



# Market Review

**Market Report** Paper by Bloor

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## Hybrid IT Infrastructure Management Vendor Landscape

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**The volume of data being collected by a myriad of monitoring tools has grown exponentially. Businesses are reliant more than ever on IT for the delivery of their business objectives and need rapid and accurate analysis of the data not only to resolve IT problems quickly, but also to start predicting potential problems and remediating problems autonomously.**

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# Management summary

Over the past few years, there has been a gradual breakdown of the domain centric infrastructure performance management approach that focused on, say, network management or server management separately, into a more holistic domain and vendor agnostic view of IT infrastructure performance that is “*application aware*”. This resulted in a level of mergers and acquisitions in the market as vendors sought to broaden their monitoring and management capabilities, and also the emergence of AIOps vendors like BigPanda and Moogsoft focused on being the event correlation and analytics hub at the centre of a web of connectivity with existing tools.

However Multi-Cloud and Hybrid-Cloud are rapidly becoming the de-facto assumptions for IT architecture. Containers in general, and orchestration of containers via Kubernetes specifically, are the assumed target development environments for new application functionality AND the ability to “*develop once... deploy anywhere*”. DevOps is the way these new applications are being developed and deployed. These are all presenting new monitoring, management and remediation challenges for enterprises and vendors alike.

End-to-end visibility means something very different today than it did a few years ago. It now encompasses multiple end-user channels, takes in edge based IoT devices, crosses public cloud networks and global value chains as well as more traditional on-premises data centre architectures. The volume of data being collected by a myriad of monitoring tools has grown exponentially. Businesses are reliant more than ever on IT for the delivery of their business objectives and need rapid and accurate analysis of the data not only to resolve IT problems quickly, but also to start predicting potential problems and remediating problems autonomously.

The result is that the boundaries of what we view, broadly, as the Hybrid IT Infrastructure Management (HIM) market have increased. It now encompasses Digital Experience Management (DEM) and IT Service Management (ITSM), as well as the more traditional Data Centre, Networking and Application Performance Management disciplines. Changing development and deployment models, characterised by DevOps and Containerisation, require management and monitoring tools to provide observability into, and tools for, new development environments.

In this period, the larger, legacy vendors (IBM, BMC, CA/Broadcom, Micro Focus etc.) seemed stuck in time and appeared to lose their mojo. At the same time, we have seen the emergence of a group of, often, start-up vendors who haven't yet been able to dominate the market space in any meaningful way.

This has led to a large and seemingly complex vendor landscape. Some vendors do cover multiple domains and functional areas. The arguments about a single, integrated solution, a more pragmatic platform approach, or multiple best-of-breed tools supplemented with a domain agnostic AI enabled event correlation, analytics and automation hub have swirled back and forth. Despite many vendors continuing to broaden their overall capabilities, we remain convinced that no one vendor can provide a single integrated, end-to-end solution or platform at this stage.

While there is certainly scope to reduce the overall number of tools being deployed in most enterprises, the imperative to ensure the availability and performance of IT systems that increasingly are the business, points to the need for a small number of best-of-breed monitoring and management tools and an AIOps event correlation and automation hub.



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# Introduction

**T**his document is intended for reading by CIOs/CTOs; managers with mission-critical applications, responsible for monitoring SLAs for virtualised infrastructure; their staff; and (probably, the executive summary only) associated business managers.

The bottom line is that in order to be competitive in the world of Mutable Business, where the need for constant re-invention is the norm, you need to embed intelligence in your infrastructure to help ensure that all workloads run performantly and reliably on the most

appropriate platform. It is important that the operation of this intelligence and the resulting decisions it automates or facilitates are transparently available to all the stakeholders in appropriate, usually business language or, preferably, in visual form. The vendor marketplace that supports these requirements is complex and diverse. This report attempts to position the available solutions in a meaningful way to aid with identifying potential solutions for further evaluation.



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# Changing business and technology drivers

**W**e are constantly urged to be more agile and to act faster to ensure that the business or organisation survives and thrives in a world of constant change. But speed and agility do not in themselves guarantee survival. According to Darwin's Origin of the Species, *"it is not the most intellectual of the species that survives; it is not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself."*

So, the key it seems is to be able to recognise and adapt to the changes going on around you. Given the dizzying pace of societal, technological, environmental and political changes occurring, business need to exist in a constant state of reinvention... as we at Bloor say... business needs to be Mutable.

Most of the recent business and technology drivers of change have been discussed and debated in detail. Broadly speaking, the globalisation and increased competitiveness of trade, the huge improvement in the price performance of Information Technology (IT), the immediacy and scale of modern communications and, latterly, the growth of Cloud computing are well understood. In this environment, IT has moved very rapidly from being a business enabler, to being the business. But it is the change in both the amount of data being captured and the different ways it can be stored, analysed and acted upon that is key to being able to recognise, or even predict, the changing environment and adapt to it at pace.

IT departments face a conundrum. Business now expects the rapid and regular deployment of new customer facing applications across multiple channels and geographies on a 7x24x365 basis with extremely high availability and

consistent, fast response times. Also, the business now believes that the move to the Cloud appears to offer reduced costs, increased agility and surely, at least in the mind of the non-technical business executives, a much easier technical environment to manage now that there is less (or no) owned IT infrastructure. The reality for the Chief Information Officer and his operations team is quite different.

