Ovum Decision Matrix: Selecting an Application Lifecycle Management and DevOps Solution, 2019–20

Summary

Catalyst

Software lifecycle management (SLM) is the management of software development by taking a lifecycle approach from concept through the management of requirements, testing, coding, deployment, upgrades, maintenance, and final retirement. The market provides tools to support this lifecycle in the form of application lifecycle management (ALM) tools and, with the rise of DevOps, tools that provide DevOps-style release management, orchestration, and automation. This Ovum Decision Matrix (ODM) examines ALM tools that cross over into DevOps to support the full arc of the lifecycle from application/product concept to deployment into production.

Ovum view

ALM origins and trends

The need for taking an SLM approach is best thought of as good practice in the relatively young art of software development. The ALM tools market has evolved to support SLM through the years; at its core is the development methodology or work process, and this has evolved over time, starting with waterfall or linear stage-gate processes and incorporating various innovations such as Tom Gilb's evolutionary delivery, Barry Boehm's spiral model, and Rational's unified process, before Agile and lean swept the board with examples such as Scrum, extreme programming, and Kanban boards post-2001 (when the Agile Manifesto was created).

The integrated ALM suite tools market really took off around 2003 but supported waterfall because Agile was still under the radar. By 2010, Agile became mainstream and ALM tools were revolutionized by it, so next-generation ALM tools had to support hybrid processes (because enterprises were spread across the spectrum of adoption) or go all in for Agile (a subsector of the ALM tools market and several vendors in this category avoided the term ALM).

Just as Agile hit the mainstream around 2009–10, DevOps was born, and it gained mainstream status by 2016, much faster than Agile. DevOps had less impact on ALM than Agile, because DevOps tooling formed a separate tools market from ALM, being focused on creating continuous delivery (CD) pipelines and, at the top end of the tools market, managing them for large-scale enterprise use.
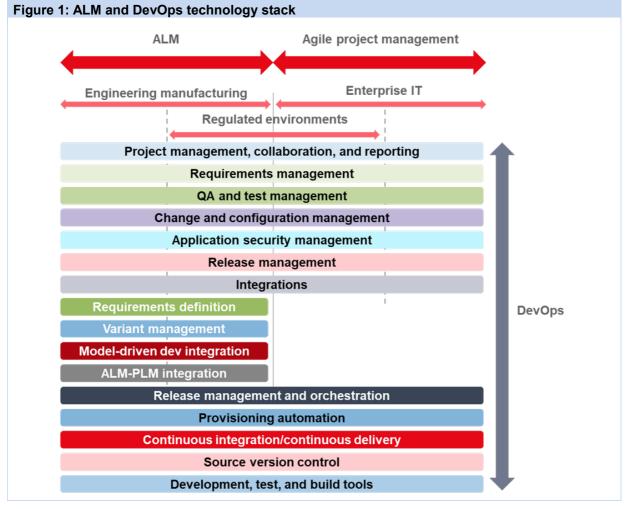
Bridging ALM and DevOps

A key question addressed in this report is whether ALM should extend into DevOps, and the answer, as always, depends on customer needs. First, we are talking about management tools – tools used by project/product managers and team leaders. These tools integrate with core developer tools, which in recent years have become dominated by open source software (OSS) tools and which tend to go through relatively fast cycles of fashionable adoption as styles of programming change. But the management tools need to be more stable and long lasting, because they carry significant assets for the business; for example, product requirements in engineering manufacturing are mission-critical assets.

Second, highly regulated industries need to comply with deep traceability requirements, and it is only by connecting traditional ALM with DevOps release management tools that the traceability can be performed seamlessly and rapidly at command to support auditing and a host of compliance activity:

automating deep traceability makes it an every-workday benefit rather than an exercise performed mainly for auditing because of the manual labor involved.

The modern computing environment is rapidly being transformed beyond DevOps with cloud-native computing (microservices in containers, managed by Kubernetes, as well as use of serverless computing), but DevOps CD pipelines underpin cloud-native computing. Agile and DevOps development are therefore an essential foundation for doing cloud-native computing.

Managing software development will become fragmented if the management tools become fragmented, so Ovum believes there is a strong case for ALM to bridge into DevOps release management, whether as one integrated suite or through out-of-the-box integrations with best-of-breed DevOps management tools. And there is an advantage in the former for the customer in only needing one management tool for the whole span of the development lifecycle.

Figure 1: ALM and DevOps technology stack

Source: Ovum

Figure 1 shows the technology stack covered by ALM and DevOps. The bottom four layers are practitioner tools in which OSS has a large presence. The layers above are mostly focused on management, and there is a demarcation between ALM practiced in advanced engineering manufacturing (i.e., with large software content) and in enterprise IT: Ovum uses the terminology ALM and Agile project management to separate these segments in the figure but uses the name ALM in its broadest sense across both engineering and enterprise IT in this report.

DevOps spans everything from development to operations, but the DevOps tools market is mainly focused on release management, orchestration, and automation, relying on other tools for everything else, often OSS for continuous integration/continuous delivery.

