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POINT OF VIEW | BUSINESS PROCESS OUTSOURCING

Your Bots Are Going to Fail — Here's How to Prevent It

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Bots are here to stay, but how do you protect your automation investment?

Automation is poised to drive the next wave of digital transformation, as the savings and productivity gains it delivers can transform any enterprise. Forrester, in late 2018, predicted that automation would become the tip of the digital transformation spear in 2019.[1]

Today, robotic process automation (RPA) plays a major role in every industry, and that impact will only continue to grow. Forrester estimated that by 2023, the RPA services market will reach $12 billion.[2] Bots can help organizations achieve more than just cost savings; and given the pace of adoption, we can be confident that they're here to stay.

The fact that bots have proven their worth can't be denied. Now that they're becoming an integral component of the business and production is on the verge of being deluged with several million bots, it's time to ask: Have we mastered the art of managing bots like we manage human beings? The answer lacks confidence.

Imagine all the bots you rely on to run a large chunk of your business running loose. Suppose they neither work as expected nor perform assigned tasks. And what's more, what if you don't even know what's going wrong and where? Can you imagine the impact on your organization, as well as the potential losses in cost and reputation?

Centralized bot controllers are available to help monitor work queues, schedules and execution rules. These tools may also have features to start, stop or clone robots. But the help controllers provide can be limited; they're reactive, triggering bot failure alerts only after the event occurs. So, by the time your team springs into action, trying to first identify and then investigate the issue, production has already been affected.

Limitations with traditional bot monitoring systems

- Existing bot monitoring systems can record their performance, but they lack the capability to predict the future.
- Multiple bot platforms often lead to multiple monitoring systems that either aren't integrated or are challenging to integrate.
- Data collection, performance metrics and other bot-related information are not in an integrated system.
- Alerts are triggered only after a bot failure event has occurred. This invariably results in production downtime.
- When bots fail, it takes time to understand what caused the issue before fixes can be made, delaying remediation efforts.

What can you do to prevent this?

Prepare for all that could go wrong

Organizations and the business units within them create automation islands — using multiple technologies, as well as different RPA and artificial intelligence (AI) platforms, with limited standardization. It's becoming increasingly difficult to monitor the performance fluctuations of bots, and it takes time to identify the reasons behind any productivity variations.

Because of this, using a centralized mechanism to keep tabs on your digital agents soon won't be enough. Remember: Bots are reactive in nature and don't alert you in time to avoid problems.

Wouldn't it be great, though, if we could predict bot failure — or even prevent it? Is there a way we can scrutinize the performance of bots and alert users about potential breakdowns that may occur in the near future? If that doesn't seem possible, think again. It's happening already in the manufacturing industry, where robots handle high precision machinery.

To avoid unexpected downtime, monitoring the health of machinery and generating status alerts are very common, because conditions do degrade over time. And anomaly detection using predictive algorithms helps manufacturers identify early patterns of failure and bring them to users' attention.

We need a similar system for software bots, one that can help us stay on top of potential problems while continuously evaluating bot performance.

Artificial intelligence has the answer

A comprehensive framework can help prevent automation investments from failing and harming your company. Think of it as a predictive monitoring system for bots. It can not only evaluate and forecast a bot's future performance but also its failure.

Using data analytics, machine learning and deep learning models, it's possible to gather insights that will open up new operational efficiencies, productivity gains and cost benefits.

Forrester predicts that we'll see the creation of "automation strike teams" that include roles like robot architects and automation jump-starters.[3] Also, since all the easy tasks have been automated already, the mean time to resolve incidents will increase.

How can you safely integrate bots into your operations?

When building your bots, you need to:

Consider using formal bot architecture, design and engineering principles

Prepare the IT business application landscape to accommodate bots

Consider all business and system exceptions

Plan bot capacity

Check bot quality and security aspects before deploying in production

Implement a unified governance and change-management mechanism

Consider building a center of excellence for all automation initiatives

While these steps go a long way toward preventing bot failures, unexpected scenarios will always occur.

Build a predictive bot monitoring and forecasting system

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Figure 1: Model for building a predictive bot monitoring and forecasting system

