

Technology Spotlight: Automate Application Performance Management

Automate Your Incident Management Process With Run Book Automation

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WHY READ THIS REPORT

This document highlights innovative solutions in application performance management that can help infrastructure and operations (I&O) teams increase their productivity in incident and problem management. IT process automation emerged several years ago, and although it has quickly reached attention-grabbing status as run book automation (RBA) and can no longer be considered a totally new solution, it has yet to develop its full potential. Application performance management (APM) is a growing yet mature technology that improves incident and problem management processes. The benefits of linking the two technologies (i.e., triggering an RBA action directly from APM problem identification) are huge, as it would considerably reduce the time to repair problems and improve the scalability of APM solutions by reducing the resources needed to identify and correct issues. We are not there yet, but AppDynamics' latest combination of APM and RBA is a first stake in the ground.

WHY IT MUST EMBRACE AUTOMATION

“Operability” and “automation” will be keywords in the future data center, as IT currently uses too many resources and too much of the IT budget just to keep the lights on. The exponential growth of infrastructure capacity coupled with the ever increasing demand for new business services indicate that IT operations must now scale up to a level that is no longer compatible with human intervention: Too many moving parts in complex, multi-tiered applications means that even the best human brain needs help in resolving performance issues.

This IT operation scalability issue is amplified by the proliferation of new technology that has invaded all facets of the business. Keeping up with these business technology innovations requires more and more of the precious IT budget.

Infrastructure commoditization and the increased reliability of hardware components have changed the nature of the problems resolved by IT operations. Where IT was mostly concerned with the reliability of infrastructures in the past, it is now focused on resource provisioning, configuration accuracy, alignment of development and production environments, architecture and reuse of existing services, and quality of the code put into production.

All service issues still reveal themselves in production, but the nature of these issues is different: Whereas yesterday's infrastructure hardware failures required a physical action of changing components such as boards or cards, today's problems in production tend to be of a “softer” nature, such as rolling back software or configuration changes or applying patches.



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Thus, you can correct most if not all of the issues found in application performance management software or console intervention. Remediation becomes a sequence of operations using software tools that can be described in a workflow and thus can be automated using RBA.

Industrial Automation As An Example Of Future IT Automation

Industrial automation starts with a process that describes the key steps needed to reach a specific result. Whether parts have to be stamped, welded, machined, and painted or a nuclear reactor controlled, the basic principle is to describe the process workflow and then define the events that will trigger the start of a process step and the events that will conclude a process step. These events can be signals, discrete digital inputs, or the result of an algorithm that combines multiple events. Thus, the fundamentals of process control automation are the monitoring of events, the ability to interpret a “trigger” from an event, and the ability to initiate and complete actions that contribute to the performance of the overall process.

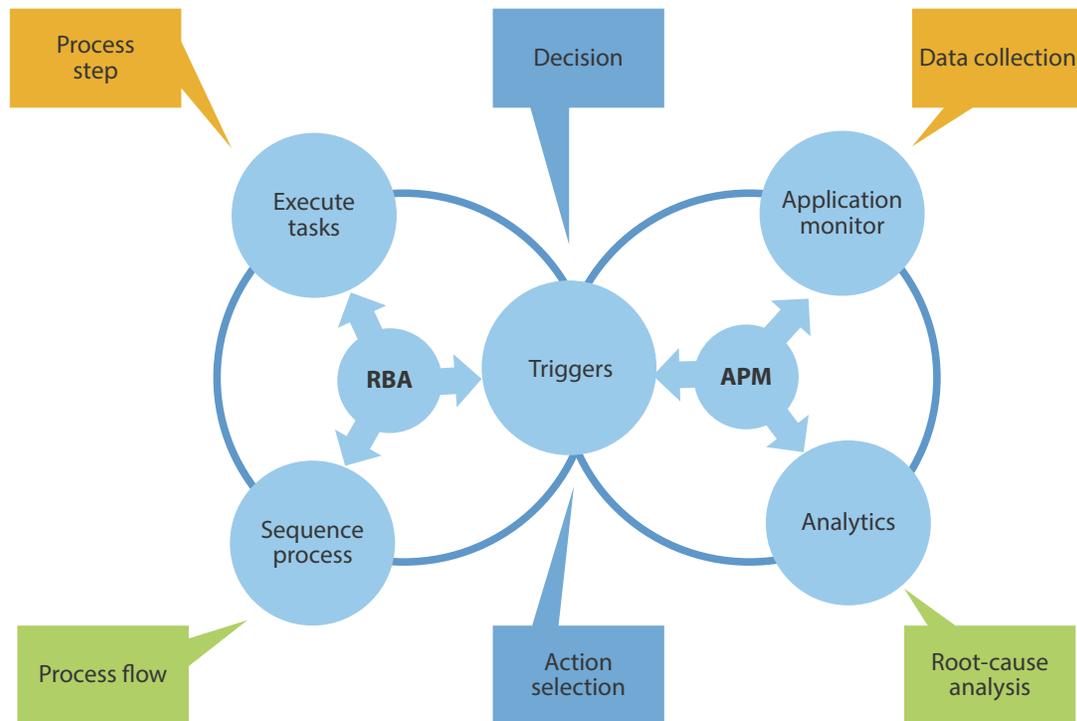
Today’s IT process automation, RBA, and other automation forms, such as workload automation, have the capability to perform actions from a predefined library, often extensible, within the framework of a specific workflow. What you need to do to fully automate an IT process such as incident and problem management is to determine the appropriate action sequence for a given issue (the process workflow) and find the right triggers to initiate that sequence.

