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Proactive Problem Management – Towards a Zero-Incident Enterprise

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Executive **Summary**

Enterprise IT departments are continually adopting new technologies that are faster, more scalable, and have a shorter time to market, in order to make their companies more agile and competitive. However, these changes tend to make the IT landscape more complex – and that increases the probability of service disruption, whether through malfunctions in software, hardware, or networks, external factors such as natural disasters, or simple human error. To reduce disruptions and keep systems operating efficiently, organizations have invested heavily in various technology and application monitoring tools. Yet IT disruptions continue.

With significant progress made in the field of Artificial Intelligence (AI) and Machine Learning (ML), customers aim to improve the resiliency of their IT operations by analyzing the information available across the different monitoring products to proactively identify the problems that could possibly disrupt the services and impact business SLAs.

Digitate's ignio™ AIOps, an AI-driven product for autonomous operations, proactively identifies problems across complex IT landscapes through intelligent problem lifecycle management.

This paper explores how proactive problem management, driven by machine learning, helps identify the problems, providing observations and recommendations and assisting in resolution of problems to improve the resiliency and efficiency of enterprise IT. It also highlights how switching from a merely reactive to a proactive approach to IT problems can prevent incidents, shorten downtime, and reduce the amount of time spent in firefighting, thereby helping organizations reach a zero-incident state.

Enterprise context for **proactive problem management**

The modern-day enterprise consists of on-premises and cloud-based systems that include servers, storage, and networks. These IT systems host various third-party and customer applications and services and are managed by an IT operations team of support professionals (L1, L2, and L3).

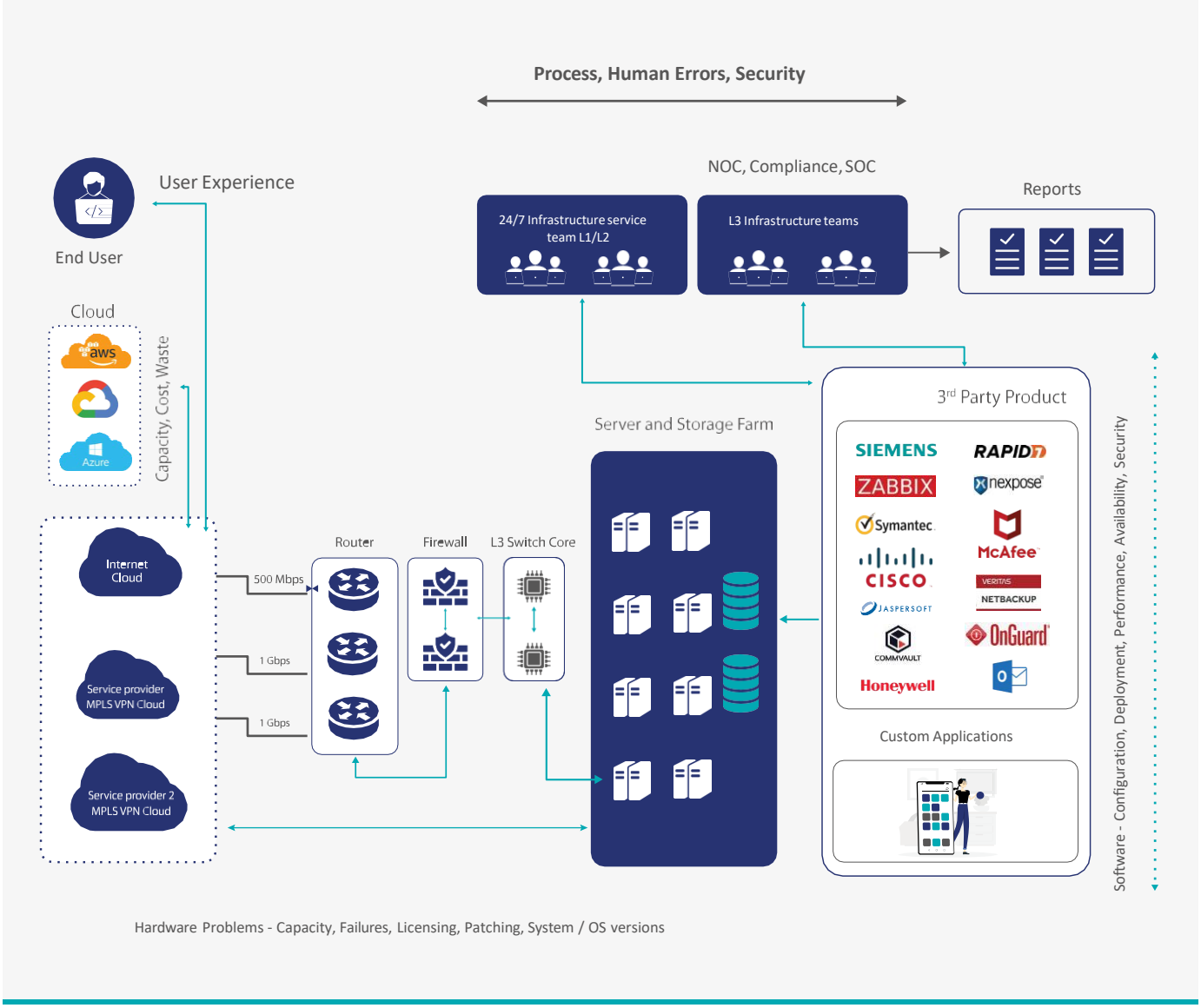


Figure 1

As seen from the above figure, the disruption could occur across any of the systems' hardware components, applications, or third-party products, deployed on-premises or on cloud platforms, due to human errors or inefficient processes. Some examples:

A department is unable to access an enterprise application due to a switch failure.

