

IT Operations analytics redefined: uncovering business impact and opportunities with Application Analytics

Harnessing application intelligence to reconcile ever-increasing user expectations and ever-more-complex and dynamic application environments.

The business world is in the midst of a dramatic transformation, and IT is at the center of it. Enterprises increasingly depend on software across all parts of their operations. More and more, businesses don't simply run on software, but are in fact defined by software. Every time we deposit a check using our bank's mobile app, every time we watch a streaming movie on our TV, every time we buy gifts online from our favorite retailer, it's software in action. And that means IT has moved front and center, responsible for the health of operations, and now also holding the keys to a treasure trove of data that can guide not only the smooth functioning of systems and applications, but also the success of the businesses they support.

Unlike previous technology-driven transformations, this is a paradigm shift driven largely by customers, and powered by mobility and the cloud. Never before in the history of IT have customers so leveraged their own technology choices to drive how they engage with the businesses that serve them and the enterprises with which they choose to interact. As consumers, our experience with the Facebooks, Googles, Twitters, and Ubers of the world have raised the bar for performance at scale for all other organizations. End-user expectations have never been higher.

To serve these ever-increasing expectations, today's IT environments are dynamic, complex, and no longer contained within the walls of the enterprise. The rise of cloud computing has scattered IT resources, sometimes around the globe, increasing the complexity and inherent risks of the now-distributed infrastructure. Gluing all this technology together is the API economy, extending the principles of service-oriented architecture to the cloud, mobile devices and applications, and ultimately, to the growing host of connected devices insinuating themselves into every part of daily life.

Simultaneously maintaining control over this complexity and delivering amazing user experiences at the speed of "now" is the crux of the challenge IT faces today.

Application Intelligence to the rescue

To get a grip on what's happening for the end user and throughout their now-highly complex, highly distributed application environments, enterprises and their IT departments are exploring new ways to leverage the operational as well as business data processed by their application ecosystem. By unlocking insights hidden in this data, both IT and business can collaborate to respond to fickle user preferences and deliver winning experiences.

First task at hand is to collect the data itself. Numerous dedicated technologies are used to collect data from machines -- applications, servers, databases, devices, and even wire data flowing through the network. In many cases previously available log files are used, but in other cases, the data collection technology has to understand where to look for the relevant data. But as the number of systems, devices, and networks under management grows, so too do the quantity and variety of log files and other data. Such information is difficult to manage in a fragmented IT organization, and at best provides only static views of increasingly dynamic environments.

In an attempt to consolidate and harvest value from this data, a new discipline has emerged: IT Operations Analytics (ITOA), which Gartner defines as “processes and technologies that support the automated generation of insights from data for IT system behaviors, states, configuration, problems, and incidents.”

Now with the help of ITOA, IT has a greater understanding than ever before about what is happening in its domain. But current generation ITOA still is hamstrung by the fundamental way the data is framed: it still looks at unstructured or machine-generated log data as the primary unit of analytics, when what is more relevant and of value is the user-generated business transaction.

This legacy perspective is not surprising, because it’s typically been an arduous task to parse huge volumes of data to reconstruct the business context. But unless that data is able to answer questions that are relevant to the business — to understand revenue impacts, user behaviors, anomalies that can become opportunities (user tiers, gender, time of day, etc., etc.) — it’s just another set of application performance metrics, the utility of which doesn’t go far past the walls of the IT department.

What ops and business personnel need is a holistic view of all the available management information, so they can effectively correlate application metrics and the operational and business impacts of any issues anywhere in their fragmented production environments. This parsed and consolidated data can be interpreted and used in the decision-making process to give the broader business a substantial competitive advantage over firms that are unable to leverage this critical application insight.

Introducing Application Analytics

AppDynamics has developed a powerful new solution to address this huge data challenge and opportunity through its Application Analytics offering. AppDynamics collects this data from the application and processes it in real-time so organizations can get up to the minute views into the health of the software defined businesses. With Application Analytics, customers can automatically extract the data associated with each transaction flowing through their application and propagate business context without having to worry about coding to logs.

