

## TECHNOLOGY AUDIT

# ABACUS

## Avolution

### BUTLER GROUP VIEW

#### ABSTRACT

Avolution's ABACUS suite enables enterprise modelling and simulation of architecture options using a number of different metrics. ABACUS Standard provides modelling capabilities, whilst the Professional component additionally offers advanced analytics and simulation functionality. The Designer and Publisher modules provide meta model customisation, and publishing information to a secure Web site, respectively. ABACUS ships with a comprehensive library of architecture frameworks and a large number of architecture patterns for common platforms, as well as supporting data imported from a wide range of modelling solutions and infrastructure management sources. Butler Group really likes the company's focus on metrics-based evaluation addressing the key challenge of fact-based objective scenario analysis for driving architecture decisions, something which will become increasingly more important. The solution is relevant to organisations adopting an architectural approach, both as a standalone modelling solution, and when used in conjunction with more visually/tabular-focused modelling tools, such as Visio and Excel.

#### KEY FINDINGS

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|--|--|
|  XML-based file format allows flexibility if visually changing meta models. |  Analyses various to-be scenarios by multiple metrics.                      |
|  Provides a free library of standard architecture frameworks and patterns.  |  Data can be imported from a wide range of sources and modelling solutions. |
|  Small size may restrict market penetration.                                |  ABACUS is based on Microsoft .NET.   |

Key:  Product Strength  Product Weakness  Point of Information

#### LOOK AHEAD

Avolution is developing the capability for ABACUS to guide an architect to a preferred to-be architecture from a set of potential architectures, according to pre-defined metrics and patterns. The company continues to collaborate with the University of Technology, Sydney.

## FUNCTIONALITY

Over the last several years the awareness and adoption of specialised tools for documenting and communicating Enterprise Architecture in a centralised way has increased, driven by multiple overlapping regulatory pressures, considerations of standards-based development, and the benefits of best-practice frameworks. Whilst organisations have benefited from establishing reference architectures, and cascading requirements and constraints to downstream activities, Enterprise Architecture as a discipline still lacks the data and performance analytics driven approach that is slowly becoming pervasive in IT. Without a fact-based assessment of each architecture option, Enterprise Architecture is prone to be guided by opinion, which can prove relatively expensive, be open to manipulation, and sometimes inefficient.