1

A business-critical application has not been meeting performance SLAs under high workloads for the last couple of days.

2

Servers fail frequently during regular operations.

3

When any unplanned disruption, or "incident," happens, the key objective of the incident management team is to first identify a quick workaround and then permanently fix the problem. Recurring incidents or major incidents further need detailed root cause analysis to keep the issue from happening again.
Technical experts performing root cause analysis can gain valuable context about the disruptions through multi-dimensional information stored by various tools and logs.

Then a question arises: When you have so much rich information about the performance of each technology component, can you use it to predict future disruptions – and, hopefully, even prevent them?

What is **proactive problem management?**

It is possible to move beyond simply reacting to problems, which takes up valuable time and energy while still leaving organizations vulnerable. An approach called proactive problem management can identify problems, analyze them, and provide observations and recommendations that mitigate them before they cause business-critical events.

The figure below showcases some classes of problems, but not all, that could occur in an enterprise.

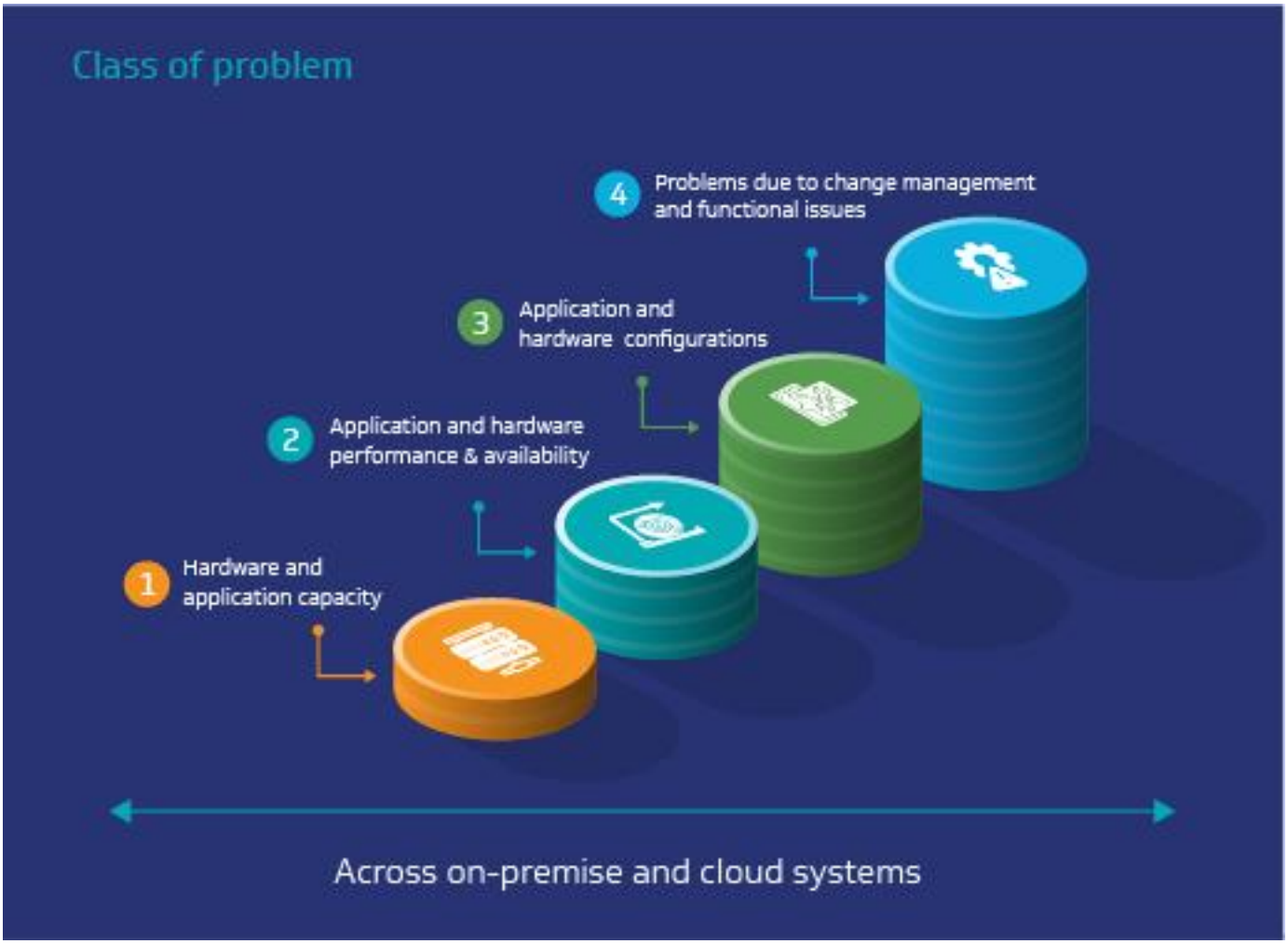


Figure 2

At the base we have problems due to hardware capacity, followed by applications and hardware performance, availability problems, and problems due to change.