APPLICATION PERFORMANCE MANAGEMENT AND AUTOMATION

Forrester has created an application performance management reference model as a guide for understanding the discipline better and providing IT operations with an approach to building up their APM solution portfolio.¹ In this reference model, data is collected in real time from devices and software technologies used in delivering a specific application or business service. The data thus collected is aggregated using transaction topology mapping to provide a consistent end-to-end view of specific transactions. This leads to a better mathematical analysis and helps localize performance problems. Analytics are at the core of APM.²

Joining the two technologies of APM and RBA is a logical next step. The overall concept is similar to the one used in manufacturing automation (see Figure 1).

Figure 1 APM Meets RBA



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Source: Forrester Research, Inc.

AppDynamics' Implementation Of The APM-RBA Concept

AppDynamics is one of the leading vendors in application performance management. Its solution is based on three steps: monitor, troubleshoot, and automate:

- **Monitor:** AppDynamics monitors Java-, .NET-, and PHP-based applications. It also monitors end user experience through browser-based code injection, including mobile apps. Database performance monitoring is also available.
- **Troubleshoot:** AppDynamics provides application topology mapping and error analysis, especially code execution and database analysis.
- **Automate:** You can create actions to answer known and common errors identified in the application code. Actions are user defined.

AppDynamics Client Implementations

Forrester interviewed three AppDynamics clients that use the latest version of the solution. While these three implementations are still in their infancy as far as RBA is concerned, all three clients are effectively thinking in terms of productivity and scalability:

“This is important when you want to move from DevOps to NoOps. The number of applications coming poses a scalability issue in terms of people. We cannot achieve our availability and performance goals using monitoring consoles.” (John Martin, senior director, Edmunds.com)

“We have started automating simple actions, such as stopping traffic to a server at fault. We are just beginning to explore the solution potential.” (I&O executive, large nationwide financial institution)

The main obstacle to implementing an APM-RBA solution is of course determining the appropriate actions once an application problem is detected. This, however, should be considered an investment that pays off in the medium- to long-term, when application complexity and volume will make scalability and productivity a major issue.

“What does it mean, and what do I do? The application has been created with an assumption that there are no failures. This makes it difficult to imagine what the remedy to an identified problem is.” (John Martin, senior director, Edmunds.com)

WHAT IT MEANS

AUTOMATE YOUR INCIDENT RESPONSE WITH APM AND RBA

This is not a solution that will magically automate your incident response: The key ingredients of triggers and response actions and processes are still a work in progress. However, AppDynamics' approach represents a critical milestone on the way to the industrial IT revolution. You should prepare for it by:

- **Taking a closer look at your incident logs.** As automated APM-RBA solutions become available, it is important to understand where incidents are coming from, the frequency at which they appear, and the remedial actions that had been taken to correct them. This preparation should concern not only I&O but also your application development and testing teams.
- **Embracing analytics for root-cause analysis.** The next step is to validate your APM solution. Not only should you implement APM analytics, but best practices mandate that you effectively validate the accuracy of diagnostics: You cannot rely on triggers that do not

provide the right answer all the time. The key to automation's value is that it repeats the same operation reliably and accurately forever. The association between trigger and action must be foolproof.

This may appear as a long-term vision of IT operations and a very arduous road to APM. However, consider the famous Pareto principle: 80% of incidents are probably minor issues that are easy to document and which may already be documented in the application run book.³ Automating these from an APM trigger will already provide substantial productivity and scalability gains.

Companies Interviewed For This Report

A large hosting and consulting international service provider	AppDynamics Edmunds.com
A large nationwide financial group	

ENDNOTES

- ¹ Based on client inquiries and vendor briefings, Forrester developed a model of what an application performance management solution should include. See the February 27, 2013, "[Realize Practical Application Performance Management](#)" report.
- ² All processes involve decisions that require solid information. Information is not the same thing as data; it is the result of taking the right data and processing it based on some context to be something more meaningful to the decision. For example, data could be a series of barometric pressure readings over time. A simple information processing algorithm would track these readings, and if the trend is a rapid decline in pressure, the context tells us that a storm is likely. The data alone will not tell us this, only when it is analyzed according to the context. See the December 5, 2012, "[Turn Big Data Inward With IT Analytics](#)" report.
- ³ The Pareto principle, also known as the "80-20 rule," was named after Vilfredo Pareto, who observed that 80% of the land in Italy was owned by 20% of the population and that 20% of pea pods contained 80% of the peas harvested in his garden.