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Digital user experience management: Solution guide

Topics

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Introduction

A good digital user experience is more than on-screen elements and simplified workflows. It is an ideal state that every digital company strives to achieve through comprehensive visibility into their tech stack. Only this approach will ensure that the user enjoys the best availability, performance, and security of applications over the Internet.

In today's online-first, mobile-first, app-centric, and SaaS-focused world, delivering the best user experience for your customers in your digital businesses is a non-negotiable. When recurrent glitches, crashes, and sub-optimal speeds happen, users are easily tempted to click a few buttons and switch to your competitor. They seldom return to your website. Since it is a herculean task to acquire new users through marketing, it is wise to retain your current user base by ensuring they receive the best user experience.

There is only one surefire way to ensure the best digital user experience: gain comprehensive and constant visibility into all layers of the tech stack. Users only see the user interface, although there can be disruptions at any point in the multi-layered, complex tech stack, and glitches will ultimately affect the digital delivery chain.

Businesses need to rigorously monitor all their applications from the user's perspective to reduce complexities in the digital delivery chain. This calls for a comprehensive strategy to monitor all the vital statistics from the end-user point of view, and understand their pain points from as many locations, devices, and user conditions as possible.

With empathy and foresight, a winning strategy for good digital user experience monitoring combines insights from both internal and external viewpoints. In other words, a combined monitoring approach of the actual, i.e., real user monitoring (RUM) and an empathetic simulation of user behavior through synthetic monitoring provides complete insights into the end-user experience for all digital businesses.

In this e-book, we'll look into the three major aspects of digital user experience, the challenges involved in achieving them, evaluate a two-pronged strategy of combining RUM and synthetic monitoring to deliver the best user experience worldwide, and present the best practices for setting up comprehensive dashboards to gain complete visibility into the end-user experience 24x7.

What is a good digital user experience?

A digital user experience is defined as the collective end-user experience of using a web or computer application. It extends beyond the scope of web designers and content managers, and it ties together multiple layers of complexities and uncertainties that deliver content and enable services.

At its core, digital user experience involves three aspects: availability, performance, and security.

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Availability

Availability involves ensuring the uptime of your web assets whenever and wherever the user wants it, and from whatever device or browser

No web app is an island. An ultimate user experience can only be ensured when all components work as expected. Beyond the traditional application delivery infrastructure, the web application delivery chain should also ensure the best integration and monitoring of third-party services, such as payment gateways.

Downtime could be caused by various reasons, ranging from website server crashes, ISP downtime issues, regional network issues, data center issues, or even distributeddenial-of-service (DDoS) attacks. Therefore, it is vital to have a robust monitoring tool with centralized dashboards to spot errors, swiftly drill down on the root cause, troubleshoot, and fix them. Also, you can ensure transparency and drive trust for the brand on hosted status pages that detect any downtime and its seriousness and convey details to your user base.

Performance

Just as a chain is as strong as its weakest link, the performance of any application is determined by how individual blocks that constitute the digital delivery value chain function, individually and collectively. When devising a monitoring strategy for performance assurance, look into all the performative factors contributing to the end-user experience, and fix the lags.

Performance factors involve narrowing the gap between the actual and perceived speed of loading different parts of the web application, high usability, smoothness, and reflexes to deliver content within expected time frames with minimal latency.

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Application performance monitoring covers all three pillars of observability: gauge performance metrics, perform an in-depth analysis of logging, and trace the location of errors or lags to improve the end-user experience continuously.

Security

Security monitoring is the invisible cloak protecting a web application from breaches and attacks.

Ensuring security throughout the digital delivery chain involves strict access control and constant monitoring of breaches, such as defacement, and proactively monitoring the security certificates, such as TLS, to deter intrusions, data theft, and other serious breaches security lapses.

Business challenges

Availability

Numerous business challenges affect your web application's availability. Here are the top factors:

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Datacenter outages

Datacenter outages are major issues that halt service for a user, and often produce a loss of business and a negative customer service experience. Discounting planned outages that could be communicated through a hosted status page, unforeseen data center outages are often serious, and could result from glitches in bare-metal or cloud connectivity, cybercrime, or human errors.

Monitoring systems that measure energy consumption patterns and the related facility infrastructure, such as storage, network switches, and servers, are essential to detect and respond to any glitches in the data flow.

ISP and connectivity issues

Internet service providers (ISPs) provide the systems that serve as gateways to the internet. Any latency in the myriad links in the transit of data from the server to the client greatly depends on ISPs and other transit providers.