Market size and forecasts

Ovum has a separate research product on sizing of the ALM market and forecasts. In summary, the market has slowed down its rate of growth despite software activity increasing globally. Ovum believes increasing adoption of OSS tools and low-cost pricing models by the leading players has dampened the ALM market size. The actual shrinkage over the last two years has had an impact on ALM vendors, leading to acquisitions and mergers, the largest one being the divestment of HPE's ALM software into a joint venture with Micro Focus. Micro Focus has emerged as an important ALM player, having acquired the assets of several prominent ALM vendors of past decades. There is also evidence that segmenting the ALM market between engineering manufacturing and enterprise IT reveals growth in the former as digital transformation impacts advanced products with more software content and the need for managing its process.

Future of ALM

While styles of programming in software development continue to evolve (the latest paradigm is cloud-native computing), the management tools need to remain more stable and long lasting. However, it is software development processes undergoing significant change that has the largest impact on ALM tools. The current wave of activity in artificial intelligence (AI) will have an increasing impact on how software is developed and managed in production and on the use of AI within software applications.

A benefit of integrating ALM and DevOps is raising new data that can be mined with machine learning (ML) tools. We are already seeing several vendors exploring the use of ML in ALM/DevOps and combining the data across the tool lifecycle to provide insights into software quality and team velocity.

Several DevOps vendors have introduced value-stream management/mapping (VLM), a lean methodology practice. With greater automation and use of DevOps pipelines, it becomes feasible to measure team velocity, identify bottlenecks, and generally track time delays in the delivery process. A combined ALM and DevOps solution with ML mining VLM data is likely to prove fruitful.

The use of AI in operations has led to the burgeoning of AIOps tools; these tools increase DevOps automation through AI principally in the operations segment. Application performance management (APM) tools are another category of essential tools in software engineering; historically they have focused on development or operations but the best today span the DevOps arc, including end user monitoring. APM is beginning to be impacted by AI. AIOps and APM lie outside the scope of this report and deserve separate ODMs.

With the rollout of 5G, there will be increasing use of Internet of Things (IoT) and edge applications. We are witnessing the growth of an edge technology stack around containerization, and this will increase the role of DevOps in the advanced engineering and manufacturing space, giving greater momentum for ALM vendors to address the needs of DevOps teams.

Finally, there is the increasing use of ML in software applications. Where do you draw the line between an ML application and a "traditional" software application that has ML content? We will see all grades between a "pure" ML application (however you wish to define that) and a software application with no ML content. The point is that the ML lifecycle has parallels with ALM but has

additional needs. This will lead to a collision between tools that cater for the ML lifecycle and traditional ALM (even our advanced ALM and DevOps). The second point to be made is that ML applications need all the capability of traditional ALM plus ML/data science-specific lifecycle management needs. This will become a hot area in the tooling market.

Market overview

The makeup of the market since Ovum's last ODM on ALM in 2016–17 has evolved; the following vendors have had notable changes:

- **Atlassian** had an IPO in 2015 and has continued to almost double its revenue year on year since then: its 2018 annual report quotes $874m. This makes it the largest player by revenue in the ALM market. Its operating model is disruptive, dispensing with a sales team (except for the largest accounts), with an attractive pricing model and the sticky nature of its collaboration/issue tracking solution JIRA, which has been pivotal in its success. The company does not use the term ALM. Atlassian declined to participate in this report.
- **CA Technologies** acquired the Agile project management solution Rally Software in 2015 and then DevOps solution Automic in 2017. The company is being acquired by Broadcom at the time of writing. CA Technologies declined to participate in this report.
- **HP** split into two parts, and HPE's software division, which includes its ALM solutions, merged with Micro Focus in 2017.
- **Microsoft** offers Azure DevOps and Azure DevOps Server as successors to Visual Studio Team Services and Team Foundation Server respectively. The business model emulates Atlassian, with free access to open source projects and small commercial projects with a maximum of five users and escalating fees depending on the number of users.
- **Perforce**, historically known for enterprise version control, has emerged since 2015 as an ALM player through its Helix product portfolio, based on acquisitions of Seapine Software in 2016 and Hansoft in 2017.
- **Polarion** was acquired by Siemens soon after participating in our last ALM ODM. It continues to operate as a distinct business unit, Siemens Polarion.
- **PTC** has refocused its mission on IoT as well as continuing its product lifecycle management (PLM) activity, but it no longer openly promotes its ALM solution.