Application Analytics provides insight into business outcomes by combining pattern discovery, root cause analysis of problems, and anomaly detection against ‘in-flight’ transactions. Not only is data collection automated via distributed, code instrumentation agents, but the data processing is fast and scalable, and finally, people can view and take action on the resulting analysis via sophisticated visualization techniques that present information with a business context. Because of this built-in business context, Application Analytics provides high-value information to decision-makers across the organization, pulling together a full spectrum of data ranging from user behaviors and their data, system behaviors, states, and configurations to problems and incidents.

Analytics-ready data sets with built-in business context

Application Analytics runs on the AppDynamics Application Intelligence Platform. This platform focuses on the business transaction as the primary unit of measure — it provides real-time visibility into each user interaction, each click-through from the web tier all the way to the database. This single platform seamlessly connects business and IT priorities with a real-time big data analytics architecture, a key requirement for today's software-driven business. At the core of this platform is AppDynamics' application intelligence technology that automatically records every transaction end-to-end across the entire distributed environment — with low overhead and no custom coding required.

Purchase transactions are among the most obvious and important, but other examples of business transactions include logging into the website or mobile app, signing up for a newsletter, submitting information on a form, or posting via social media. By leveraging the Application Intelligence Platform's ability to automatically discover and group these distributed business transactions, Application Analytics automatically propagates business context without requiring code changes, and maintains it over time even as applications change, saving a huge amount of programming effort and time.

Application Analytics helps illuminate the drivers behind any number, including answers to both business and operations questions — for example: real-time information about behavior of different customer tiers, what purchases customers are making, and how they are combining various technology touchpoints to interact with the enterprise.

Customer use cases

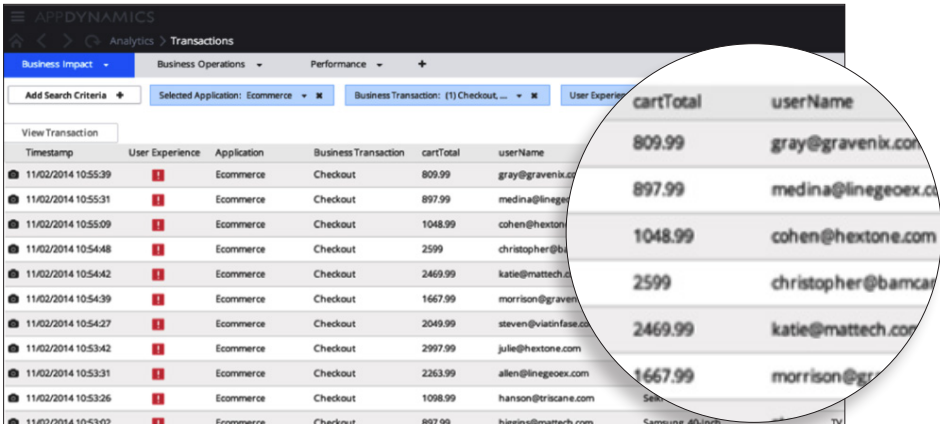
1. Business impact analytics
2. Business operations monitoring
3. Customer analytics
4. Performance analytics
5. SLA management

Customer use cases

AppDynamics customers are using Application Analytics to address a range of business and technical challenges. Here are some examples.

Business impact analytics

In action: The checkout function errored for a large group of customers who had filled their shopping carts — an expensive application failure for any online retailer. With Application Analytics, not only are all the affected customers identified, but the contents of their shopping carts are captured as well. Spreadsheet-friendly reports are generated for the marketing team, who quickly puts together a win-back campaign that puts the items back in the carts, automatically includes a 10% discount, and notifies all the affected customers. A good portion of sales are recovered, and the negative impact of the outage has been mitigated.