Also, errors like latency failing to meet the service-level agreements (SLAs) impact the digital end-user experience. Latency monitoring solutions help monitor these vitals from multiple locations, visualize the entire network route and trace the links to spot, analyze, and fix the issues proactively. ISP issues, such as latency, are specific to regions and can be missed if not monitored from outside the data center.

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DNS issues

DNS is the internet's phone book that is both a system and a protocol. It is also the most vulnerable, first point of entry for attackers. Thus, DNS requires constant attention from IT teams to ward off attacks.

Some of them include cache poisoning, zero-day vulnerabilities, DNStunneling, and misconfiguration of records. DNS monitoring tools constantly check the availability and response time of a site's DNS server from multiple global locations and alert teams to remedy the issue with DNS providers.

Performance

There are many business challenges to web performance, and these can relate to the digital delivery chain. Let's discuss the top factors.

Resource optimization

When a website heavy with code and content loads slowly, users often become annoyed. Some simply stop viewing the webpage altogether. To alleviate this problem, each resource's load time should be monitored from multiple locations to identify the items that prompt a lag in the load time. Actions can then be taken to resolve the issue and ensure a better user experience.

A dashboard that displays granular details of the media loading timesprovides instant clarity and helps ensure the best resource optimization.

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Content delivery networks (CDN)

CDNs are a web of geographically distributed data servers that provide faster and more efficient delivery of content to users across geographies, reduce latency, and ensure reliable performance.

CDNs are prone to DDoS and other types of cyberattacks that render apps unreachable to the end-user. CDNs can also experience cache misses and connectivity problems that slow down websites and applications. CDNs need constant monitoring from multiple locations to detect latencies and attacks, and remedy and restore regular service.

Security

Here is a roundup of the major security monitor essentials to provide a secure digital end-user experience.

Blocklists

Unmaintained and infected web applications and sites are flagged and blocklisted bybrowsers to disallow access and ensure user safety.Websites and applications with performance problems often directly impact the user experience, resulting in lower search rankings and negative financial implications for the organization.

By monitoring hostnames or IP addresses against internationally important DNS-based blocklists, IT managers can be assured that if a website is negatively impacted, remedial steps will be taken promptly to resolve issues.

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Website defacement

Website defacement, or digital vandalism, costs more than money. It dents business reputations and customer trust. Phishing attacks manipulate anchor or iframe source tags, and redirect users to illegitimate sites. Site24x7's detection helps flag any abnormal behavior that alerts IT teams to perform prompt repair actions. Site24x7's Defacement checks ensure the integrity of web elements by auto-fetching top webpages that are baselined for dynamic content comparison with thresholds.

Preventing website defacement attempts requires a proactive strategy that involves continuous monitoring routines to proactively identify and fix issues before customers are impacted. A defacement monitoring system also helps spot security breaches and alerts key users to expedite fixes before they hit the news wires. With a well-thought-out website defacement monitor strategy, teams can easily set the baselines to compare the website for any defacement at the code level, and implement actions to automatically revert webpages to their original states before users view any issues.

Certificates expiry

While in transit, data without encryption is often a recipe for a security disaster. Secure sockets layer (SSL), and its improved version, transport layer security (TLS), enables data transport safety between the server and the client through encryption. The process is crucial for providing a safe zone for the end-user, and more so when monetary transactions are involved. Often, web admins fail to renew their SSL certificates, and risk having their websites blocked, or blocklisted, a process also sometimes termed blacklisting.

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Today, user awareness about security certificates has increased, leaving absolutely no room for a lapse. Setting up a monitor to alert for expired security certificates ensures all data remains safe. This provides a continuum of trust among the user base, and helps the organization retain its business reputation.

Solution: Merge synthetic monitoring and RUM

A solution is a conscious approach to merging the best aspects of synthetic monitoring and RUM to ensure an excellent digital end-user experience. Two approaches are explained through use cases that highlight the benefits, drawbacks, and unique selling propositions (USPs), and how these approaches complement each other in increasing observability.

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Synthetic Monitoring

(?) What is synthetic monitoring?

Synthetic monitoring is the process of constantly simulating user behavior on web applications to ensure that all core functions perform as expected. It helps replay the sequence of events and visualize the user experience in different ways, including analyzing the time taken for elements to load and execute.

The user paths are charted and simulated by running scripted interactions against web applications to record and ensure the proper functioning of core flows in the code. Synthetic monitoring simulates the sequence of user actions by running automated scripts from across the globe. This is not restricted to webpages, and extends to cover the whole stack, such as application program interfaces (APIs) and external applications, and third-party software that a business relies on.

Synthetic monitoring has merged user interface design with humanpsychology and has evolved from being just uptime simulators to assuming a vital position in digital user experience monitoring.