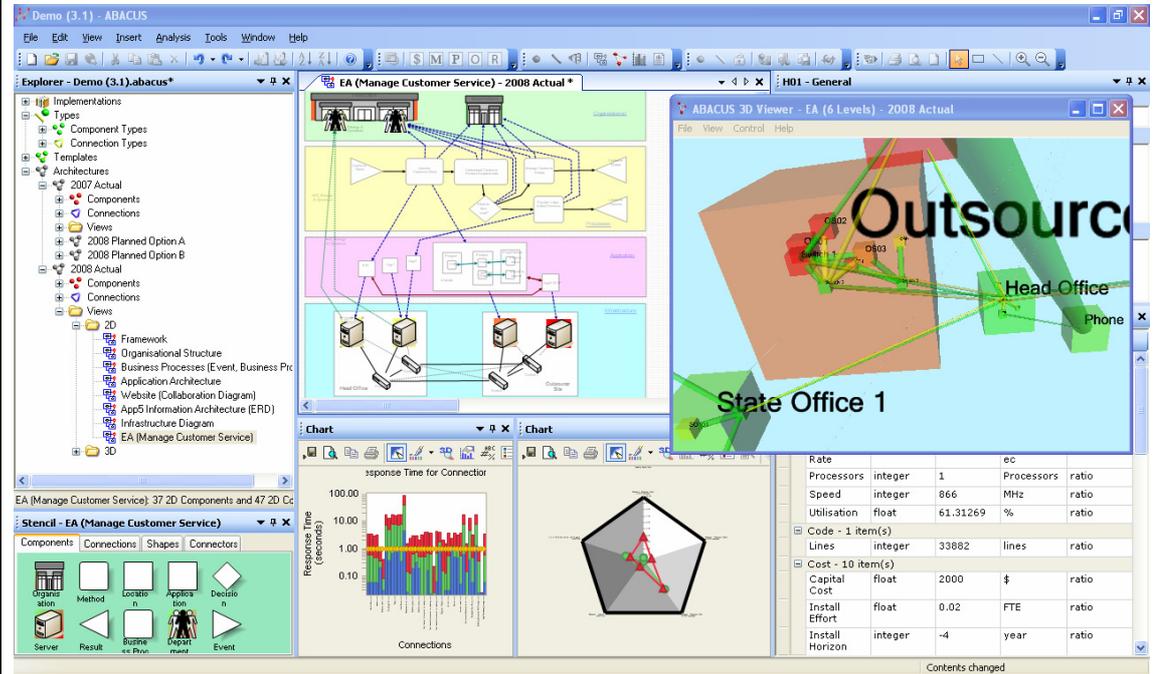
### *Product Analysis*

Avolution supplies the ABACUS Standard and Professional modules with the latter providing the full set of architecture modelling and scenario analysis capability and the former offering mostly architecture modelling functionality. The solution enables enterprise modelling based on the Component, Connection, and Constraints framework with features for assigning properties for components and connections, which are accessible through a tabular view alongside the graphical models (see Figure 1). An ABACUS file comprises of meta models and multiple architectures, along with views for each meta model. The solution provides a large set of libraries comprising standard frameworks, such as Zachman and The Open Group Architecture Framework (TOGAF), along with common architecture patterns.

ABACUS Professional is focused primarily on simulation. A typical usage scenario would involve as an initial step creating architecture models either by modifying ABACUS libraries, importing models from tools, such as Visio and Excel, or from scratch, and creating multiple architecture scenarios by editing properties (the data can be imported from a host of databases, spreadsheets, CMDBs, and service desk solutions) and also components and connectors. The user would then run simulation models that generate metrics on performance, reliability, Total Cost of Ownership (TCO), and many others which are displayed through a very impressive set of charts and graphs. It is the focus on simulation capability that makes Avolution a pioneer in the Enterprise Architecture modelling space and relevant to a wide range of companies in the enterprise, software, and System Integrator (SI) sectors.

The simulation capability includes Star Plots which rate architectural scenarios against multiple parameters, which could include factors such as 'openness' and 'security', in addition to performance, reliability, and TCO. Additionally, the Star Plot chart allows easy visual determination of the evolution of architectures and allows users a high degree of flexibility in prioritising decision parameters. Butler Group is impressed with the range of infrastructure data sources supported and the data import/export mechanism. Avolution, whilst offering import from other modelling tools, is focused very much on easy import from Visio and Excel. Given that the Microsoft Office tool-suite remains the de facto modelling tool for the majority of organisations, Butler Group believes this to be the right approach. Overall, ABACUS is a solution well aligned with the requirements not only of Enterprise Architecture, but potentially for a variety of infrastructure initiatives and process optimisation projects.

**Figure 1: ABACUS Overview**



Source: Avolution

**DATAMONITOR**

## Product Operation

The ABACUS suite consists of four Microsoft .NET-based products namely ABACUS Standard, ABACUS Designer, ABACUS Professional, and ABACUS Publisher. The ABACUS Standard edition is the entry-level solution that offers comprehensive architecture modelling functionality, some analytical capability, and common repository, along with extensive data import and export capabilities. ABACUS Professional provides additional evaluation functionality, such as comparison of architecture options by performance, TCO, reliability, and other metrics. The ABACUS Designer ships as an add on to the Professional and Standard editions and enables the creation of meta models based on pre-defined ABACUS libraries, or entirely new frameworks. The ABACUS Publisher which is also shipped as an add on to both editions allows publishing of 2D and 3D models, along with metrics, to a secure Web site, enabling a completely customisable environment where, if required, only specific portions of models can be made available.

At the heart of ABACUS is a XML-based file format (tree-based hierarchical file storage structure) which acts as an objects database. A new component or connection, the building blocks of ABACUS architecture models, is saved as another object in the objects database. This infrastructural difference is significant because creation of new architecture meta models or enhancements to existing meta models can be implemented using simple 'right-clicks' in the standard User Interface, as opposed to making changes to the internal database that many modelling tools need to do. The changing of meta models solely by updating the internal database typically leads to long implementation times for customising meta model frameworks (which again remain rigid) and offers limited scope for expansion or enhancements.

