



## Company Efficiently Delivers Advanced Forecasts with Scalable Software-plus-Services

### Overview

**Country or Region:** France  
**Industry:** Professional services

#### Customer Profile

Lokad develops statistical forecasting models that enable its customers to manage inventory levels, call volumes, and sales demands. The company has six employees and serves 300 customers of all sizes.

#### Business Situation

Lokad wanted to deliver a more accurate forecasting model but was constrained by the computing requirements and costs associated with such a powerful model. Lokad also wanted to expand into new markets.

#### Solution

Lokad chose the Windows Azure™ platform to deliver its software-plus-services application to customers and extend its solution offerings.

#### Benefits

- Fast development time
- Reduced IT maintenance costs
- Improved service offerings for customers
- Greater competitive advantage

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Rinat Abdullin, Chief Technology Officer, Lokad

Lokad is a software development company that delivers sales, demand, and call volume forecasts for more than 300 customers—from one-person eCommerce companies to multinational retailers. To improve its forecasting capabilities, the company developed advanced forecasting tools and models. However, the more powerful forecasting models required significantly more computing resources than the company had available. Lokad decided to implement its software-plus-services forecasting application on the [Windows Azure™ platform](#)—a quick, efficient process. As a result, Lokad reduced IT maintenance costs compared to traditional approaches, delivered more powerful and accurate forecasts to its customers, and improved its ability to expand into new markets.



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Lokad

## Situation

Based in Paris, France, Lokad provides sales, demand, and call volume forecasts for customers of all sizes. Lokad’s customers rely on accurate forecasts to optimize their business operations. Often used by retailers to help meet supply and demand needs, forecasts are also used across several other industries. For instance, banks need cash statistics to supply automated teller machines and branches with banknotes; and businesses with large call centers need to forecast call volumes and staffing levels to meet customer service needs.

Statistical forecasting is a complex process, especially if there are multiple products and what-if parameters. With traditional statistical forecasting methods, businesses must hire specialists to prepare data using a time-consuming, complicated process, taking into consideration special situations, such as exception points and seasonality. The mission for the six-person team at Lokad is to facilitate this process for its customers and make forecasting a simple task that does not require any statistical expertise.

With the Lokad solution, which is built on the Microsoft® .NET Framework 3.5, customers send their relevant data to Lokad through a Web-enabled service, and Lokad returns accurate forecasts within one hour. The company delivers its forecasting technology through a simple object access protocol (SOAP)-based Web services application programming interface (API). Customers upload their data to Lokad and then download their forecasts programmatically. Because the Lokad solution is based on standard technologies, it can be integrated into virtually any third-party application, as long as an Internet connection is available. In addition, Lokad provides specialized client applications: a safety stock calculator to optimize

inventory levels, a call center calculator to optimize staffing levels, and a sales forecast add-in for Microsoft Office Excel® spreadsheet software. Lokad also continues to develop other applications with Microsoft technologies, each solving specific forecasting problems for its customers.

Though Lokad provides a unique statistical forecasting solution that makes the forecasting process simple and quick for its customers, the company wanted to deliver even higher-quality, more accurate forecasts. “The forecasts we deliver to customers directly impact their bottom line,” explains Joannès Vermorel, Chief Executive Officer at Lokad. “For that reason, we take any opportunity we can to improve our forecasts.”

The company developed a set of more powerful forecasting models; however, to continue delivering forecasts within one hour, those models required a significant amount of processing power. To handle the increased CPU requirements, Lokad considered adding more physical servers to its rented data center in the United States. That option, however, is both time consuming and expensive for a small company. Lokad would need to hire full-time systems administrators to manage the additional servers, and it would not be able to scale up quickly to meet processing needs. Also, adding more servers to handle peak processing loads meant that the company would pay for unused server space during non-peak times.

“Our new statistical models are extremely powerful and will allow us to deliver intricate and highly accurate forecasts, but it’s also greedy in terms of CPU,” says Vermorel. “It would be so expensive for us to implement in terms of computing power and personnel resources that we didn’t

even bother to put those models into production.”

In addition to delivering powerful, accurate forecasts, Lokad wanted to expand into new markets. For instance, the company recognized an opportunity to not just provide forecasts for inventory levels in a retailer’s warehouse, but also to provide forecasts at the point-of-sale. Instead of providing monthly forecasts for products in a warehouse, customers could take advantage of daily forecasts to gain insight into fluctuating inventory levels at retail locations. However, point-of-sale forecasts require significantly more processing power, which Lokad did not have available.

