Ovum Decision Matrix: Selecting an Application Lifecycle Management Solution, 2016–17

How ALM is transforming the ability to manage complex software development

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Summary

Catalyst

The field of software lifecycle management has undergone a number of transitions since Ovum last reported on the topic. For the first time in its application lifecycle management (ALM) ODM coverage, Ovum examines in depth the role of ALM in systems of systems and engineered product manufacturing, as well as in traditional enterprise IT and regulated environment software development.

There has been an exponential increase in software content in advanced products, from medical instruments to software-based control systems (especially in automobiles), whether embedded in electronic control units or running as full-blown applications on computers integrated into products. Consequently, the use of ALM tools to deal with the complexity of software development in engineering manufacturing has been a growth area. This has made the question of ALM and product lifecycle management (PLM) integration a hot topic in manufacturing. The growth of the Internet of Things (IoT) will also continue to accelerate the use of software in products and with it the need for ALM solutions to manage the development of this software.

In enterprise IT and regulated environments, there have been a number of transformations. Agile and, most recently, DevOps have taken center stage in the way in which organizations develop and deliver software, while open source tools have come to dominate core development tool adoption. What enterprises seek from their ALM solutions has therefore changed. This ODM report covers this changing landscape and how ALM tools have met the new challenges. The ODM comprehensively compares the leading ALM products available on the market.

Ovum view

The concept of ALM was born with the promise of artifact traceability across the lifecycle, as well as transparency and visibility into project progress. However, with the adoption of best-of-breed tools, the resulting heterogeneous mix in a typical organization means that real-time views of projects are not possible and tools are only partially integrated if at all. Organizations are therefore beginning to look at single ALM solutions, which operate at the management layer, and which can deliver the full promise of ALM while being able to integrate with the heterogeneous mix of core development tools, often free open source.

Agile has revolutionized the way in which developers work and has led to a new movement, DevOps. Ovum expects DevOps to become mainstream in enterprise IT in 2016-2017, but this view covers a range of usage patterns. Many organizations, particularly larger enterprises, run a range of legacy systems that will continue to be maintained under traditional, waterfall, styles of management. Enterprise software development projects will therefore use a range of process styles, mixing traditional, agile, and DevOps patterns. This multi-speed approach enables project managers to use the methods and practices appropriate to the needs of the project. ALM solutions should therefore support multi-speed development patterns.

DevOps has also led to a new breed of solutions for improving release management and automation. In this ODM we only cover release management features at a high-level, for in-depth examination of
DevOps tools and an explanation of the meaning of DevOps there is a companion ODM: DevOps Release Management 2016-2017.

The criteria in this ALM ODM are based on product capabilities that can be used by systems engineers in manufacturing, as well as by enterprise IT departments and regulated environments. ALM solutions that reflect solely the needs of projects in enterprise IT and regulated environments are covered in a companion ODM: Agile Project Management 2016-2017. The categories that appear in this ALM ODM and do not appear in the Agile Project Management ODM are:

- Process management
- Requirements definition
- ALM in software-rich product manufacturing and systems engineering

The two ODMs also differ in the weights attached to feature categories (for category weights, see Methodology).

With digital transformation taking place, software developers now appear in nearly all industries. Agile and DevOps continue to impact how software is developed and delivered, and are driving new styles of software architecture. The ALM solutions reviewed here are designed to meet these changes and challenges.

**Key findings**

- Digital transformation is taking place in businesses and large engineering industrials alike, with software at the root of added value and product differentiation.
- ALM is now an essential solution for building software-rich products in the manufacturing sector, as well as in enterprise IT.
- Real-time end-to-end lifecycle traceability, visibility, and team collaboration are compromised by a heterogeneous mix of ALM tools that lack sufficient in-depth interoperability.
- Organizations are beginning to appreciate that standardizing on a single ALM solution removes tool friction as an impediment to agility, and helps them deliver faster to market.
- Many enterprises and manufacturers continue to use a mix of traditional waterfall, agile, and hybrid/custom development practices. ALM solutions therefore need to be process-agnostic and designed for multi-speed project environments.
- Free open source dominates core development tools adoption, so ALM needs to focus on management and interoperate with leading open source tools.
- Source code version control is dominated by free open source tools. Ovum has therefore removed change and configuration management as a core part of ALM solutions.
- The Internet of Things will drive ALM solution adoption in engineering industrials.
- DevOps release management and automation will transform enterprise ALM solutions.
- The next IT wave will be microservices architecture and the use of container technology. There will be an associated challenge in managing microservices proliferation chaos.
Market and solution analysis

Ovum Decision Matrix: Application Lifecycle Management, 2016–17

True ALM

An ALM solution is designed to help manage complex projects regardless of whether the complexity is due to the scale of the amount of code being developed, or due to the nature of the technology being used and how it is applied. An ALM solution should allow three principal real-time benefits: traceability, visibility, and collaboration. For example, traceability allows a requirement to be traced across the lifecycle from being defined, to test cases generated, to implementation in design, model, and code, to test case execution and results linked back to the requirement, to final code release and deployment details linked back to the original requirement.

In an IT environment with a mix of tools, work item traceability is difficult to achieve. The lack of true lifecycle management hinders work, resulting in wasted effort and increased development time. This has led to some disenchantment in the field. At the same time, the agile and DevOps revolutions have changed the tools landscape. The adoption of agile processes and methodologies led to a new generation of tools that provided ALM capabilities geared to support agile styles of work. This in turn led to a new generation of ALM tools that could support any development process from waterfall to agile.

Today we see the emergence of ALM solutions that are sufficiently strong across the complete lifecycle to allow organizations to standardize on that one solution and to realize the benefits of ALM. This is a case where rip-and-replace does make sense compared with best-of-breed for a large enterprise engaged in software development across multiple teams, across multiple locations, and with multiple suppliers and partners. In this scenario, the ability to transfer work sets across teams with minimum tool mismatch and friction allows projects to accelerate development and significantly reduce delivery time. For example, in manufacturing, modern vehicles and planes are reaching the market from initial concept at vastly reduced times compared to previous decades, and this is largely due to efficiencies that software introduces. Choosing the right ALM strategy to match the increased use of software in products further accelerates time to market.

ALM and open source tools

ALM tools have been affected by the open source and free market, which dominates core development tools. Providing an open API and integrating with the most popular open source tools is now essential to play in the ALM market.

Open source code version control solutions have taken a large part of the change and configuration management (CCM). For the first time Ovum has removed this category as being a core part of ALM, because we expect ALM solutions to integrate with the most popular version control systems that developers choose to work with. A snapshot from Google Trends shows that Git began to dominate the version control market from around 2013, and this is an ongoing trend. Many of the CCM vendors now build solutions on top of Git, adding features that enterprises need when building large-scale and complex projects. For example, they want to see access based on role or named individuals. CCM has become a commodity tool but with a market for niche premium solutions to add advanced management features, and Ovum will explore these changes in a future CCM report.

