Market Guide for Digital Experience Monitoring

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Improving the end-user experience is a strategic part of digital transformation, yet I&O is losing direct control of infrastructure and applications. I&O leaders must use digital experience monitoring to optimize business transactions and customer journeys regardless of where workloads reside.

Key Findings

- Traditional monitoring practices and technologies are limited in their ability to effectively monitor the end-user experience, limiting I&O leaders’ ability to identify and impact digital experience performance gaps.
- I&O leaders often deploy monitoring tools that are domain-centric and do not provide perspective on the overall user experience, resulting in a focus on the wrong areas.
- Most end-user experience issues are discovered by reacting to service desk incidents, undercutting I&O leaders’ initiatives to respond to and correct issues more quickly.

Recommendations

I&O leaders focused on infrastructure, operations and cloud management to optimize end-user experience should:

- Provide business-level context by using DEM technologies that monitor the performance of applications from the end-user perspective.
- Augment traditional, domain-centric tools by deploying AIOps and DEM together to detect patterns in the data that lead to greater insight into experience and help improve users’ satisfaction.
- Monitor end-user experience proactively by enabling DEM to track the most critical transactions and customer journeys and prevent impact to their users.
Strategic Planning Assumption
By 2023, 60% of digital business initiatives will require I&O to report on users’ digital experience, up from less than 15% today.

Market Definition
This document was revised on 12 September 2019. The document you are viewing is the corrected version. For more information, see the Corrections page on gartner.com.

Digital experience monitoring (DEM) is a performance analysis discipline that supports the optimization of the operational experience and behavior of a digital agent, human or machine, with the application and service portfolio of enterprises. These users, human or digital, can be a mix of external users outside the firewall and inside it. This discipline also seeks to observe and model the behavior of users as a flow of interactions in the form of a customer journey.

Market Description
Gartner forecasts show that, in 2019, 44% of cloud spend will be on SaaS (see the Evidence section), creating visibility challenges for I&O teams that can impact customer experience, revenue and brand reputation. DEM can be considered a form of black box monitoring that tracks application behavior through signals from the end-user experience for applications over which IT may have little or no control. DEM tools can help improve the visibility into new applications that are becoming increasingly critical to digital business transformation (see “I&O Leaders Must Use Monitoring Metrics to Optimize Customer Experience”). DEM technologies are an integral part of IT monitoring initiatives and, as such, are deployed alongside other technologies, such as APM and NPMD, as seen in Figure 1. The Market Analysis section provides details about the benefits and challenges of the different technologies and approaches.
Improving employee productivity is an important objective of DEM. By monitoring endpoint devices, physical or virtual, DEM can be used to improve the experience with applications accessed from users’ devices. This can also help mitigate, for example, the impact of configuration changes to services or endpoint devices, software migrations, and other changes to end-user systems. This should be done in direct interactions with employees via bots and surveys that provide real-time and ongoing feedback to the IT operations teams.

I&O leaders should analyze business journeys, for internal and external users, by taking a top-down (from end user to infrastructure) and outside-in (observing behavior and impact on system performance) approach. This process captures the health of business-critical applications and workflaws and helps understand how users interact with these applications. Capturing end-user metrics and tracking them across flows of interactions can help organizations model business processes and support customer journey analysis (see “Market Guide for Customer Journey Analytics”). Table 1 summarizes the key challenges that I&O leaders face and the solutions to optimizing end-user experience as more of their applications and infrastructure become distributed and cloud-based, which introduces control and visibility gaps.
### Table 1. I&O Challenges and Benefits of DEM

<table>
<thead>
<tr>
<th>Challenges</th>
<th>DEM Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimization of the end user’s digital experience of application availability and performance</td>
<td>Takes a user-centric approach to application performance monitoring, capturing the last mile of all application transactions</td>
</tr>
<tr>
<td>Cloud-induced performance visibility gaps due to loss of control of technology stack</td>
<td>Focuses on SLAs and SLOs rather than only monitoring the internals of applications and underlying systems</td>
</tr>
<tr>
<td>Remote user experience</td>
<td>Device-centric approach helps to detect where in the system performance is affected</td>
</tr>
<tr>
<td>Improving internal user productivity and satisfaction</td>
<td>Employee engagement is improved by capturing employee sentiment, scoring performance and automated remediation</td>
</tr>
<tr>
<td>Impact of poor end-user experience on business performance</td>
<td>Takes a top-down and outside-in approach to analyze business customer journeys, relating digital experience to business objectives</td>
</tr>
<tr>
<td>A cross-domain monitoring strategy</td>
<td>Complements APM, NPMD, ITIM and other areas of IT monitoring</td>
</tr>
</tbody>
</table>