The ALM/DevOps market continues to show new activity with companies such as Digite, Orcanos, and Pantheon appearing on Ovum's radar. While there are many ALM and DevOps players in the market, the vendors participating in this ODM represent key players with the ability to arc across ALM and DevOps and have a broad reach across enterprise and engineering use cases.
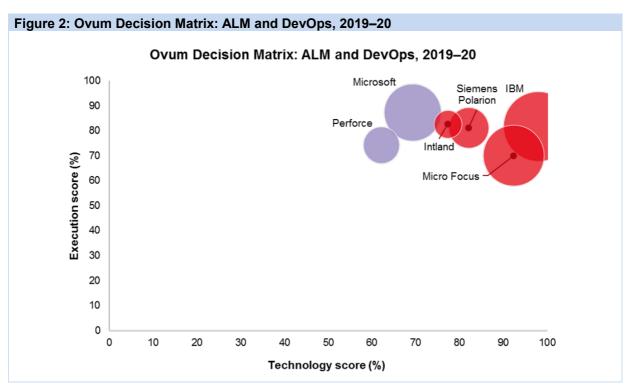
Key findings

- The ALM market is benefiting from the convergence of enterprise IT and engineering IT, with DevOps and cloud-native computing technologies (containerization) beginning to make a showing in advanced engineering manufacturing.
- The role for ALM in highly regulated industries is being recognized and is driving the premium end of the market.

- The overall ALM market has shrunk in revenue size because of the impact of free tools and disruptive pricing of low-cost tools. However, the adoption of ALM tools has increased as the developer community has grown.
- The ALM market makeup has changed since Ovum last produced an ALM ODM, with acquisitions and general market shakeout and the emergence of Atlassian as the largest-by-revenue ALM vendor (despite eschewing the label).
- While the ALM market has been turbulent, the names of the participating ALM and DevOps vendors in this ODM are familiar names that have evolved and ridden above the market changes to emerge or continue as leaders in this space.
- ALM and DevOps represents a next step in ALM evolution, allowing traceability from requirements through deployed microservices and applications.
- The data generated in ALM and DevOps combined systems is an opportunity to be exploited using ML for prediction (such as project progress and quality control) and further automation.
- New-generation ALM dashboards have evolved with fresh and responsive interfaces that span traditional and mobile form factors.
- Value-stream management/mapping has emerged as a feature in ALM/DevOps tooling.
- Edge computing applications will increase on the back of converged technologies (5G, cloud-native computing, ML, low-cost edge compute) and further drive ALM and DevOps tool opportunities.
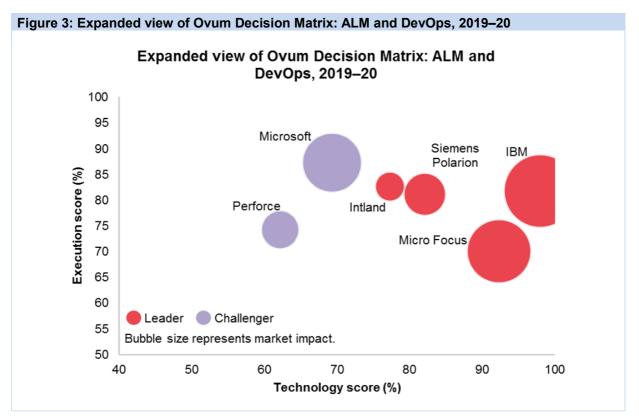
Market and solution analysis

Ovum Decision Matrix: ALM and DevOps, 2019–20

The ODM chart (Figures 2 and 3) maps the three assessment dimensions: the X-axis is the technology score, the Y-axis market execution, and the size of the bubble the market impact. Ovum found that all the solutions performed exceptionally well, and we have divided the vendors into two groups, with IBM, Intland, Micro Focus, and Siemens Polarion as market leaders and Microsoft and Perforce as market challengers. There were no vendors in the market follower category in this ODM.
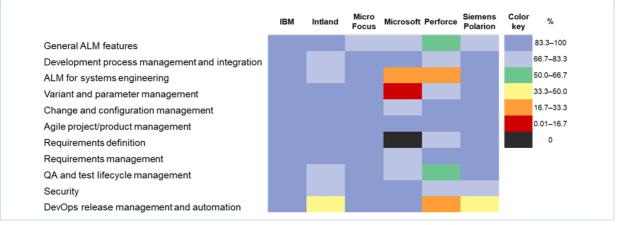
Figure 2: Ovum Decision Matrix: ALM and DevOps, 2019–20

Source: Ovum

Figure 3: Expanded view of Ovum Decision Matrix: ALM and DevOps, 2019–20

Source: Ovum

Table 1: Ovum Decision Matrix: ALM and DevOps, 2019–20

Market leaders	Market challengers	Market followers
IBM	Microsoft	n/a
Intland	Perforce	
Micro Focus		
Siemens Polarion		

Source: Ovum

Figure 4: Rainbow chart for technology dimension of ODM: ALM and DevOps, 2019–20

Source: Ovum

Vendor solutions

Market leaders

Technology

IBM and Micro Focus had the highest scores in the technology dimension assessment. Figure 4 shows the rainbow chart for technology. The other leader-category vendors, Intland and Siemens Polarion, also performed exceptionally well but, as a matter of policy, prefer to integrate with DevOps best-of-breed vendors and subsequently had reduced scores for this category. Both Intland and Polarion are focused on engineering and highly regulated industries, and DevOps adoption is only beginning to spread in these industries. Ovum expects adoption to grow, and this will be an opportunity for Intland and Polarion to extend their out-of-the-box coverage. While open source predominates in the core DevOps functionality – there is to support this a newly formed Linux Foundation Continuous Delivery Foundation – the management of DevOps should ideally be part of an ALM solution: users will want to gain a view across the complete lifecycle.