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**ALM in enterprises versus ALM in manufacturing**

Ovum has expanded its traditional enterprise IT scope for ALM to encompass software engineering in systems of systems development and advanced product manufacturing (see Figure 1). This is a result of the exponential growth of application software and embedded software content in products. For ALM vendors to market in the engineering manufacturing space requires fulfilling certain demands of this market. Foremost is the refinement in requirements, which in manufacturing breaks down top-level requirements into variants, parameters, and configurations (these terms have distinct meanings that differ from enterprise IT vernacular). ALM solutions that include variant management will be able to address these needs.

Another differentiator is in the support for model-driven design and development. Software modeling has been a mainstay in engineering manufacturing, and a decade ago ALM vendors attempted to bring enterprise IT to this practice with UML 2.0+ and auto-code generation. It never took off for two reasons: each vendor had its own proprietary extension of UML, and agile development, which eschewed the heavier modeling approach, was beginning to spread. However, in engineering manufacturing, modeling is an essential activity, where, for example, baseline models are created for say, mobile phones or washing machines, and the many variations of these products are auto-generated from the baseline models. This approach saves a huge amount of effort. ALM in engineering manufacturing should manage models and integrate with modeling tools.

Finally, an essential ALM capability for engineering manufacturing is integration with PLM systems and environments run by these systems. ALM-PLM integration is an active area of development for vendors. PTC’s acquisition of MKS, and Siemens acquisition of Polarion were driven by this need.

When looking at the client lists of ALM vendors, it is possible to find examples from a variety of industries. However, when concerned with the question of ALM in enterprises versus manufacturing, it should not be forgotten that a large manufacturing industrial organization is also an enterprise with an IT department, and has ALM needs for software projects that are not solely concerned with embedded or systems engineering software. The focus on ALM for manufacturing is therefore specifically to address the wider needs of software developed to go into manufactured products.

Note that the companion ODM on Agile Project Management 2016-2017 essentially covers ALM for only enterprise IT and regulated environments.

**ALM and DevOps**

DevOps has become a hot topic in enterprise IT since its inception in 2008-09, and Ovum predicts that it will enter the mainstream in 2016-17. The impact on ALM is that the category of DevOps release management solutions, which is covered in a third accompanying ODM, is likely to merge with enterprise IT ALM. There is a logical sense in this combination, as well as advantages from a tooling viewpoint. Already Microsoft and new player Clarive are offering this type of single integrated solution that spans agile project management to DevOps release management.

However, in engineering manufacturing, the DevOps concept of continuous engineering delivery is novel and mainly unknown, so we may see ALM vendors split in how they treat DevOps. In the long term, just as agile is now making inroads in software-rich manufacturing, we expect to see DevOps have a similar effect, albeit modified for an embedded and engineering context.
DevOps is also driving the microservices architecture and container IT wave in enterprise IT, which has not impinged on engineering manufacturing. Microservices architecture (MSA) fits well with agile/DevOps because it allows changes to be made to production systems while they are running live. Leading Internet companies, such as Alphabet, Amazon, and Netflix, are good examples of the power of MSA. DevOps adopters are therefore aware of and considering MSA. We expect to write a lot more about MSA and containerization in the years ahead.

**ALM vendor comparisons: ODM results**

Ovum invited ALM vendors to participate in the ODM based on criteria given in the vendor inclusion section. Vendor solutions are assessed on three dimensions: technology features, market execution, and market impact. The methodology behind these ODM dimensions is given in the Methodology section (see Appendix). The three dimensions of the ODM are combined in a bubble chart (see Figure 2) and with expanded view (Figure 3).

The Ovum Rainbow Map (Figure 4) provides a view of how well vendors scored in the technology dimension by feature category, with the violet end of spectrum scoring highest, red end scoring lowest, and black representing no capability present at all.
Ovum Decision Matrix: Selecting an Application Lifecycle Management Solution, 2016–17

Figure 4: Ovum Decision Matrix: ALM, 2016–17, Rainbow Map

Ovum ratings

The ALM vendors are ranked into three types as follows:

- **Market leader**: This category represents the leading solutions that we believe are worthy of a place on most technology selection shortlists. 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 are being sold and marketed well. The products offer competitive functionality and a 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 particular kind of customer. As a tier-one offering, they should be explored as part of the technology selection.

On the basis of the types of ranking, Ovum’s results for the ALM ODM 2016-17 are given in Table 1.

Table 1: Ovum Decision Matrix: ALM, 2016–17

<table>
<thead>
<tr>
<th>Market leaders</th>
<th>Market challengers</th>
<th>Market followers</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM</td>
<td>CA Technologies</td>
<td>Hansoft</td>
</tr>
<tr>
<td>Intland</td>
<td>HPE</td>
<td>Inflectra</td>
</tr>
<tr>
<td>Polarion</td>
<td>Micro Focus (Borland)</td>
<td>Seapine</td>
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<tr>
<td>PTC</td>
<td>Microsoft</td>
<td>TechExcel</td>
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Source: Ovum
Market leaders: vendor solutions

The market leaders have excelled in both the technical features they offer and in how well they execute in the market. Ovum has reviewed vendors of different size and maturity, with different impacts on the market, and all the leaders performed highly in meeting the needs of systems engineering/manufacturing as well as enterprise IT and regulated environments. This means, for example, that they are able to manage complex requirements, such as variant management for software embedded in manufactured products, as well as meet the needs for managing multi-speed enterprise IT and offer processes that are compliant with industry regulations.

IBM has been a leading vendor in the ALM space for many years and has a strong presence in both the enterprise IT and engineering industrial sectors. IBM understood the need for an ALM approach in software-rich product manufacturing before many other ALM vendors recognized the opportunity. While niche suppliers in manufacturing offer segments of ALM, typically requirements management, the opportunity to offer an end-to-end ALM solution has been IBM’s strength for the past decade.

Intland is a relatively new entrant to the ALM space but it recognized from the outset the opportunity afforded by engineering manufacturing. The rise of software content in engineered products has helped grow this part of the ALM market and helped propel Intland and its business process automation approach to the front line of ALM vendors. Ovum was impressed by Intland, and this is the first time the company has appeared in an ODM.

Polarion has grown over the years, offering an integrated ALM solution to the mechatronics specialist space, as well as enterprise IT and regulated environments. Its recognition of the importance that ALM-PLM integration plays resulted in investment and subsequent acquisition by Siemens. Given the huge customer base within Siemens, this represents an excellent opportunity as software content in engineered products increases and more projects need ALM solutions.

PTC became an ALM vendor with the acquisition of MKS, and was the first leading PLM vendor to make an ALM acquisition. The company is now transitioning to be a major Internet of Things vendor, and ALM continues to play a role as the means of managing the content that goes into devices and machines. PTC’s ALM solution is principally targeted at the manufacturing space, and this is a growth market and offers excellent opportunities.

Market challengers: vendor solutions

The market challengers are all vendors with a focus on enterprise IT that have been challenged by Ovum opening up its ALM ODM to manage high-content software in engineered product manufacturing, as well as enterprise IT and regulated environments. This is the main difference when comparing challengers and leaders in this ODM. The distinction is in the large-scale product manufacturing such as automobile, aerospace and defense, and other manufacturing. These industries are becoming software-centric at a phenomenal pace, and have wider ALM needs captured in the technology feature categories (ALM for systems and product engineering, process management, and requirements definition).