The irony of IT in the 21st Century is that while the ability of cloud computing, mobile technology and a plethora of new application development tools and methodologies has made it easier for all of us to consume technology quickly, easily and relatively cheaply, it has also made the task of implementing and managing the underlying IT infrastructure vastly more complex.

For most businesses, that IT Infrastructure encompasses on premises legacy systems, public, private and hybrid cloud (see [Figure 1](#)) which, in some cases need to act in concert to deliver the end user application. Add into that mix the choices of bare metal, virtualisation and containers and the need for connectivity across networks and you begin to get a sense for the operational complexity IT departments now face.

So, business now expects more to be delivered, for less cost, much faster. More than that, the business also demands highly available and highly performant applications to support ever changing end user experience expectations and rapidly changing business models. It is our view at Bloor, that IT departments need to provide business service and application performance SLAs. This requires monitoring and management solutions that can see right across the various technology and organisational silos.

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# Market description

Over the past few years, we have seen a gradual breakdown of the domain centric infrastructure performance management approach that focused on, say, network management or server management separately, into a more holistic view of IT infrastructure performance that is “*application aware*”. This resulted in a level of mergers and acquisitions in the market as vendors sought to broaden their monitoring and management capabilities, and also the emergence of AIOps vendors like BigPanda and Moogsoft focused on being the event correlation and analytics hub at the centre of a web of connectivity with existing tools.

That is all changing. There are some seismic shifts going on in the Hybrid IT Infrastructure management space (HIM). Multi-Cloud and Hybrid-Cloud are now the de-facto assumptions for IT architecture. Containers in general, and orchestration of containers via Kubernetes specifically, are the assumed target development environments for new application functionality AND the ability to “*develop once... deploy anywhere*”. This is presenting new monitoring, management and remediation challenges for enterprises and vendors alike.

Figure 1 gives an idea of the scope of the monitoring and management challenge facing IT operations departments. The environment they have to cover is now much broader and more complex. Historically, IT operations teams have deployed a variety of specific, standalone, domain centric tools from different vendors to monitor and manage their environments. Potentially, this could lead to even more standalone tools being deployed. But as pressure has grown to reduce the number of tools and increase collaboration and integration between different IT operations teams, so vendors have started to offer a wider set of, sometimes more integrated solutions. In such a scenario it has become an almost impossible task to map individual vendors to individual segments. Indeed, if we are to work towards an IT operations environment that enables the use of fewer tools and the existence of less organisational silos, it is counter-productive to sub-divide the market segments too finely.

But, let’s be honest, we all like categorising stuff. IT analysts are no different. If we take a cross section of the way IT analysts (including Bloor) have tried to categorise the market and populate the various segments with vendors, you get something that looks like Figure 2.

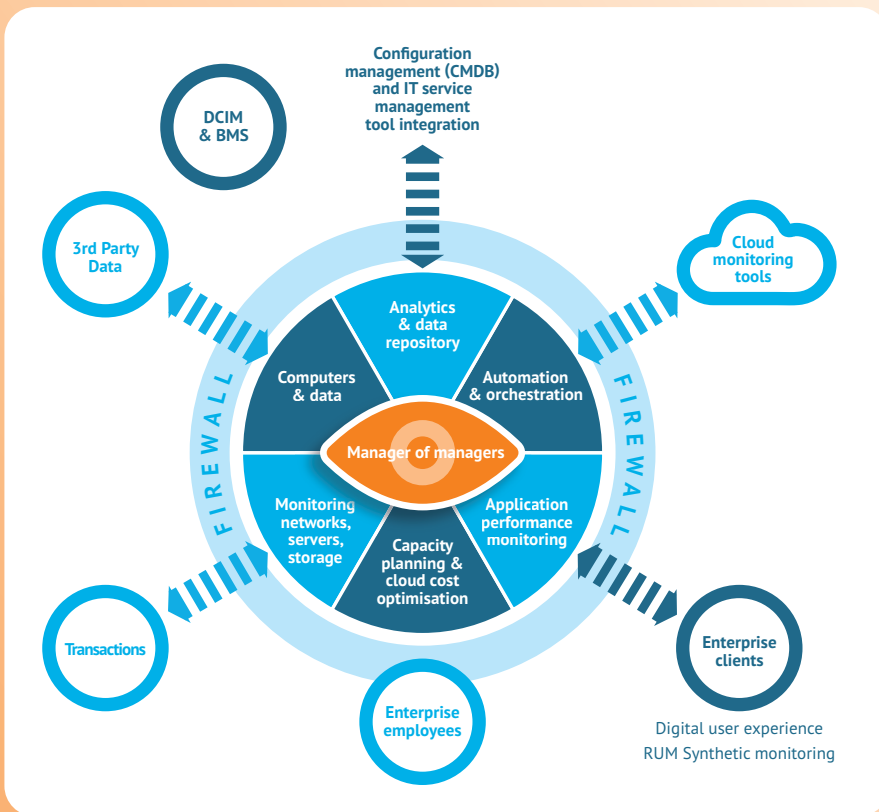


Figure 1: Scope of hybrid infrastructure management

In this period, a group of, often, start-up vendors have emerged who haven’t been able to dominate the market space in any meaningful way. At the same time, the larger, legacy vendors (IBM, BMC, CA/Broadcom, Micro Focus etc.) seemed stuck in time and appeared to lose their mojo.