Problem management – **Current operations**

The figure below depicts two indicative flows for problem management in current scenarios.

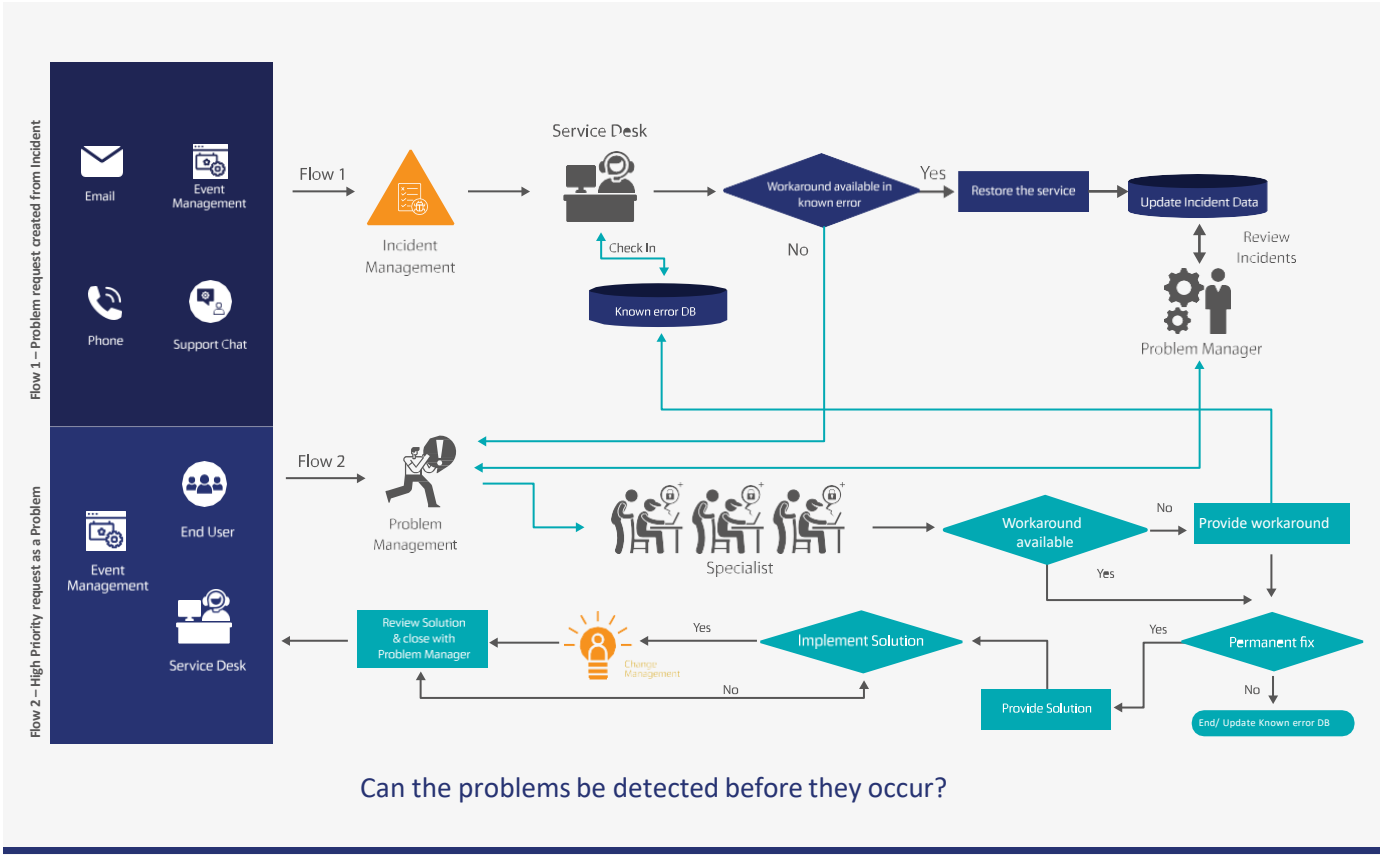


Figure 3

In the figure, *Flow 1* indicates problem requests generated from incidents, where incidents not having a workaround could be assigned to a team of specialists for further analysis. In situations where a temporary workaround is available, an incident/problem manager manually analyzes that incident's data store and identifies recurring or major incidents for the root cause analysis.

In *Flow 2,* Priority 1 or Priority 2 requests are assigned as a problem request and flow to the problem management team.

In either of the flows, the experts on the problem management teams identify the root cause and provide fixes, which are then applied through the change management process, and close the request.

Both the flows described above are reactive approaches – i.e., the end user is experiencing a situation and as a reaction to that, the situation is being analyzed.

ignio Proactive Problem Management (PPM)

Digitate recognizes the need to move beyond simply reacting to incidents. ignio AIOps includes a unique feature called ignio Proactive Product Management (PPM). It leverages powerful machine learning techniques to observe how all the components of your technology stack work. It can actually learn from the various types of information those components generate to spot potentially troublesome behavior patterns and predict business-critical events, in time to quickly fix or even prevent them. ignio PPM supports both on-premises and cloud-based systems.