CA Technologies appears for the first time in an Ovum ALM ODM, and the result of acquisitions, such as Rally Software, and organically grown products, such as CA Application Lifecycle Conductor. Because the company has made a strategic decision to become an ALM vendor, Ovum expects CA’s solution to continue to evolve.
HPE, named Hewlett Packard Enterprise (HPE) after the HP split, offers a solid ALM solution with particular strength in QA and test management, and is one of only four vendors to offer a service virtualization solution (CA and IBM are the others in this ODM, and Parasoft is the fourth).

Micro Focus (Borland) continues to offer the Borland suite of ALM products, as well as the Silk test tool portfolio. Technologically, the solution just fell short of the leader category, but in terms of execution it did not address the manufacturing sector with sufficient strength.

Microsoft Team Foundation Server is popular with embedded software engineers but the solution could be improved with the management capabilities addressed in this ODM that manufacturers require. Microsoft has also opened up its solution to be agnostic to target platforms and has the attraction of the Azure PaaS environment.

Market followers: vendor solutions

The market followers are all vendors that have achieved recognition as major ALM players in the market and have significant presence in certain industries. For example, Hansoft and TechExcel are particularly strong in the computer games industry. These vendors’ products are also able to be used in regulated industries as well as in enterprise IT.

Together with leader-ranked Intland and challenger-ranked CA, follower ALM vendors Inflectra, Hansoft, and Seapine all appear for the first time in an ALM ODM. We expect the follower solutions to chase the challenger ALM vendors in this hotly contested market.

Emerging vendors

There remain a number of ALM vendors that have not made it into this ODM. For example, Atlassian appeared in the ALM ODM 2013-2014 but declined to participate this time. The initial public offering of the company coincided with the ODM’s research phase and this was understandably a sensitive time for the company. CollabNet’s core strength is in CCM and we removed this as a category in ALM so CollabNet did not participate this time, but we expect to see CollabNet covered in a future CCM report.

The question of ALM tool integration has been touched on. Many organizations struggle to gain the benefit of ALM from their solutions because they have a mix of tools from many vendors and these typically do not interoperate well. Ovum recommends considering standardizing on a single ALM solution, while letting developers choose their core development tools (standardize at the management level but allow best-of-breed at the coal face). This is not always possible, so vendors such as OpsHub and Tasktop offer solutions that improve spot solution interoperability.
Market leaders

Market leaders: technology

IBM scored exceptionally well all round in the technology dimension. Intland, Polarion, and PTC scored neck-and-neck on average in this dimension.

Market Leaders: execution

Source: Ovum

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IBM again scored top marks in this category with Polarion a close second, followed by Intland and PTC.

**Market Leaders: market impact**

**Figure 7: Ovum Decision Matrix: ALM 2016-2017 – Market leaders – market impact**

IBM is the largest vendor in the market in Ovum’s estimate of its ALM revenue. PTC is second, followed by Polarion and Intland.
Vendor analysis

CA Technologies (Ovum recommendation: challenger)

**Figure 8: CA Technologies**

Source: Ovum

**Products**

The primary products are CA Agile Central and CA Application Lifecycle Conductor.

**Ovum SWOT assessment**

**Strengths**

CA Technologies has launched itself as an ALM vendor with strong potential

CA has made a strategic step to become an ALM player. Its acquisitions of Rally Software (Rally Platform has become CA Agile Central), Nolio, and inUnison (UnifyALM is now CA Application Lifecycle Conductor) provide a foundation on which it can continue to evolve its solution. CA has a strong presence in project and portfolio management at one end of the software application lifecycle, and IT service management at the other end. CA ALM connects the two ends while also acting as an integration hub for a heterogeneous environment through the CA connector framework. The acquisition of Rally adds a leading solution for agile project management to CA’s ALM capability and raises CA to leader ranking in the companion Agile Project Management ODM.

**Weaknesses**

The potential for CA is to target the systems of systems and product manufacturing space.
As its ALM capability currently stands CA does not address certain essential activities in the systems of systems and engineered-product manufacturing space, including engineering model-driven design and development with auto-code generation, variant management, and ALM-PLM integration. CA ALM capability does extend to engineering and regulated environments but not where these activities are required. This is certainly a market worth considering by CA for future expansion, because Ovum believes that ALM in the PLM world is a growth area. CA does, however, have other pieces in place to support this evolution, including for example, supporting SAFe, lean thinking, and lean development in the systems space. Also worth noting is that CA already has capabilities in engineering model-driven design and development for mainframe software development and database modeling.

**CA could look to add impact analysis to its requirements management**

CA’s overall ALM capabilities are impressive, and Ovum suggests adding impact analysis to the requirements management offering. This allows changes in requirements to be assessed in terms of their knock-on effect on related work and is a valuable capability.

**Opportunities**

**CA’s ALM can improve support for the software security development lifecycle**

Ovum is a strong advocate for developers to work with tools that support the software security development lifecycle. In the age of the Internet and the transition to the digital economy, the issues that will continue to preoccupy businesses are the problem of security breaches. With greater reliance on software, there is a need to improve application security. CA has demonstrated features that support improving application security and Ovum can see room for growth. The more automation that can be applied in this respect, the better the security within applications, because a typical software developer will never become a security expert. CA Flowdock from the Rally stable is often used as a collaboration tool to surface issues discovered from monitoring systems and then collaborate as a team on resolution.

**Threats**

**Application development is evolving rapidly and CA is in a good position to support its management**

Application development changes continuously, and the next IT wave to cause disruption will be microservices and containerization. Leading Internet companies including Amazon, Google, and Netflix have led the way, moving to these technologies a decade ago, and they have shared their knowledge with the open source community. These technologies are now percolating to the early adopters, driven by agile and DevOps adoption. CA already supports microservices and containers and it will be interesting to see how its ALM evolves to manage these new environments.
Hansoft (Ovum recommendation: follower)

**Figure 9: Hansoft**

Source: Ovum

**Products**

The primary products are Hansoft and HansoftX.

**Ovum SWOT assessment**

**Strengths**

**Hansoft is an organically built, integrated, and holistic ALM solution**

Hansoft ALM offers a natively built solution that has full traceability across the lifecycle with a solution that is also very fast in working with large amounts of data. Hansoft has many clients in the computer games industry where working rapidly in agile processes is favored, and these customers demand a fast response from their tools, as well as a tool that scales with users without affecting performance. HansoftX is an additional tool for collaboration and is available as a free to use mobile and desktop app.

**Hansoft is able to switch between traditional, agile, and Kankan methodologies side-by-side**

A strong advantage with Hansoft is the ease with which a user can switch between view modes. The traditional, agile, and Kanban process views are synchronized in real time so that teams can use mixed methods and choose the approach that best suits their work. Many organizations still use Gantt charts, and Hansoft is one of few tools on the market to still offer these waterfall charts within a tool that also supports agile methods.

**There is comprehensive support for agile methodologies**
Hansoft supports the Scaled Agile Framework (SAFe), which has growing adoption, as well as Disciplined Agile Development (DAD), Large Scale Scrum (LeSS), and others. It also has an in-built tool similar to business intelligence, which provides actionable agile metrics, and intuitive dashboards. These metrics support decision-making at team level, for which there is a growing need because agile encourages greater autonomy for development decisions.

