For MRO software, airlines have pure-play solutions, specialist point solutions and ERP solutions to choose from. There are also EFBs & ETLs to consider. The products of 50 industry suppliers are reviewed & profiled.

MRO IT market suppliers survey

As we reported a year ago *(see MRO IT market suppliers survey, Aircraft Commerce, February/March 2008, page 63),* there are a large number of software systems aimed at improving commercial aviation maintenance, repair and overhaul (MRO) efficiency. The market entry barriers remain low and this year, in spite of the economic climate, there are a number of relatively new entrants.

Again this year, *Aircraft Commerce* categorises vendors and tries to explain the range and depth of functionality on offer. The survey also looks at company credentials of longevity and customer base. Not every single vendor is covered; those who did not provide responses to our questionnaire are marked 'no data'.

There are five categories of solution: 'pure-play MRO solutions', which are the main vendors in the market; 'specialist point solutions', which usually augment pure-play solutions; 'enterprise resource planning' (ERP) solutions', which provide extended capability in finance and human resources; 'tier-two MRO solutions', which target smaller organisations; and 'electronic flight bag (EFB) and electronic technical log (ETL) software solutions', which deploy software into the aircraft and MRO shop environment to support real-time data exchange between users and the main MRO software. Vendors are surveyed in alphabetical order.

Pure-play MRO solutions

Most of the pure-play MRO software companies have the capability to respond to small and large airlines and MRO facilities seeking a new software solution. These are tier-one specialists that provide fully integrated maintenance and supply systems for commercial aviation. Some of the companies listed have more limited capability than others.

AD Software

This French-based company has been in business for just over a decade and has offices in Thailand and Africa. It has 17 customers for its AIR suite of products, four of them added in the past year. The company's 14 staff produce a range of discrete solutions called AIRTIME, AIRSTOCK, AIRUSER, AIRDOC and AIRSTAT. These offer an integrated maintenance management, inventory control management, security management, electronic documentation management, and fleet and equipment reliability management capability. The market for this product appears to be small operators, with the largest customer being the French Ministry of the Interior with 34 aircraft. This puts it at the edge of a tier-one pure-play MRO company.

Applied Database Technologies

This is a 32-man US company, now with a sales base in Turkey. Responding for the first time to the survey, ADT has 14 live customers, including four new ones in 2008, although it still has a little way to go to prove it has the longevity to stay a tier-one player. The company has Oracle as an implementation partner.

The product, called Wings, has the following modules: fleet management (planning); maintenance & engineering; production control & planning; inventory control; labour collection & employee attendance; employee training & licence tracking; billing; tooling; and inspection. Recent customers include Kuzu Airlines where the system is now live.

Aerosoft Systems Inc

Aerosoft is a 20-man amalgamation of two companies that started in aviation maintenance software in the mid-1990s.
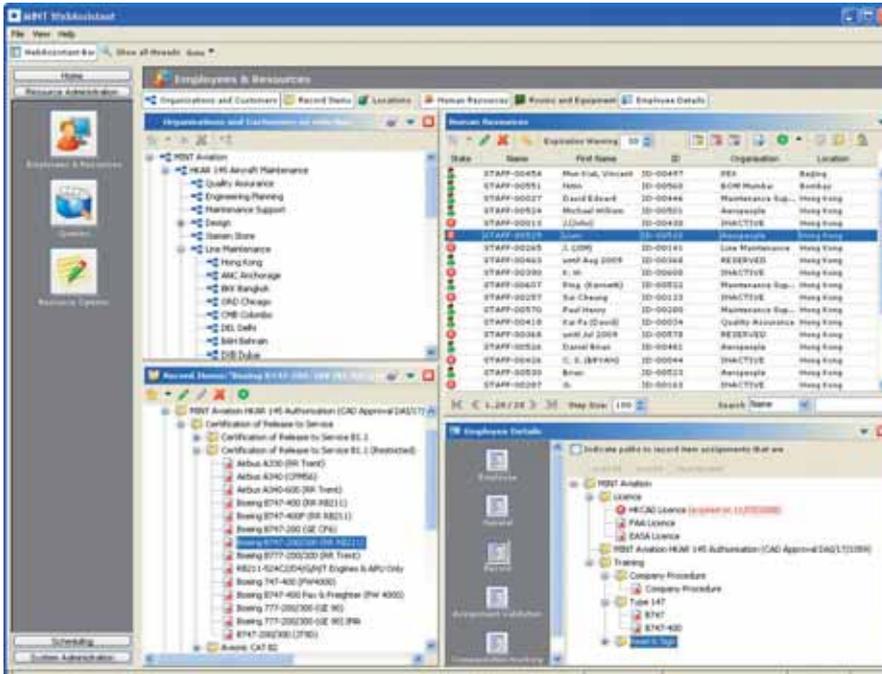
It is based in Canada, the US and Austria. Aerosoft acquired the second maintenance product, PMI, in early 2004 from SITA, with which it still has a marketing relationship.