In a world where the performance and availability of an application affect more than just profits, synthetic monitoring has become crucial in simulating user behavior in a multitude of applications from as many points of view as possible. Global locations across different time zones that depend on different points in the global internet backbone, devices and software applications of choice, network access points, IT restrictions such as firewalls, and third-party integrations should collectively work together to produce an optimal experience for the end-user.

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Who uses synthetic monitoring?

↘ IT teams use synthetic monitoring to identify availability and performance issues while accessing the web application, regionally or globally, even within firewalls.

↘ It fits small and large companies who run applications that range from payment gateways to complex orchestrations involving third-party services through APIs.

Why use synthetic monitoring?

↘ Synthetic monitoring helps IT teams gain complete visibility into webpage speed and load times, application availability and performance, and internet backbone services such as DNS, APIs, third-party integrations, and user flows.

↘ Synthetic monitoring helps set expected performance metrics and track them, and when things go wrong, get to the repair mode soon. This directly reduces the MTTR.

↘ Cost-effective, reliable, and more immediate than real user monitoring (RUM), synthetic monitoring provides a ringside view that is dynamic and insightful, and helps businesses know their flaws before they can impact users.

↘ Be it websites, API calls, or infrastructure parts, such as DNS servers, SSL certificates, or even WebSocket endpoints, synthetic monitoring can reproduce user behavior in a controlled fashion, and run it perpetually to give IT managers a ring of assurance from a central dashboard.

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- An important benefit of synthetic monitoring is that its metrics help measure SLAs.

- Synthetics also help benchmark services, pit them against those offered by the competition, and continually improve the company's continuous integration/ continuous delivery strategy.

- Performance issues can occur anywhere, anytime, and on any chain in the complex architecture involved in a SaaS application. There are hundreds of device types, thousands of networks, and millions of endpoints, but one goal for an IT operations manager: to achieve the best uptime and functionality for users. Not only does synthetic monitoring help administrators be aware of where, when, and how issues happen, but it also equips them with insights to zero in, isolate, and fix the issue to get the business back up again.

Drawbacks of synthetic monitoring

- It is not possible to predict extensively and check every move from the user.

- If not performed correctly, synthetic monitoring will incur high costs due to the relentless repetition of actions that require computing resources, including money.

- Synthetic monitoring needs trained hands for troubleshooting, as there is a glut of data requiring keen analytical skills.

- There is numerous noise generated by synthetic monitoring, which adds an unnecessary bulk of data, which is unavoidable in the whole scheme.

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USP of synthetic monitoring

↘ Synthetic monitoring enables predictive analysis. Synthetics can easily fix nearly 90% of persistent issues with minimal trial and error by identifying the root cause.

↘ Synthetic monitors are like on-site reporters. They go where applications go and simulate the experience from locations where customers access them to validate them, be it geographical location setups, or using an on-premises agent.

↘ Synthetic monitoring is a part of site reliability engineering. When companies run time-critical and mission-critical applications with unusual surges of activity, such as e-commerce sale events, ticket booking windows, or tax filings, synthetics can perform continuous testing. This ensures an optimal performance when it matters through the testing of all processes involved, layer by layer.

↘ Synthetic monitoring is centered on the end-user. Strong empathy wins in synthetic monitoring design, as it can truly put an IT team in the shoes of an end-user to catch errors before the user does, thus serving as a watchtower, safety net, and alarm system.

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Real User Monitoring

? What is real user monitoring?

As its name suggests, RUM measures actual digital end-user experience on-site as and when it happens by including JavaScript blocks in the web application that track and relay vital statistics about user experience.

Over time, RUM collects sufficient insightful data to tell you exactly where most errors occur and help correct your deployment at a strategic level. Granular, contextual, and precise, RUM is a passive listening mode of monitoring (versus an active mode of synthetics) that helps in root cause analysis.

RUM offers a broader perspective from close quarters of the customer and provides IT teams with insights into the user experience, with metrics such as time spent on pages, errors encountered, and malfunctioning elements such as third-party calls.