**Weaknesses**

**Hansoft has little integration with other software development tools**

The range of tools that Hansoft will integrate with out-of-the-box is quite limited. Although Hansoft provides strong integration with Git, Perforce, and Subversion, it does not provide out-of-the-box integration with IDEs, continuous integration, testing tools, release automation, mobile application development platforms, security development lifecycle tools, performance testing, and application performance management. Some of these categories are ‘nice to have’ and others would be considered essential.

**Opportunities**

**Hansoft should add QA and test management**

The one crucial segment in the lifecycle that could be further strengthened in Hansoft is QA and test management, and we consider this to be an essential part of an ALM solution. The traceability between requirements and test cases and results is vital in many cases and should be part of an ALM solution. Ovum believes that Hansoft should further develop this element to improve its opportunity in the market. At time of writing, Hansoft has introduced additional quality assurance and test case management features via an extension.

**Threats**

**The ALM market is highly competitive**

Hansoft will be under pressure to achieve full ALM status in a field that has now expanded to cover software-rich systems and product engineering. We believe that the product has strong opportunities with a focused approach on sectors that value ALM, with flexibility in the process used. With the gaps identified in this report filled or connectors with third-party tools made available, Hansoft will be better prepared to face market competition.
HPE (Ovum recommendation: challenger)

**Products**

The primary products are HPE ALM 12.50 and HPE Agile Manager 2.5.

**Ovum SWOT assessment**

**Strengths**

**HPE ALM is a leading ALM solution for the enterprise IT market**

HPE ALM is designed for the enterprise IT and regulated environment markets and is a leader in this category (see the companion ODM on agile project management). Ovum has changed its scope for ALM to include ALM in the PLM world, which is not a sector targeted by HPE. If the engineering in manufacturing elements are removed, the offering is a first-class ALM solution.

**HPE ALM leverages the company’s heritage in QA and testing**

HPE is able to offer a superior QA and test management capability, leveraging its established leadership in this segment of the application lifecycle. These management capabilities are integrated into HPE ALM, so that a seamless capability exists across the lifecycle, in particular between requirements and testing.

**HPE Service Virtualization is one of the leading solutions on the market**

Service virtualization is not well understood in the industry but is a secret weapon for developers who do understand its power. HPE is one of a small number of vendors offering such a solution. It allows, for example, for tests to be conducted on components when the modules they are meant to connect...
to do not yet exist. For organizations using agile and DevOps practices, service virtualization enables a fast iterative capability, because component and systems testing is accelerated against virtual interfaces to components and systems necessary for testing but not yet built or available during testing. It enables teams to complete their testing by de-coupling dependencies to other teams.

**Weaknesses**

**There is no ALM support for embedded software engineering and systems engineering**

Engineering industries building software-rich products have become a significant market for ALM and have particular needs, such as variant management and modeling. For HPE to be active in manufacturing, it must offer ALM capabilities these markets demand, such as model-driven development and variant management.

**Opportunities**

**In the long term the Internet of Things (IOT) and digital transformation (such as mobility) will cause enterprise IT and engineering IT to converge for many businesses**

The case for re-scoping ALM that Ovum has made is reinforced by trends such as IOT, mobility, and digital transformation in general. We believe that HPE should consider expanding the scope of its ALM solution because this new market is a growth area for ALM, whereas the competition in the enterprise IT space is fiercer as a result of open source software.

**Threats**

**HPE needs to assess its ALM focus**

HPE needs to assess its priorities in the ALM market. Ovum believes in holistic solutions, and we see DevOps, for example, as encompassing a wider scope than what many see today as just development and operations collaboration over releases. We believe the future will see improved integration between ALM and DevOps solutions, and ALM products that have DevOps capabilities out of the box will have significant advantages in a highly competitive market. HPE has plenty of good pieces in place across its portfolio, and it is a question of what, how, and if it puts these together into a single holistic ALM product.
IBM (Ovum recommendation: leader)

Figure 11: IBM

Source: Ovum

Products

The primary products are IBM Rational Collaborative Lifecycle Management (CLM) version 6.0; IBM Bluemix DevOps Services, continuously enhanced. CLM comprises: IBM Rational Team Concert, IBM Rational DOORS Next Generation, and IBM Rational Quality Manager.

Ovum SWOT assessment

Strengths

Breadth and depth in product and systems engineering, including IoT

IBM’s DOORS requirements-management solution is highly popular in the aerospace and automotive sectors as well as other industries, and the new edition, DOORS Next Generation, modernizes the tool, as well as being a part of the integrated ALM solution, IBM CLM. Systems engineering and IoT require greater refinement of requirements than in enterprise IT, and IBM is one of a select group in this ODM able to meet these industry demands.

IBM Rational Engineering Lifecycle Manager (RELM) fulfills the need to be able to quickly locate information that is distributed across many different tools and repositories. Using Open Services for Lifecycle Collaboration (OSLC) to link data at source in real time, RELM saves engineers and managers time and effort in retrieving information.
IBM is one of the few ALM vendors to continue to offer modeling tools and have these tools integrated with IBM CLM. As high-tech engineered products and software-rich products converge, the need for ALM tools will grow, especially with IoT growth, and IBM is positioned well in this market.

**IBM supports Scaled Agile Framework for enterprise agile development at large scale**

Enterprise agile software development at large scale can be done but requires experience which is not always easy to find. The Scaled Agile Framework (SAFe) encapsulates many proven agile techniques and processes in one framework, and adoption has grown. IBM’s support for SAFe will therefore be welcomed by project managers.

**Weaknesses**

The broad range of tools in the portfolio could be enhanced with a single-box ALM solution

IBM has both breadth and depth of features it can offer across the categories reviewed in this ODM. Although CLM is a single-license ALM solution, IBM often sells individual products, and this can be a disadvantage compared to solutions that are available in a single box. Both in terms of ease of use and cost, we would encourage IBM to offer a single-box solution that uses a single dashboard/front-end console for working with all the lifecycle tools.

**Opportunities**

IBM CLM integrated into Bluemix is an opportunity to enhance the practice of ALM

IBM Bluemix PaaS provides a first-class application development environment on the cloud, and the possibility of managing projects on Bluemix using IBM CLM is an opportunity for IBM to offer a highly integrated experience. Bluemix delivers a subset of ALM capabilities, so we would encourage IBM to offer a full ALM capability. Bluemix should offer a range of experiences for its users, from services for small teams of developers to services for project managers working on large-scale projects.

**Threats**

Responding to customer needs is the way to meet the challenges in the market

In recent years, the application development tools market for enterprise IT has been rocked by a number of forces including open source tools (often with free licenses), agile and DevOps work practices, and mobile development. This has had an impact on the ALM tools market, with new players emerging, providing greater competition. For IBM, the growth of ALM in product and systems engineering and IoT is a clear opportunity, but the leading PLM players are building out their own ALM solutions. IBM must appeal to this market on the basis of providing an independent ALM offering that is highly responsive to customer needs. In the large manufacturing industrials, the biggest competitor to commercial ALM solutions are often home-grown ALM tools.
Inflectra (Ovum recommendation: follower)

Products
The primary products are Inflectra SpiraTeam, comprising SpiraTest, SpiraPlan, and SpiraTeam.

