

## Case Study: The Power of the Cloud - Med Device Company Boosts Operational Efficiency and Customer Satisfaction

### Background

A diversified medical device company has a leading position in the global endoscopy device space. In this market, the company generates growth and differentiates its products primarily through incremental innovations and investment in research and development. In fact, the company's R&D investments have consistently been around 5% of total sales. A portion of that investment was allocated to improving an endoscopy medical device that accounts for 14% of total sales. This top revenue-generating product features a camera that uploads high quality images to a digital capture medical device. The company has thousands of devices currently distributed nationwide to hundreds of hospitals and plans to increase market penetration in the coming years. Given the reality of competitive markets and evolving technology, the company tasked SPK with improving operational efficiency, increasing customer satisfaction, and unlocking additional product value.

### Challenges

Like all companies that strive to remain leaders in their industry, this Fortune 500 medical technologies firm needed to adjust to many competitive challenges. The key challenges included:

- Changing technology and infrastructure models
- Increasing cost pressures requiring higher operational efficiency
- Changing customer needs and expectations

As new technologies hit the market and client expectations grew, the company's top endoscopy medical device began to reveal its inefficiencies. For instance, the device required each hospital surgeon or nurse to manually adjust settings for a customized experience. As a result, depending on the number of hospital staff and physicians involved, each device could potentially be reconfigured eight or more times a day. This user experience was not only demanding, but also increased the risk of misconfiguration due to human error. In addition, whenever a new or replacement device arrived, the company's support team needed to travel on-site to configure its initial settings.

### Solution

As a result, the company decided to consult with SPK with the goal of improving operational efficiency, increasing customer satisfaction, and unlocking additional product value.

Given the benefits of cloud computing, SPK recommended cloud-enabling this endoscopy device so customized settings could be remotely managed and maintained. SPK was asked to lead the initiative due to their previous experience and expertise in cloud-enabling medical devices.

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## Benefits

By creating a cloud-based platform for these devices, customized settings that sometimes required eight or more configuration changes per day could now be easily stored in and accessed from the cloud. Connected to this cloud platform, a device could, for example, quickly be moved from one room to another or settings could be efficiently switched for different doctors. This change would be of great benefit to the company as well. If something went wrong with the device settings or hardware, the remote access support team could troubleshoot and fix issues more efficiently. The company's travel-weary sales team would also benefit as remote access would eliminate the need to travel on-site for device configuration.

## Process

In business there is always a desire to make the RMA process more efficient. Traditionally, this process has been a manual one. It took manual effort to program a new device once a previous one had been returned. By storing settings in the cloud, new devices could be programmed almost instantly and with minimal effort at the hospital. The learning curve for training also becomes a more even plateau with this cloud-based device configuration solution. Users have more immediate access to a product that is properly configured and the entire hospital staff has a much better user experience.

The goal with this transition to cloud connectivity was meant to have minimal impact on existing customers. The current customer base needed to feel that this move was going to benefit them directly with minimal impact to their typical work day. The plan was to provide a software upgrade to the existing customers that contained the necessary logic to connect to the cloud. Once this software upgrade was completed, the sales staff stepped in to train customers on this new functionality. Facilitating the upgrade with an immediate training effort by the sales staff made for a smooth transition. The overall customer experience with the upgrade process was positive.

## Implementation

During the development lifecycle of the platform, this medical device company determined that going through internal IT channels would be too restrictive. After setting up a development system and completing the initial application, R&D asked SPK to take over.

By using a cloud-based solution, large amounts of data could be collected and stored across multiple servers. To compile this amount of statistical data without the power of the cloud would be a massive undertaking. In addition, there were a large number of devices distributed nationwide at multiple hospitals. To maintain high availability across this group, SPK implemented ad-hoc load balancers. Load balancers, like the elastic load balancer found in AWS, have the ability to distribute incoming traffic from an application.

Scalability was also key to this strategy. AWS has the ability to auto scale, which is very beneficial in managing application load. SPK's custom solution for the company included AWS Elastic Search, S3, EC2, and Microsoft Federal Active Directory.

SPK and the company used an agile development process to create the cloud platform. They engaged in multiple sprints across a period of weeks to produce a powerful but flexible cloud platform supporting the existing customer base, with room to grow. Along the way, SPK followed ISO 13485 guidance to ensure an acceptable and validated solution. SPK currently continues to manage and support the cloud platform, still following ISO 13485 standards.

*“Customized settings that sometimes required eight configuration changes during one day could now be easily stored and accessed from the cloud.”*



## Results

Now with several thousand cloud-enabled devices, the company has taken the industry's best practices and created a sustainable product. One of the standout features of this cloud-enabled device is that it creates a personalized experience for users. Surgeons can now create their own custom profiles that can be applied across any number of devices. Device settings can now be optimized by surgeon and surgery type. Establishing a single sign on profile reduces time spent building individual configurations and, as an added benefit, the device is now less prone to configuration errors.

*“The cloud infrastructure design provides the proper balance of speed and storage essential for this device.”*

Sales and support also benefit because they no longer need to travel to hospitals to fix simple configuration issues. Cloud-based settings also allow customer support to remotely troubleshoot issues. Connecting these devices to a cloud platform reduced the demands on the sales team, lowering support costs.

Both sales and support now have the ability to remotely configure and access medical device settings. This greatly

reduced the need for on-site visits by members of the sales team, which allowed them to refocus on business development.

The cloud infrastructure design provides the proper balance of speed and storage essential for this device. In a short time, the number of incidents related to misconfigured devices has decreased. The amount of time it takes to get RMAs returned and configured correctly has also drastically decreased. Because user profiles are now stored in the cloud, all the settings are preserved. The downtime needed to configure a replaced device is reduced to the time it takes to sign-on.

Cloud-based storage also allows companies to leverage analytics tools in order to collect and analyze valuable device usage data. Business intelligence tools like Tableau can be used to do predictive analysis on cloud-based data stores containing useful information about medical device usage.

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