The WinPMI product is now marketed with WebPMI as a browser implementation over a corporate intranet, and the other Aerosoft product, DigiMAINT, is now web-enabled. These products have been augmented with a new series of AeroBUY and AeroREPAIR. These electronically manage requests for quotations, purchase/repair orders and invoices for vendors that participate in e-business logistics. It is designed around the requirements of the ATA standard Spec 2000. This integration capability, utilising Aeroexchange, has been acquired by Mesaba Airlines and LIAT recently.

With 32 customers, including three new ones in 2008, Aerosoft still qualifies as a tier-one supplier, although the future technology strategy to move away from client-server architecture is unclear as yet. The company has a marketing relationship with Corena (see below in point solutions) for technical document management in the DigiDOC module and with Casebank Technologies Inc for integration of its Spotlight reliability analysis technology. Aerosoft also teams with 4Sight Technologies (see below in point solutions) to integrate and co-market its em360 solution as DigiPLAN for logistics and maintenance planning.

Cimber Air Data

Cimber Air Data is part of the Cimber Group, based in Denmark but with offices in Malaysia. Its AMICOS product was first implemented in Cimber Air as a mini computer system. Now a client-server system, it gained three new sales in 2008.

MINT Media is a specialist point solution offering scheduling and manpower management capabilities. These usually bolt-on to other pure-play MRO software or ERP systems.

The AMICOS II product has a range of modules spanning the full scope of normal airline and MRO requirements, including: engineering; planning; reliability and quality control; technical records; material planning; cost control; purchasing; third-party work; inventory; sales; loan order management; and MRO which includes cost control and invoicing.

The company has 12 staff, and the live airline customer count has reduced from 2008, possibly because the airline downturn has led to airline bankruptcy. Like Aerosoft, the test will be whether Cimber Air Data can take the technology forward from 4GL client-server architecture.

Commsoft

Commsoft started in business over 30 years ago. Based in the UK, the company still markets the OASES client-server product around the world. The company has 42 users and continues to sell systems, adding eight in 2008. The company has 25 staff, including nine developers. Commsoft partners with Vector, IASG and Aviotech for implementation.

Functionally, OASES covers most of the main areas of business process and is provided as a modular solution. The modules available include inventory control & purchasing, electronic demand handling, reliability, technical log & defect control, workcard production & planning, digital documentation system, technical records, job scheduler, shop floor data collection (SFDC), work in progress (WIP), sales order processing (SOP), request for quotations (RFQ), Line maintenance control (LMC), dispatch reliability (DR), integrated maintenance planning (IMP) and invoicing. OASES has yet to add integration to Boeing and Airbus systems like AHM.

Commsoft aims to keep carving out its niche supporting smaller airlines and third-party maintenance operators. It offers OASES as a hosted ASP solution.

IBS (formerly VISAer)

One of the changes from early 2008 is VISAer. Having reported last year that it has had a low profile in recent years, the company was sold to IBS Technics for a publicly reported $3 million, including all operating assets. The US-based IBS Technics is now a fully-owned subsidiary of IBS Software, with offices around the world, including in the USA, UK and India. This division inherited 42 existing customers and has 95 staff, including 65 developers, up from 50 staff that came from VISaer. The company offers the IBS Maintenance Software (formerly VISaer) as an application service provider (ASP) to the market, alongside the traditional customer installation option.

