

TOP 10 PYTHON USE CASES

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We've been building Python since 1999. Since then millions of enterprise developers worldwide have downloaded and deployed our commercial offering of Python, ActivePython.

Over the past two decades, the use cases for Python have grown, as has its usage and adoption. ActiveState has seen our customers' use of Python grow from a scripting solution for sysadmins to web development for programmers to the driving force behind machine learning.

This paper covers 10 of the most common use cases by industry for Python that we've witnessed implemented by our customers:

| 1. Insurance | creating b |
|------------------------|-------------|
| 2. Retail Banking | flexible da |
| 3. Aerospace | meetings |
| 4. Finance | data mini |
| 5. Business Services | API acces |
| 6. Hardware | automatii |
| 7. Healthcare | predicting |
| 8. Consulting Services | bespoke \ |
| 9. InfoTech | IT moderr |
| 10. Software | adding ex |

ActiveState[®]

business insights with machine learning

- ata transformation and manipulation
- software system deadlines
- ing to identify cross-sell opportunities
- ss to financial information
- ng network administration
- g disease prognosis
- web development
- nization
- xtensibility to legacy applications

ActiveState

#1 INSURANCE

CREATING BUSINESS INSIGHTS

THE PROBLEM

Polyglot Disruption

An American multinational finance and insurance corporation was facing a number of challenges with their insurance business as smaller, more nimble competitors were gaining an advantage by introducing services driven by Machine Learning (ML). Rather than be relegated to a follower, the customer wanted to reinvent their internal processes, improve client-facing offerings, and ultimately disrupt the wider insurance industry through their own use of ML.

To that end, the insurer empowered multiple teams to develop new applications and services that use ML to inform and assist insurance employees. Unfortunately, each team chose their own set of data science tools leading to multiple different versions of Python across the organization. The result was support issues; compatibility issues when teams interacted, and fears of open source license lawsuits as teams installed third-party Python packages with little oversight.



THE SOLUTION

Commercial Support + Indemnification

A single, data science-focused build of ActiveState's Python, ActivePython, that delivered all of the data processing, NLP and Deep Learning capabilities each of the customers' ML teams required. Additionally, ActiveState's indemnification protected the customer from lawsuits against improper use of Python packages within their ML projects.

THE BENEFITS

Reduce Legal Risk + Eliminate Compatibility Issues

- Simplify support by providing one throat to choke.
- Reduce legal risk by providing protection from lawsuits.



Eliminate compatibility issues both across teams (eg., when data scientists hand off their work to software developers) and within them (eg., less "works on my machine" occurrences).

#2 RETAIL BANKING

DATA TRANSFORMATION AND MANIPULATION

THE PROBLEM

Excessive Overhead Decreases Productivity

This large American department store chain with an in-store banking arm thrives on customer data. While the data is collected centrally in a Teradata warehouse, it needs to be shared with multiple applications that enable their supply chain (SAP), retail banking (SF.com) and analytics/reporting needs (IBM DB2).

The company standardized on Python for their data manipulation needs, but allowed each team to create their own version of Python specific to their requirements. As a result, the teams spent a lot of time and resources creating and maintaining their own Python distributions on AIX, a platform that is notoriously complex to build. And internal support teams were challenged to be able to provide each team with good technical support.



THE SOLUTION

Standard Python Build

A single, data engineering-focused build of ActiveState's Python, ActivePython, that delivered all of the data processing and manipulation each of the customers' teams required. ActivePython built on AIX provided all users with the Extract, Transform and Load (ETL) capabilities they need: multiple business units; multiple data migration targets; multiple use cases.

THE BENEFITS

Increase Engineering Velocity + Decrease Support Costs

- ✓ A single, standard solution across the org decreases support & maintenance costs.
- Reclaim developer hours dedicated to Python support & maintenance.



#3 AEROSPACE

MEETING DEADLINES FOR SOFTWARE SYSTEMS

THE PROBLEM

Meeting Critical Deadlines

An American multinational aerospace, military and defense corporation was contracted to provide multiple systems for the International Space Station (ISS). Initially responsible for just the critical safety systems onboard the station, the contract was subsequently expanded to include multiple noncritical systems, providing more opportunity, but also more challenges.

Aerospace software that is focused on critical safety systems is typically written in stable, proven programming languages, such as Ada. But these older languages do not lend themselves well to scripting tasks, GUI creation or data science analysis. Additionally, cargo run dates to the ISS are fixed, which means that updates to existing systems or provisioning of new systems need to be created, vetted and delivered in a timely manner.



THE SOLUTION

Commercial Off-the-Shelf (COTS) Python

A single, data science-focused build of ActiveState's Python, ActivePython that delivered all of the data processing, NLP and Deep Learning capabilities each of the customers' ML teams required. Additionally, ActiveState's indemnification protected the customer from lawsuits against improper use of Python packages within their ML projects.