Execution

The leaders also performed exceptionally well in the market execution assessment. IBM plays well across enterprise IT and the engineering industries, and its investment in DevOps has moved it into a leading position in DevOps tooling. Micro Focus has acquired a wide portfolio of tools and is integrating these to form a cohesive offering. It has the potential to penetrate further into the market,

especially in the engineering sectors, where it has shown technical capability. Intland and Siemens Polarion are relatively newer ALM players with a strong presence in the German market, from which they are growing outward, listening closely to the requirements of their engineering and safety-critical development users.

Market impact

The leading players in this ODM have strong competition from the fragmented ALM market, where many standalone tools exist. For large organizations with significant investment in software development, Ovum believes doing without an integrated ALM solution is risky, and we expect the lack of fashion for ALM, especially across the Agile and DevOps communities, is likely to change. As things stand, IBM and Micro Focus are the large players in this ODM compared with Intland and Polarion, which have a narrower industry focus.

Market challengers

Technology

Microsoft measures the success of its tooling in the huge number of downloads it receives. The move to Azure has made perfect sense, and an on-premises version of what was Team Foundation Server continues with Azure DevOps Server. Microsoft performed exceptionally well across the technology categories in which it has chosen to offer features and has the potential to provide more for engineering users. With digital transformation the divide between enterprise IT and engineering will reduce, and ALM players can grow across both sectors. Perforce is on a mission to become a leading ALM player, and Ovum expects to see it grow in the years ahead.

Market execution

Microsoft performed exceptionally well in the market execution assessment and is clearly performing all the right actions to regain its leader status in Ovum's ODM. Perforce also performed well in this assessment and is on a par with the leaders.

Market impact

Microsoft remains a major player in the market and only lost the leader position it held in the previous ODM on ALM because of the tough criteria of this ODM that spanned engineering and enterprise IT. Perforce has built a strong reputation for enterprise-grade version control, and its move into ALM in recent years is allowing it to grow further in the market.

Vendor analysis

IBM (Ovum recommendation: leader)

Products reviewed

IBM's flagship solution for ALM is called IBM Engineering Lifecycle Management (ELM). It has a separately licensed DevOps solution named IBM Cloud DevOps for Hybrid Deployment, and this includes UrbanCode, Rational Test Workbench, and Rational Test Virtualization Server. In addition, IBM can fulfill segments covered in Ovum's ALM and DevOps scope, notably application security, from its wider portfolio of products.

Ovum SWOT assessment

Strengths

- IBM has strengths across the range of ALM use cases including advanced engineered products and meeting the needs of Agile and DevOps teams in enterprise IT.

- Product engineering has a need for in-depth variant management and multiple configurations across requirements, tests, plans, and code. IBM has features to support these, also enabling reuse of assets. Supporting compliance is another strong engineering feature, for example, with link validation.

- IBM DOORS has been a leading requirements management solution in engineering industries for many years. Facing competition, IBM has launched its next-generation DOORS Next edition.

- There is a clear understanding of the benefits in spanning the arc of ALM and DevOps deployment, and the ALM and DevOps solutions integrate to share data and provide a complete end-to-end lifecycle view.

- UrbanCode is pushing the capabilities of DevOps solutions with its value-stream mapping/analysis to discover delivery bottlenecks and help identify causes when integrated with ELM.

Weaknesses

- IBM has no technical weaknesses; its weaknesses are in market execution. The wide range of products within the solution portfolio can be confusing for newcomers to the vendor, and the need for multiple licenses to cover the lifecycle may be a disincentive. IBM does make its licensing flexible with options such as tokens and flexpoint bundles.

- Support for vertical solution templates could be more comprehensive: while IBM offers banking, healthcare, and manufacturing engineering, it could add more, for example, in insurance and investment services, life sciences/pharma, and telecoms, which all have compliance requirements.

- The diverse origins of products within the IBM portfolio mean that some products have a different user interface (UI) and user experience (UX). While IBM is in the process of rolling out a common UX across its tools, there is weakness in some roles having to learn different UIs for the current or older versions.

Opportunities

- Digital transformation is leading to a convergence of engineering and enterprise IT in terms of software development needs. IBM's best opportunities are in supporting development with the latest technologies such as containers and microservices while fulfilling the requirements for safety-critical compliance.

- The rollout of 5G will grow the edge computing market, and this will become a growth area for ALM, with the need for safety-critical compliance again in mind.

- The ALM market has become hugely disrupted by waves of development revolutions/evolutions (Agile, DevOps, cloud native), and the rise of open source tools (the creation of Linux Foundation Continuous Delivery Foundation is the latest to impact DevOps) means that IBM needs to continually rethink its go-to-market strategy.

