In today’s digital era where new technologies are emerging every day, modern applications not only provide value but also round-the-clock availability, fast response, convenience and problem-solving in real time. Since businesses depend on software applications for operations, it is important to them that all these apps run seamlessly. This is where they need to implement **Application Performance Monitoring.**

**What is Application Monitoring?**

Application Monitoring or Application Performance Monitoring is the act of tracking and monitoring application performance and availability along with end-user experience – continuously. The purpose of **application monitoring tools** is to detect issues, troubleshoot anomalies, identify patterns, optimize the usage of resources and collect insights to drive business growth and ensure customer satisfaction.

**Application Performance Monitoring vs. Application Performance Management**

We should not confuse the two Application Performance Monitoring and **Application Performance Management**, since both are abbreviated as APM. However, Application Performance Management is a broader term that covers the management of overall application performance, including code, transaction times, application dependencies and overall user experience.

Performance monitoring, on the other hand, is a small but important part of management, as it identifies a problem in the app. An **application monitoring software** will alert you when your website or app is down or slow, but an application management software will address this problem and let you make changes accordingly.

**Why Application Performance Monitoring Tools are Important?**

When you think of the digital economy, it is crucial for every business to **minimize downtime**, respond quickly and ensure availability at all times. If your application is running slow, you need to find out since when it started running slowly, why is it slow and what is the cause of it.

This was easy back in the days with **conventional monitoring techniques** such as measuring network activity, CPU and disk usage or performing ping tests. But with highly distributed and multi-tier applications today built on multiple frameworks such as Python, PHP and Angular to Node.js and Rails, it gets increasingly difficult without Application Performance Monitoring tools.

When using distributed apps or terminal clients for operating systems such as putty application, traditional techniques are not very helpful in analyzing interdependency of components. **Application event log** and other metrics are located in the cloud, hybrid cloud and beyond. It’s not easy to manually locate them and identify why your application is running slowly.

**How does Application Performance Monitoring Work?**

Let’s look at the steps a generic mobile or **web application monitoring tool** takes:

1. Tracks if your app is behaving according to the normal parameters or not
2. If it’s not, sends alerts and collects data about the source of problem
3. Analyzes the data and considers its impact on the business
4. Offers insight into how you can adjust your app environment to proactively detect similar issues in the future before they can affect the end-users

**What are 5 Core Elements to Monitor?**

The [Application Performance Monitoring Gartner conceptual framework](https://en.wikipedia.org/wiki/File:APM_Conceptual_Framework.jpg) discusses five core aspects of application monitoring for businesses to focus on. These include:

1. **End-User Experience**

**End-User experience monitoring** tracks the behavior of a software application from an end-user’s perspective, and considers the times when a user experiences downtime, slowness or errors in the application. It can be done passively with the help of real-user monitoring or proactively with synthetic monitoring.

1. **Runtime Application Architecture**

This involves **application runtime architecture** modeling, discovery and display. It is done by mapping out all components of the app and analyzing their interaction with each other. In other words, it checks how network topologies interact with application architecture. Presenting data in visual form makes it even easier to detect problems.

1. **Business Transactions**

**Business transaction profiling** checks the flow of each user transaction and separates interactions where a performance issue is detected. This tracing method helps you follow a user’s path from frontend till backend, which makes it easy for developers to find the exact database query, line of code or third-party call that is affecting application performance.

1. **Deep Dive Component Monitoring**

For this element, the application monitoring tools collect performance metrics from each component in the **app infrastructure**. It increases quality of accurate testing and enables better code reviews and resolution. Infrastructure monitoring must be integrated with an Application Performance Monitoring tool for this to work.

1. **Analytics/Reporting**

It includes **data analysis** of trends, usage patterns and performance issues to help you create a plan for dealing with similar situations in future before they can become potential problems and affect the end-users. This trend analysis enables application profiling and service level management of the application.

Later, the **Gartner framework** was reorganized into three parts. End-user experience was changed to Digital Experience Monitoring (DEM); Runtime App Architecture, Business Transactions and Deep-dive component monitoring were merged and became Application Discovery, Tracing and Diagnostics (ADTD); and Analytics became Artificial Intelligence for IT Operations (AIOps)

**What Metrics can an Application Performance Monitoring Tool Measure?**

APM measures two basic types of metrics. i.e. the ones that monitor your infrastructure resources and those that show experience of end-users with the app. Below are some of the most important **application performance monitoring metrics** that you must measure:

* Average response time
* Number of application instances
* Server and application monitor and CPU usage
* Garbage collection
* IIS application pool performance
* Application Availability
* User satisfaction / apdex score
* Error rate
* Request rate

**Choosing the Right Application Monitoring Solution**

In addition to an easy interface and **actionable insights**, a network monitoring application tool must be able to manage apps in the same languages as the applications you are using, predict end-user experience, carry performance monitoring at code-level, use artificial intelligence, enable the monitoring of complete infrastructure and present information to integrate with business processes.

**Virtual Metric’s Application Performance Monitoring Solution**

Virtual Metric offers a comprehensive [**web application monitoring solution**](https://www.virtualmetric.com/windows-monitoring)that provides end-to-end visibility of your app’s performance. It provides application specific permission settings and traces requests across multiple apps, servers, tiers, process and microservices down to databases in order to identify the slow performing parts of the stack.

For an all-in-one application performance monitoring solution, get a free 30-day trial [here](https://www.virtualmetric.com/trial).