The IBS Maintenance Software product joins three IBS products for airline operations: AvientCrew for airline crew management; AvientFleet for airline fleet management; and TopAir for integrated flight operations. This makes IBS one of the few software providers to offer a true portfolio of heavyweight maintenance and operations software.

Functionally the maintenance product contains a complete range of modules for engineering, maintenance and material management. IBS has live customers across all markets, from airlines operating solely EASA OPS-1 to component repair vendors. The software is modular, and includes a strong finance management general ledger component, but it currently lacks integration with Boeing's AHM and Airbus' Airman product.

IFR

IFR is an EADS company, based in Toulouse, France. It provides maintenance software alongside catering and flight operations systems. One of the longest-serving MRO software vendors after Commsoft, the company started in 1987. It has 74 airline customers, many from former French colonies. In 2008 it added nine new customers. The maintenance product is AMASIS. The sales and company size are somewhat distorted by the fact that the company also sells a range of airline solutions. These include CANOPES for catering, KEOPS for operations management, and RAMSES for revenue accounting. It is not clear if the AMASIS system has moved from its COBOL origins, but it is in the process of moving to .NET. The solution is offered as a hosted ASP system, and has 18 airlines using it in this mode.

AMASIS is used mainly by airlines, some third-party maintenance providers, and the French navy. Modules include: routine maintenance; scheduled maintenance; airworthiness directive (AD) and service bulletin (SB) management; logistics; finance; e-documentation; assemblies & sub-assemblies; automatic provisioning; labour man-hours (MH); technical library; and barcode and data import-export. The system links to the Airbus suite of products, and also has a native link to a project planning tool. A link to Boeing's AHM product is planned in the near future.

Infospectrum

Infospectrum bought the Avexus company in December 2006. Headquartered in California, USA Infospectrum has strong roots in India where much of the development and business process outsourcing is done. A deal in mid-2008 with Satyam provides a partnership for implementation services and Software as a Service (SaaS).

The company also has a SAP practice. Little is known about the customer base for the re-named infoTRAK product suite, since no data were received from the company.

Traditionally, Avexus sold to the MRO facilities and shop environments, with some defence contractor business also part of their portfolio. Their website suggests that this is Infospectrum's market segment also.

MIRO Technologies

Miro has been supplying aviation MRO systems for nearly 30 years. Based in California, USA it has 85 staff, and offices in the USA, UK, and India.

The company has recently moved the commercial model to react to the current economic climate, and claims it acquired four new customers in 2008. Customers include large airlines like SAS and the US regional carrier ExpressJet, but the company also offers a lightweight, hosted ASP offering to small carriers.

The company has moved to a new JEE service-oriented architecture, and still plans to move the client-server AuRA product into the same environment as the GOLDesp development that is used by manufacturers like Lockheed Martin, Boeing, Raytheon and militaries such as the UK's Ministry of Defence (Army, Navy and RAF) with over 600 aircraft.

Functional modules include: enterprise/organisational modelling; engineering; materials/warehouse; procurement; planning and scheduling; line maintenance; maintenance operations; hangar maintenance; shop maintenance; quality control/quality assurance; training; licences and certifications; financial interface; and tools & ground support equipment management.

MRO Software/IBM

No data was received from IBM, so this entry is gathered from public sources. Operating in several market segments, MRO Software's product, called Maximo, is sold to support everything from computer assets to aircraft.

Maximo has customers like China Eastern and Shanghai Airlines, but its wider adoption is unknown. It is available in separate sub-modules: IBM Maximo Asset Management, IBM Maximo for Transportation and IBM Maximo Asset Configuration Manager. The range of customers using the application in a live environment today is wide, and includes airlines as well as component maintenance companies.

MXi

MXi continues to be one of the strongest and largest tier-one pure-play MRO software providers. Formed in 1996, the company has grown from 211 people last year to 306, including 77 development staff. The company works out of Ottawa, Canada, but has overseas offices for its international customers. Half of its business is airline and third-party commercial MRO. While available as a hosted ASP, the company has no live customers to date on this option. The company works with implementation partners worldwide including IBM, Bearingpoint TATA Consulting, Hexaware and Milcon Gulf Group.