Threats

- IBM has been impacted by low-cost disrupter Atlassian, despite this competitor not calling itself an ALM vendor. The key differentiator for IBM is being able to address the needs of the engineering and compliance market.
- An engineering company confided to Ovum that its biggest concern with a tool vendor was not lock-in (quite the contrary; it was prepared to pay the asking price for a good tool) but rather whether the tool would hinder the company in fulfilling its needs for safety and compliance because it could not change fast enough when it needed to. IBM needs to accelerate its release cycle to ensure it does not get sidelined by nimbler competitors.

Intland (Ovum recommendation: leader)

Products reviewed

Intland's ALM solution is codeBeamer and includes the Intland Retina package. The Retina UI supports PC, tablets, and other mobile devices. Intland has an intensive roadmap for new features over the next 12 months, especially around enterprise scalability. These have been announced publicly and, given the lifetime of this report, are included in the analysis below.

Ovum SWOT assessment

Strengths

- Intland has a clear focus on a one-stop ALM solution targeting the advanced engineering space, where regulatory compliance is often a must have, with, for example, compliance reporting out of the box. The company provides domain-specific solutions for regulated sectors: medical devices, automotive systems engineering, avionics technology, and the pharmaceutical industry. These tailored templates include simplified compliance, a local partner system, and validation for faster auditing.
- Working in organizations that typically have legacy as well as modern Agile/DevOps work processes, codeBeamer can support legacy waterfall (V-model), Agile, Kanban, and hybrid workflows. It supports popular Agile enterprise frameworks LeSS, SAFe, and DAD. Furthermore, the platform can combine multiple methodologies in a single project, providing flexibility for advanced system-of-systems engineering.
- Intland practices an Agile development process internally and can turn around feature requests within weeks of receiving them. This close working relationship with its customers is a distinguishing feature of the company. This has helped Intland win many customers in its target industries of safety-critical product development.
- Intland continues to evolve codeBeamer. For example, its new Retina UI allows for mobile access and has a modern look and feel that can also be tailored to the experience of the user, so, for example, beginners receive a less busy UI than experts. So as not to disrupt its user base, codeBeamer allows customers to switch between the new and old UI.
- The solution offers high performance in large-scale deployments, introducing in its latest and upcoming releases high availability with active-active clustering, load balancing, parallel versioning, and distributed database support.

Weaknesses

- Intland was also evaluated for its DevOps management capability. It integrates with Jenkins for its continuous delivery features, and it also integrates with OpenShift for its container-as-a-service capabilities. However, some of the management features found in DevOps release management solutions are not available in codeBeamer. The engineering market, Intland's target, is yet to embrace DevOps, but in time Ovum expects DevOps to become more prominent in engineering (a good example is Tesla's over-the-air software updates, which is DevOps in practice), and Intland will face growing demands for such features.

- There are some areas in its coverage of application security that could be enhanced. Ovum looks for strong integration with security-focused code analysis tools rather than expecting the ALM vendor to have these out of the box. However, we expect reporting of application security-related matters to be out of the box through these integrations.

Opportunities

- Intland says being private and independent means it is not beholden to shareholders or market whims and is able to be highly responsive to its customers. Ovum believes this dedication to listening to its customers is a strong characteristic of the company and an advantage of being a smaller player in the ALM market. As the company continues to grow, it risks losing this characteristic and should ensure this cultural continuity to retain competitiveness.

- The software development field continues to evolve with cloud-native computing currently at the forefront, and edge computing will grow significantly with 5G rollout. While ALM sits above these trends, there will be an opportunity to mine the data that a new generation of core development tools generates. ALM vendors that can mine such data and apply ML to it will have a strong position.

Threats

- The wider ALM market has gone through multiple disruptions but is now settling down with a set of players that may now pose a threat to Intland if they decide to play in the engineering and compliance market.

- It is Ovum's view that ALM is a necessity for producing high-quality code. Of the major public cloud players, Microsoft and IBM recognize this need, and while AWS and Google offer development tools, they have avoided offering ALM, a discipline that appears to be out of fashion in the enterprise IT community. This could change as the software community matures, and if more public cloud providers offer ALM, this will put further pressure on independent ALM players such as Intland.

Micro Focus (Ovum recommendation: leader)

Products reviewed

Micro Focus products reviewed were Micro Focus ALM Octane 12.6, Micro Focus Project & Portfolio Management 9.5, Micro Focus Dimensions 14.4 (incorporating Micro Focus Deployment Automation 6.2), and Micro Focus Release Control 6.2.3. Micro Focus Fortify provides application security.

Micro Focus has acquired several ALM players in recent years: Borland, Serena, and HPE Software (the last being a reverse takeover of HPE Software, which included products such as Quality Center,

ALM, and ALM Octane). The result is a comprehensive portfolio of solutions that span the whole lifecycle, with some overlap, but Micro Focus chose the above selection as most relevant for this ODM.