Ovum SWOT assessment

Strengths
Inflectra SpiraTeam has the advantages of an integrated ALM solution

Inflectra launched its first product in 2007 in the QA and test management space, and has organically grown its solution to provide a full ALM solution, with excellent project management for planning, development, and QA. With its QA heritage, this product offers one of the best feature ratings in the QA section of this ODM. Users have the benefit of an integrated single-box ALM solution that delivers true ALM benefits, including end-to-end traceability, project visibility, and team collaboration, whether using agile, traditional waterfall, regulated, or a hybrid development process.

Weaknesses
The solution is not designed for systems of systems engineering ALM

Inflectra SpiraTeam does not have the features required for managing the development lifecycle of advanced systems of systems software. Lacking, for example, is support for ALM-PLM integration and most variant management features reviewed in the ODM. Inflectra does have aspirations to expand into regulated environments, and will be adding electronic signatures which are needed in industries such as healthcare.
Opportunities

ALM offered as SaaS or on-premise with good integration capabilities

Inflectra made a strategic decision to offer all its products as both SaaS and on-premise with easy downloads. Its customers typically look for an end-to-end solution covering more than one domain (requirements management, QA, bug tracking, task management, project planning, agile planning) as opposed to customers looking for a point solution to address one need. Ovum sees this approach to ALM as a strong opportunity where a single-box solution can be offered.

Threats

The ALM market can sustain a range of ALM players with niche product capabilities

Inflectra will need to heed the direction the ALM market is moving, with, for example, the Internet of Things and the need to support software development that is either embedded or runs in machines and devices. Its aspirations to improve its attractiveness in regulated environments will help it grow its market size, and its roadmap appears to be on the right track. As the solution currently stands, against the highly competitive ALM market, Inflectra has challenges in advancing its position.

Intland (Ovum recommendation: leader)

Source: Ovum

Products

The primary product is codeBeamer.
Ovum SWOT assessment

Strengths

Intland ALM has a complete solution in one box for all types of development methodologies

Intland codeBeamer is a new-generation ALM solution that provides complete development lifecycle support out of one box. The solution offers comprehensive features across the lifecycle that are suitable for engineering software development purposes as well as enterprise IT. End users are able to realize the promise of ALM without the integration issues that hamper a mixed ALM tooling approach. The solution supports a range of methodologies, from traditional/waterfall, to agile and Scaled Agile Framework (SAFe), and any mix of these.

Support for safety-critical systems is strong

The support for embedded software engineering is exceptionally strong, with templates available, for example, for medical IEC 62304, FDA regulations (21 CFR Part 11), automotive ISO 26262, and avionics DO-178C. The solution also offers security features, with e-signatures and comprehensive risk-management functionality, and is extendable through apps and templates for creating workflow processes for specific industries and processes.

codeBeamer uses a business process management (BPM) system to advantage

codeBeamer is based on a business process engine that drives the workflow. This approach has a number of advantages because of the way it can integrate with other systems, from enterprise resource planning (ERP) solutions to product lifecycle management (PLM) solutions. Events can be triggered and data exchanged from a number of sources such as REST or email. PLM integrations include PTC Windchill and Oracle Agile PLM.

Weaknesses

The support for application development security could be improved

The ALM industry does not generally support application security well, leaving it instead to third-party tools. Ovum believes that the market has a strong need for improved security, and ALM solutions that provide out-of-the-box integration with leading scanning tools, for example, would help improve this.

Opportunities

The rise of embedded software in engineered products is a huge opportunity for Intland

The need for ALM is becoming understood by senior management in high-technology product manufacturing organizations. This represents a huge opportunity for ALM vendors such as Intland to offer an ALM solution that meets the needs of engineering, but also captures the latest advances in enterprise IT. As the large PLM vendors become aligned on their ALM approaches, there is an opportunity for independent ALM vendors, such as Intland, to focus on open standards for interoperability in the PLM world. For example, codeBeamer’s BPM approach is an excellent way to integrate with other products that can exchange BPMN models.

Threats

The ALM market continues to evolve and is not yet saturated

There is room for growth in the ALM market, and engineering and Internet of Things activities all represent good opportunities for Intland, but it will face tough competition from small and large
competitors. Intland will need to continue to innovate to stay ahead in the market and it is showing evidence of being able to meet this challenge.

Micro Focus (Borland) (Ovum recommendation: challenger)

**Figure 14: Micro Focus (Borland)**

Source: Ovum

**Products**

The primary products are Micro Focus Atlas, Agile, Caliber, and Connect.

**Ovum SWOT assessment**

**Strengths**

**Micro Focus (Borland) offers a mature ALM solution for enterprise IT**

Micro Focus acquired the Borland ALM and Borland Silk testing suites in 2009 and has since evolved these tools into three core segments: Atlas and Caliber for requirements management; Agile for project management, Borland Connect for change management and integration capabilities; and Silk for QA, performance, and testing. Connect acts as an integration hub and allows a heterogeneous tool environment to be connected through the hub. Ovum found the requirements definition, requirements management, and QA and test management to be Borland’s strongest points.

**Weaknesses**

**The Connect hub integrations available could be expanded**

Borland Connect is the integration hub at the center of the ALM suite, and is designed to connect the Borland solutions and also third-party ALM tools. However, we found some gaps in the out-of-the-box
integrations available in this solution. Missing categories include release automation, software security lifecycle tools, help desk systems, and application performance management, and categories such as performance testing and build tools could be expanded. While not out-of-the-box, the integration hub adapters have proven to be flexible in integration with most tools.

**Opportunities**

**Expanding into ALM for systems and product engineering is a possibility**

Ovum has had to widen the scope for ALM as a result of the exponential increase in embedded software and software applications running in advanced products today. Borland has some capabilities suitable for this space, such as model-driven design (Borland Together) in add-on products and advanced requirements definition, but some important areas are lacking, such as variant management and ALM-PLM integration. However, with some further evolution, Borland would be well placed to expand into the engineering space on the basis of the tooling it has.

**Threats**

**The ALM market has changed and Micro Focus (Borland) needs to consider its strategy**

The ALM market now spans enterprise IT to systems of systems and advanced product manufacturing. Micro Focus needs to decide whether it will play across this expanded market with its greater opportunities or focus on enterprise IT. The Borland product range has sufficient pieces in place that could form a good base for evolving into the engineering industrial space. Within enterprise IT, the adoption of DevOps will become as huge a disrupter as agile has been, and ALM solutions will need to evolve with this change. For example, we expect greater integration to be required between ALM and DevOps release management tools. ALM solutions will need to evolve in whichever sector is involved (enterprise or engineering).
Microsoft (Ovum recommendation: challenger)

**Figure 15: Microsoft**

**Products**

The primary products are Visual Studio Team Foundation Server (on-premise), Visual Studio Team Services (SaaS).