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Who uses RUM?
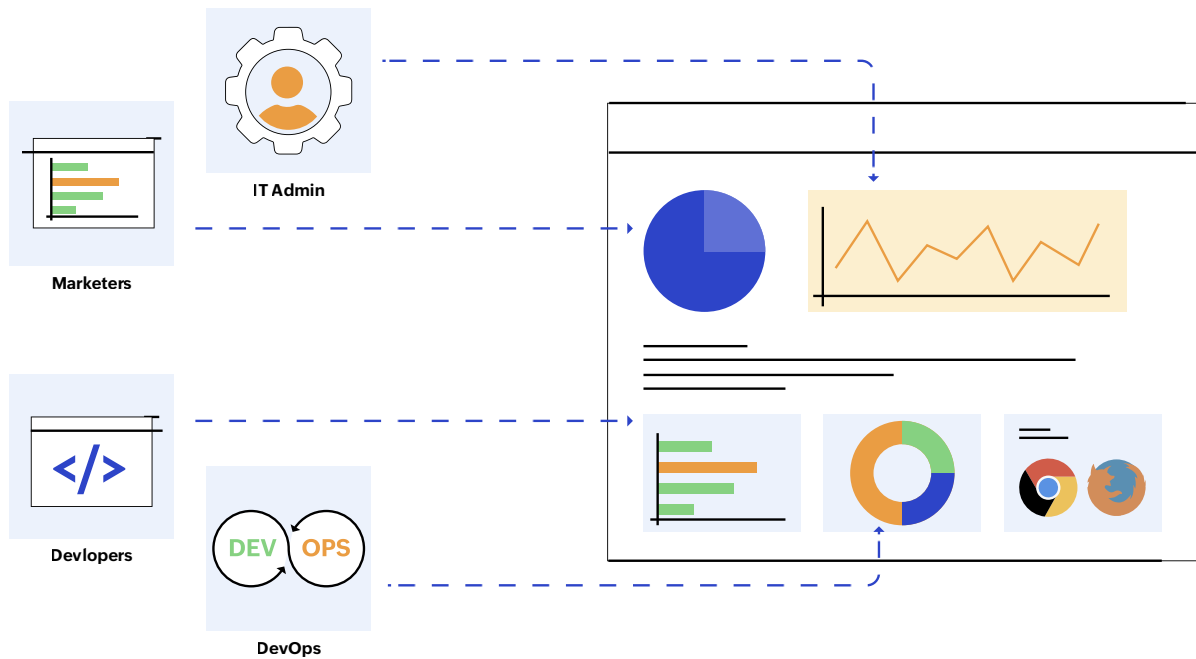
↘ **Developers:** to acquire granular insights during the build phase and correct them before shipping, and course-correct them later.

↘ **DevOps:** to evaluate how their infrastructure is functioning and find the root cause of why a certain factor such as ISP or CDN issue could have been a reason for a glitch. For example, a RUM traceroute helps identify the path taken by a web application to the delivery site, like an elaborate road map plot.

↘ **IT administrators:** to maintain dashboards, monitor vital user experience metrics, spot incidents and emerging bottlenecks, and alert the management.

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? Why use RUM?

↘ RUM gathers user data in various environments, such as the page load speed, network bandwidth and how the elements on a page react to it, and the several variables in the user device and behavior.

↘ RUM data is granular and is specific to unique, subjective, and specific variations arising from user behavior, application version, location of access, device and operating system, browser choice, and network type.

↘ RUM provides an accurate, comprehensive, behind-the-scenes view into the problems afflicting real users.

↘ IT teams can build a three-point user experience dashboard to evaluate satisfaction levels and work to optimize their technology stack to bring the best possible experience.

↘ RUM can configure customized JavaScript variables that help track and collect custom application-specific data.

↘ RUM monitors the user experience on a live relay, serving as a bellwether to the current service state.

↘ RUM can capture screenshots or screen recordings of real experiences to detect the same anomalies and drill down on the causes.

↘ RUM helps correlate user engagement and benchmark key business performance indicators against application performance.

↘ RUM can calculate granular engagement metrics to gauge business progress, including click conversion ratios.

↘ RUM uses long-term data to forecast business outcomes and prepare for contingencies.

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Drawbacks of RUM

↘ RUM is virtually pointless before an application goes live to the real end-user population.

↘ RUM generates all types of data, including noise, that requires qualified and competent teams to weed out what is irrelevant by gleaning actionable insights.

↘ RUM is not so effective in monitoring small and niche applications, and it yields better results only after long-term usage.

USP of RUM

↘ Understand how actual customers experience your application in real time.

↘ Understand the application performance across differentgeographic locations in real time.

↘ Identify front-end performance impact on your end-users.

↘ Identify intermittent issues or errors that occur for specific user conditions.

↘ Spot JavaScript errors before end users complain.

↘ Measure the real-world experience for your website and single-page applications.

↘ Capture high-resolution times for page loads. Analyze statistics by dimensions like geography, browser, or device to identify whether you deliver a consistent experience.

↘ Monitor performance data for interactions that lead to a view change and all the AJAX requests for single-page applications. Upload source maps and troubleshoot JavaScript errors using stack trace details.

