technologies such as mobility, the cloud and IoT enable IT to be much more efficient, dynamic and agile, but they also introduce many new challenges as a result of the following factors:

The number of connected endpoints is exploding. IT currently manages about two connected devices for every employee. The influx of consumer devices in the workplace combined with IoT will dramatically increase the number of endpoints connected to the company network. ZK Research estimates that the number of connected devices will grow from the current 2-to-1 device–employee ratio to approximately 7-to-1 in the next five years.

It's time for organizations to build an application-strengthening strategy to meet the needs of digitization.

The border will continue to erode. IT security has been built on the premise that there are only a few points in a network where traffic enters or exits. In the past, most organizations had only one. But today, every WiFi access point, cloud application and consumer device effectively creates a new entry point, meaning the traditional "border" is nonexistent. Consequently, the number of attack surfaces has already increased by a factor of 10, and ZK Research predicts that this number will grow by another factor of 10 by 2020. This increase creates an asymmetric problem for security teams, as they need to protect hundreds or even thousands of entry points, while hackers merely need to find one to get in.

Hackers are becoming smarter. All perimeter firewalls offer great protection and are very difficult to penetrate. However, cyber criminals understand this and are now focusing on circumventing firewalls through phishing attacks and spam as well as compromising mobile devices to generate attacks that bypass the firewall. Also, every time a new security technology is developed, cyber criminals find a way to evade it. For example, a few years ago, sandboxing was a great way to find threats by inspecting files in real time before users accessed them. Now, these same threats pass through the sandboxing technology and lay dormant in a company's network. Solving this problem doesn't mean adding more security vendors. In fact, the ZK Research 2015 Security Survey found that enterprises have, on average, 32 security vendors. Having more vendors doesn't equate to being more secure. It's time for organizations to completely rethink their security strategy to fight this new paradigm in security.

The number of IT "blind spots" is increasing. Legacy IT was built on the concept of end-to-end control. Corporate IT would determine what applications the company would use, where the data was stored and even what devices workers should use. Today, workers are bringing in their own devices, more data is being stored in the cloud and lines of business are purchasing their own applications. In fact, ZK Research studies have found that 90% of businesses have purchased cloud services without the knowledge of the IT department. IT simply doesn't have the necessary visibility to effectively manage the technology infrastructure.

Addressing these challenges requires a fundamental change in the way technology is managed and secured. Historically, a "bottom up" approach was used in which each device was managed independently and then security was placed at different points in the network. IT must shift to more of an application-centric, or "top down," approach to managing the technology, as this will create a tighter link between IT and the lines of business. It's time for organizations to build an application-strengthening strategy to meet the needs of digitization.

SECTION III: INTRODUCING APPLICATION STRENGTHENING

Today's applications are highly network centric. Any infrastructure or security problem leads directly to sub-optimal application performance, which has a direct correlation with user productivity.

Exhibit 3: Poor Application Performance Has a Direct Impact on Productivity

How much is productivity impacted by poor application performance and availability?
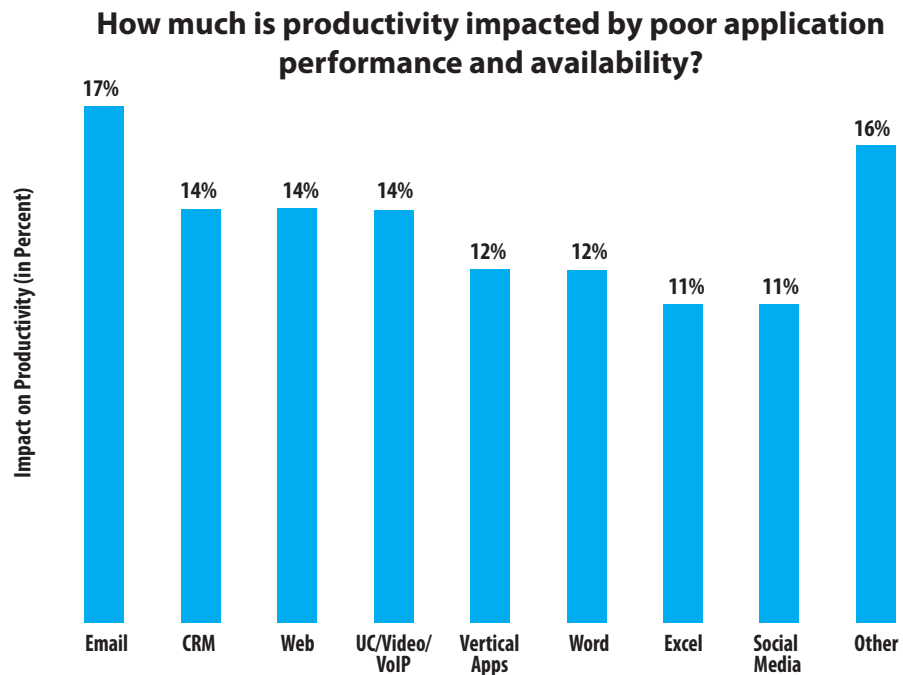
Note: Average of all is 14%.