THE BENEFITS

Bigger Contract Value + No Exposure

- "Cost-plus" Uplift For contracts where performance, quality or delivery time is a much higher concern than cost, purchasing a COTS solution speeds time to solution while increasing contract price.
- ✓ Timely Support Private, commercial support avoids the need to post issues on public sites, avoiding exposure of software flaws and decreasing time to solution.



#4 FINANCE

DATA MINING FOR CROSS-SELLING **OPPORTUNITIES**

THE PROBLEM

Business Transformation

An American multinational financial services corporation headquartered in New York City wanted to accelerate their digital transformation in order to put themselves at the forefront of the digital revolution. By mining complex digital customer and prospect behavioral data, the customer hoped to transform it into actionable information.

But such a major business transformation would require a corresponding technology transformation. To that end, the customer initiated a number of data science and machine learning projects to examine the structured data they've been collecting for years. The customer then correlated the structured data with unstructured data from web and social media.

THE SOLUTION

Python for Machine Learning

A single, standard, data science-focused build of ActiveState's Python distribution, ActivePython, for AIX, provided all of the data engineering and data modeling capabilities required.

Using ActiveState's Python, ActivePython, ActivePython, the customer was able to combine their transactional data with social media (such as Facebook and Foursquare) data in order to identify when a customer was preparing for a vacation. Those customers were then offered cross-sell services such as travel insurance, foreign exchange, etc.

THE BENEFITS

Increase Cross-selling & Reclaim Resources

- ✓ A marked increase in cross-selling opportunities.
- tasked with creating, maintaining and supporting Python builds for each project.





Free up resources by alleviating pressure on their build team who would normally be

#5 BUSINESS SERVICES

API ACCESS TO FINANCIAL INFO

THE PROBLEM

Enabling Partner Applications

This privately held financial data and media company headquartered in New York City had provided partners with access to their financial information through various electronic means. And with the popularity of Web APIs on the rise, the customer had also exposed their data via a set of APIs that partners could access directly with a simple REST call.

But many partners wanted to build desktop applications in a variety of languages, including Python. These partners wanted to incorporate the customer's API directly into their own applications.



Python SDK

The customer used ActiveState's Python, ActivePython, ActivePython on Windows to create a Python Software Development Kit (SDK) for their financial information API. As a result, the customer can provide their API not only as a loosely coupled service, but also as a package that can be simply pip-installed into any Python project.

THE BENEFITS

Increased Revenue & Customer Satisfaction

- An SDK opens the door to new revenue opportunities through third-party installations of the customer's API.
- World class support and timely updates to outdated/vulnerable packages from a commercial vendor increases customer and partner satisfaction.





#6 HARDWARE

AUTOMATING NETWORK ADMINISTRATION

THE PROBLEM

Device Configuration at Scale

This American technology leader based in Silicon Valley develops, manufactures and sells networking hardware. A key enterprise demographic for them is network administrators, who are often confronted with managing the vendor's multiple devices across extended corporate networks.

The challenge lies in the fact that network admins aren't typically developers. Yet they want to improve their efficiency by being able to programmatically make configuration changes to multiple network devices at once. While sample scripts are easy for any network admin to use and modify, the vendor did not want to be on the hook for creating all the scripts their user base might require.



THE SOLUTION

Python Scripting

Enter Python, which is simple enough for any technical person to learn and start using effectively. ActiveState's Python, ActivePython, allows the customer to quickly create sample Python scripts to cover the majority of typical network admin use cases. And it also allows network admins to create Python libraries they can leverage to create their own, custom scripts in order to manipulate the configuration, operational state, or event data from network devices.

THE BENEFITS

Lower TCO + Increased Security

- ✓ Programmatic access to physical networking devices and virtual network resources, lowers the cost of administering enterprise networks by making network admins dramatically more efficient.



ActiveState's ability to deliver timely Python updates is also of paramount importance since Python code is executed directly on each network device, posing potential security risks.

#7 HEALTHCARE

DISEASE PROGNOSIS PREDICTION

THE PROBLEM

Predicting Terminal Illness Progression

This California-based medical center is consistently ranked as one of the best hospitals in the US, and also serves as a teaching hospital. But even the best medical practitioners struggle with predicting how diseases will progress.

In fact, it's more guesswork than science, especially when it comes to terminal illness. Existing solutions help improve patient treatment by better predicting disease prognosis. But these solutions are either too costly or too time-consuming to implement in a practical manner. What's required is a solution that provides better predictions, more cheaply and more quickly than existing methods.



Deep Neural Networks

With recent breakthroughs in Artificial Intelligence (AI), predictive prognosis solutions have turned to Python-based Machine Learning (ML) techniques for an answer. In this case, ML was used to predict the mortality of a patient within 12 months of a given date based on their existing Electronic Health Record (EHR) data.

ActiveState's Python, ActivePython, was used to create a Deep Neural Network (DNN) using Pytorch and Scikit-Learn in order to predict death dates for patients with terminal illnesses. Each patient's EHR was input to the DNN, including current diagnosis, medical procedures and prescriptions.