This chart raises all sorts of questions, not least from the vendors themselves. While some obvious vendors like IBM or BMC appear in more than one category, nearly everyone on the chart has expanded from their original category into others, either organically or through acquisition. However, it does give some idea as to the original focus of vendors and I will return to this later on. The most problematic category is AIOps. You can read a detailed view of what we think AIOps was originally about ([here](#)), and why the original AIOps intent around

Event Correlation and Automation is still both valid and important. Unfortunately, nearly every vendor is using the term AIOps to cover any part of the HIM spectrum that contains even the smallest amount of algorithmic machine learning.

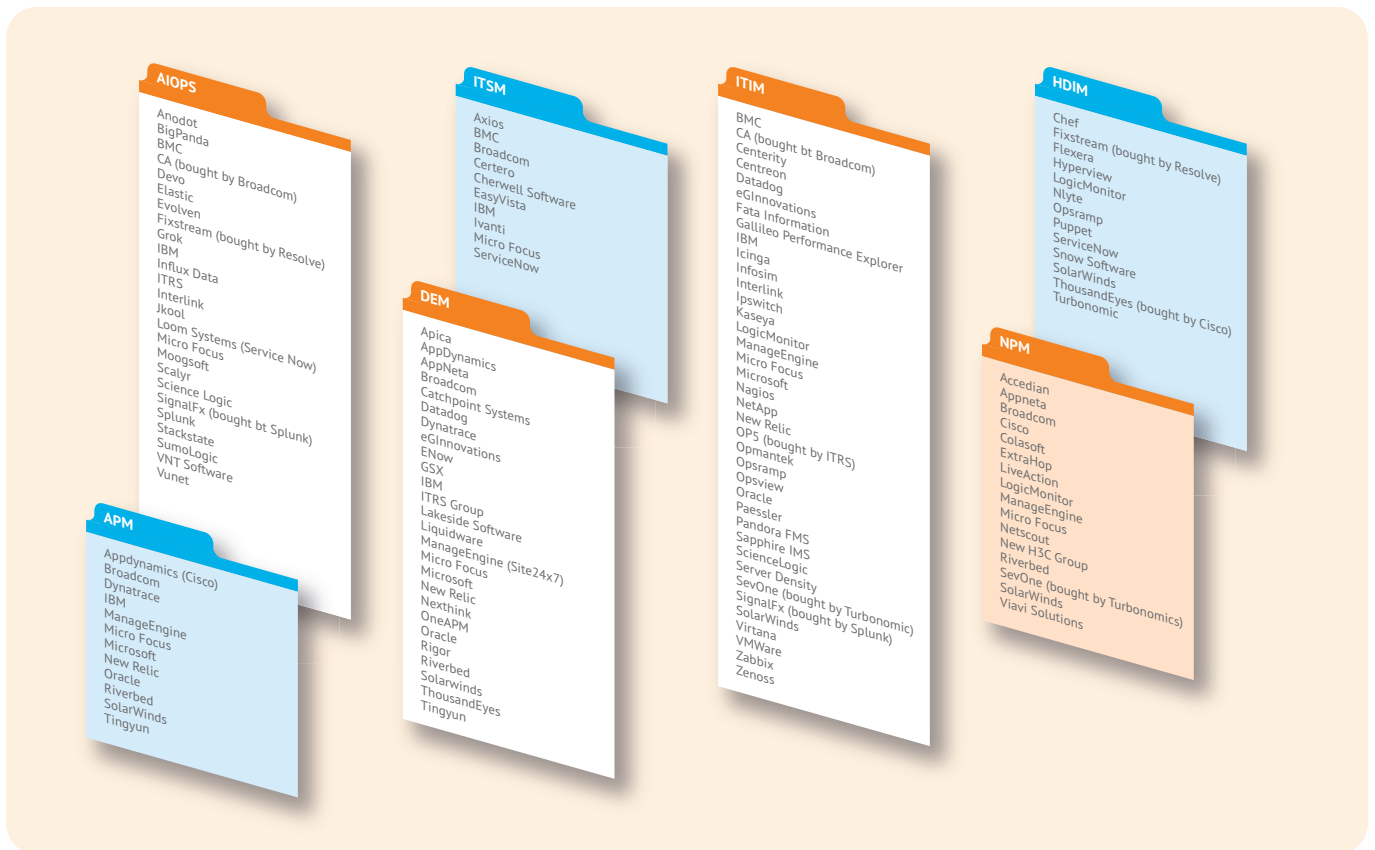


Figure 2: Traditional Vendor Classification

# A different classification

If we now accept that there is a critical requirement to manage the performance and availability of businesses services and applications across a varied and widely dispersed IT infrastructure, then it probably makes sense to look at it from the perspective of the jobs that IT needs to do to achieve this. I have recently come across this classification, in **Figure 3** below, of the jobs to be done from US services company Trace3 which neatly encapsulates the various tasks and will be useful in evaluating vendor positioning and capabilities.