Figure 4 below depicts ignio Proactive Problem Management's approach.

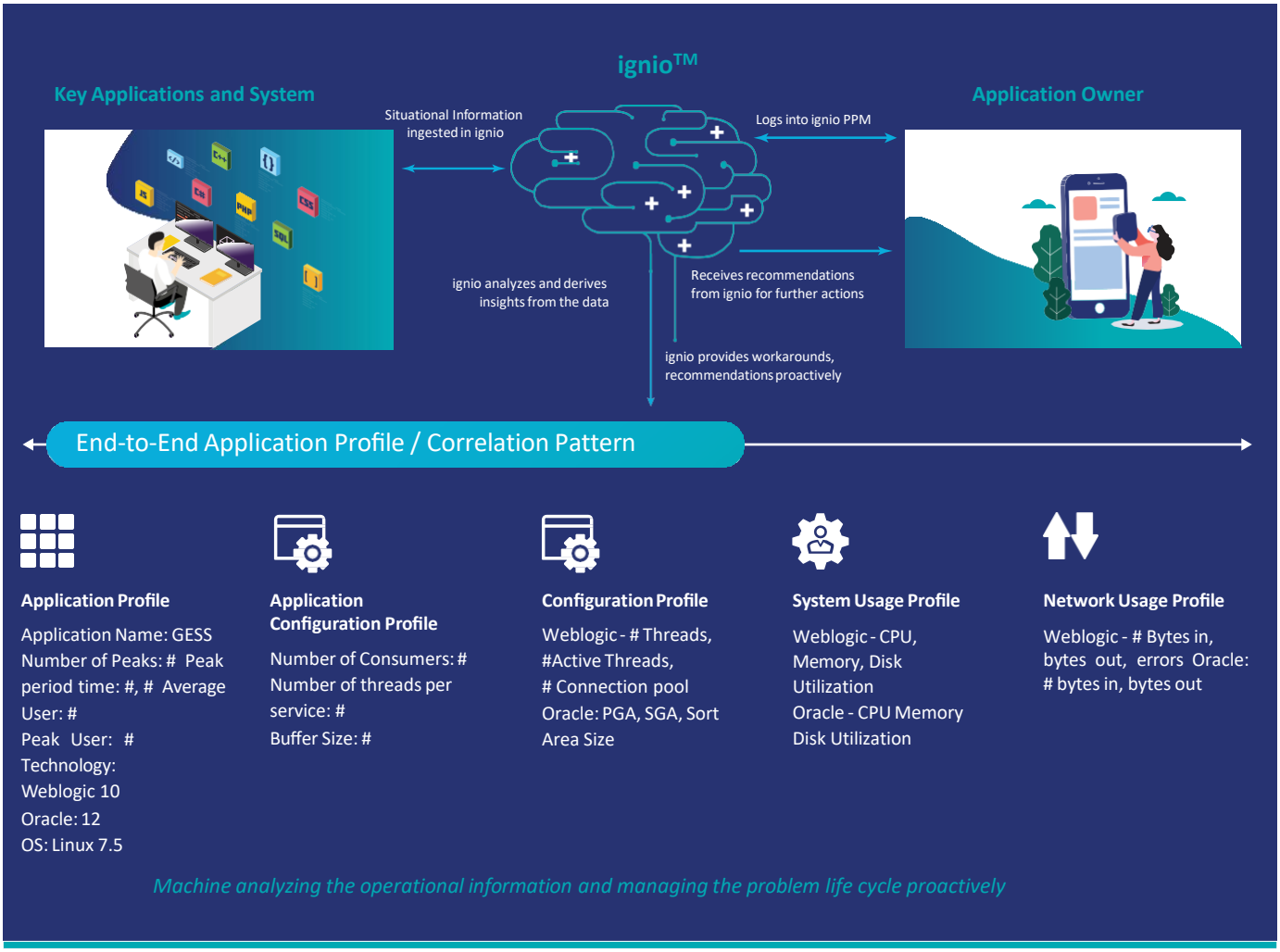


Figure 4

As seen from the figure above, ignio PPM learns system behavior by ingesting multi-dimensional data that could include metrics, configurations, incidents, problems, and change management. Analyzing this

data through machine learning techniques, it identifies the potential problem and provides observations and recommendations. It helps the user make informed decisions to resolve the problem before it occurs by assisting in raising a problem or change request through integration with ITSM systems.