## Solution

In an effort to address its needs for a scalable, cost-effective solution that would yield significantly more processing power, Lokad decided to implement the [Windows Azure™ platform](#), a solution that provides application hosting by Microsoft with high-availability and virtually unlimited processing and storage capacity. The Windows Azure platform includes a cloud services operating system and a set of developer services.

Prior to the public announcement of Windows Azure, Lokad knew that it wanted to implement a “cloud computing” solution—the hosting and management of Web applications and services on the Internet through data centers. The company evaluated both Rackspace and Amazon Elastic Compute Cloud (EC2), but neither option was an optimal solution to meet its needs. For instance, Lokad has built its IT infrastructure on Microsoft products and technologies and develops its solution using the C# programming language and the Microsoft Visual Studio® 2008 Professional Edition development

system. With Rackspace and Amazon EC2, developers at Lokad would have to learn new technologies; however, with [Windows Azure](#), developers can use their existing skills and develop new solutions with tools they are already familiar with. In addition, the Windows Azure software development kit provides a utility that [simulates the Windows Azure development fabric](#) on a local machine, enabling developers to run and test services locally before deploying it.

## Software-plus-Services for Storage Needs

In addition to the Windows Azure operation system, Lokad is taking advantage of Windows Azure Storage services, including Blob Storage and Queue services. With [Blob Storage](#), Lokad can store the limitless unstructured, binary data that customers upload for analysis. Queue services enable [Web Roles and Worker Roles](#) in Windows Azure to communicate with each other. Lokad customers upload their data via the Web-based application implemented by a Windows Azure Web Role, which then writes a message to a queue. A Windows Azure Worker Role reads the message, completes the forecasting task, and returns the results through another queue.

For its relational database needs, Lokad uses Microsoft SQL Server® 2008 data management software. In the future, it will upgrade to [Microsoft SQL Azure](#) and use cluster agents to meet the infinitely scalable needs of the company. Lokad will continue to use Language Integrated Query (LINQ), which it already uses in its current environment, to retrieve table data with expressive queries.

## Forecast Accuracy with a Cost-Effective, Efficient Strategy

With the nearly limitless processing power offered by Windows Azure, Lokad can

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implement more powerful forecasting models. Its new statistical models require 10 times the processing power of its existing models. And with the limited capacity of its rented server space, the company would not be able to process forecasts with its new model in the one-hour turnaround time that it promises customers. “Previously, we could not produce such an advanced forecasting model with accuracy in an hour—it is only with Windows Azure that this is possible,” says Rinat Abdullin, Chief Technology Officer at Lokad.

The company now expects to deliver significantly more forecasts each hour with Windows Azure. “We anticipate the ability to deliver 100 times the forecasts—up to 100 million forecasts per hour with Windows Azure,” says Vermorel. What’s more, Lokad can quickly and [cost-effectively scale up](#) or scale down to meet customer needs. Instead of paying for racks of underutilized servers, Lokad can pay for its computer processing and storage needs on a pay-per-consumption basis with Windows Azure.

#### **Opportunities to Develop New Solutions**

Because Lokad has nearly limitless storage and processing resources with Windows Azure, the company can experiment with new solutions for niche markets and expand its marketing opportunities. In addition to delivering point-of-sale forecasts, Lokad is looking to develop a solution that measures energy consumption. For instance, in Europe, energy companies are installing smart grids in consumers’ homes to measure electricity use. By using advanced forecasting models based on that data, energy companies can tune electricity production and reduce the amount of energy that is lost due to over-production. To develop a forecasting solution to process that amount of data

would result in exorbitant costs. Without Windows Azure, Lokad would not be able to implement the solution, much less develop it.

#### **Benefits**

By using the Windows Azure platform, Lokad efficiently implemented its software-plus-services forecasting application. Lokad quickly developed the solution and, by relying on Microsoft hosting services, maintaining its technology infrastructure is not a worry. In addition, by focusing on its business logic, Lokad can invest more time developing powerful solutions and expand its services to new industries, giving the company a competitive advantage in its unique market.

#### **Fast Development Time**

Because Lokad already uses the .NET Framework and developer tools, such as Visual Studio 2008, developing on the Windows Azure platform requires minimal training time. Developers can use their skills to migrate the existing Lokad solution to Windows Azure and make better use of their time spent developing new applications, especially compared to other offerings.