ZK Research 2015 Network Management Survey

Exhibit 3 shows that, on average, workers are 14% less productive because of poor application performance. Although businesses spend billions of dollars a year deploying technology to improve worker productivity, optimizing the performance of existing applications can lead to a double-digit improvement.
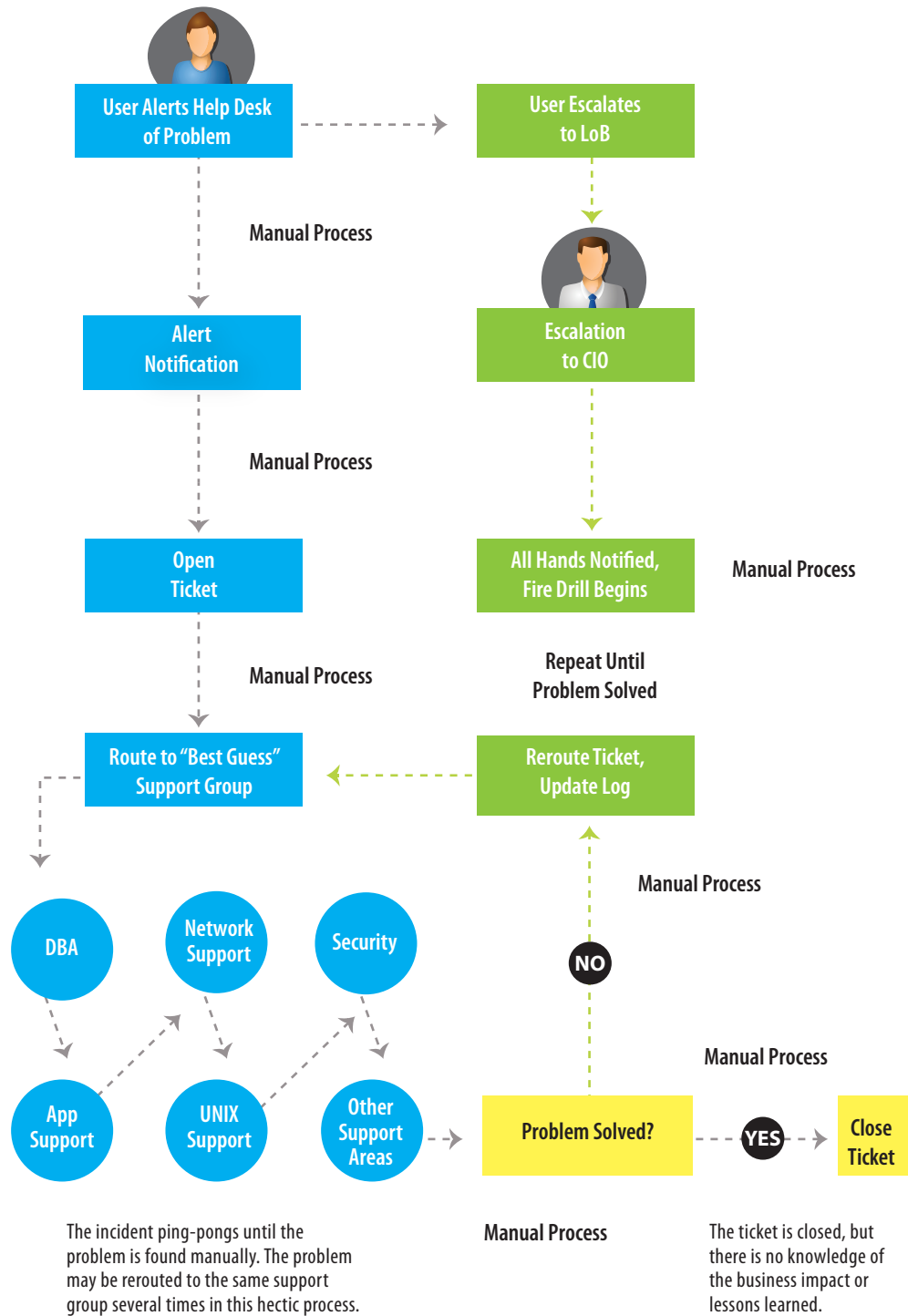
Creating a high-quality digital experience requires building great applications, as the application is the center of a user's experience. Today, though, there are more entry points to secure, more endpoints to manage and more data to handle, meaning that it's becoming a challenge to create an optimized digital experience.