## SYSTEM OF ENGAGEMENT

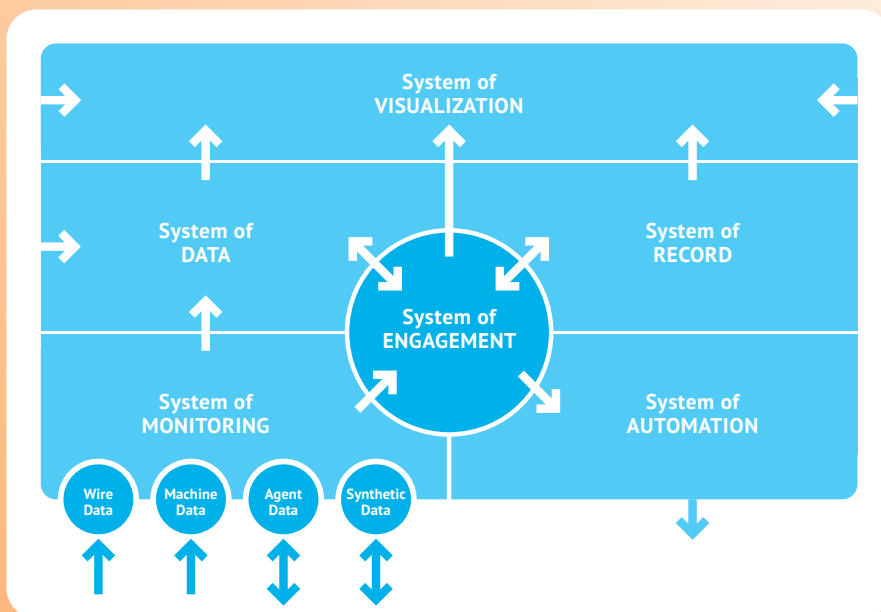
At Bloor, we have termed this “*the beating heart of AIOps*”. It is where all the monitoring data is aggregated, correlated, enriched, and events routed in real-time. It allows operations teams to analyse the root cause of problems quickly, reduce alert noise and improve Mean Time to Resolution (MTTR). Most, if not all, vendors have some sort of system of engagement capability. In some cases, the level of machine learning, and AI might be less sophisticated and there might be a limited set of monitoring data integrations depending on their domain focus. However, vendors who focus on this area exclusively rely on being able, out of the box in many cases, or easily and quickly at the very least, to integrate ALL the sources of monitoring data required. For these vendors more sophisticated algorithmic machine learning, and, in some cases, advanced heuristics are used.

## SYSTEM OF DATA

When procuring a HIM solution this system is not always as visible, or apparent. However, it is critical to the effective functioning of the overall solution. To quote Trace3 directly “*Working in tandem with the System of Engagement, the System of Data consists of one or more technologies that act as a warehouse or lake to store and analyse structured, semi-structured, and unstructured data over long periods of time.*” All vendor solutions should be using Time-Series and/or Graph databases to store and analyse the monitoring data. Most will use either commercial or open-source databases that they integrate into their solutions.

## SYSTEM OF RECORD

This system equates most closely to IT Service Management (ITSM) systems. This is where issues, alerts and proposed remediations are turned into actions to resolve problems. It incorporates Service Desk activities that keep a record of problem tickets, user queries, operation team collaborations. In other words, a record of all the processes and actions that record the journey of a fault or issue from



**Figure 3:**  
Trace3 “System of” Classification

## SYSTEM OF MONITORING

Monitoring is the foundation on which Hybrid Infrastructure Management is built. I am totally in agreement that you need to collect telemetry from Wire Data, Agent Data, Machine Data, and Synthetic Data and combine it to provide a complete picture of a modern hybrid IT environment (**Figure 1**). While Agent Data and Machine Data (Event Logs) are widely used by vendors, the ability to capture Wire Data comes predominantly from NPM vendors and sometimes from vendors who have to monitor the performance of storage arrays. Synthetic data is usually used by DEM vendors to supplement real-user monitoring (RUM) where that is impractical.



initial identification through to resolution. Until recently there has been a distinct vendor divide between those vendors with monitoring capabilities and those with a service management orientation. Initially some monitoring vendors started to build out into the service management side. Now, we are seeing a strong drive from ITSM vendors moving into the monitoring and engagement space.

#### SYSTEM OF AUTOMATION

In some way automation is an integral part of the system of engagement. The volume of monitoring data IT operations has to deal with, the criticality of the business systems they are now supporting and the increased velocity of business generally, and change in particular, means that automation is absolutely critical to success. Automation of business processes and workflows has become a given. In incident management for example, context enrichment, once a highly manual task can now be automated. Similarly, many other areas, such as incident ticket creation and routing, runbook lookup, notifications, alert prioritisation are now routinely automated, and we are now seeing automated triage remediation of some simpler, often seen issues.