Source: Gartner (September 2019)

IT monitoring, which traditionally focused on collecting data from a single application using domain-specific tools, is becoming more comprehensive. IT incorporates on-premises, cloud, different types of endpoint devices and proactively tests user transactions in order to improve the end-user experience. Organizations must treat DEM as a key component of a holistic IT monitoring strategy that spans from the infrastructure supporting applications and business processes to end-user experience, as shown in Figure 2.
DEM technologies include the following:

- Real user monitoring (RUM) or browser telemetry (using JavaScript injection)
- Synthetic transaction monitoring (STM) for both web- and mobile-based end users
- Synthetic transaction monitoring for applications and network path analysis
- Endpoint monitoring agent (mobile, desktop, tablet, IoT)
- APM agents and NPMD probes
Market Direction

Modern application architectures are becoming more modular, dynamic and distributed across hybrid infrastructures, with components that increasingly are not owned by organizations. The number of points of failures due to shifting application and services boundaries necessitates new approaches to monitoring the experience of users as they interact with an organization's products and services. I&O leaders are used to having full control of their technology stacks where they can instrument the environment to obtain detailed insight into its availability and performance.

As businesses adopt commercial cloud stacks to run applications, I&O leaders are becoming blindsided because of the lack of control and visibility this creates. This is especially the case with SaaS applications, where monitoring teams have no visibility into the infrastructure layer and cannot instrument the application (see Figure 3). User experience expectations are rising along their use of digital solutions, making monitoring of their experience, as measured through their use of applications, all the more important.

![Visibility Gaps Created by Changing of Technology Ownership](image)

Based on Gartner’s infrastructure software forecast, we estimate that enterprises will spend approximately $650 million to $850 million on DEM tools as part of IT performance analysis in 2019, with a five-year CAGR of more than 10% (see the Evidence section). Given the intersecting nature of DEM with web and mobile analytics and digital experience platforms, spending on such technologies could be even higher (see “Market Share: All Software Markets, Worldwide, 2018”), as there are distinct areas of organizations that drive investments in these initiatives.

While DEM and web and mobile analytics all analyze website performance, web and mobile may look at the marketing aspects of the website. DEM, on the other hand, is focused on understanding user experience through the interaction with applications and will be used in conjunction with the internals of application performance. DEM is typically used by I&O teams while web and mobile analytics is used by business areas such as marketing operations, business analysts and product owners.

While the move toward cloud and mobile-based applications is certainly driving the need for change in how IT organizations monitor performance (see “How to React to the Impact of the Cloud on IT
Operations Monitoring”), it is by no means the only driver in measuring digital experience. Gartner sees two additional drivers that should be the focus of I&O teams:

- The lack of SaaS providers’ experience monitoring their own services, which often leaves customers in the dark and can put the organization’s business at risk.
- The realization that user experience is not just concerned with the organization’s external customers, but equally important is the productivity and effectiveness of employees and other internal stakeholders. DEM technologies offer a unique way to help both employee experience and customer experience.

The demand for IT monitoring tools is expected to grow at 9% CAGR through 2023. Gartner end-user inquiry data shows that interest by organizations for DEM products and technologies continues to increase, and a review of end-user purchasing data also shows that up to a quarter of APM spending is concerned with DEM (see the Evidence section). This makes sense, since tracking the performance of applications, infrastructure and all of the other components is important, but does not provide the ultimate outcome that the business is looking for: the impact on the user and business. There are also distinct but related user experience monitoring markets, with buyers looking to add best-of-breed synthetic monitoring, web, mobile, customer, application and network to augment existing toolsets (see “Market Guide for Web and Mobile App Analytics”).

Market Analysis

Implementing DEM will often depend on the part of the organization that is driving the performance improvement initiatives. This could be IT, both for external end users as well as internal employees, or the business (usually to measure external end users), which may have a different intended goal, such as to optimize the performance of applications, optimize user experience, or drive revenue or brand recognition.