One approach to addressing this challenge is through a concept called "application strengthening" in which the underlying infrastructure that enables the business makes applications more reliable and secure and helps them perform better.

There are three core pillars to building an application-strengthening strategy:

Testing: The axiom of "measure twice, cut once" has never been more true. ZK Research studies have shown that every hour of pre-deployment testing saves organizations seven hours of troubleshooting time post deployment. As the cloud, security threats, IoT deployments and data continue to grow at exponential rates, it becomes critical to test and ensure the infrastruc-

Exhibit 4: Resolution "Ping Pong" Happens Because of a Lack of Visibility

Implementing a comprehensive application-strengthening strategy can save organizations hundreds of thousands of dollars in operational costs every year.

User Alerts Help Desk of Problem

User Escalates to LoB

Manual Process

Alert Notification

Escalation to CIO

Manual Process

Open Ticket

All Hands Notified, Fire Drill Begins

Manual Process

Manual Process

Repeat Until Problem Solved

Route to "Best Guess" Support Group

Reroute Ticket, Update Log

Manual Process

DBA

Network Support

Security

NO

Manual Process

App Support

UNIX Support

Other Support Areas

Problem Solved?

YES

Close Ticket

Manual Process

The incident ping-pongs until the problem is found manually. The problem may be rerouted to the same support group several times in this hectic process.

Manual Process

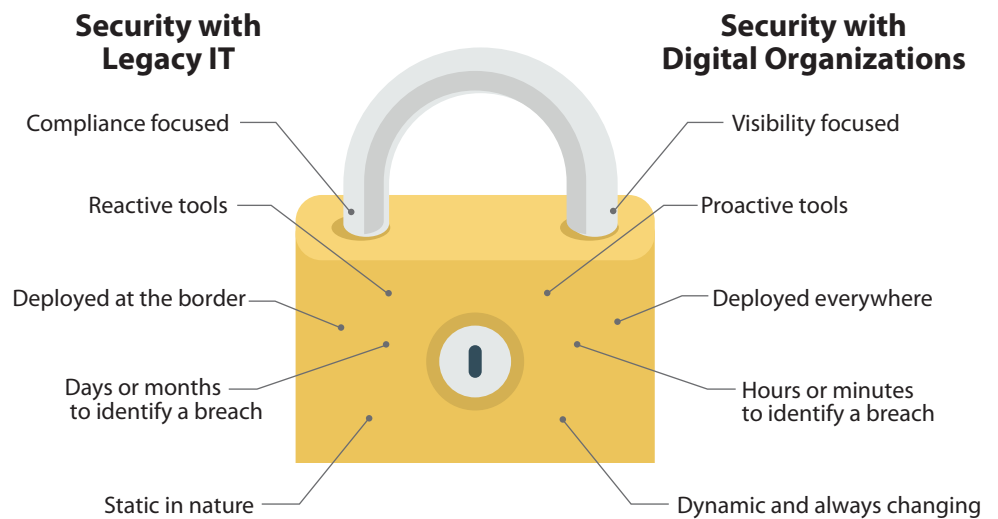The ticket is closed, but there is no knowledge of the business impact or lessons learned.

ZK Research, 2016

ture that is deployed can support business applications now but also into the future. Testing should be an ongoing process that enables IT to shift to a proactive capacity-planning model.

Visibility: Real-time visibility is the key to developing an application-centric IT management model. The ability to see all the traffic generated by applications helps IT understand which applications are using which IT components as well as the dependencies between them. This can significantly reduce troubleshooting times and eliminate the "resolution ping pong" (Exhibit 4) that occurs when users report problems. The ZK Research 2015 Network Purchase Intention Study revealed that 90% of the time taken to solve a problem is directly related to locating the problem. Good visibility can significantly cut the problem identification time. Visibility will reveal any weak spots in the network as well, such as places where delays are occurring or packets are being dropped. This can improve application performance even when the users and IT department aren't aware there is an issue.