MXi did have a relationship with Sabre, which it has now dropped, but it maintains a strong relationship with Boeing, especially on the 787 Dreamliner programme. The company has six airline customers live, and won eight new customers in 2008. Large customers include Air France and Qantas.

The Maintenix modules include: maintenance engineering; line maintenance; heavy maintenance; shop maintenance; materials management; and finance. While not used today, the product is capable of integrating with EFBs, the Airbus Airman product and Boeing AHM.

Pentagon 2000SQL

No data was returned by Pentagon 2000 so this entry is gathered from public sources. Pentagon 2000 focuses largely on the military market, but it has a
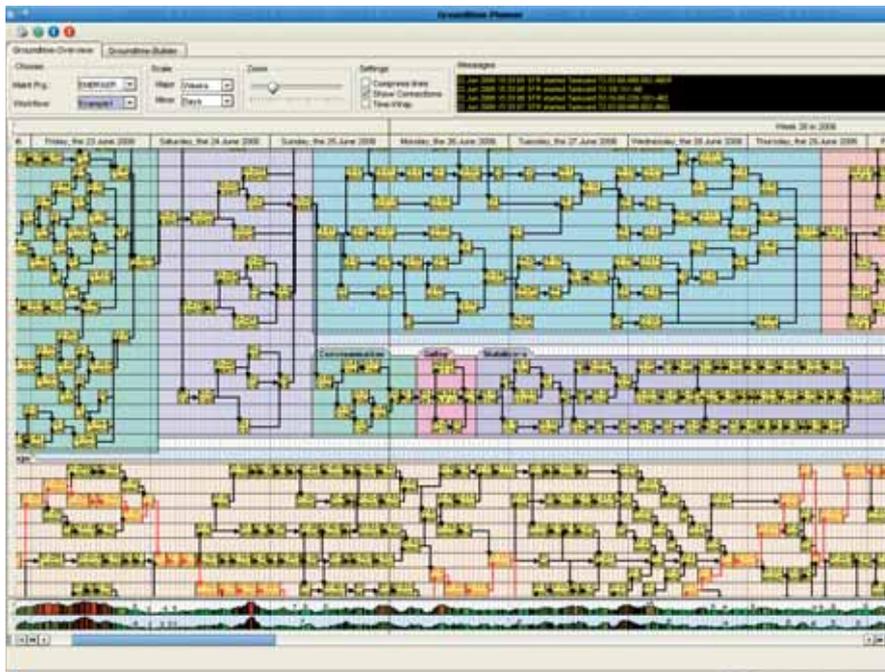
MRO & FLIGHT OPERATIONS SOFTWARE VENDOR COMPANY DETAILS