THE BENEFITS

Better, Timely Care

- ✓ The DNN provides results that allow doctors to bring in palliative care teams in a more timely manner.
- ActivePython allows researchers to focus on their R&D, not managing open source, so they can be more efficient and productive.





#8 CONSULTING SERVICES

BESPOKE WEB DEVELOPMENT

THE PROBLEM

Customization + Negligible Human Interaction

This global professional services firm focuses primarily on Human Resource (HR) consulting, based on a customizable self-service Employee Benefits & Pension Administration System. The firm is typically contracted to tailor the Benefits System for each of their blue chip clients, and also provide end-user support.

Although the firm bundled end user support into the solution, their goal is to automate everything a user can do (from enrolment to retirement) in such an intuitive way as to minimize support calls, improve customer satisfaction, and ultimately maximize profits.

THE SOLUTION

Web Specific Python Packages + Simplified Web App Dev

Creating a complex, fully customizable Web Portal that's simple to use requires a framework that offers clean, pragmatic design. ActiveState's Python, ActivePython, provides Web development frameworks like Django and Flask that help simplify the creation of Web applications.

THE BENEFITS

Decreased Costs & Time to Market

- ✓ An automated, self-serve Web Portal that emphasizes usability reduces the need to spend time administering & supporting it, decreasing overall costs.
- ✔ For fixed time and materials contracts, the speed offered by an offthe-shelf solution like ActivePython far outweighs the time to create, maintain and update your own Python runtime environment.





#9 INFOTECH

IT MODERNIZATION

THE PROBLEM

Managing Remote Workers with EOL Tooling

This US State Legislature is comprised of 147 representatives, as well as hundreds of supporting personnel who work on premise and/or remotely. As a result, the legislature's IT team is challenged to be able to remotely manage thousands of user desktops.

One of the key tools that empowered the team was Windows Powershell. The IT team used it to run scripts when users logged in, installed or updated applications, periodically collected system information, etc. Unfortunately, Powershell is unsupported, and no longer works under newer Microsoft operating systems.

THE SOLUTION

New Scripting Tools

Rewriting any application that's a cost center (i.e. any application that doesn't generate revenue) is always hard to justify. As a result, rewrites are rarely budgeted, planned and resourced appropriately. But the alternative was much more costly in terms of capital and resources: dispatching IT personnel to physically install, update and manage each user's desktop, as needed.

Python is famously easy to get started with, and easy to develop with, as well. While there was no way around a rewrite of their desktop management scripts, the IT team could at least minimize the time and resources required. ActiveState's Python, ActivePython, was chosen to provide the development and runtime environment for the new scripts.



THE BENEFITS

Increased Productivity + Support Safety Net

- ActiveState's commercial support provided a safety net during the learning and implementation phase, allowing IT to proceed with their modernization project with confidence.



V Python's productivity allowed Powershell script rewrites to be done incrementally in IT's "spare time," lowering costs and reducing the risk of a "big bang" rip and replace project.

#10 SOFTWARE

ADDING EXTENSIBILITY TO I FGACY APPLICATIONS

THE PROBLEM

Custom Distribution & Installation of Python

This US-based public company has a 30+ year history of providing a suite of Electronic Design Automation (EDA) tools to their more than 5,000 customers worldwide. Their suite of tools has been historically built in C++, and is packaged for deployment on premise.

Because each customer has their own instance, it's natural for them to want to customize it to their needs. The customer has leveraged Python to wrap some of their C++ APIs in order to expose key functionality, thereby making their software solutions not only more extensible by customers. But ensuring Python gets deployed properly at customer sites meant including it within their existing installer, rather than relying on their customers to install Python correctly.



THE SOLUTION

Python OEM + Indemnification

The OEM distribution of ActiveState's Python, ActivePython OEM, allows the customer to include a standard version of Python within their application, and deploy it into a custom manner to ensure all EDA tool teams can take advantage of it. Additionally, ActiveState's indemnification eliminates the legal risk of incorporating open source libraries in the customer's products.

THE BENEFITS

Decreased Support & Opportunity Costs

A standardized Python version deployed across all customer sites and developer desktops means the customer can:

- Decrease support costs via a custom installer that deployed a portable version of ActivePython.
- Speed time to market by eliminating the need for legal department reviews.
- Eliminate the opportunity cost of managing their own Python build.
- V Better identify issues, bugs and performance issues through ActiveState's debug build.

Don't waste time with DIY. Fast-track your Python apps. Get the infographic.





This paper covered the Top 10 uses cases for Python we've witnessed implemented by our customers.



You can **check out our resource page** to learn more about our solutions and offerings



Or, **contact us** to learn how we can help

Eliminate dependency conflicts and language build.

Fortune 1000 use our software:

solutions@activestate.com



ABOUT ACTIVESTATE