Timestamp	User Experience	Application	Business Transaction	cartTotal	userName
11/02/2014 10:55:39	1	Ecommerce	Checkout	809.99	gray@gravenix.com
11/02/2014 10:55:31	1	Ecommerce	Checkout	897.99	medina@linegeoex.com
11/02/2014 10:55:09	1	Ecommerce	Checkout	1048.99	cohen@hextone.com
11/02/2014 10:54:48	1	Ecommerce	Checkout	2599	christopher@bamcar
11/02/2014 10:54:42	1	Ecommerce	Checkout	2469.99	katie@mattech.com
11/02/2014 10:54:39	1	Ecommerce	Checkout	1667.99	morrison@gr
11/02/2014 10:54:27	1	Ecommerce	Checkout	2049.99	steven@vianfasc.com
11/02/2014 10:53:42	1	Ecommerce	Checkout	2997.99	julie@hextone.com
11/02/2014 10:53:31	1	Ecommerce	Checkout	2263.99	allen@linegeoex.com
11/02/2014 10:53:26	1	Ecommerce	Checkout	1098.99	hanson@teriscane.com
11/02/2014 10:53:02	1	Ecommerce	Checkout	897.99	higgins@mattech.com

Perhaps the most important type of question business personnel can ask of IT operations is how a technical problem impacts the business. For example, how much revenue is being lost as the result of a system outage? Which customers were affected by an outage or slowdown?

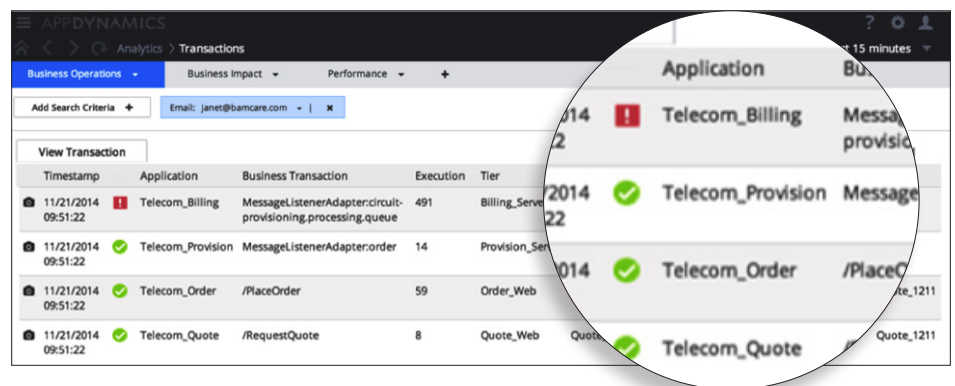
In those situations where there is a complete outage, Application Analytics is able to identify the affected users with incomplete transactions, and then provide information to the marketing team so that they can put a re-engagement plan into effect to assuage and win back disgruntled customers. In such damage control situations, it's important to see details about every error and report back with the information the business needs to recoup lost revenue and goodwill. This type of resolution is not possible with traditional business intelligence that works only off of data stored in the operational database where only completed transactions are recorded. The operational database is unaware of such in-flight transactions; hence the need for a modern, real-time solution.

Customer use cases

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Business operations monitoring

In action: A customer calls into a telecom provider to take advantage of a promotion and order deluxe TV and Internet service. She works out her package with the customer rep, sets up installation, and is told a confirmation email will be sent. Three days later, no email. With Application Analytics, when the new customer calls back in, her order can be found wherever it is in the system using any number of criteria — order number, email address, phone number, etc. The rep can quickly identify where the order stalled and get it back on its way.



Timestamp	Application	Business Transaction	Execution	Tier
11/21/2014 09:51:22	Telecom_Billing	MessageListenerAdapter:circuit-provisioning.processing.queue	491	Billing_Server
11/21/2014 09:51:22	Telecom_Provision	MessageListenerAdapter:order	14	Provision_Server
11/21/2014 09:51:22	Telecom_Order	/PlaceOrder	59	Order_Web
11/21/2014 09:51:22	Telecom_Quote	/RequestQuote	8	Quote_Web

In many organizations, critical business transactions are part of complex business processes that span multiple applications on multiple systems as well as human-powered steps. It is essential for businesses to monitor such processes in-flight to understand where a particular transaction resides and if there is a problem completing any step of the transaction as expected.