DEM tools are designed and optimized to work with web applications. However, thick-client applications, often used internally and, in some cases, for critical use cases, present a challenge in terms of monitoring their performance and the impact on the user experience. For such use cases, endpoint monitoring can be used to measure the latency of network and API calls, as well as resource consumption on the endpoint as a means of inferring whether there is a performance issue. This last approach is particularly applicable to monitoring the internal user experience.

Organizations should deploy DEM not only to prioritize performance problems that have the greatest impact on users, but also to optimize their experience. This is done through the analysis of errors or slow performance in applications as well as through funnel analysis, conversion rates and lost orders. Understanding customer journeys and business relevance can be accelerated by using more of what you already have, by implementing real user monitoring (RUM) to capture immediate insight into the users’ experience, utilizing applications.

Organizations should publish the data that RUM provides, including customer engagement, application usage, click-throughs, and positive or negative experience, using measurements such as Apdex ratings, errors and performance metrics. The information could be grouped by
application, geographic location, business units and other groupings that align with organizational structure. This provides application owners, line-of-business leaders and the office of the CIO with access to this information via self-service querying or curated dashboards (see “Broaden Application Performance Monitoring to Support Digital Business Transformation”).

The approaches to DEM often utilize a single DEM technology, but sometimes involve a combination of DEM technologies. Each technology and approach has its benefits and challenges, as shown below.

Common DEM Approaches

**Endpoint monitoring** instrumentation via agents to understand the performance of applications from the perspective of the end user on a mobile device or desktop/laptop (including VDI support).

- **Benefits:** Helps I&O teams monitor performance issues for distributed environments, particularly with remote workers, for whom the isolation of bottlenecks may not be simple to identify and configuration changes may have occurred.
- **Challenges:** Requires deploying and managing agents running on a potentially large number of devices. Sending data across large and distributed geographies may present latency and financial investments.

**Real user monitoring,** including JavaScript that is injected into web applications to collect data such as application response time, latency and errors, or alternatively via plug-ins when HTML is not accessible.

- **Benefits:** Provides real-time performance visibility of web-based applications from the perspective of the end-user.
- **Challenges:** Not always practical for SaaS applications because of the inaccessibility of the application’s html, where instrumentation is inserted. However, alternative approaches using browser plug-ins can be utilized.

**Synthetic transaction monitoring** (STM) uses synthetic transaction execution records to simulate user interactions with applications, and can leverage RUM data to create most natural conditions.

- **Benefits:** Proactive monitoring of services, particularly suited for SaaS applications that provide very little insight into the availability and performance of the services.
- **Challenges:** Must create and maintain scripts (using recorders or other people’s scripts), which can be limited in scope because they are created by IT practitioners who may not fully understand the use case of the applications and all the possible navigation paths. Tracks only transactions as defined by scripts.

**Network analysis** of packet of raw data delivers insight into application response times and user experience.

- **Benefits:** When coupled with deep packet inspection, passive packet-based techniques help to understand user experience by providing rich information about user behavior.
Challenges: Access to packet data continues to get more difficult, and the challenges can sometimes outweigh the benefits. These tools need to support the decoders to understand the applications being monitored, which is only common for web-based applications.

**Synthetic network path monitoring (internet)** builds a model of interactions across the internet including TCP, BGP, DNS and authorization interactions to detect deviations from that model.

- Benefits: This can isolate SaaS application issues. It can leverage aggregated data from multiple users across the globe.
- Challenges: It is not effective at determining a root cause of issues inside the application.

**Screen capture and session replay** records user interactions with applications to view, replay and correlate with performance metrics.

- Benefits: Ability to see what users actually did and where they may have encountered application issues.
- Challenges: Adds to the cost of monitoring deployment. It can generate lots of data. I&O is typically not well suited for this use case, and it may compromise user data privacy.

Organizations face a number of choices when it comes to monitoring products, with I&O teams having several dozen monitoring tools in place (see the Evidence section). It is no surprise then that point solutions are often purchased to solve specific needs, such as running synthetic transactions to proactively monitor the availability of applications and services.