#### SYSTEM OF VISUALIZATION

Ultimately, senior executive management need to be assured that the availability and performance of their IT systems are meeting, and will continue to meet, the needs of the business. The high volume of source IT operations data is hardly business-user friendly. Also, it is usually federated, residing in many different locations, both inside and outside an organisation. Therefore, this requires technologies that can display the data from disparate locations using APIs and other integration techniques for data extraction, transformation, blending, and analysis. The objective is to express and visualise the data in a way that provides meaningful business insights and experiences based on the roles of different business and technology users within the organisation.

Of these six “Systems”, Monitoring, Engagement and Record are about getting the job done. Systems of Monitoring and Record have been around for a long time and are almost thought of today as commodities. Engagement is newer in concept and has come about as a result of the need to try and make sense of the surge in monitoring data and to pass on more relevant and timely information about alerts into the IT Service Management function. Data, Automation and Visualisation are all enablers that are essential to getting the jobs done. The advent of time-series and graph databases, the capabilities of Big Data and streaming analytics has made the capture and analysis of monitoring data in near real-time a viable, if overwhelming possibility. Automation has been absolutely essential in turning that overwhelming possibility into a realistic, valuable solution for effective event management and problem resolution.

#### So where do vendors predominantly sit if we take this “Systems” view of the market?

Traditionally the focus of ITIM, NPMD, APM and DEM vendors in *Figure 2* has been to provide Systems of Monitoring. ITSM vendors are predominantly about providing Systems of Record. These systems and vendors have been around for some time, but it gets a little more challenging to see any commonality of heritage when we come to the HDIM and AIOps categories.

HDIM is a fairly new category, defined by Gartner, that feels a little like a home for solutions that don't fit anywhere else. But, using the “Systems of” approach makes things a little clearer. Hyperview and Nlyte, for example, have a heritage in Data Centre Infrastructure Management (DCIM) and sit, predominantly in the Systems of Monitoring Category. Snow Software and Flexera with a background in IT Asset Management sit in the Systems of Record Category, and Puppet and Chef are closest to Systems of Automation.



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The original intent of AIOps as an event correlation and automation hub should put it firmly in the Systems of Engagement category. Clearly a number of monitoring solutions have event correlation capabilities, but the use of the term AIOps applied to virtually any part of the Hybrid Infrastructure Management landscape that has even the most basic of algorithmic machine learning functionality has muddied the waters considerably. Looking at [Figure 2](#) again, there are a significant number of vendors in the AIOps category whose heritage, one way or another,

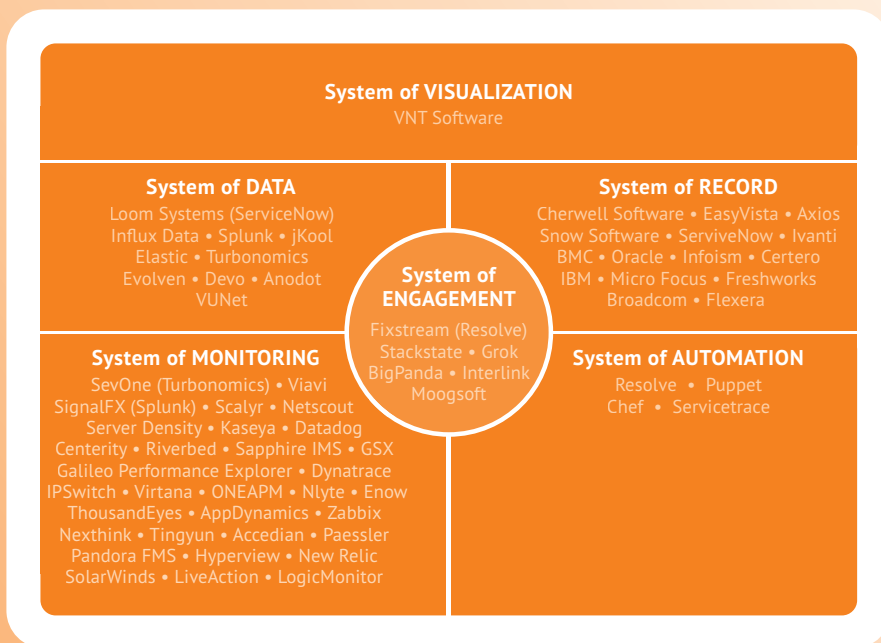
[Figure 4](#) shows a graphic representation of what we have discussed above. It is still a somewhat arbitrary approach, but gives a sense of the orientation and origins of the various vendors. Keep in mind that most of the vendors will have broadened out their capabilities into other “Systems of” categories. In a few cases we have shown where key acquisitions (acquirers shown in parenthesis) have catapulted that acquirer into a new “Systems of” category.

We have also placed the legacy vendors with broad suites of tools, into the Systems of Record category. This is based on their long heritage in proprietary systems management and doesn’t assume no, or poor capabilities in other areas.

The lack of vendors in the Systems of Visibility and Systems of Automation does not imply that these are the only options for organisations. Indeed, many vendors in the other three categories have developed sophisticated visibility and automation capabilities.