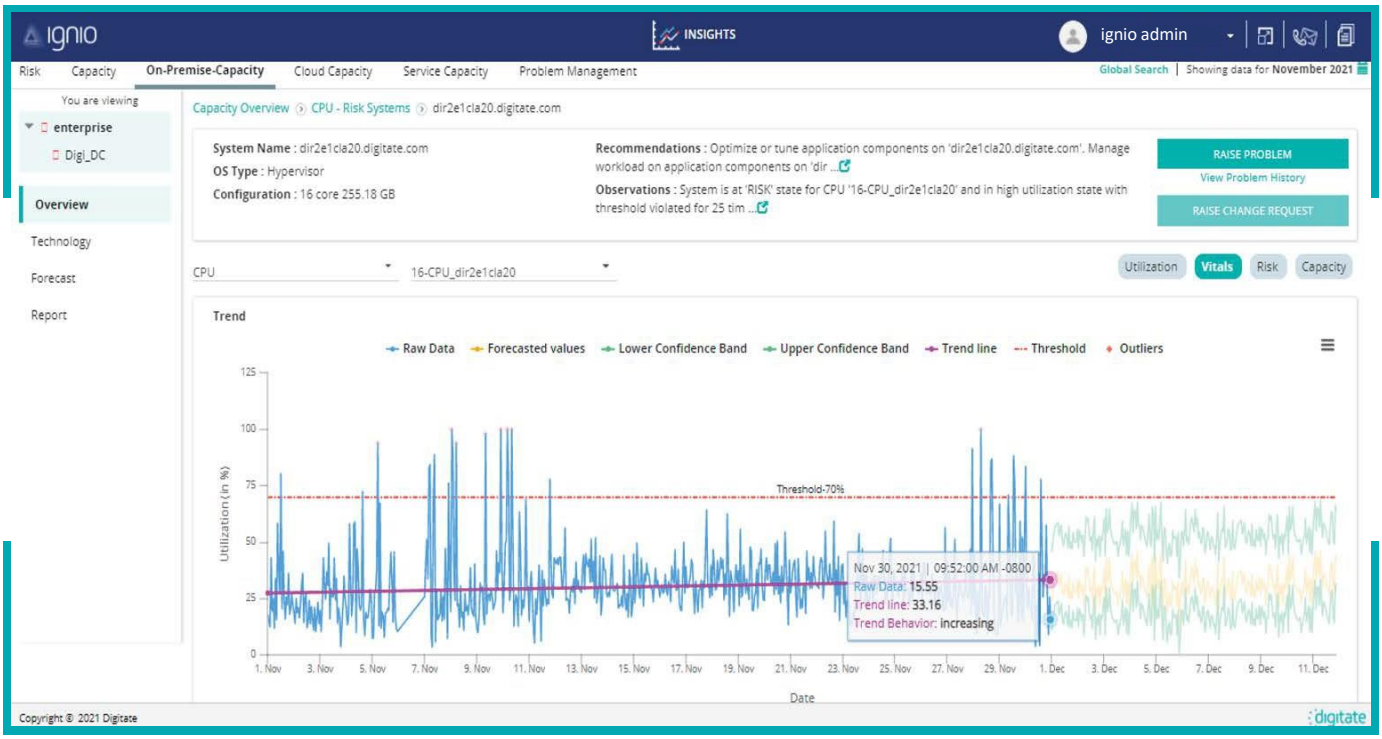
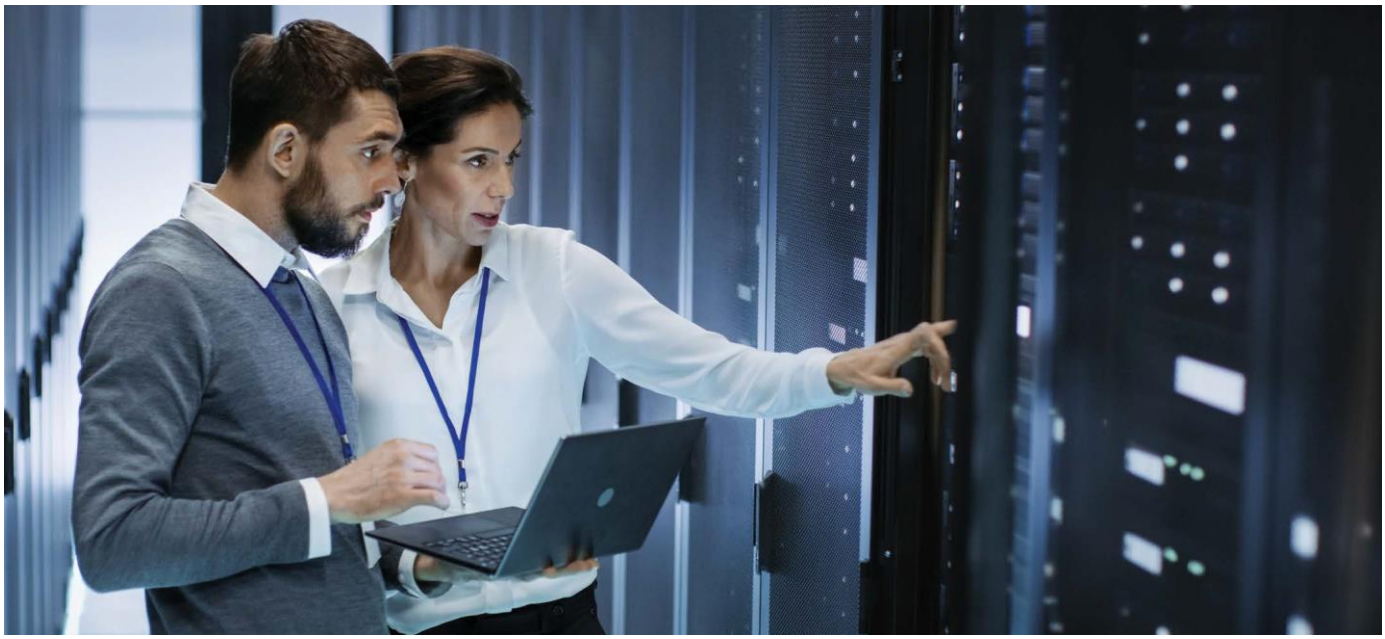