**Individual monitoring needs should not be addressed in isolation, rather as part of a comprehensive monitoring strategy.**

Organizations should use STM, RUM and, to the extent possible, endpoint monitoring for basic DEM. For use cases that involve complex environments where there are multiple components that can impact user experience, it may be necessary to deploy other monitoring technologies, which track the availability and performance all the way down to the infrastructure level, in order to have complete visibility. For internal applications that are not top tier and the cost of agent instrumentation is high relative to the benefit obtained from monitoring it, a comprehensive monitoring approach using multiple technologies may not be warranted.

**Representative Vendors**

The vendors listed in this Market Guide do not imply an exhaustive list. This section is intended to provide more understanding of the market and its offerings.
Market Introduction

There are many providers of DEM, with capabilities and approaches depending on their core or primary focus in the market. Some may offer point solutions focused on synthetic transactions, and others may offer DEM as part of an APM suite, as shown in Table 1. We grouped the vendors into four categories — Synthetic Transactions (Layer 7 Applications), Synthetic Transactions (Layer 3 Network), Endpoint Agent Monitoring and APM-Centric — although they may have capabilities in multiple categories.
## Table 2. Representative Vendors Digital Experience Monitoring (DEM) by Primary Function

<table>
<thead>
<tr>
<th>Category</th>
<th>Vendor</th>
<th>Product, Service or Solution Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthetic Transactions (Layer 7 Applications)</td>
<td>Apica</td>
<td>Apica Synthetic</td>
</tr>
<tr>
<td></td>
<td>Catchpoint Systems</td>
<td>Synthetic Monitoring, Real User Monitoring, Internet Intelligence, DEX Sonar, Managed Monitoring</td>
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<tr>
<td></td>
<td>ENow</td>
<td>End User Experience Monitoring, Office 365 Monitoring &amp; Reporting</td>
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<tr>
<td></td>
<td>GSX</td>
<td>GSX Gizmo for Office 365 Monitoring</td>
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<tr>
<td></td>
<td>Datadog</td>
<td>Datadog Synthetics</td>
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<tr>
<td></td>
<td>eGInnovations</td>
<td>Synthetic Monitoring, Real User Monitoring</td>
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<tr>
<td></td>
<td>ITRS Group</td>
<td>ITRS Synthetic Monitoring</td>
</tr>
<tr>
<td></td>
<td>Rigor</td>
<td>User Experience</td>
</tr>
<tr>
<td>Synthetic Transactions (Layer 3 Network)</td>
<td>AppNeta</td>
<td>AppNeta</td>
</tr>
<tr>
<td></td>
<td>ThousandEyes</td>
<td>ThousandEyes</td>
</tr>
<tr>
<td>Endpoint Agent Monitoring</td>
<td>Lakeside Software</td>
<td>SysTrack</td>
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<tr>
<td></td>
<td>Liquidware</td>
<td>Stratusphere UX</td>
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<tr>
<td></td>
<td>Nexthink</td>
<td>Digital Employee Experience</td>
</tr>
<tr>
<td>APM-Centric</td>
<td>AppDynamics</td>
<td>End User Monitoring: Browser RUM, Mobile RUM, Browser Synthetic Monitoring, IoT Monitoring</td>
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<tr>
<td></td>
<td>Broadcom</td>
<td>DX App Experience Analytics, DX App Synthetic Monitor</td>
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<tr>
<td></td>
<td>Dynatrace</td>
<td>Synthetic Monitoring, Real User Monitoring, Session Replay, RUM for SaaS Vendors, Mobile App Monitoring</td>
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<tr>
<td></td>
<td>IBM</td>
<td>IBM Cloud Application Performance Management</td>
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<tr>
<td></td>
<td>ManageEngine (Site24x7)</td>
<td>Real User Monitoring, Website Monitoring</td>
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<tr>
<td></td>
<td>Micro Focus</td>
<td>Micro Focus AppPulse Active, Micro Focus AppPulse Mobile, Micro Focus AppPulse Web</td>
</tr>
</tbody>
</table>
## Market Recommendations

Organizations should integrate end-user monitoring into the overall IT monitoring strategy. While it is important to understand how an application is performing from the perspective of the code and how infrastructure components affect it, it is equally important to closely monitor how application performance impacts the end-user experience.