**Ovum SWOT assessment**

**Strengths**

**Microsoft Visual Studio Team Foundation Server is one the most popular ALM tools on the market**

For many years Visual Studio integrated development environment (IDE) has led the market as the exemplar state-of-the-art IDE across all sectors, enterprise IT, and embedded software development for engineered products. Team Foundation Server (TFS) builds a comprehensive ALM solution on the IDE. The focus for Microsoft is the enterprise IT department, and as evidenced in the Agile Project Management ODM (essentially ALM for enterprise IT), where Microsoft is a leader.

**Microsoft understands technology and consumes its own ALM tools**

Being a technology company which consumes its own ALM tools allows Microsoft to understand the trends sweeping through application development at any given time. The current trends in DevOps, microservices, and containers will redefine how software is architected, delivered, and consequently managed. Microsoft is expected to retain a strong position in the ALM market in the years ahead.

**A lifecycle approach to application development security was pioneered by Microsoft**
Microsoft was one of the first vendors to take security issues in application development seriously and introduced the concept of the software security development lifecycle (SSDL). This approach has now become standard in the industry. TFS integrates well with the code-scanning tools on the market and Microsoft is one of the few vendors to achieve high scores in application security.

Weaknesses

There is a lack of features for managing software development in engineered products

The market for ALM in product manufacturing is a growth area as the result of the exponential increase in software content in advanced engineered products.

The introduction of connected machines opens the possibility for the Internet of Things, so this sector will continue to grow in its use and dependence on software. With this growth there is a need for managing complex software development in products, particularly for safety-critical products. Microsoft has so far opted not to make any changes in its ALM solution to cater to this sector and this explains why it is a challenger and not a leader in this ALM ODM.

Opportunities

The growth in ALM is in supporting advanced product engineering

Microsoft is missing an opportunity in not providing features that are needed in developing systems of systems, such as requirements that are broken down into variants, parameters, and configurations. Convergence is taking place across all sectors of business (the digital economy) because these areas rely more on software. Many of these businesses are only now beginning to understand they need ALM, which has matured in enterprise IT but elsewhere it is relatively new and represents a growth opportunity.

Threats

The steady decline in PC sales is slowly shrinking the market for Windows applications

Microsoft is seeing its cloud business grow while the PC market continues to decline against the mobile sector. Microsoft tools are a first choice for developers targeting Windows, but Microsoft in recent years has opened up its tools to run and deploy to any OS. Its ALM solutions, as web clients, can support IDEs such as Eclipse and IntelliJ, not just Visual Studio, and TFS can support development on Mac as well as Windows. The development tools market is wide open and Microsoft has to win customers who wish to develop to multiple platforms. Nevertheless, the Windows customer base is so huge, particularly in the corporate sector, that Microsoft faces no serious threat in the short to medium term.
Polarion (Ovum recommendation: leader)

**Figure 16: Polarion**

Source: Ovum

**Products**

The primary product is Polarion ALM.

Note: Siemens acquired Polarion at the time this ODM project was in progress.

**Ovum SWOT assessment**

**Strengths**

**Polarion ALM is suitable for engineering manufacturing and enterprise IT sectors**

Polarion ALM had a holistic, integrated, ALM solution in one box before the market understood its advantages. However, now the market recognizes the advantages of an integrated approach to ALM. For example, a single repository is used across the whole lifecycle for a consistent view. Polarion is designed to meet the needs of software engineers in systems engineering and product manufacturing, with a strong presence in the mechatronics space, as well as software development for enterprise applications.

**Polarion ALM has superior real-time data tracking technology**

Moving from a document-based requirements process to the disciplined ALM approach can pose cultural impediments, so Polarion has created technology to ease the transition. Polarion LiveDoc can read Microsoft Office documents (Word, Excel) and convert them into structured requirements and keep them synchronized. The LivePlan technology enables high-level work items to be tracked in
planning. These features also present complex data views in real time in an intuitive format synchronized across teams, supporting collaboration.

**The solution is suitable for safety-critical engineering applications**

ALM in the engineering space needs to be compliant with a host of regulations and standards. Polarion ALM is fully certified for ISO 26262/IEC 61508 compliance. In addition, industry standards such as CMMI, SOX, FDA, SPICE, FAA, and others are provided to users via project templates for fast implementation and proof of compliance.

**Weaknesses**

**The solution could improve its application security capabilities**

Application development security is an area that has been a silo for many years, but with the connectivity that the Internet has introduced, and not least with the growth of the Internet of Things, security has become of paramount importance. ALM solutions should support the software security development lifecycle, and Polarion could improve its support by having out-of-the-box integrations with both static and executing code-scanning tools.

**Opportunities**

**ALM-PLM integration has been a strong focus for Polarion**

Polarion has been a strong advocate of integrating ALM and product lifecycle management (PLM) solutions. To assist this it has adopted standards to enable interoperability with third-party tools, including Requirements Interchange Format (ReqIF), and Open Services for Lifecycle Collaboration (OSLC). It has also sought to create deep custom integrations with leading PLM solutions, and its work with Siemens led to an initial investment by Siemens into Polarion and now the acquisition. The experience of integrating Polarion ALM with Siemens Teamcenter will help Polarion in its integration with other leading PLM solutions and will open up new opportunities.

**Threats**

**The acquisition by Siemens will reduce any threat to Polarion**

A very large parent company backing Polarion will create many new opportunities, and threats to Polarion will diminish as a result. The Siemens customer base will open up new possibilities to market the Polarion ALM solution. The experience of integrating Polarion ALM with Siemens Teamcenter will serve it well in marketing its solution to users of other PLM solutions. Finally, the considerable need for ALM internally within Siemens design and development work will also create an important opportunity for Polarion.
PTC (Ovum recommendation: leader)

Figure 17: PTC

Source: Ovum

Products

The primary products are PTC Global Software Development, PTC Requirements and Validation, PTC Model-Based Systems Engineering, and PTC Software Modeling. The first two products are based on PTC Integrity Lifecycle Manager.

Ovum SWOT assessment

Strengths

ALM for smart connected products

PTC acquired MKS in 2011 for its integrated ALM product to complement its product lifecycle management solution, and has now evolved the offering to fit its ambitions in the PLM/CAD/CAM engineering space. With digital convergence taking place across all business sectors, driven by connectivity, the Internet of Things (IoT), and embedded software, there is a need for a new kind of ALM solution that meets the most demanding needs of software development for systems and product engineering, and PTC is one of a select group of ALM vendors able to meet these requirements.

ALM for agile and traditional processes, with strong lifecycle traceability

PTC Integrity Lifecycle Manager, at the root of PTC’s ALM solution, is designed to manage the user’s choice of development methodology, from waterfall and V-model, to agile and lean development. Industrial engineers are strongly wedded to the V-model and expect a lifecycle management solution
that allows the linking and traceability across the arms of the model, from requirements to testing. In PTC Integrity, traceability is supported through the concept of relationship, defined as a name, direction, and the item types they can affect. The most powerful relationships are those between items contained within Integrity (authored in or synchronized into Integrity) because these allow much more rigor in process automation and enforcement and also for metrics roll-up, reporting, and so on. In addition, Integrity supports traceability to external items through other means such as URLs and the OSLC standard.