In addition, when a new developer joins the team at Lokad, he or she can get to work quickly without learning a new programming language or tool set. “We hired a new developer this week and he has already started working on the Windows Azure project—he was immediately productive,” explains Abdullin.

#### **Reduced IT Maintenance Costs**

With only six staff members at Lokad, all of whom are developers or mathematicians, the company has lean operations and relies on an easily managed IT infrastructure. With Windows Azure, Lokad does not need

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to redirect valuable developer resources or hire additional staff to deploy and manage the server infrastructure that supports its forecasting solution. Instead, because the solution is hosted by Microsoft, Lokad can rely on enterprise-class service for maintenance tasks, such as troubleshooting issues or producing backup files. “With the classic approach to client-side computing, as opposed to the cloud computing that Windows Azure offers, you need a lot of personnel and money just to administrate and maintain your infrastructure,” says Vermorel. “Now, we can rely on Microsoft to absorb that work for us, making the cost of Windows Azure considerably lower than if we had to do that same work.”

#### **Improved Service Offerings for Customers**

In times of global economic downturn, companies look for new ways to optimize inventory and staffing levels, helping them to maintain tighter control over expenditures. By using the computing power of Windows Azure, Lokad can offer improved service offerings and implement more advanced forecasting models that give businesses the insight they need to modify resources, inventory, and sales techniques.

Lokad has the development and mathematical expertise to create more advanced and precise forecasting models; however, the company did not have the computing resources to deliver that model to its customers. Explains Abdullin, “With advanced forecasting models there was no hope to deliver forecasts in less than one hour, but Windows Azure is changing that.”

#### **Greater Competitive Advantage**

By using the Windows Azure platform, Lokad developers are focused on building new service offerings for customers. With robust forecasting services in place, the company can inject its business logic and statistical models into other niche markets—while still maintaining scalability. For instance, Lokad could extend its services beyond traditional forecasting markets and into new markets, such as construction project management. Forecasting and model optimization is critical for delivering complex and long-running projects to success; however, the construction industry does not currently have the technology, research methods, or software to optimize relevant forecasts. With Windows Azure, Lokad can take its established business logic and evolve a construction project schedule in real-time and solve issues with project constraints.

“Windows Azure gives us the ability to experiment and find new, innovative ways for us to penetrate new markets with our statistical forecasting models,” explains Abdullin. “This isn’t possible—from a time, cost, or scalability perspective—with any other solution.”

## For More Information

For more information about Microsoft products and services, call the Microsoft Sales Information Center at (800) 426-9400. In Canada, call the Microsoft Canada Information Centre at (877) 568-2495. Customers in the United States and Canada who are deaf or hard-of-hearing can reach Microsoft text telephone (TTY/TDD) services at (800) 892-5234. Outside the 50 United States and Canada, please contact your local Microsoft subsidiary. To access information using the World Wide Web, go to:

[www.microsoft.com](http://www.microsoft.com)

For more information about Lokad products and services, call (716) 989-6531 or visit the Web site at:

[www.lokad.com](http://www.lokad.com)

Additional Resources:

Download: [Windows Azure Platform Training Kit](#)

## Windows Azure Platform

The Windows Azure platform provides an excellent foundation for expanding online product and service offerings. The main components include:

- **Windows Azure.** Windows Azure is the development, service hosting, and service management environment for the Windows Azure platform. Windows Azure provides developers with on-demand compute and storage to host, scale, and manage Web applications on the Internet through Microsoft data centers. In addition, Windows Azure serves developers' connectivity needs through the following services.
  - › The **Service Bus** connects services and applications across network boundaries to help developers build distributed applications.
  - › The **Access Control Service** provides federated, claims-based access control for REST Web services.
- **Microsoft SQL Azure.** Microsoft SQL Azure offers the first cloud-based relational and self-managed database service built on Microsoft SQL Server 2008 technologies.

To learn more about the Windows Azure platform, visit:

[www.windowsazure.com](http://www.windowsazure.com)

### Software and Services

- Windows Azure Platform
  - Windows Azure
  - Microsoft SQL Azure
  - Blob Storage
  - Queue
- Microsoft Visual Studio
  - Microsoft Visual Studio 2008 Professional Edition
- Microsoft Server Product Portfolio
  - Microsoft SQL Server 2008
- Technologies
  - Microsoft .NET Framework 3.5
- Solutions
  - Software-plus-services