### Integrated platform vs best of breed

Is there a single integrated solution suite or platform that adequately covers the whole Hybrid IT Infrastructure Management landscape as depicted in [Figure 1](#)? The answer is a resounding “No”. There are a number of vendors who have capability and functionality across the Systems of Monitoring, Engagement and Record. Others have focused on integrating monitoring and engagement functionality. This is particularly true of APM vendors who have integrated engagement into their observability (monitoring) solutions. Additionally, many vendors have sought to build automation into their solutions to deal with the increased volume and velocity of data IT operations departments have to deal with. This has often been achieved by acquisition and the speed with which the various components have been integrated into a seamless, integrated whole has been slow. Even within the large, legacy



**Figure 4:**  
Reclassification of Vendors  
using Systems of

is in Systems of Data. These include Splunk, InfluxDB and jKool. Some, like Sumo Logic seem to straddle Systems of Monitoring and Data. Then, the large, legacy systems vendors, IBM, BMC, Broadcom and Micro Focus all make an appearance here. All have added AI and ML capabilities to their platforms, but I am not sure that this necessarily qualifies them as AIOps vendors. Given our existing position on AIOps this really only leaves BigPanda, Moogsoft, Interlink, Grok and, possibly, Stackstate as out and out AIOps specialists.

vendors, the product or capability silo heritage is still too apparent. This means that the functionality and maturity of the suite or platform is not consistent. If anything, the growth of Public Cloud and the need to rely on the public internet and 3rd party backbone wide area networks (WAN) has only served to expose more gaps. Two examples demonstrate the challenge.

Park Place Technologies, the leading global 3rd party maintenance organisation has recently entered the HIM market with their DMSO offering (Discover Monitor Support Optimise). They use BMC to monitor and manage the data centre hardware and software of their customers, but went out and acquired Entuity, an NPM vendor, to deliver the network monitoring and management functionality they felt they needed. Similarly, a leading global systems integrator with a strong heritage in network and data centre managed services, liked the monitoring and management functionality of their ITIM vendor, but were less convinced about their AIOps capability. This systems integrator had a data science and AI capability of its own and decided to develop their own AI enabled System of Engagement.

Does that automatically mean you should adopt a policy of only using best of breed tools in every category? The answer here is more equivocal. Our view is that CIOs and IT Operations Directors should be looking to reduce the number of tools and to promote more cross-team collaboration. Given that most vendors have broadened the functionality of their solutions beyond their original heritage, there is ample opportunity to retire some individual tools. You should be able to monitor most IT infrastructure components using a single vendor's solution. There may be functional gaps or weaknesses in Public Cloud Infrastructure monitoring, or in some legacy on-premises IT that require specialist vendors' solutions, but modern virtualised server, storage and network infrastructure should be well covered.

Until recently Systems of Record were the exclusive preserve of vendors who cover IT Service Management, IT Asset Management, CMDB etc., or the large legacy HIM vendors such as IBM and BMC. Most monitoring and engagement vendors used APIs to integrate with the ITSM world, particularly with ServiceNow. The large legacy HIM vendors have their own ITSM solutions, and one or two newer vendors, like SolarWinds also have modules covering ITSM. Ironically, while most Monitoring and Engagement vendors have halted at the gates of ITSM, ServiceNow has started to build out capability across Monitoring and Engagement, as have others like Resolve.

Most vendors will have some Systems of Engagement functionality. However, we believe that sophisticated AI driven event correlation and automation is a weakness for many vendors who are predominantly monitoring oriented, and often focused on their specific domain of expertise. In this instance, newer, domain agnostic vendors whose primary focus is on the key engagement areas of AI driven event correlation and remediation tend to score more highly from a functional perspective.

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# Different scenarios require different tool strategies



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## **Scenario 1 Public Cloud Only**

In the Public Cloud the focus for IT operations moves very strongly from the underlying IT infrastructure to the application. The level of forensic insight into the server, storage and network is much less than in an on-premises environment. So, it becomes absolutely critical to ensure the reliability of the application and its suitability for the target Cloud platform. Newer Monitoring vendors, themselves born in the Public Cloud, have focused on ensuring that their solutions integrate well with modern DevOps Continuous Integration/Continuous Delivery (CI/CD) tool chains. New terms, such as Observability and Site Reliability Engineering (SRE) are common in these areas and reflect a shift-left mentality to integrate more closely into the application development eco-system. More traditional APM vendors have also developed or acquired solutions in these areas. For digital start-ups, or for companies that are absolutely certain that there will be no use of any form of hybrid IT infrastructure then it may be possible to use solutions from these vendors as their primary, if not only, solution.

## **Scenario 2 Highly distributed, network critical hybrid IT infrastructure environment**

To an extent, the current Covid-19 pandemic has put many more organisations into this category with employees working from home, an increase in on-line ordering and reliance on partner networks (in both the physical and IT sense). There will be branch offices, regional data centres, either owned or co-location and a mix of Public, Private and Hybrid Cloud deployments. If the network is seen as business critical, the need to monitor and capture wire, machine, agent and synthetic data will be a mandatory requirement. NPM vendors will be much more likely to have this capability, at the level of functionality required.

However, few have comprehensive DEM functionality which may need to be added separately. It is also unlikely that the level of event/data correlation and automation will exist to enable rapid identification and remediation of alerts, so that a native AIOps solution may also be a key requirement. A small number of APM oriented vendors have built out a much wider infrastructure monitoring capability, but we have not seen any provide wire data, so, in addition, both APM and NPM solutions will be needed here.