Ovum SWOT assessment

Strengths

- Micro Focus has a history of looking after legacy software. Its original business was supporting Cobol applications, but the company has spent the past decade acquiring ALM vendors. These vendors had suffered disruption from continual waves of revolution/evolution in the software field. Upon acquisition, Micro Focus has integrated these vendor products to enhance the capabilities available for their existing customer bases. This wide portfolio allows Micro Focus to offer well-known "brand" solutions that are enterprise focused.

- Micro Focus scored highly in the technology assessment and was strong across all the segments under review. This includes being able to span across the whole lifecycle into deployment: the DevOps functionality sits within Micro Focus Release Control and Deployment Automation.

- Micro Focus scored highly in the engineering-oriented ALM segments. For example, variant management is supported by the enterprise change and configuration management tool Dimensions.

- Micro Focus understands the need for application security: it talks about continuous security – its take on the software security development lifecycle – where security is considered at every phase of the lifecycle. It offers Micro Focus Fortify, an integrated security-specific product line, as a component of the ALM + DevOps toolchain.

Weaknesses

- Prospective customers will find the wide range of solutions available somewhat confusing. A client wanting a one-stop ALM solution, specifically focusing on Agile transformation and third-party developer tools, could just opt for ALM Octane. Choosing multiple products may raise licensing costs, but no doubt deal-making is possible.

- The different Micro Focus products offer integration using the Micro Focus Connect Technology, but native point-to-point integrations could be improved. Unless they originated from the same acquisition, integrations are sometimes "lumpy." Customers can also use glue technology (e.g., from Tasktop) to integrate these diverse parts.

- In comparison with the other vendors in the ODM, Micro Focus was weakest in market execution. Ovum believes that Micro Focus needs to demonstrate stronger leadership, particularly in innovation.

- In the engineering market, especially those parts heavily regulated such as for safety-critical products, Micro Focus has shown technical capability, and this needs to translate into penetration into this market.

Opportunities

- Micro Focus's biggest challenge is to convince the market that it is continuing to invest in its portfolio and that the business model is more than just supporting the existing customer base. With such a wide product portfolio, there is a case for rationalization and from this an opportunity to grow its market share.

Threats

- The large-enterprise market has always understood the importance of ALM, but as cloud-native computing takes center ground in large enterprises (it will eventually), this community, often driven by OSS, will be making its ALM choices from vendors it has grown up with. Micro Focus's challenge is to be visible to this new breed of developer community.

Microsoft (Ovum recommendation: challenger)

Products reviewed

Microsoft offers Microsoft Azure DevOps for ALM, and Microsoft Azure Sentinel for application security.

Microsoft has gone through a new iteration with its ALM product-naming conventions. The familiar Team Foundation Server is now named Azure DevOps Server, which can be run on premises, and Azure DevOps is the cloud-based home for Microsoft ALM.

Ovum SWOT assessment

Strengths

- Microsoft has been a leader in the enterprise IT market for many years, and it continues to offer first-class tools for developers, including an ALM solution. Azure DevOps is the new home for Microsoft ALM on Azure, and DevOps is the key target audience.

- Microsoft Azure DevOps is a fully integrated ALM and DevOps solution, demonstrating the value of combining ALM and DevOps. It can provide an integrated view of the lifecycle from concept to deployment.

- Microsoft's scoring in market execution was the highest in this ODM. It has gained all-round scores across most segments: maturity, interoperability, innovation, and enterprise fit and licensing.

- Microsoft has a wide portfolio of tools it can bring to bear on ALM. Application security is an increasingly important topic given that firewalls do not apply to cloud-native applications that call services from a variety of sources. Microsoft Azure Sentinel offers a range of features to support a security development lifecycle.

Weaknesses

- The main weakness in the Microsoft solution is the lack of ALM functionality for the development of code in the advanced engineering space. Essential features such as support for systems engineering tools, variant management, requirements definition, and compliance reporting are all needed at a deeper level of functionality than is normal in enterprise IT, and Microsoft has made the decision not to play in this sector.

- Microsoft's only weakness in market execution is in the segment named "product support and deployment," and this was due to a lack of vertical industry templates: Microsoft has none in any industry. However, as mentioned, its scores were outstanding in all other respects in market execution.

Opportunities

- Microsoft made the decision not to target the advanced engineering product development space with Azure DevOps, despite Team Foundation Server often being a popular tool in this

space. With increased convergence between enterprise IT and engineering manufacturing as all businesses become software centric, the opportunity exists for Microsoft to extend into this space, maybe through an acquisition.

▪ Application security was given a decisive improvement when Microsoft essentially invented the software security development lifecycle (SSDL) concept some years ago. The coverage of SSDL could be better defined and expressed in Azure DevOps with built-in features, and it could be integrated with a range of standalone security solutions.