When evaluating tools and technologies for DEM, consider the following factors that could drive your decision making:

- Type of application (internally developed, SaaS, thick client, VDI, etc.)
- Location of application and workload
- Number, location and type of users accessing applications
- Criticality of the application
- Monitoring strategy in place
- Monitoring tools and technologies in place
- The impact of customer satisfaction on business KPIs as they interact with applications
- The cost of outages or downtime to the business

As part of the evaluation exercise, I&O teams charged with monitoring applications need to:

- Work with the business and application owners to map their business (employees and customers) needs and requirements to technology KPIs. This will prevent the use of metrics that are misaligned with business KPIs (see “I&O Leaders Must Use Monitoring Metrics to Optimize Customer Experience”).

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### Category

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<tr>
<td>Microsoft</td>
<td>Azure Monitor</td>
</tr>
<tr>
<td>New Relic</td>
<td>New Relic Browser, New Relic Mobile, New Relic Synthetics</td>
</tr>
<tr>
<td>OneAPM</td>
<td>OneAPM Browser Insight, OneAPM Mobile Insight</td>
</tr>
<tr>
<td>Oracle</td>
<td>Oracle Management Cloud End User Experience</td>
</tr>
<tr>
<td>Riverbed</td>
<td>SteelCentral Aternity, SteelCentral AppResponse, SteelCentral AppInternals</td>
</tr>
<tr>
<td>Solarwinds</td>
<td>Solarwinds Pingdom, Solarwinds Web Performance Monitor</td>
</tr>
<tr>
<td>Tingyun</td>
<td>Tingyun App, Tingyun Browser, Tingyun Sense</td>
</tr>
</tbody>
</table>

Source: Gartner (September 2019)
Inventory tools and approaches the business units are utilizing, as it is very likely they have deployed web and mobile app analytics that help them address many of the same issues that I&O is concerned with, such as user behavior analysis, anomaly detection, business flows, user segmentation, funnel analysis and event tracking (see “Market Guide for Web and Mobile App Analytics”).

Monitor remote internal users by deploying endpoint agents, carefully considering the implications of the increased deployment, management and tracking of a potentially large set of agents and the associated data generated and transmitted for analysis.

Deploy DEM tools and technologies as part of a holistic IT monitoring strategy that spans from the infrastructure supporting applications and business processes to end-user experience.

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

“Broaden Application Performance Monitoring to Support Digital Business Transformation”

“I&O Leaders Must Use Monitoring Metrics to Optimize Customer Experience”

“Deliver Cross-Domain Analysis and Visibility With AIOps and Digital Experience Monitoring”

“Innovation Insight for Digital Experience Monitoring”

“Hype Cycle for the Digital Workplace, 2019”

“Market Guide for Customer Journey Analytics”

“Market Guide for Web and Mobile App Analytics”

Evidence

“Forecast: Infrastructure Software Markets, Worldwide, 2017-2023, 2Q19 Update” shows the continued growth in the IT performance analysis market, which includes technologies like DEM that are counted under the APM market segment.

We have seen a steady rise in demand for information about DEM topics, including STM, RUM, endpoint monitoring as well as how such tools and technologies form part of APM and other monitoring suites. The recent and very public internet outages of cloud services such as the Facebook outage on 13 March 2019 and Google on 2 June 2019 also drive interest and demand for tools to monitor third-party services. Gartner client engagement data shows a threefold increase in inquiry regarding DEM from 2017 to 2018, with another 1.5X increase in the first six months of 2019 relative to the same period.

Based on a review of contracts and pricing proposals over the past 12 months, we have observed an increase in DEM products and technologies as part of the expanding offerings of monitoring
vendors, in particular APM providers. At the same time, DEM point solutions offerings are also increasing, as evidenced by inquiry and contracts and pricing proposals we reviewed.

A poll conducted during the session titled “Optimizing Your IT Monitoring Strategy in an Evolving Vendor Landscape” in December 2018 at our Infrastructure, Operations and Cloud Strategies Conference showed that 36% of 225 respondents have more than 30 IT monitoring tools in use.

**Note 1  Representative Vendor Selection**

The vendors listed in this report represent a sample of core DEM providers that have one or several capabilities as outlined in the Market Analysis section of the report.

**Note 2  Gartner’s Initial Market Coverage**

This Market Guide provides Gartner’s initial coverage of the market and focuses on the market definition, rationale for the market and market dynamics.