**Variant management is essential for advanced engineering requirements management**

The need to manage custom variations on main product lines is a hallmark of manufacturing, and there is no equivalent for this in enterprise IT. Traditional software requirements need to be augmented with management of variations, parameters, and configurations. PTC’s ALM solution offers these features, making it suitable for software-rich product development and manufacturing. These features are also an essential element in product-line engineering, an approach for streamlining product manufacturing.

**Weaknesses**

**There is limited native support for release management**

While PTC Integrity, the foundation of the ALM solution, satisfies most of the essential segments of the lifecycle, the out-of-the-box release-management capability could be improved. With the growth of DevOps, the release management tool space has increased dramatically, and PTC has so far decided not to compete in this area and recommends using a third-party tool, Electric Cloud, with its ALM solution.

**Opportunities**

**PTC emphasizes service as the “killer application” for IoT**

PTC is redefining its business in providing solutions for modeling, authoring, and coding applications for the IoT. For example, it sees servicing complex devices and machines as the quickest ROI for businesses exploiting IoT. Writing these applications requires having the tools to manage the design and development, and this is where the ALM capability fits in with PTC’s new ventures. These synergies in PTC’s portfolio put it in a prime position to exploit the opportunities the IoT opens up.

**Threats**

**Product lifecycle management vendors are lining up their preferred ALM solutions**

PTC was the first major PLM player to recognize the need for an integrated PLM-ALM solution, when other major PLM players were still formulating their ALM strategy. This gave PTC an opportunity to market its ALM solution to the wider PLM user base, with an ALM solution geared for systems engineering. This has now changed. Siemens acquired Polarion, and Dassault is fleshing out its ALM solution. This makes ALM in the PLM world far more competitive. The way forward for PTC is to ensure its ALM solution plays well with the open integration standards, and PTC’s participation in OSLC well help ensure it can appeal to the wider PLM user base.
Products

The primary products are Seapine ALM. The solution is also available as individual modules: TestTrack RM, TestTrack Pro, TestTrack TCM, Surround SCM, QA Wizard, and ALM Data Warehouse.

Ovum SWOT assessment

Strengths

A single-box, integrated ALM solution for scalable, team-based development

Seapine ALM can be used in modular fashion but is available as an integrated end-to-end lifecycle solution. Ovum found that Seapine is particularly strong on application project portfolio management, project management, requirements management, and QA and test management. The solution is used for embedded software development in engineering industries, and is also well suited to enterprise IT ALM. The ALM segment TestTrack is ideal for issue management, test case management, and exploratory testing, and the ALM segment QA Wizard is ideal for test automation and web load testing. The solution is organically grown and has the advantage of a holistic, tightly integrated product.

Weaknesses

There is no coverage of application security

Seapine’s support for application security tools is nonexistent. Ovum believes security is undervalued by ALM vendors, whereas end users care a lot about application security. With the increased
connectivity and growth in Internet of Things, we believe ALM vendors should at a minimum offer out-of-the-box integration with security code scanning tools. There are also other ways vendors can support the software security development lifecycle, which Ovum believes should be part of every project management, and in the ALM scope.

**Opportunities**

**The solution will need evolving for some engineering industry applications**

The ALM market has expanded into the engineering industries and Seapine has taken advantage of the opportunities this has created. Its office in Munich is well positioned to address the large German mechatronics industry, and globally the solution is positioned for regulated development environments, such as life sciences, casino gaming, energy, and others. Ovum found that the capabilities for ALM in systems engineering could be improved. There is no variant management and ALM-PLM integration, and for the automobile and A&D industries these would be must-haves. While Seapine has customers in medical instruments and mechatronics, it could expand its engineering presence by evolving its solution.

**Threats**

**Seapine has been in the ALM market for many years but will need to evolve**

The ALM market has changed in recent years with the expansion into engineering and with DevOps pushing the boundaries of agility into application delivery and IT operations. ALM vendors have an opportunity to grow with these sectors as their need for ALM grows. Seapine already has a presence in embedded software development and regulated environments, and is therefore well placed to expand into the wider engineering industries.
TechExcel (Ovum recommendation: follower)

**Figure 19: TechExcel**

- **Market impact**
  - Revenue
  - Revenue growth
  - Partnerships
  - Global reach
  - **Market impact**
  - TechExcel
  - Maximum
  - Average

- **Execution**
  - Maturity
  - Licensing and enterprise fit
  - Interoperability
  - Product support and deployment
  - Innovation
  - **Execution**
  - TechExcel
  - Maximum
  - Average

**Source:** Ovum

**Products**

The primary product is TechExcel DevSuite.

**Ovum SWOT assessment**

**Strengths**

**TechExcel DevSuite is a holistic integrated ALM solution with full end-to-end traceability**

TechExcel DevSuite offers a single interface for managing the entire ALM process. The unified solution provides full traceability of work artifacts throughout the lifecycle. The solution is suitable for globally distributed teams, with multi-site support. A workflow engine runs at the core of the solution and processes are available for agile, waterfall, and hybrid. Large organizations typically have teams using a spread of development processes, and with TechExcel they can standardize on a single solution while supporting these different styles of working.

**Suitable for medical device development**

The solution is suitable in regulated environments such as medical instrument development, with support for standards such as IEC 62304, FDA 21 CFR Part 11, with pre-configured templates. There is out-of-the-box support or FDA General Principals of Software Validation. ALM is a must-have in safety-critical systems development, and TechExcel has a proven track record in the medical industry.

**Weaknesses**

**The solution has limited support for ALM in advanced product manufacturing**
While TechExcel DevSuite has been used in a number of regulated environments, the solution lacks features for building software-rich advanced engineering products where variant management or ALM-PLM integration are required. The process capabilities for building visual models are also lacking.

**Support for application security needs to be added**

The solution has no support for the software secure development lifecycle, and Ovum believes that TechExcel should improve its integration with code-scanning tools as a result of its presence in regulated and safety-critical systems development. Developers need tools that make the transition to application security as smooth and easy as possible given that historically the development industry has neglected this area, as have ALM solutions. The Internet has raised the priority for application security.

**Opportunities**

**TechExcel has a presence in embedded software development and could expand further**

Ovum believes TechExcel DevSuite has the potential to be further enhanced with capabilities for the engineering industries. The requirements definition and requirements management features performed well in the ODM review and could form a basis for further evolution of the product. There is a huge opportunity in engineering industries for ALM adoption, and the Internet of Things will grow this market.

**Threats**

**TechExcel has carved a niche in the market but needs to consider how ALM is evolving**

ALM is evolving in a number of ways. It is expanding to support the needs of software-rich product development in manufacturing industries. These products may run embedded software in electronic control units, or run software applications on embedded computers. ALM will also be impacted by the growth in DevOps adoption. ALM needs to grow with the opportunities that these trends introduce. TechExcel has a good niche position in the market and Ovum believes it should review its strategy in light of the trends identified.

**Vendor solution selection**

**Inclusion criteria**

Ovum drew up a shortlist of vendors to invite for participation in the ODM project. The shortlist was designed with the objective of capturing the largest players in the market as well as the most innovative and fastest growing companies. The general inclusion criteria are given below, but discretion was used to ensure the above objective was met.