▪ There was little evidence in this review of Microsoft exploring use of AI/ML for ALM; this is a missed opportunity given the depth of knowledge Microsoft has in AI. ALM for software development and ALM for the ML development lifecycle are twins with potential for further alignment, because developers will be increasingly adding ML to their software applications.

Threats

▪ Under CEO Satya Nadella's leadership, Microsoft's culture has transitioned to greater openness, interoperability, and support for OSS. The age of open source software is great for users but also makes it tougher for the vendors to compete, because customers can avoid any sign of lock-in. The enterprise IT market has also shied away from ALM in recent years, and while this fashion is likely to change, Microsoft's ALM market share may shrink without a vision to capture developer mindshare. Microsoft's focus on Azure and its ML offerings will help attract a new generation of developers.

Perforce (Ovum recommendation: challenger)

Products reviewed

Perforce's products are Helix ALM and Hansoft Agile Project Management, available on premises or though cloud subscription.

Perforce is known for its eponymous version control system. This is now rebranded as Helix Core and Helix4Git. The company expanded into end-to-end ALM with acquisitions: Seapine in 2016, subsumed under the Helix brand, and Hansoft in 2017, remaining as Hansoft and targeting the Agile enterprise IT market.

Ovum SWOT assessment

Strengths

▪ Perforce received top ODM scores in technology for features across the development lifecycle, with end-to-end traceability throughout. The focus for the company's Helix ALM is enterprise IT, but it does penetrate engineering areas as well. While PLM-related support was weak, there was strong capability in other engineering-related features: variant and parameter requirements management and requirements definition.

▪ Perforce has managed the disruption of OSS that has seen premium version-control systems struggle to differentiate themselves. Perforce has achieved this with enterprise-grade features notable for security and scalability. It also offers to add such features for a user preferring the Git repository.

▪ The solution supports the most popular Agile frameworks such as Lean, Scrum, and Scaled Agile Framework (SAFe), while also supporting traditional V-model and waterfall processes in more traditional environments as well as hybrid scenarios.

- Perforce also achieved high ODM scores in market execution across all the segments examined, notably in interoperability, product support and deployment, and solution maturity.

Weaknesses

- This ODM has been tough in demanding ALM capabilities across both enterprise IT and advanced engineering environments. In addition, Ovum examined DevOps release management capabilities. Perforce lacked systems engineering support, especially where PLM products are also in use, although it does provide these capabilities through the REST API. Users that do not need such support out of the box can safely ignore such weaknesses and rate Perforce higher accordingly.

- The other extended ALM area, as mentioned, is DevOps, and again Perforce mostly integrates to cover such features. Ovum believes that in a few years' time, as cloud-native computing becomes the dominant development style, the need for DevOps management will grow, and thus ALM solutions should extend into this area.

Opportunities

- The opportunities for Perforce are clear from this ODM analysis: filling the gaps in engineering environments and DevOps management. Both relate to aspects of ALM that Ovum believes will grow: advanced engineered products will only increase in software content; digital transformation is converging technology across enterprise IT and engineering manufacturing; and cloud-native computing makes DevOps an essential foundation.

- Perforce is known for change and configuration management. And Perforce provides an additional opportunity to reach customers through Helix ALM. For the smaller players in the market, listening to the customer and offering fast turnaround on requests can be critical to success. This is helped by Agile development of the platform with more frequent incremental releases.

Threats

- The consolidation that has taken place in the ALM market has made it difficult for smaller players, so they need to shine to be noticed. The move of development to the cloud also means public cloud providers are increasing competition for independent ALM players.

- The need for ALM will grow because software use in all products will only increase, and at some point, software engineering will mature as a discipline and establish best practices, of which SLM will be a part. For the smaller players, it is a question of riding the lack of fashion for ALM in some software communities, mostly independents and open source, to reach a change in adoption and regrowth.

Siemens Polarion (Ovum recommendation: leader)

Products reviewed

There is one product: Polarion ALM, which is also available in modules: Polarion Requirements, Polarion QA, Polarion Pro, and Polarion Reviewer.

Ovum SWOT assessment

Strengths

- Siemens Polarion achieved high scores in the technology dimension of the ODM as well as in the market execution dimension, an all-round high performance that maintains the vendor and product in the leader category since Ovum last ran this ALM ODM.

- Polarion is focused primarily on the growth area in ALM: advanced engineering software applications such as the mechatronics industry and highly regulated industries where safety-critical products are built. It can satisfy the high demands and standards of such use cases.

- Polarion is built on three pillars of collaboration, traceability, and reuse, all in one integrated ALM solution. Having a single ALM product that covers the lifecycle end to end is an advantage and strength of the solution. This also helps in compliance scenarios, because auditability of data and work items is easy to perform through the workflow process.

- The solution is built to be open and has many out-of-the-box integrations with open source and other tools popular in this space. Polarion itself is built on a foundation of several open source tools. It has an open API for building apps and extensions.

Weaknesses

- This ALM ODM has included DevOps release management features as part of the evaluation. Polarion largely integrates with external tools for this capability and has consequently shown weakness in the ODM on this aspect. Ovum's view is that DevOps will grow in importance in the engineering manufacturing world and that ALM vendors should be looking to support this eventuality.