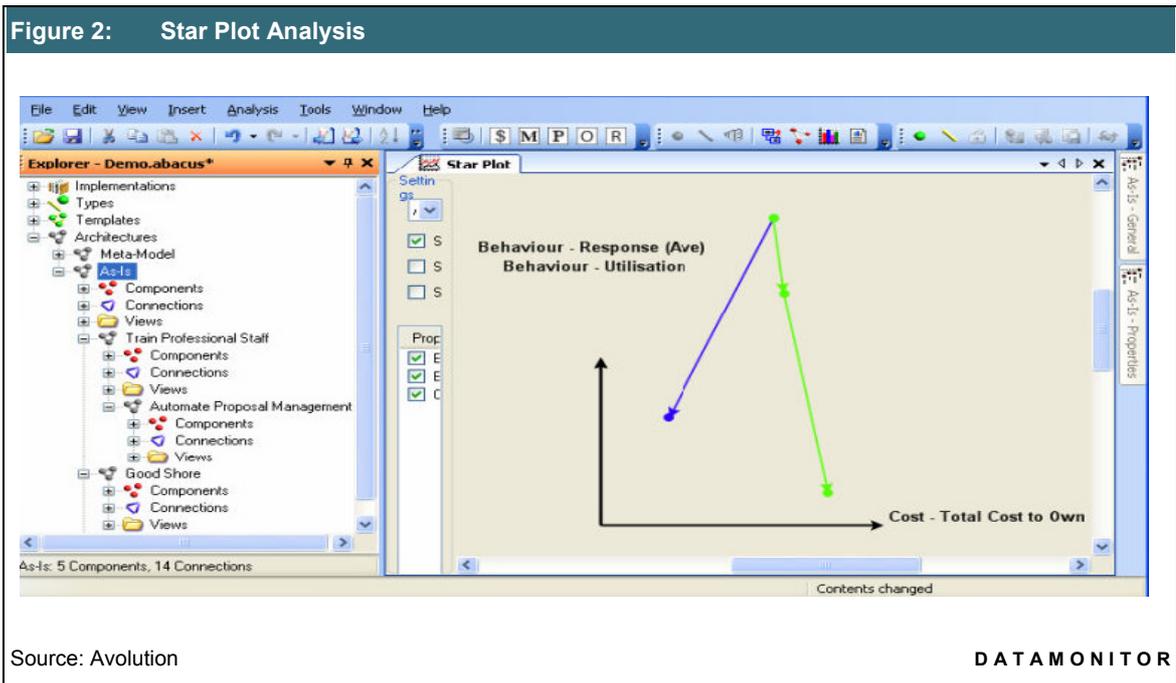
The ABACUS approach to defining meta models uses three key units, Component, Connection, and Constraints, a structure that conforms to the IEEE1471 standard. It would be pertinent to mention in this context that Avolution's founders were contributors to the IEEE standard. ABACUS ships with various libraries of such components, connectors, and constraints. Examples of Component, Connection, and Constraints would be servers or applications, physical or logical connections, and the component logical hierarchy or parent child relationships respectively. ABACUS ships with over ten such libraries or meta models, i.e. sets of Component, Connection, and Constraints, including TOGAF, Zachman, Capgemini IAF, and DoDAF/MoDAF. The ABACUS list of libraries includes over 50 common architectural patterns. The flexibility of the Avolution approach manifests in a much larger number of standard architectural frameworks available compared to other modelling solution providers. The solution permits users to create new libraries, as well as merging existing libraries, to create an organisation specific framework in a matter of minutes.

Importantly, ABACUS offers significant import/export capability with common modelling solutions (and *de facto* sources of architecture and process related information) and with common sources of infrastructure related data. Data can be imported/exported from/to Microsoft Visio, Excel, and Powerpoint, as well as Corel iGrafx, Casewise Corporate Modeler, Rational System Architect, and Proforma Provision. ABACUS integrates with relational database such as Microsoft Access and SQL Server, along with CMDBs such as HP Openview, IBM Tivoli, CA UniCenter, Centennial Discovery, BMC Patrol, and Solarwinds Orion, and also service desk solutions such as those from HP, CA, and Sunrise. Integration with third-party solutions is accomplished through a variety of means including scripting for data access from external repositories, XML/XMI, and using the ABACUS DB/SQL importers to extract data from other tool databases.

All components that are present in the models can have properties such as behaviour and cost attached to them and can be viewed in the context of the architectural models. The properties provide the base data for simulation capabilities, which are aimed at helping users make fact-based decisions on architecture trade offs, understand performance, reliability, and cost considerations of comparable architectures, and analyse the impact of change.