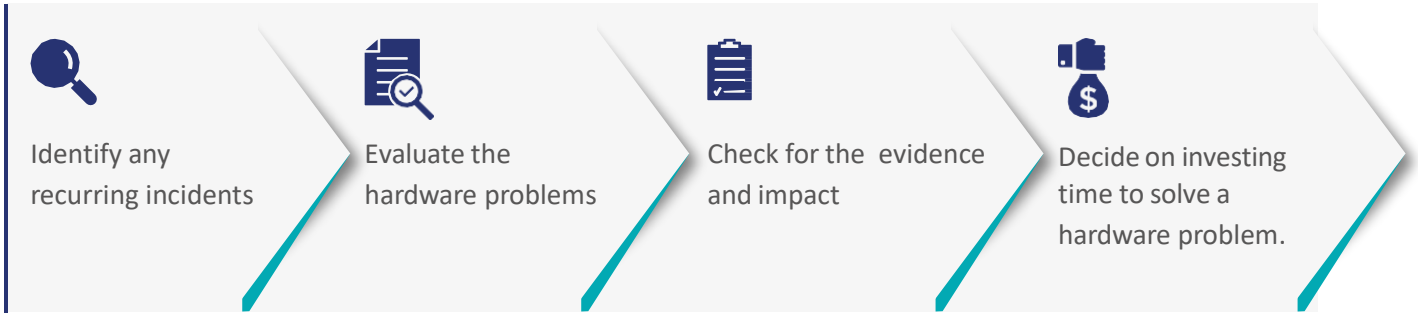
Figure 5

For example, while identifying hardware capacity problems, ignio categorizes the hardware into four categories based on the capacity consumption data: Healthy, Risk, Possible Risk, and Optimization. The Risk and Possible Risk categories indicate systems that are over-utilized or may be over-utilized soon. The Optimization category covers under-utilized systems. ignio PPM's machine learning algorithms use this information for detecting problems.



User **scenario**

The user persona for this scenario is a hardware problem manager whose key responsibilities are to:



The problem manager deals with problems in a reactive way and has no control over the occurrence of incidents, total number of incidents or how often they recur.

ignio PPM's capacity analysis and problem detection algorithms provide the problem manager with a list of problems that could occur in the near future or a recurring problem that could have been missed earlier. It performs detailed and precise impact analysis of the problem and equips the manager with associated evidence to take an effective decision for problem resolution.