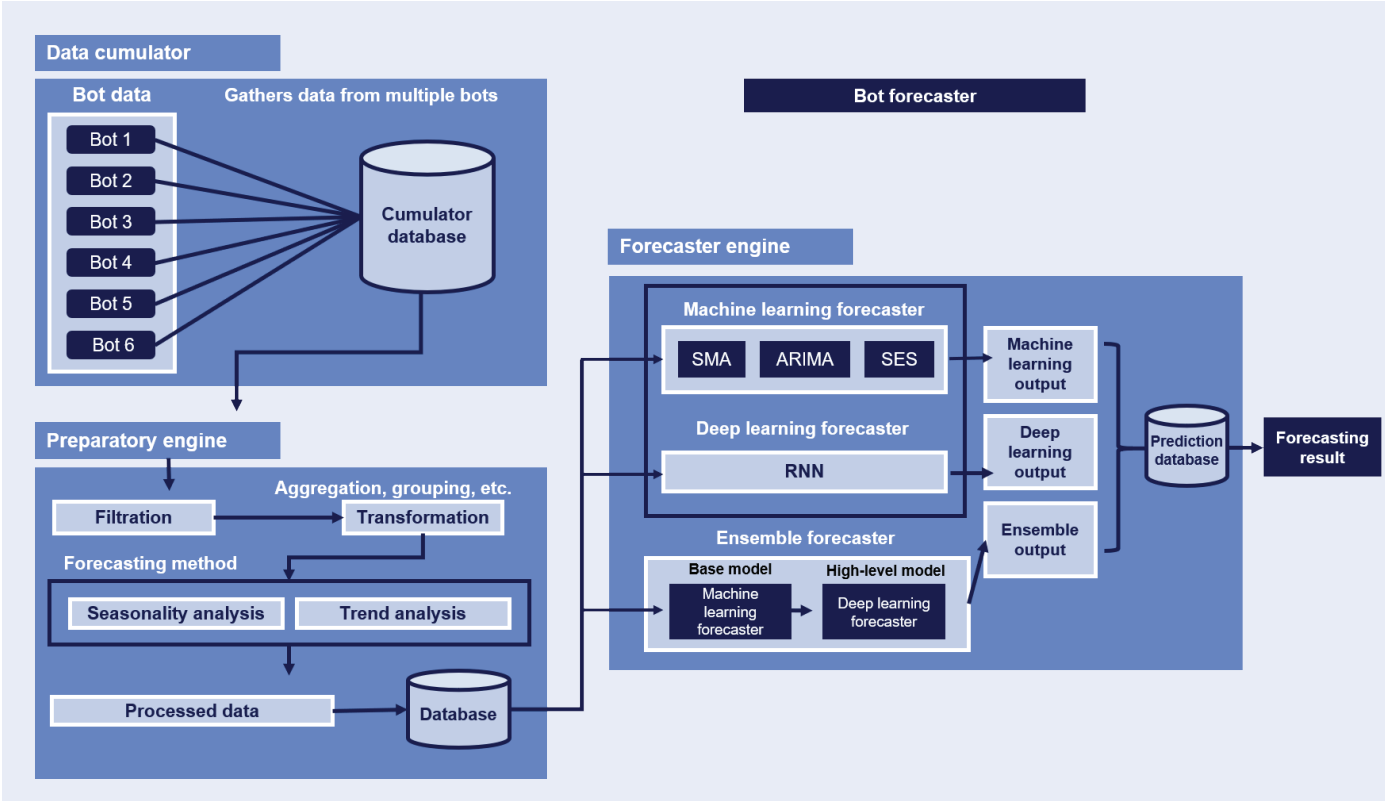
Data preparatory engine

- Historical bot performance data is gathered and stored in a data cumulator.
- This data is cleansed, reduced and fed to a preparatory engine, where data is preprocessed to prepare it for either seasonality analysis or trend analysis.
  - If the data is influenced by seasonal factors (such as quarters, the year or the month), opt for seasonality analysis. It's fixed in time and known as periodic time-series forecasting.
  - When the data is historical, opt for trend analysis. It predicts what will happen in the future; for example, stock prices based on economic factors.

Predictive engines

- The data preparatory engine output is preprocessed and transformed data can then be used for forecasting.
- Forecasting can be achieved by using a forecaster engine that includes the following forecasting models
  - **Machine learning** uses techniques like SMA, SES and ARIMA.
  - **Deep learning** includes RNN with a LSTM cells model.
  - **Ensemble** combines the two models, using either machine learning or deep learning as a base model and the other as a high-level model.

Figure 2: AI-enabled predictive bot monitoring and forecasting system architecture



The architecture of a typical AI-enabled predictive bot monitoring and forecasting system includes the following elements:

- **Data cumulator** gathers the historical performance data of all bots. It serves as a data lake that can be used for future evaluations.
- **Preparatory engine** cleanses the data the data cumulator gathers. Data transformation, such as aggregation and grouping, is done based on the type of forecasting you perform. The engine provides users with seasonality or trend analysis options.
- **Machine learning forecaster engine** uses machine learning forecasting techniques such as simple moving average (SMA), simple exponential smoothing (SES) and autoregressive integrated moving average (ARIMA).
- **Deep learning forecaster engine** uses deep learning forecasting techniques such as neural networks and recurrent neural networks (RNN) with long short-term memory (LSTM) cells.
- **Ensemble forecaster engine** combines the machine learning and deep learning forecasting methods, using one as a base model and the other as a high-level model. This engine helps increase forecasting accuracy.
- **Prediction data model** captures the output of the machine learning, deep learning and ensemble forecaster models and then uses the output of the model with the lowest error rate for prediction results.

Be proactive to empower your business

Imagine the advantage your business could gain by eliminating unexpected bot downtimes. By proactively planning to handle issues as (and before) they arise, you can minimize exceptions and ensure harmonious production. And there are other significant advantages to using a predictive bot monitoring and forecasting system, including:

- **Continuous monitoring** gathers data when a problem occurs for the first time and periodically obtains performance-related information to form a data lake. This capability also draws a baseline for comparison among bots.
- **AI-enabled bot performance analysis** evaluates bot performance and failure and then creates failure classifications that serve as labeled data for further supervised learning.
- **Failure detection** uses predictive modeling to identify underperforming bots and detect potential failures in advance.

Conclusion

RPA began as an efficient fix that companies used in existing platforms to boost operations without expensive upgrades. Today, RPA — together with AI technology — brings new approaches to improve your organization's efficiency and performance.

Surprises, and unexpected bot downtimes, can impact your business. Your existing bot monitoring system records bot performance, but it lacks the capability to predict the future. It's designed to alert users once a bot fails, and not before.

So, it's time to adopt a predictive monitoring system that offers a three-pronged approach: Start with continuous bot performance surveillance. Next, use an integrated environment that collects, processes and analyzes data, and then uses that data to forecast bot health. And finally, leverage a multimodel and dynamic approach to make forecasting efficient.

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Let's get started

Want to learn how to streamline your processes to gain enterprise efficiency? Visit nttdataservices.com/RPA to discover how you can boost business value with RPA.

Sources

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