Application Analytics enables organizations to find lost or compromised customer requests across the end-to-end transactional environment for even the most complex processes. Sometimes a lost or missing transaction is due to a software bug or infrastructure issue, while in other cases, it could be due to bad data (an incorrect zip code, for example). Application Analytics can differentiate among various causes, empowering customer service or technical support to address the problem with the customer quickly.

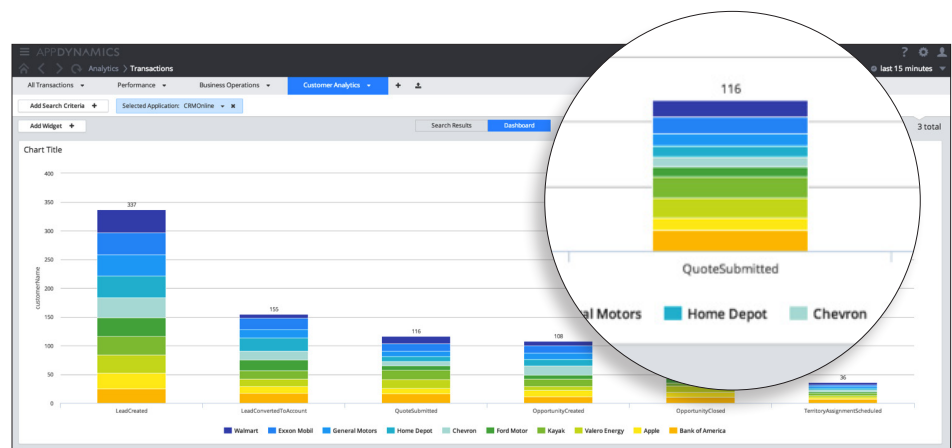
Application Analytics also enables visibility across all business transactions in progress, providing an ordered list of such transactions, as well as other critical operational insight into the health of business operations.

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Customer analytics

In action: At a company offering an online project management system, marketing believes that smaller customers with 25 employees or less are not using the forecasting module because they aren't taking the time to learn it. Through Application Analytics, they identify those small companies who have accessed the forecasting module less than once a week in the past quarter, and target them for a special online training promotion.



Application Analytics provides vital insight into the day-to-day behavior of customers – even when everything is working perfectly. For example, Application Analytics answers questions such as “which customers have used product X the most in the past week?” or “how do conversion rates compare between type X and type Y customers?”

Application Analytics helps business managers understand both aggregate and detailed customer usage patterns, empowering them to make data-driven business decisions. As the business continues to augment and refine the digital experience, such customer visibility becomes critically important for identifying what works well and what doesn't, and why.

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Performance analytics

In action: The marketers at a major e-commerce company have determined that high-value customers with cart averages of \$500+ are absolutely critical to their revenue projections. So it's imperative that those customers have an exceptional experience. With the help of Application Analytics, they are able to separate out those customers, see their experience plotted visually, and zero in on those transactions falling outside the 95th percentile — the slowest 5%, in other words — and proactively troubleshoot and correct those slowdowns to keep them from affecting more customers, thereby protecting the revenue stream from this highly valuable customer segment..



Every digital professional realizes how closely tied technical performance and business performance are in today's customer-driven world. Technology consumers – both at work and elsewhere – expect fast, responsive interactions from all of their technology touchpoints. If your web site or mobile app is a fraction of a second too slow, customers will switch to your competitor and leave you bad reviews to boot.

These stringent customer expectations are why performance analytics is such an important part of the Application Analytics value proposition. Business users, for example, can get answers to questions such as “which transactions were above the 95th percentile response time?” or “which customers were impacted by certain poorly performing transactions?”

For slowdowns, the platform identifies which transactions are affected and enables rapid root cause analysis. In many cases, AppDynamics can also fix the issue automatically, without human intervention.