Exhibit 5: Security in a Digital World

Security with Legacy IT
- Compliance focused
- Reactive tools
- Deployed at the border
- Days or months to identify a breach
- Static in nature

Security with Digital Organizations
- Visibility focused
- Proactive tools
- Deployed everywhere
- Hours or minutes to identify a breach
- Dynamic and always changing

ZK Research, 2016

Security: As mentioned previously, the IT security model must change to adapt to the digital world (Exhibit 5). Security today is highly compliance focused and reactive in nature, but simply checking boxes doesn't mean organizations are secure. Security must be focused on finding threats quickly by identifying anomalous behavior. For example, if a user attaches a compromised mobile device to a WiFi access point and it launches malware that attacks the accounting servers, this will create new traffic patterns. Any unusual traffic should trigger the security tools to investigate further, minimizing the "blast radius" of the threat. Today's secu-

rity requires dedicated security solutions but also inline security frameworks that provide the necessary visibility to locate those problems. It's foolish to assume that an organization will never be breached. The key is that when a breach occurs, the organization must use visibility to quickly identify the source of the breach and then quarantine traffic to minimize the impact.

Application strengthening builds a better, more solid foundation for the digital enterprise with tangible benefits. According to the Six Sigma Institute, the cost of fixing a defect in the product phase is 100x more expensive than doing so in production (Exhibit 6). Implementing a comprehensive application-strengthening strategy can save organizations hundreds of thousands of dollars in operational costs every year.

The security implications of application testing can't be understated. A 2015 study by IBM found that the consolidated total cost of a data breach is now $3.8 million, representing a 23% increase since 2013. The study also revealed that the cost incurred for each lost or stolen record containing confidential information increased 6%, from $145 to $154. However, when it comes to security breaches, cost is only part of the damage. Many organizations lose customers and suffer brand damage as well, and many businesses never recover.

Exhibit 6: Fixing Defects in the Design Phase Leads to Significant Savings
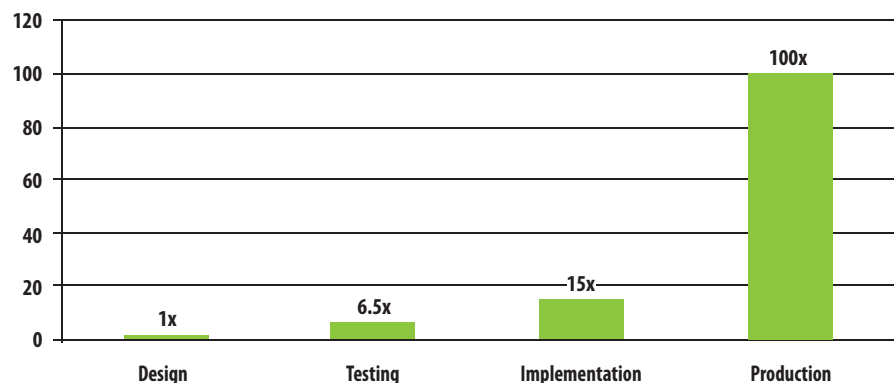
ZK Research, 2016

SECTION IV: WHAT TO LOOK FOR IN A SOLUTION PROVIDER

Deploying an application-strengthening solution is a critical step in the evolution toward becoming a digital enterprise. IT leaders should ensure that developing an application-strengthening plan is at the top of their priority list. Several products available today claim to offer many application-strengthening components, but the solutions can vary widely from vendor to vendor.
IT executives and other decision makers involved in building a digital enterprise can use the guidelines below when evaluating an application-strengthening solution provider:
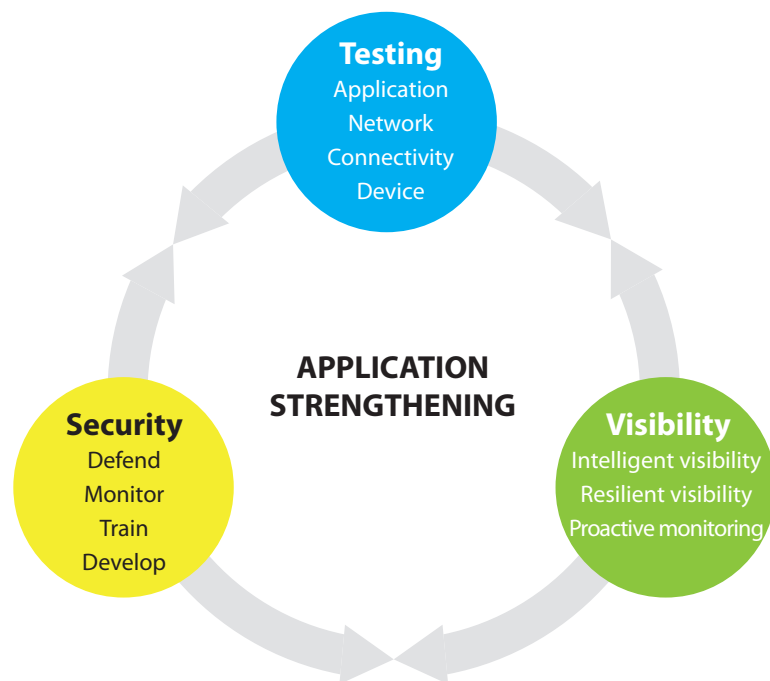
End-to-end solution: The applications in a digital enterprise are only as strong as their weakest link. The testing solutions need to span across the infrastructure that powers applications, including mobile devices, wired and IoT endpoints, network infrastructure, data centers and even out to the cloud.