Ovum assessed vendor inclusion on basis of meeting:

- A minimum revenue threshold based on licenses or combined licenses and consulting threshold or threshold number of customers.
- Vendor does not focus on ALM in a single vertical industry.
- Vendor solution should include support for at least four core functional areas in release management and automation.
Methodology

This research is based on the considerable depth of research Ovum analysts have accumulated in the software lifecycle management space. Participating vendors were asked to complete a comprehensive spreadsheet for the three dimensions of the ODM. Briefings and product demos followed, and the various parts of the research were reviewed with the vendors before signing off.

Technology assessment

In this assessment dimension, Ovum analysts develop a series of features and functionality that would provide differentiation between the leading solutions in the marketplace. The criteria groups identified for ALM are given below, with section weight percentage. Note: the main sections are listed with the sub-row headings, but the sub-sub-rows are omitted.

General ALM features, 10%

- There is an embedded workflow system for creation and orchestration of processes
- Work item traceability
- Is the product available as a cloud service?
- Is the product available on-premise?
- Control solution
- Does the product have an admin mobile app for accessing the dashboard?
- Solution repository
- Reporting
- Dashboard
- API
- Data link or transfer standards supported
- Role-based features: managers/team leaders/developer-tester roles

Breadth of ALM coverage, 6%

- Application project portfolio management
- Project management
- Requirements definition
- Requirements management
- Software architecture and design modeling
- Database modeling and design
- Change and configuration management
- QA and test lifecycle management
- Defect/issue tracking management
- Release management and automation
- Performance monitoring and analytics

Process management, 7%

- Create custom processes using a modeling, visual environment
- Out-of-the-box process support
Integrations, 6%

- Has connector technology for creating bi-directional traceability of data and reporting
- List tools for which integration exists out-of-the-box, by lifecycle discipline

ALM in software-rich product manufacturing and systems engineering, 15%

- Supports live data linking (list standards supported)
- Supports standards for data transfer (list standards)
- Search and query engineering data that is stored and managed in multiple sources and locations
- Impact analysis across multiple engineering tools
- View and browse data in one console/dashboard from multiple engineering tools and data sources
- Model-driven design tool
- ALM-PLM integration
- Are traceability linkages between any two stages across the PLM ALM divide required to be entered manually?
- All traceability links across the ALM PLM divide are automatically created and filled
- List tools for which integration exists out-of-the-box
- How does the product support software product line (also called product line engineering)
- Variant management

Application Project Portfolio Management, 7%

- Multiple projects and teams management
- Financial management
- Product planning
- Project planning
- Automated timesheets (pulls data from work done by team members)
- What-if modeling
- Resource management
- Demand management
- Risk management
- Multi-project/multi-team planning
- Multi-project/multi-team resource balancing/allocation
- Multi-project/multi-team artefact dependency management
- Can projects be prioritized?
- Cross-project reporting

Project management, 7%

- IT governance and compliance regulatory check features
- Identification of risks and dependencies
- Collaboration and knowledge capture and exchange
Requirement and task estimation support (agile points system, time, FPA, etc.)
Visual and flexible tracking of work effort
Resource allocation and scheduling
Release planning
Iteration planning
Prioritization of iterations, and agile stories/tasks
Customizable agile user stories/tasks allowing comments/annotations and flags
Electronic workflow whiteboard
Project charts
Project intelligence (metrics for appdev with real-time analytics and reporting)

Requirements Definition, 7%
Semantic analysis of text for ambiguity, omissions, and compliance
Visual requirements prototyping/modeling
Customizable user interface labeling
Glossary
Convert unstructured input data to structured formats
Output formats
Generate work flows
Traceability acceptable for audit trails supported
Multiple definition versions supported

Requirements Management, 11%
Idea management
Search and query data that is stored and managed in multiple sources and locations
Demand and request management
Requirements interdependency mapping
Requirements reuse management and support for inheritance rules
Baselining
Change impact analysis
Coverage analysis
Built-in instant messaging
Can the following be annotated/commented:
Requirements collaboration is Wiki-based with read and write capability
Process/methodology authoring and publishing
Authorship of requirements and changes/updates visible
Link requirements to models and prototypes

QA and test lifecycle management, 11%
Test cases auto generated by requirements
Automated validation of test plan coverage of requirements
Conduct gap analysis of test plans through requirements tool
Defect tracking/task management integration
Track tests by requirement
Test case branching and reuse
Automation in use case test authoring and refactoring
Historical based analytics and reporting
Can product features.Tasks be represented on a risk chart?
Manage combinatorial testing
Scheduling and automated execution of tests
Test data management
Unit test management
Manage test lab environment
Out-of-box testing tools supported (list)

Application Security, 6%
Integrate with static testing (code scanning) tools
Integrate with dynamic testing tools
Security issues auto populate defect tracking system
Security tracking integrated with trouble ticketing system
Security issue impact analysis
Risk prioritization of security issues
Security assessment reporting

Release Management, 7%
Continuous integration and testing
Continuous deployment
Build rollback
Build dependency tracking
Intelligent build (for example, only needs to build files that have been changed)
Build validation
Release management
Is there a mechanism for end user feedback to be captured and fed back to developers?
Third-party release automation integration (list out-of-the-box)
Automatically provision and deploy to a private cloud
Automatically provision and deploy to a public cloud (list supported public clouds)

Execution
In this dimension, Ovum analysts review the capability of the solution around the following key areas.
Maturity: The stage that the product/service is currently at in the maturity lifecycle is assessed here, relating to the maturity of the overall technology/service area.

Interoperability: In this element we assess how easily the solution/service can be integrated into the organization's operations, relative to the demand for integration for the project.

Innovation: Innovation can be a key differentiator in the value that an enterprise achieves from a software or services implementation, and this is assessed in this criteria.

Product support and deployment: Referring to a combination of assessed criteria and points of information, Ovum analysts provide detail on various deployment issues, including time, industries, services, and support.

Licensing and enterprise fit: Ovum analysts assess the product from a licensing perspective, such as if it is a single product with a common console for all modules. If the solution can be easily downloaded and purchased. Types of licenses available. The alignment of the solution is assessed in this dimension, and the potential ROI period identified.

Market impact

The global market impact of a solution is assessed in this dimension. Market Impact is measured by a formula based on revenue and revenue growth. The final score has a maximum score of 10 and is represented on the ODM by the bubble size. Revenue is filtered by a ceiling cutoff. The ODM radar diagrams provide additional information on market impact:

- Revenues: Each solution’s global DevOps Release Management revenues are calculated as a percentage of the market leader’s. This percentage is then multiplied by a market maturity value and rounded to the nearest integer. Overall global revenue carries the highest weighting in the market impact dimension.

- Revenue growth: Each solution's revenue growth estimate for the next 12 months is calculated as a percentage of the growth rate of the fastest-growing solution in the market. The percentage is then multiplied by 10 and rounded to the nearest integer.

- Global reach: Ovum determines local presence in the four regions of the world: North America; Europe, the Middle East, and Africa (EMEA); Asia-Pacific; and Latin America. A score is provided factored to a maximum of 10.

- Partnerships: Ovum estimates the size of each vendor’s partnership eco-system and then factors this to a maximum possible score of 10.

Appendix

Further reading


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Ovum Consulting
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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