



OPEN SOURCE LANGUAGE AUTOMATION PRIMER:

INDUSTRY MEGA-TRENDS

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MESSAGE FROM BART COPELAND, CEO & PRESIDENT





Polyglot is killing the enterprise. There is a void in the open source ecosystem when it comes to languages. And keeping open source language builds up to date at scale is virtually impossible.”

Bart Copeland, CEO & President, ActiveState

After more than 20 years building open source languages for 97% of the Fortune 1000 and millions of developers, we’ve learned enterprises can’t gauge the risk of their polyglot environments and are taxed with developers wasting time retrofitting languages.

The first building block of most software applications is an open source language. Yet the industry continues to be plagued by disparate tools, manual build engineering processes and lack of visibility of open source languages in production. In fact, our annual developer survey for 2018 reported that 67% of developers wouldn’t add a language because of the associated hassles and risks.

As the leader in Open Source Language Automation, ActiveState pledges the following:

 *As a member of the open source languages industry, ActiveState sees the increased usage and complexity of open source tech stacks in agile development, DevOps and run-time application quality, in environments in which people and applications are increasingly dispersed yet connected, as major megatrends impacting our industry. We believe the open source language industry has the opportunity to automate and manage the certification, build, deployment and operational management of open source to help organizations accelerate their velocity of delivering secure innovative applications in our increasingly connected yet fractured industry. To advance our industry, ActiveState pledges to offer a new framework by which open source languages can be built, certified, deployed and resolved continuously and automatically to help organizations leverage their polyglot environments and deliver innovative applications to differentiate against competitors and drive desired business outcomes. By supporting Open Source Language Automation, ActiveState will help companies decrease risk to deploy applications across polyglot environments, enable engineering teams to deploy robust applications with speed and security, and free up developers to spend time on high-value work.”* 

As we look ahead we will be working with the industry to build the solutions and awareness that will drive change in how we build, certify and resolve open source languages. We look forward to collaborating with you on this important initiative to benefit our open source industry. This is the advent of Open Source Language Automation.

Bart Copeland
CEO & President, ActiveState

ACTIVESTATE OPEN SOURCE TRAJECTORY

ActiveState is the leader in open source languages: packaging, distribution and management; and has been so for over 20 years. As such, ActiveState has created the category of Open Source Language Automation. The [blueprint](#) to implement Open Source Language Automation comprises four phases: define policies, centralize dependencies, automate builds, deploy and manage artifacts.

INDUSTRY MEGA-TRENDS

ActiveState identified eight industry mega-trends in the advent of Open Source Language Automation. Each of these eight trends serves to increase the adoption and results in more challenges of managing polyglot environments. The trends also illustrate that if “software is eating the world” open source is what builds the software. Lastly, the industry mega-trends depict the tension between speed and security increasing.

What follows are details on each of the eight industry mega-trends listed below:

1. Innovation is driven by open source, but its proliferation creates code management challenges.
2. The power shift to developers in the enterprise creates language/tech stack variants.
3. Data and the desire for analytics are exploding in the enterprise.
4. Multi and hybrid cloud strategies are driving a proliferation of tech stacks, management variants and challenges.

5. The rate of change in design standards produces more enterprise cloud management complexity.
6. Enterprise CEOs and executives are driving digital transformation to keep pace and lead in their markets.
7. Smart data privacy & security policies necessitate an understanding of what's in the code.
8. Agile development and DevOps is accelerating which drives complexity in the management of tech stacks and reduces runtime application quality.

1 Open Source Drives Innovation and Presents Challenges

Open source code snippets (sourced from repositories, online peers, Stack Overflow, etc.) are growing exponentially across the enterprise resulting in unmanaged open source code variants. All of these variants are cause for security concerns as there is a gap in addressing a guarantee of code health. In other words, how can aspects of code security and licensing of deployed code be monitored, tracked and updated? Further, there are gaps in management, maintenance, evolution and change of open source frameworks. For example, what happens if the projects open source maintainer leaves or a framework's popularity changes?

Ultimately innovation is driven by open source but there are a number of challenges to managing the code for the enterprise as a whole, its management and its developers.

2 The Power Shift to Developers in the Enterprise Results in Code Variants

The shift to developers has created decentralization, inefficiencies and knowledge gaps. There are numerous language and tech stack variants which ultimately present even more challenges in code management.

Decentralization impacts tech choices and policies. Developers want language choices beyond .Net and Java. The multitude of different choices results in a fracturing of technology choices and their corresponding language policies. And although developers now have a voice in policy direction and compliance, these many voices create greater inconsistency in technology and the development of language policies.

Inefficiency is most painfully felt in the “first mile” of developer onboarding. Industry lacks focus when it comes to creating policy standards for developers. Instead the expectation is that developers will figure out how to build high performance, innovative, secure, well managed code as well as the standard development processes around it.

Knowledge gaps are felt within the developer workforce, as well as overall corporate awareness. The developer workforce is undergoing a generational shift which ultimately creates tension in taking ownership of someone else’s prior code. Further, technology changes, such that languages become more abstracted without a good understanding of the underlying details. Conversely, enterprises need development resources to build cutting edge applications, yet there is a deficit in corporate awareness with respect to the trends of the workforce to hire and retain modern developers.

To summarize, the power shift results in code variants through decentralization, inefficiencies and knowledge gaps.