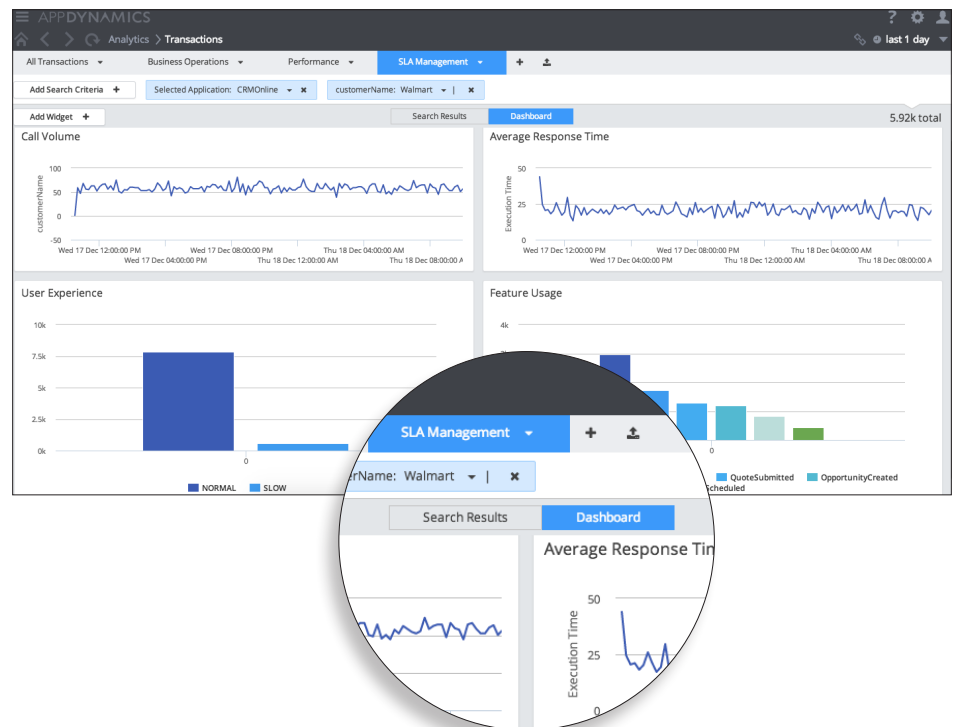
Performance impacts customer behavior at every step of the purchase funnel, from the initial encounter, to search, to shopping cart interactions, to checkout. Substandard performance at any step in this funnel means lost customers and abandoned carts. While retail e-commerce is the most common example, the same principles apply to any business transaction across all industries.

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SLA management

In action: A major financial institution has an agreement with a tier one customer to execute its transactions within certain time constraints. Using Application Analytics, the financial institution's operations team creates a dashboard for the account leader, so she can see that transactions are being completed within the target timeframes and continuously safeguard the customer's experience. Often times, the delays are a result of third-party services that this bank's service relies on. If outlier transactions occur because of external dependencies, the ops team can quickly drill down to see who was impacted, discover root cause, and quickly remediate with the partner, minimizing customer impact.



The final use case for Application Analytics is management of service-level agreements. Whichever side of the the SLA one is on — the enterprise making the performance promise, or the one receiving the guarantee — an SLA is only as good as the collection and reporting of the data that governs it.

It's not untypical for multiple third parties to contribute to a single customer interaction. In these cases, an enterprise will have contracts with those outside parties that include SLAs that specify response times or other requirements for third-party services.

When a third-party service slows down a transaction, all the customer sees is poor performance that is attributed to the primary brand, not the third party. Operations staff must monitor in real-time whether each business partner (or group of business partners) is meeting their SLAs.

Conversely, as in the action example above, an enterprise may have SLAs that they need to honor to protect relationships with key customers and ensure that they are delivering an outstanding experience.

In either case, Application Analytics delivers real-time insight into the performance of business transactions governed by SLAs, so action can be quickly taken when one is undermining overall performance, and reports incidents where performance thresholds have not been met over time, so underlying issues can be addressed.

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AppDynamics – The Leader in Application Intelligence

In today's digital world, the business and technology contexts for business operations increasingly overlap. For the software-driven business, the business context makes IT operations personnel more effective and better aligned with the business. Correspondingly, the IT operations context drives the efficacy, influence, and power of business operations. Application Analytics is designed to deliver the vital real-time business visibility, in context, that empowers both IT and business teams to reach and exceed their performance goals.