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Merging Insights from synthetic monitoring and RUM

Here are the advantages of combining insights from synthetic monitoring with RUM:

↘ Precisely analyze and establish how web performance metrics directly affect a company's revenue, such as correlating conversion rates from RUM with synthetic metrics for deeper analysis of where the buck stops.

↘ Up the proactive game a notch further by identifying any cyclical patterns that depend on the geographical spread and complexities of the internet and the many uncertainties, such as latency, cloud glitches, or regional configuration issues, especially during peak hours such as e-commerce sale events.

↘ Testing in the staging environment to compensate for the limitations of RUM in pre-production environments, such as during staging. Combining it with synthetic monitoring provides better simulation.

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↘ Troubleshoot easier, fix problems better, document sharper, and make IT teams smarter.

Synthetic monitoring and RUM are not exclusive but complementary, as combined insights from these divergent approaches to monitoring provide unprecedented insights and unparalleled advantages for monitoring teams. They are both endeavors to improve every step of the web application delivery chain. Ensure that your end-user monitoring strategy combines the capabilities of both and even draws from eachother's strengths.

Overall, synthetic monitoring and RUM are divergent, even opposite perspectives that gather insights that enrich user experience. While RUM provides long-term trends with individual pointers of what went wrong, where, and how, synthetic monitoring suits rigorous approaches like regression testing, especially during the developmental stage where there is no user experience to fathom.

The best of both worlds: The winning strategy

Overall, user experience monitoring is a continuous process of ensuring the best end-user experience through optimization of all the background applications and computing processes to deliver a constantly seamless front-end experience. Digital user experience ties together all the complex ends that require the best upkeep of application components, APIs, networks, data storage and orchestration, and computing resources.

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User experience directly correlates with brand reputation and the ultimate success of any business that has a digital front-end. Combining the powers of RUM and synthetic monitoring gives you the twin-edge of comprehensive observability by being the first to know how your customer experiences your services.

Also, in this process, full-stack AI-powered monitoring solutions such as Site24x7 help take stock of every observable component of a digital business, always stay alert, and remedy issues and outages by being proactive and intelligent with the help of AI-led insights.

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How to set up complete digital monitoring with Site24x7: Best practices

To ensure the best digital user experience, IT teams should set up a holistic digital monitoring strategy. With a full-stack AI-powered cloud monitoring solution such as Site24x7, teams can set up a comprehensive list of monitors across availability, performance, and security to gain maximum observability and actionable insights.

In terms of availability, websites can be monitored using Site24x7's website monitoring tool that captures issues proactively from customer vantage points that span more than 130 global locations. The tool monitors website uptime, content validation, and HTTP status check to ensure complete website availability.

A slow webpage is a missed business opportunity, and therefore, having a webpage speed monitor will help analyze web components (page speed insights) that slow your site down to optimize it. Combining insights from synthetic monitoring and RUM, as we have seen earlier, gives continued visibility to ensure speedy redressal for user issues.

End-users experience is also adversely impacted by ISP latency encountered during data transit and the optimum functioning of file and mail transfer protocols.

DNS resolution time is often the reason websites are unreachable. Therefore, it is crucial to keep a tab on the health of the DNS server. Site24x7 helps set up multi-location monitoring for DNS availability and response time.

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In terms of security, Site24x7 offers real time checks for website defacement, also checks your websites against major blocklists to ensure brand reputation, and alerts admins ahead of certificate expiries, such as for domain purchase and SSL/TLS certificates.

To summarize, knowing how different layers of the web infrastructure perform helps set up a monitoring strategy through customizable dashboards and widgets to form a single source of truth. "A distributed system is one in which the failure of a computer you did not even know existed can render your computer unusable." — Leslie Lamport, American computer scientist and an expert on distributed systems.

In a diversified world with microservices, extensive public cloud adoption, and distributed systems, end users are spread across hybrid workforces, connected through various devices, networks, and ISPs.

To cut across these layers, web admins should put themselves in the end user's shoes and connect the dots through comprehensive monitoring to ensure the best digital user experience. Site24x7, with its extensive expertise and exhaustive coverage of the full-stack IT monitoring capabilities, helps set up the optimal digital monitoring strategy.

About Site24x7

Site24x7 offers unified cloud monitoring for DevOps and IT operations. Monitor the experience of real users accessing websites and applications from desktop and mobile devices. In-depth monitoring capabilities enable DevOps teams to monitor and troubleshoot applications, servers and network infrastructure including private and public clouds. End user experience monitoring is done from 100+ locations across the world and various wireless carriers.

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