Operates across all platforms: When it comes to deploying infrastructure, many options are available to organizations. The application-strengthening solution must work with every possible option, including providing support for software-defined networks (SDNs), WiFi, network speeds all the way up to 100 GigE, encrypted and non-encrypted traffic and virtual infrastructure.

History of innovation: The technology industry is moving faster than ever before, and it's critical to choose an application-strengthening provider with a history of innovation to provide the widest range of validation methods against the broadest range of real-world scenarios. It's important to use a vendor that supports the latest standards and specifications—otherwise, the business may need to wait to deploy leading-edge technology and fall behind its peers.

Available in different form factors: There is no single approach to application strengthening. Different points in the network and different types of infrastructure require a variety of

Exhibit 7: Application Strengthening Requires a Set of Interconnected Architectures

Testing
Application
Network
Connectivity
Device

APPLICATION STRENGTHENING

Security
Defend
Monitor
Train
Develop

Visibility
Intelligent visibility
Resilient visibility
Proactive monitoring

ZK Research, 2016

solutions. Application-strengthening vendors should offer chassis-based solutions, fixed form-factor applications, flexible line cards, network taps, virtual products, in-line appliances and out-of-band solutions.

Market leadership: There may be no better way to evaluate the quality of a solution provider than to look at its usage by the most demanding customers in the world. Given the network-centric nature of applications today, it's important to understand how widely the vendor is used across different types of customers whose businesses are highly dependent on the network. This includes Fortune 500 companies, service providers and network equipment manufacturers. If the application-strengthening solution works in these environments, it will work in any environment.

Provides all aspects of application strengthening: Making applications stronger requires all three of the following components: visibility, testing and security (Exhibit 7). Although a wide range of vendors address these categories, organizations can gain many benefits by using a single solution provider, such as better purchasing power, consistent data, interoperability between products and faster support.

Based on the above criteria, ZK Research believes that Ixia is best positioned to deliver an end-to-end application-strengthening solution.

SECTION V: CONCLUSION AND RECOMMENDATIONS

The digital era has arrived, and it will change the business landscape forever. In this IT-driven era, competitive advantage is based on an organization's ability to be agile and adapt to changes as well as to make rapid shifts to capture market transitions. Trends such as virtualization, mobility, the cloud and the Internet of Things enable businesses to rapidly become digital organizations, but they have significantly increased the complexity level within IT.

In the digital era, applications will be used to harness the power of digitization. Applications that offer a great user experience create more ways for workers to be productive and develop new methods of interacting and engaging with customers. For this to happen, applications must be fast, reliable and secure. Making applications stronger must be a top priority for IT and business leaders. Consequently, ZK Research makes the following recommendations:

Embrace digitization and continuous change. A business's past success has nothing to do with its ability to continue being successful. A digital organization can constantly adapt to new market opportunities. It's time for all businesses to embrace the digital era. Companies that do so will be more profitable, will enjoy higher levels of customer loyalty and will leapfrog their competition.

Automate IT processes. The ZK Research 2015 Network Purchase Intention Study found that 83% of organizations' current IT budget is used just to maintain the status quo—which means only 17% of the budget is used for innovation. The digital era requires constant innovation, so it's imperative to find a way to cut the cost of "keeping the lights on." Automating IT processes can have a significant impact on operational costs and is the best way to increase the amount of resources available to empower a digital business.

Focus on making applications stronger. In the digital era, businesses will build more applications faster than ever before. These applications will be a mix of mobile, cloud and virtual technology, and they may interface with IoT devices. Any weakness in the applications can lead to performance problems, security breaches and lost revenue. It's critical to have a comprehensive application-strengthening strategy composed of testing, security and visibility to ensure applications can meet the needs of the digital era.

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