## **Scenario 3 High volume, mission critical and/ or regulatory controlled environment**

Traditionally the applications in this scenario are dominated by on-premises infrastructure where minimising latency, optimised workloads and/or data sovereignty are the key requirements. Where Cloud technologies are used, they will tend to be Private rather than Public. This market is characterised by financial trading, ad-serving and on-line gaming where even small degradations in millisecond responses can cost \$millions. In our view, there are only a very small number of vendors with the capability to monitor and capture all the sources of data in real-time. Transaction rates and the amount of data collected, particularly wire data, can make implementation and deployment more costly than most other solutions. However, this is usually justified by the potential huge losses of revenue and reputation in the event of outages or performance degradation. The solutions we have studied all provide a level of application awareness and contextualisation, but dedicated APM will still be needed and, dependent on the event correlation and automation functionality of the solutions, a dedicated AIOps platform might also be required.

#### Scenario 4 Predominantly single vendor IT environments

The focus here is on IBM, Oracle and VMWare dominated environments, with Hybrid-Cloud very much the de-facto consumption model. All three vendors have a broad array of monitoring tools and have been busy developing and acquiring a wide range of new cloud and domain agnostic management capabilities. VMWare scored highly in a vendor study ([see here](#)) focused on monitoring and management of mission critical hybrid-cloud infrastructures we undertook two years ago. If there were any shortcomings it was in the area of AIOps. IBM on the other hand appear to have very capable AIOps capabilities following the release of Watson AIOps. There is no doubt that, for IBM, Oracle and VMWare “shops”, their respective solutions could meet many of their needs. However, both APM and domain agnostic AIOps solutions will probably need to be evaluated and incorporated.



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# Future trends

## 1. Competitive moves

There are a number of aggressive new competitors who have started to converge on this market. I will use three, Splunk, ServiceNow and Cisco as poster children for the different forces at play.

**Splunk** is a very high-profile company that has built a growing reputation (and growing revenues) on a strong AI based data analytics platform and aggressive digital marketing. It has spread into security, IT operations (ITOM) and AIOps and has now quite explicitly stated that they are going after the Application Performance Management (APM) market as well. It has a strong eco-system platform play, widespread use of open-source initiatives, like OpenTelemetry, and has also developed their in-house capabilities as well.

**ServiceNow**, long known for its leadership in the IT Service Management (ITSM) market has been quietly building out its capabilities across the IT Asset Management (ITAM), ITOM and AIOps space based on an extensive user base, strong eco-system partnerships and its own in-house developments. It has a particular focus on the end-user experience which now gives it a very credible “*end-to-end*” story. ServiceNow is also heavily pushing its low code/no code application development tools and there is clear evidence of its intent to push more broadly into robotic process automation and workflow optimisation beyond the specific IT management sphere. No mention of digital twins yet, but its overall scope would push it firmly into that space if it adds 3D Visualisation.

**Cisco** represent something different again. It is using acquisitions to build out from its core network management competency. Thousand Eyes has given Cisco an almost unique (NetScout are about the only genuine competitor) capability to monitor, model and manage global cloud and internet traffic... long seen as a gap in a genuine “*single pane of glass*” IT management capability. Cisco’s acquisition of AppDynamics takes it into the APM

space. Cisco’s biggest challenge may be its ability, or perhaps inability, to seamlessly integrate these acquisitions into a coherent whole.

On a final note, the term “*shift-left*” is one heard quite often when referring to the need to prevent and predict issues at source rather than trying to remediate after the event. We are now seeing a distinct focus on developing and deploying IT performance management tools that tie directly into DevOps. This is where the new role of Site Reliability Engineer (SRE) sits. The impetus for this is coming from APM, native AIOps and Digital Experience (DEM) vendors but has significant implications for all vendors in the wider Hybrid IT Management Market.

## 2. Open-source developments

Public Cloud, DevOps and Open Source all appear to feed off each other, moving at speed and driving productivity improvements and opening up new opportunities for business. Between them, the Cloud Native Compute Foundation (CNCF) and the Open Compute Project (OCP), supported and encouraged by major cloud players like Google and Facebook, have nurtured the development of a wide range of tools such as Prometheus for monitoring, Grafana for visualisation, FluentD for logging and Open Telemetry for observability. The development of Time-Series and Graph databases like InfluxDB and Neo4J, that are critical for the storage and analysis of all the different forms of data being captured has also been very much an open-source initiative, and there are monitoring solutions with paid for wrap around services, like Icinga and Zabbix, that are open-source

This array of open-source tooling for infrastructure management does offer the possibility for organisations to build their own in-house solutions. However, a lack of coverage of legacy, on-premises architectures on one hand, and a continuing pressure on skills availability on the other will probably restrict the



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instance of this happening to only the most technology savvy digital, cloud-native start-ups. We don't expect that to change in the near future.

On the other hand, while we haven't mentioned specific open-source software tools in previous sections in this paper, it is worth noting that, for many HIM vendors, open-source tools are becoming a key element of their solutions, and we expect to see this grow. A good example is the IBM Cloud Pak for Multi-Cloud Management. Built on a core of proprietary, largely Tivoli based, infrastructure management capabilities, IBM have built out a strong set of domain agnostic capabilities using open-source tooling such as Prometheus for monitoring and Grafana for visualisation. Although it is not always easy to understand and see where vendors have incorporated open-source tools into their solutions we expect this trend to increase.