- Polarion scored most weakly in the product support and deployment category of the market execution ODM dimension. This was mainly due to the lack of solution templates across several industries. This clearly reflects the focus of the product on engineering manufacturing where it does have solution templates. This is clearly a business decision on where to focus the sales effort.

Opportunities

- The acquisition of the company by Siemens took place soon after the last Ovum ALM ODM and has allowed Polarion to expand its use within the giant industrial parent company as well as benefit from reaching into the Siemens customer base and ecosystem. Polarion has also benefited from better integrating its ALM solution with Siemens Teamcenter, a major PLM product.

- Ovum believes adding DevOps release management capability will be an essential element for ALM vendors as software development at large moves further into the cloud-native paradigm (and remember clouds exist "up there" and on premises); this means a foundation of Agile and DevOps for architecting microservices and deployed in containers. Siemens Polarion should look to better support DevOps and exploit the end-to-end traceability benefits that compliance demands, as Ovum expects engineering to adopt these cloud-native concepts.

Threats

- The ALM market is clearly demarcated into players that are large and have public clouds, independents that are focused on enterprise IT or software in engineering but rarely both, and

some legacy players that have survived the market disruptions. Polarion should look to shine in its corner of the market, being part of a large engineering mother ship is clearly a great benefit.

Appendix

Vendor solution selection

Inclusion criteria

Vendors were required to have a set of core capabilities in the ALM space, additional capabilities spanning both engineering manufacturing and enterprise IT environments, and a broad set of DevOps release management capabilities.

The ALM capabilities can be summarized as follows:

- development process management and integrations
- ALM for systems engineering
- variant and parameter management
- change and configuration management
- Agile project/product management
- requirements definition
- requirements management
- QA and test lifecycle management
- application security
- DevOps release management and automation.

Exclusion criteria

This ODM is designed to exhaustively cover not all the ALM players in the market but a representative set of the leading players. Ovum also invites some of the smaller, possibly niche, vendors that have innovative solutions and are on a fast growth path. With this flexibility we do not set exclusion criteria but judge each participant on its own merits. While the title of this report is ALM and DevOps, the emphasis is on ALM and so we did not invite pure-play DevOps vendors.

Methodology

- Vendors complete an in-depth questionnaire and comprehensive capability matrix that isanalyzed and evaluated.
- There is a series of comprehensive, structured meetings including a demonstration whereappropriate.
- Supplemental information is obtained from vendor literature and websites and from theresults of Ovum surveys, some of which were specifically designed for this report.
- The report is peer reviewed by Ovum analysts.

Definition of the ODM

The ODM spans three assessment dimensions.

Technology

In this assessment dimension, Ovum analysts develop a series of features and functionality that provide differentiation between the leading solutions in the marketplace. The criteria groups identified for ALM closely follow the capabilities listed in the inclusion criteria section above.

Market execution

In this dimension, Ovum analysts review the capability of the solution around the following key areas:

- **maturity:** the stage the product is currently at in the maturity lifecycle of the overall technology area
- **interoperability:** how easily the solution can be integrated into the organization's operations, from out-of-the-box integrations to APIs
- **innovation:** covers both technological advances and novelty in business reach and support
- **product support and deployment:** availability of solution templates across a range of diverse industries, geographical reach, availability of support, and ease of updating the solution
- **enterprise fit and licensing:** flexibility of the solution's licensing arrangements and outlay for various deployment scenarios. Alignment with industry trends and resiliency are also assessed.

Market impact

The global market impact of a solution is assessed in this dimension. Market impact is a metric normalized to the market leader:

- **Revenue.** Each solution's global revenues are calculated as a percentage of the market leader's. Overall global revenue carries the highest weighting in the market impact dimension.
- **Partner ecosystem.** The range of partners is assessed.
- **Geographical penetration.** This metric is based on extent of global presence.

Ovum ratings

- **Market leader.** This category represents the leading solutions that Ovum believes are worthy of a place on most technology selection short lists. The vendor has established a commanding market position with a product that is widely accepted as best of breed.
- **Market challenger.** The solutions in this category have a good market positioning, and the vendors are selling and marketing the product well. The products offer competitive functionality and good price-performance proposition and should be considered as part of the technology selection.
- **Market follower.** Solutions in this category are typically aimed at meeting the requirements of a narrower range of customers. As tier-1 offerings, they should be explored as part of the technology selection.

Further reading

2019 Trends to Watch: Software Development, INT003-000279 (November 2018)

Software Market Forecasts: Software Lifecycle Management, 2018–23, PT0177-000001 (June 2019)

Ovum Decision Matrix: Selecting an Enterprise Mobile Application Development Platform, 2018–19, INT003-000133 (April 2018)

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We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Ovum's consulting team may be able to help you. For more information about Ovum's consulting capabilities, please contact us directly at consulting@ovum.com.

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