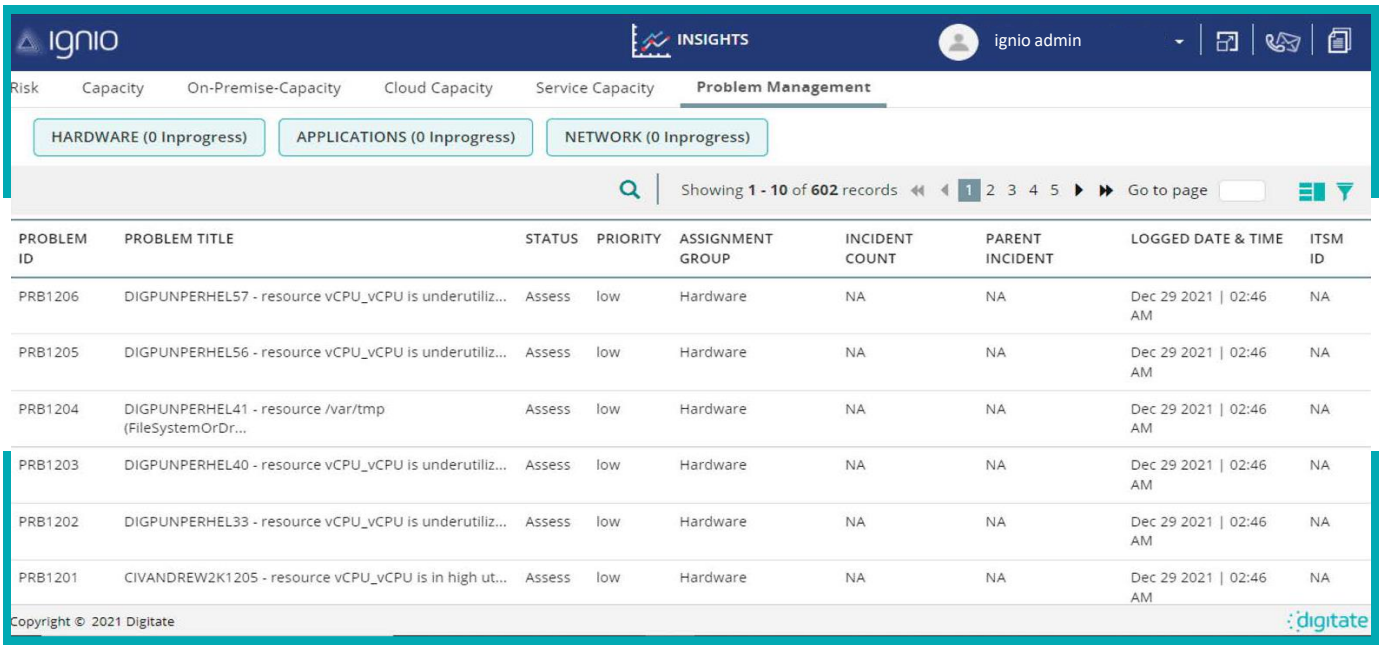


Figure 6

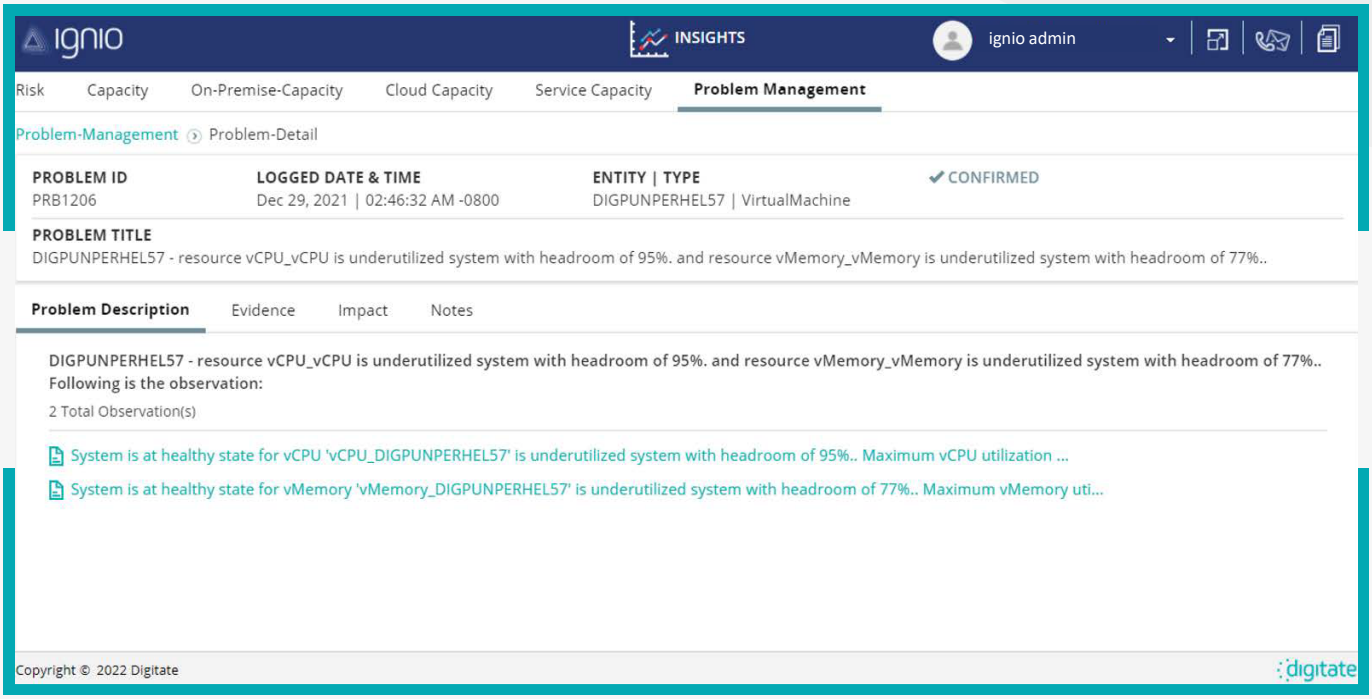


Figure 7

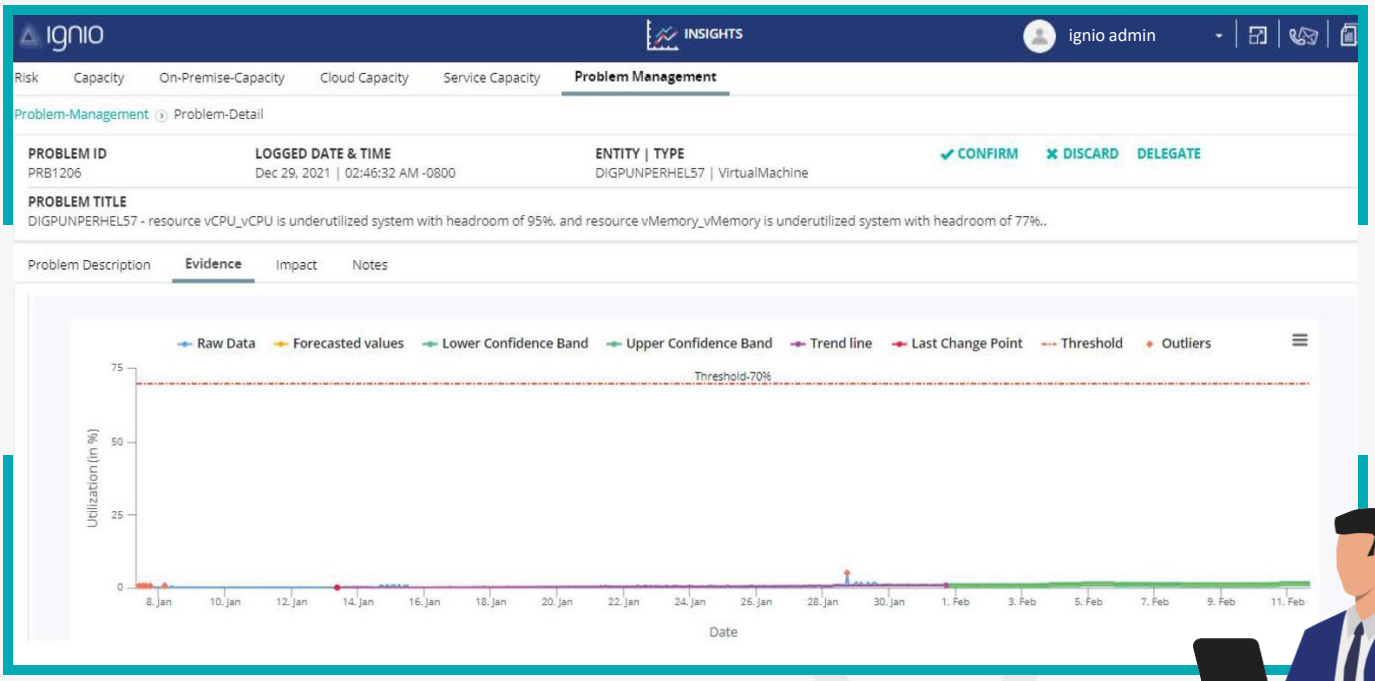
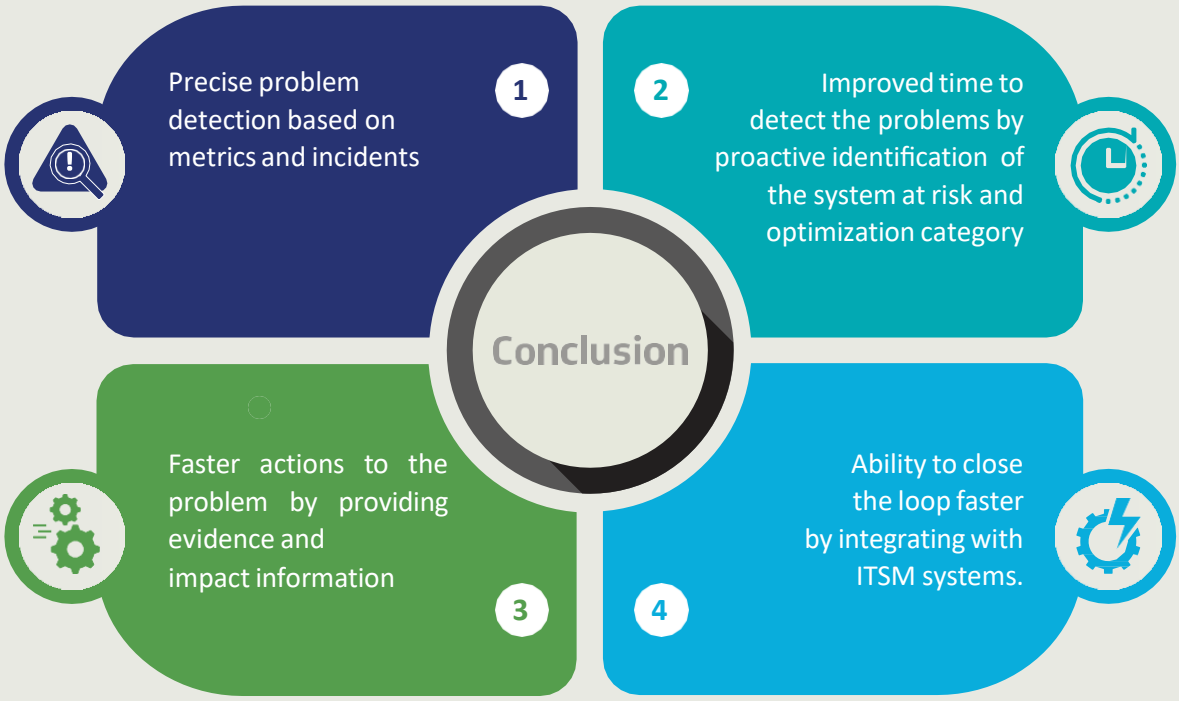


Figure 8

Conclusion

The Proactive Problem Management feature of ignio AIOps helps achieve the following:



While enterprises are embarking on their digital transformation journey, there is a growing need for a solution that assures business continuity by proactively identifying business-impacting problems and effectively managing the entire problem lifecycle. With proactive problem management, businesses will drastically reduce the number of incidents and gradually minimize the business impact of repetitive incidents. In fact, zero-incident status is now a realistic expectation.

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About the Author

Kishor Gujarathi is the Product Owner of Proactive Problem Management for IT Operations at Digitate.

Digitate is a leading software provider bringing agility, assurance, and resiliency to IT and business operations. ignio™, an award-winning AIOps software, reimagines enterprise IT and business landscape with its unique and innovative closed-loop approach that combines context, insights and intelligent automation to autonomously resolve and prevent issues. ignio's customers span across industry verticals and include large, global enterprises that are leaders and innovators in their respective industries. Digitate is headquartered in Santa Clara, California, USA and Pune, India.

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