Company	Contact / website	Contact person	Contact details	Current product	Production technology	Size - people	Years in business	No. of airlines in 2008)	New customers in 2008
PURE-PLAY MRO SOLUTIONS									
AD Software	www.adsoftware.fr	Frederic Ulrich	f.ulrich@adsoftware.fr +33 450894850	AIR suite	unknown	14	11	17	4
ADT	www.adbtech.com	Alan Yagiz	sales@adbtech.com, +90-533-4216646	Wings	unknown	32	16	14	4
Aerosoft	www.aerosoftsys.com	Thanos Kaponeridis	thanos@aerosoftsys.com	DigiMAINT, WebPMI, AeroBUY, AeroREPAIR	Client-server	20	12	32	3
Cimber Air Data	www.amicos.com	Rune Hagen	rune.hagen@amicos.com +45 74433222	AMICOS	Client-server	12	24	23	3
Commsoft	www.commsoft.co.uk	Nick Godwin	nsg@commsoft.co.uk	OASES	Client-server	25	30+	42	8
IBS Software Services	www.ibsplc.com	David Spellman	david.spellman@ibsplc.com +1 9785701605	IBS Maintenance Software (VISAer)	Client-server/.NET	100	14	42	contact IBS
IFR	www.ifrfrance.com	no data	commercial@ifrfrance.com	AMASIS	AS400 / .NET	70	21	74	9
Infospectrum	www.info-spectrum.com	no data	solutions@info-spectrum.com +1 858 436 2599	infoTRAK	JAVA	no data	no data	no data	no data
MIRO	www.mirotechnologies.com	Mark Ogren	mark.ogren@mirotechnologies.com +1512 868 5177	GOLDesp/AuRA	JAVA/Client-server	85	28	contact Miro	4
MRO Software (IBM)	www.mro.com	no data	no data	Maximo	JAVA	no data	no data	no data	no data
MXi	www.mxi.com	Erin Lawless	sales@mxi.com (613) 747 4698	Maintenix	JAVA	306	13	6	8
Pentagon 2000SQL	www.pentagon2000.com	no data	no data	no data	no data	60	24	no data	no data
RAL	www.rusada.com	no data	sales@russelladams.com	Enterprise suite	.NET	no data	no data	no data	no data
RAMCO	www.ramcoaviation.com	Thomas DeLuca	tdeluca@rsc.ramco.com +1 718 835 2112	Ramco Maintenance & Engineering/EFB/Tech Pubs Solutions	JAVA/.NET	260	17	23	10
SaSIM	www.sasims.com	John Barry	sales@sasims.com +353 61711400	SaSiMS	Client-server	16	9	35	6
SWISS Software	www.swiss-as.com	Claudia Weiss-Giessler	marketing@swiss-as.com +41 615827294	AMOS	JAVA	64	20	62	14
Tracware	www.tracware.co.uk	Patrick Waker	patrick_waker@tracware.co.uk +44 7790913717	Aerotrac/ProTrac / PartsTrac/FliteTrac	Client-server	13	10	contact Tracware	5
TRAX	www.trax.aero	Chris Reed	sales@trax.aero +1 305 662 7400	TRAX Maintenance	Client-server/.NET	76	12	80	9
Ultramain	www.ultramain.com	no data	sales@ultramain.com	Ultramain	no data	no data	20+	no data	no data
Volartec	www.volartec.com	Manuel Roché	mroche@voalrtec.aero +54 351 4809710	Alkym	no data	23	7	15	5
SPECIALIST POINT SOLUTIONS									
4sight	www.4sighttech.com	Hernan Clarke	+1 480 922 6482	em360/PMPro/CheckPlan	Java	no data	12	no data	no data
AviIT	www.aviit.com	David Brown	dbrown@aviit.com +441383 620922	eMan	no data	22	4	5	2
ARMAC	www.armacsystems.com	Michael Armstrong	+353 41 9877480	RIOsys	Java	no data	no data	no data	no data
ClickCommerce	www.clickcommerce.com	Jamie Natti	jamie.natti@clickcommerce.com +1585.419.3340	PARTS	Java	no data	no data	no data	no data
Component Control	www.componentcontrol.com	Jocelyn Scott	jocelyn@componentcontrol.com +1 619-696-5400	Quantum Control Aviation suite		52	24	750	110
Corena	www.corena.com	no data	+47 3271 7200	LifeSTAR	XML/SGML	no data	15	no data	no data
EFPAC/TES	www.tes-uk.com	Luis Davila	luis.davila@tes-uk.com +44 1443 743526	EFPAC	no data	55	13	not available	2
EmpowerMX	www.empowermx.com	Stan Melling	stan.melling@empowermx.com	FleetCycle	no data	52	9	no data	no data
Enigma	www.enigma.com	John Snow	johnsnow@enigma.com +1 781-265-3636	Enigma3C/InService suite	no data	100	17	4	3
Euroscript Intl	www.euroscript.com	Bruno Pouilleau	bruno.pouilleau@euroscript.com +33 161 087 561	TPSS	no data	1300	32	2	1
iBaseT	www.solumina.com	no data	no data	Solumina	no data	no data	22	no data	no data
IDMR Solutions	www.idmr-solutions.com	Israel Revivo	irevivo@idmr.us +1 212 461 1689	InForm & eMAT	no data	12	11	4	1
Infotrust	www.infotrustgroup.com	Chuck Brans	CBrans@infotrustgroup.com	AirGTI/EFB IDMS	no data	no data	no data	no data	no data
MINT Media Interactive	www.media-interactive.de	Ilka Wolf	ilka.wolf@media-interactive.de	MINT Suite	no data	27	11	16	5
Omega	www.omegaair.com	Michael Formby	mformby@omegaair.com +1 9727753693	AMES	Client-server	10	17	12	1
Openconnect	www.openconnect.ch	Guido Andereg	info@openconnect.ch	eDOC / eCARD	Java	no data	13	no data	no data
Perceptive	www.perceptive-inc.com	Ray Andrick	no data	Redstone	no data	no data	13	no data	no data
Superstructure	www.superstructuregroup.com	Martin Penny	martin.penny@superstructuregroup.com +44 7939599994	AQD Safety Mgt	.NET	24	12	90	12
Waviatech	www.waviatech.com	Godfrey Ryan	godfrey.ryan@waviatech.com +44 1293817655	Stream		12	7	7	5
X-hive	www.x-hive.com	Nick Kuppers	no data	AMDS	no data	no data	12	no data	no data
ERP SOLUTIONS									
IFS	www.ifsworld.com	no data	no data	IFS MRO	Java/.NET	2630	25	10	numerous
Lufthansa Sys. (SAP)	www.lhsystems.com	Dr. Andreas Jacobsen	info@LHsystems.com	SAP	Java/.NET	3320	12	15	2
2MoRO (SAP)	www.2moro.com	Jacques Beauchesne	jacques.beauchesne@2moro.com +33688450373	AeroWebb/AeroOneSAP	Java/.NET	51	5	4	1
Oracle	www.oracle.com	Hannes Sandmeier	hannes.sandmeier@oracle.com	cMRO	Java/.NET	no data	no data	no data	no data
SAP	www.sap.com	no data	no data	SAP R/3	Java/.NET	no data	no data	no data	no data
EFB/ETL SOFTWARE SOLUTIONS									
AMT Flightman	www.flightman.com	Steve Hardgrave	info@flightman.com	Flightman	no data	no data	no data	no data	no data
Boeing/Jeppesen	www.boeing.com	no data	no data	no data	no data	no data	no data	no data	no data
OSyS	www.o-sys.com	Mark Goodhind	Mark.Goodhind@o-sys.com +44 7 317 3854	Core Wing/Core Fleet/ EHM	Java	400	10	320	40
Skypaq	www.skypaq.com	no data +353 44 9350360	info@skypaq.com	MRObility/ETL	no data	no data	no data	no data	no data
Teledyne	www.teledyne-controls.com	Brian Proffitt	bproffitt@teledyne.com	AvVantage	no data	no data	no data	no data	no data