ABACUS Professional allows users to create many architectures in the same repository thus allowing the users to view as-is and also the to-be architecture(s) in the same model. The solution allows users to modify properties of the components as well as visually alter the components and connections to simulate the performance and cost impact of the changes. Simulations include performance evaluation which utilises a Discrete Event Simulator (DEVS) that assesses the flow of messages through the architecture across various components.

Performance simulation is based on Layered Queuing Network Models and Activity Cycle Diagrams. Key simulation capability includes Total Cost of Ownership (TCO) comparison, which works by assigning costs to components in an architecture, and reliability evaluation, which utilises Monte Carlo simulations with Mean Time to Repair and Mean Time between Failures of components. Finally, ABACUS Professional provides the Capability Space Diagrams and Star Plots (see Figure 2) that map and visually compare any number of architecture models across multiple parameters, aimed at providing representation of evolution in a force vector like way.



Whilst the traditional scope of enterprise modelling, namely documentation, communication, collaboration, and to a limited extent monitoring is not the main focus area for Avolution, the ABACUS solution does provide a set of key features such as model querying, model check in/check out, and policy-based notification in the event of repository rule violation.

ABACUS also allows 3D modelling which is a very unique feature in the enterprise modelling industry and this capability allows users to view models at a level of detail much higher to that obtained in a 2D view. Currently 2D views can be exported to SVG and HTML, whilst 3D views are exported to VRML or HTML. Reports are exported to HTML, PDF, Crystal Reports, Microsoft Word and Microsoft Excel, with graphs output to BMP. The entire model can be exported/published to XML, Microsoft Access, or HTML. Overall, Butler Group is very impressed with the visual richness of the 2D and 3D models, including the component and connector iconography and the intuitiveness of the charts and graphs.

**Product Emphasis**

The ABACUS solution is focused on three key aspects. Firstly, the flexibility of meta model creation, including easy import from existing models, especially those built on Visio and Excel; secondly, providing simulation of architecture options, enabled partly by the capability to quickly create multiple scenarios through architecture and attribute property modification; and finally integrating with a wide range of infrastructure data sources. Avolution also caters for the graphical ease of modelling and Butler Group is impressed with the rich iconography that can be used to build components and the virtually unique provision of 3D modelling capability.

## DEPLOYMENT

According to Avolution, deployment effort is minimal for basic implementation and organisations can easily download and install ABACUS. Implementation takes around one hour and there are no significant business procedures that need to be changed, since ABACUS easily integrates with many standard business methods, processes, and frameworks.

The company has partnerships with several SIs for value-added services, but usually not much expertise is required for installation. Unlike a lot of focused modelling solutions, ABACUS is aimed on enabling the individual architect to quickly define architecture models and perform trade off simulations, and therefore installation does not involve the usual model building phase. ABACUS can be deployed using a modular approach and organisations can implement ABACUS Standard as the base product and deploy the other three products ABACUS Professional, ABACUS Designer, and ABACUS Publisher, as add-ons.

Avolution's typical deployment involves between 3 and 5 seats, as a separate 'drawing tool' is typically used for broader Business Process Management (BPM) requirements. ABACUS clients are a Windows .NET application, which run on Microsoft Windows 2000, Windows XP SP2, or later platforms and the ABACUS server requires the Subversion platform which is freely available for Red Hat 8.0 and 9, SPARC/Solaris 2.5 – 10, Mac OS X, Windows NT, 2000, XP and 2003, HP UX, AIC and IBM i5/OS. ABACUS Standard requires Microsoft Office 2003, or higher version for Visio and Excel import/export features. The ABACUS Publisher also runs on the above mentioned platforms, as well as accommodating Linux, and Mac OS. The Publisher client requires Firefox 1.5, or higher, or Microsoft Internet Explorer 6, or higher, and the SVG and VRML Viewers, which are freely available.

The company offers half and full-day training courses either on-site or at the nearest Avolution office. Limited 'self-learning' tools are also available. Avolution has created an online community that contains a wealth of tutorials, case studies, libraries, and user forums for assistance. The product support provided is based on the type of contract selected by organisations, which can be General, Gold, or Platinum maintenance. Whilst the General category provides only minor upgrades of ABACUS (unlimited) with a 24x7 hour e-mail support, the Gold and Platinum cover offers unlimited major and minor upgrades, along with 24x7 hour e-mail support, a 9-hour per-day phone support and extra hours of on-site support at a discounted rate, depending on the license scheme purchased by the customer.