3 Enterprise Thirst for Knowledge Outpaces the Satisfying of It

The explosion of data has necessitated the ability to capture intelligence from data. It's known that intelligent applications accelerate business value, and so developers are working more with artificial intelligence (AI) and data scientists are adding more intelligence into the application. However, there is far more data and sources than there is knowledge about how to manage, analyze and track the data. The challenges are tied to limitations on resources (hiring, training data scientists) and methodology. For example, companies underestimate the time and effort required to shift to an "algorithmic enterprise," including implementing culture changes and performing data cleansing.

So the ability to capture, use and monitor data can't keep up to the volume of data and the desire to analyze the data.

4 Multi and Hybrid Cloud Strategies Result in Greater Variance

There is an industry movement away from monolithic cloud to microservices, which results in language variants. Further, enterprises are supporting hybrid cloud applications which result in multiple, cloud-specific management tools, third-party vendors and a company's own application management tools.

Differences between proprietary and public code, as well as those between serverless and containerized apps creates additional complexity. For example, public cloud application management tools don't provide visibility into open source specific code. Teams will still need to think about application management unique to their code. And although serverless computing (coding to functions deployed on cloud-based resources) and containers (a way of eliminating services) both ease portability, they raise cloud-specific considerations with respect to design constraints and management.

Lastly, all of these technical challenges require cloud-native skills. However, many organizations either wholly lack or have immature cloud-native skills compared to their on-premise skill sets. Yet expertise in cloud-specific applications, tools, rework processes and networking is contingent on development velocity and quality.

All of these multi and hybrid cloud strategies result in greater variance of open source language code.

5 Enterprise Cloud Management Is Overburdened with Complexity

Design standards are changing at an accelerated rate and burdening cloud management with new standards alongside growing legacy.

The shelf-life of any specific technology, along with its respective best practices are shrinking. Shelf-life is now measured in months versus years. Everything from application frameworks to function points are changing more rapidly. This rapid change includes greater specificity as solutions are now optimized for specific functions. And the design artifact ecosystem is exploding. Artifacts (software, components, packages, etc.) are being invented at a faster pace.

However, all of these changes are being added to existing code bases. Legacy is not disappearing, rather it's growing with additional and new code being added to it. Over time, legacy and tech debt grows significantly. Consequently, complexity increases for management as well as developers.

Ultimately tracking, managing, versioning and securing code is becoming more complex. And enterprise cloud management becomes overburdened with complexity.

6 Enterprise Uses Digital Transformation as a Leadership Edge

CEOs and executives are driving digital transformation to keep pace and lead in their markets. Since every company is in the software business, software and technology are core to a company's competitiveness. This means that the importance of creating software solutions and delivering them to market in a timely manner is increasing, and is directly tied to a company's ability to innovate. Unfortunately, for many companies innovation does not come off the shelf. Those companies that develop their own innovations are leaders; those that don't are followers.

Innovation requires resources. And since the capital requirements to start a company or project continues to decrease, larger companies have been gaining access to tech and teams through the proliferation of startups. The resulting M&A transactions to obtain tech or talent, i.e. acquire, creates more merged infrastructure, more merged code, etc.

Enterprise uses digital transformation as a leadership edge, yet the drive towards digital transformation propelled by acquisition adds drag through legacy and complexity.

7 Privacy and Security Policies Need to Know "What's In The Code?"

The lack of visibility of "what's in the code" and "where is my code" is especially topical given security issues and privacy concerns. Smart data privacy and security policies necessitates an understanding of "what's in the code".

Data is being held for ransom. When a data breach occurs it impacts credibility, company value, and executive job security. Peripheral protection is not sufficient; enterprises need to protect code and do so considering code as their most valuable resource. Protection needs to be added at every layer, from within the code.

Data policy management is complex and a huge concern for enterprises. Getting it wrong can cause severe market cap impact (e.g. witness market response to Facebook and Cambridge Analytica). As such, privacy and security policies need to know “what’s in the code?”.

8 Speed Drives Complexity and Reduces Quality

Agile and DevOps adoption is high but the maturity is low. At the workgroup level it is well understood, but agile transformation techniques at enterprise scale are still not mature or well understood (e.g. SAFe or the use of portfolio agile management tools and practices). Organizations want to adopt DevOps but typically have only completed 5-10 % of the required workflow changes.

At the same time, a focus on innovation velocity increases management risk, and often results in release deployment struggles. Speed of innovation trumps dedicated budget. This leads to variants in tech stacks and language usage. Although large companies with dedicated teams may have mastered automated deployment, mid-size firms are struggling to keep up with release automation and deployment automation. As the number of iterations accelerates runtime operational issues are produced.

All of this “need for speed” drives complexity and reduces quality of runtime applications.

Next Steps

If you’re interested in reading the next part in the series “Open Source Language Automation Primer: Industry Insights” [please click here.](#)

The next piece details each of the five insights ActiveState has compiled over its 20+ years build engineering open source languages.





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Automatically and Continuously.

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ABOUT ACTIVESTATE

ActiveState helps enterprises scale securely with open source languages and gives developers the kinds of tools they love to use. More than two million developers and 97% of Fortune 1000 companies use ActiveState open source language builds including CA, Cisco, Pepsi, Lockheed Martin and NASA. To learn more, visit activestate.com