### 3. Multi-cloud management

We are seeing a growing interest in, and development of, tools to monitor, manage and optimise multicloud environments. At the current time, these are mainly focused on optimising (reducing) cloud computing charges in individual clouds by ensuring, for example, that instances are not left running when they are not required, or by identifying areas of over-provisioning. However, given the extent of data being collected about hybrid IT infrastructure performance we expect to see those vendors who have an existing workload analysis and optimisation capability use this to profile how legacy applications might, or might not, run most effectively in a public cloud environment. Further out, we foresee a time when trusted 3rd parties, using many of the skills and capabilities being built into new Hybrid IT Infrastructure Management solutions and the genuine develop once deploy anywhere promise of modern container-based development, will start to offer cloud brokerage services across multiple clouds.

### 4. Digital twin

Data Centre Infrastructure Management vendors are already providing sophisticated visualisations of data centre infrastructure. This has been particularly important in environmental modelling and monitoring. We are just starting to see development of the ability to show alerts in data centre servers and storage to be high-lighted visually. We have also seen an early example of the remediation of simple errors and problems being automated. In other words, the Digital Twin initiates and completes remediation in the physical twin. The reality is that the market never stands still. Genuine Blue Ocean will be increasingly hard to find in the HIM market and, in my view, it is only a matter of time before Digital Twins become the next highly visible market opportunity and focus for vendors, both within, and without, the current HIM environment.



**We are seeing a growing interest in, and development of, tools to monitor, manage and optimise multicloud environments.**



# Conclusion



In an ideal world there would be total co-operation, collaboration and visibility across all IT and business teams... But reality is not like that...



In an ideal world there would be total co-operation, collaboration and visibility across all IT and business teams. In an ideal world there would be integrated solutions that cover all 6 “Systems” we have described in this report. In an ideal world all your IT operations management tools will have been fully written-down. But reality is not like that. Add to that, the rapid pace of business and technology change, increasingly complex IT architectures and the huge volumes of IT management data and it is plain to see that, at present, there is no single integrated HIM solution available to the CIO.

However, we believe businesses need to consolidate the large number of individual monitoring and management tools in use (estimates vary from 10 to more than 30 in many enterprises). Most vendors, whether they have a specific domain heritage such as APM or NPM for example, or have been more focused on ITSM in the past, have been broadening the scope of their solutions so that they almost all now cover two or more of the “Systems”.

Given that automation is a critical requirement for IT operations departments charged with delivering business service SLAs, and that it requires significant elements of AI/ML, we believe that Systems of Engagement and Automation need to be prioritised as a central point of focus when evaluating solutions. Specific monitoring tools can usually be easily integrated, out of the box or via APIs and tables if necessary. The same is the case for Systems of Record. If vendors meet your requirements for engagement and automation and they form part of an integrated solution so much the better. If not, choose the most effective engagement and automation solution to meet your specific requirements, and supplement this with as small a number of additional tools from the Systems of Monitoring and Record to meet your specific use-cases.

## FURTHER READING

Further information about this subject is available from:

[www.bloorresearch.com/research/automation-excellence/](http://www.bloorresearch.com/research/automation-excellence/)

[www.bloorresearch.com/technology/hybrid-infrastructure-management/](http://www.bloorresearch.com/technology/hybrid-infrastructure-management/)

[www.bloorresearch.com/research/event-correlation-and-automation/](http://www.bloorresearch.com/research/event-correlation-and-automation/)

[www.bloorresearch.com/research/monitoring-and-managing-the-performance-of-complex-hybrid-it-infrastructure-environments/](http://www.bloorresearch.com/research/monitoring-and-managing-the-performance-of-complex-hybrid-it-infrastructure-environments/)

[www.bloorresearch.com/research/hybrid-infrastructure-management/](http://www.bloorresearch.com/research/hybrid-infrastructure-management/)

[www.bloorresearch.com/research/instrumenting-virtualised-datacentre-performance-slas/](http://www.bloorresearch.com/research/instrumenting-virtualised-datacentre-performance-slas/)





### About the author

**Paul Bevan**

**Research Director: IT Infrastructure**

**P**aul has had a 40 plus-years career that started in logistics with a variety of operational management roles. For the last 36 years, he has worked in the IT industry, mostly in sales and marketing, covering everything from mainframes to personal computers, development tools to specific industry applications, IT services and outsourcing. In the last few years, he has been a keen commentator and analyst of the data centre and cloud world. He was also, until recently, a Non-Executive Director in an NHS Clinical Commissioning Group.

Paul has a deep knowledge and understanding about the IT services market and is particularly interested in the impact of Cloud, Software Defined infrastructure, OpenStack, the Open Compute Project and new data centre models on both business users and IT vendors. His mix of business and IT experience, allied to a passionate belief in customer focus and “*grown-up*” marketing, has given him a particular capability in understanding and articulating the business benefits of technology. This enables him to advise businesses on the impact and benefits of particular technologies and services, and to help IT vendors position and promote their offerings more effectively.

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