## PRODUCT STRATEGY

Avolution focuses on large enterprises with more than 250 people that have complex technology infrastructures, with a combination of legacy systems and a strong pipeline of new developments. Avolution's target markets include architecture practitioners in complex environments, SIs, consultancies, software/system development houses, and infrastructure providers.

As would be expected from a tool of this nature, Return On Investment (ROI) cannot be measured exactly and depends on benefits, such as increased re-use of existing solutions/resources, reduced time for product transformations, and improved architecture-related decision making. Avolution claims that ABACUS practitioners have reported a reduction in process analysis time, an improvement of between 20% and 30% in the success rate of proposals, and have avoided additional costs by not making wrong decisions. The common meta-model approach can provide up to 20% in overall efficiency improvement across the organisation.

Avolution sells its products through a direct sales force, strategic partnerships with network integration companies that influence corporate IT decision making, and channel partnerships with organisations that advise corporations on their IT and business strategies. Avolution has business partnerships with BT Global Services, Capita, Arismore, Resultex, and EA Werks, as well as technology partnerships with Microsoft, IBM, The Open Group, and CapGemini IAF.

Butler Group believes that the Avolution metrics-based approach will become increasingly more pertinent and there is a strong possibility that a large vendor will enter this space in the next three years. Therefore, Avolution's continued relevance is contingent upon expanding direct sales and channel partnerships, something which may prove difficult due to the small size of the company. In addition, the company needs to build closer relationships with other ISVs, in areas such as Business Intelligence (BI), BPM, Portfolio Management, software development, and systems management.

ABACUS can be supplied as an integrated suite or as individual component modules. The licenses need to be purchased upfront and there is an optional annual 20% maintenance fee for General maintenance. The average project value over the first year is UK£120,000 with services comprising 40% of the cost, whilst through the next three years the average cost is UK£24,000 per annum (primarily maintenance). Avolution typically targets a quarterly minor and an annual major release strategy for its products, however, the beta releases are available 1-2 months prior to this for refinement purposes.

## COMPANY PROFILE

Avolution is a private company, founded in 2001 as a spin-off from the University of Technology, Sydney. The company is headquartered in Australia and was launched with the goal of commercialising over 15 years of research that is now part of ABACUS. The company's European operation is headquartered in Oxford, whilst the recently opened American business is headquartered in the Washington DC Metropolitan area. The first three years of the company's existence were spent purely developing and marketing the product, with the initial release of ABACUS being in late 2004.

Avolution has 20 employees with a majority based in Australia. Expected employee growth is 30% largely due to expansion in the US. About 40% of Avolution's employees are engaged in the Research and Development function. ABACUS has deployed the solution in 24 countries and it is being used by over 100 different organisations. Some of the referenceable clients of Avolution include Alcatel-Lucent Australia, ANZ Bank Australia, AXA France and UK, Birmingham City Council UK, British Telecom, Business Link UK, Capita UK, CIT Bank USA, WMATA USA, Department of Defence Australia, Fujitsu, Insurance Australia Group (IAG), Lewisham Council UK, Sunrise, and University of NSW Australia. The company's revenue split across regions is: EMEA – 50%, Asia-PAC – 40%, and Rest of the World – 10%.

**SUMMARY**

Avolution stands out in the Enterprise Architecture and process modelling tools sector with its strength on metric-based evaluation of architecture options and scenarios. Simulation and comparison do not appear to be focus areas for any of the other modelling vendors with their concentration increasingly on developing standard reference architectures for governance, compliance, and best-practice initiatives. Avolution through ABACUS has expanded the scope of enterprise modelling solutions, and in choosing to provide scenario analysis has rightly stayed away from the traditional modelling market, populated by established and fairly successful vendors. Butler Group believes that Avolution’s approach is innovative, and will increasingly become more relevant driven by the increasing adoption of analytics by IT management and the enterprise. Avolution is on the right trajectory and provides a strong enterprise modelling solution, offering value beyond Enterprise Architecture for medium-sized and large enterprises, software companies, and SIs.

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