MRO & FLIGHT OPERATIONS SOFTWARE VENDOR PRODUCT CAPABILITIES

ASP offered	Airline (EASA/ FAR OPS 1)	Airline (EASA/FAR OPS 1& 145)	Third party facilities	Engine overhaul shop	Component shop	Engineering & maintenance modules	Supply modules	Purchasing modules	Native authoring/ printing	Manpower time & attendance	Manpower detailed planning	Native finance & accounting	Electronic Tech Log/ Flight Bag	Links to Boeing AHM	Links to Airbus AHM	Company
PURE-PLAY MRO SOLUTIONS																
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	AD Software
No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	ADT Wings
Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Aerosoft
No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	interface	Yes	No	Yes	Yes	Cimber Air Data
Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Commsoft
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	IBS Software Services
Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	interface	Yes	interface	No	Yes	IFR
Yes	no data	no data	Yes	Yes	Yes	Yes	Yes	Yes	no data	no data	no data	no data	no data	no data	no data	Infospectrum
Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	interface	Yes	interface	No	No	No	MIRO
No	Yes	Yes	Yes	no data	Yes	Yes	Yes	Yes	no data	Yes	Yes	no data	no data	no data	no data	MRO Software
Yes (o)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	interface	No	No	No	MXi
no data	no data	no data	no data	no data	Yes	Yes	Yes	Yes	no data	Yes	Yes	Yes	no data	no data	no data	Pentagon 2000SQL
no data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	no data	no data	RAL
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	RAMCO
Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	SaSIM
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	interface	No	Yes	Yes	SWISS AMOS
No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No	No	Tracware
No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	interface	Yes	Yes	Yes	TRAX
no data	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	no data	Yes	no data	no data	Ultramain
No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	interface	No	No	No	Volartec
SPECIALIST POINT SOLUTIONS																
			Yes								Yes					4sight
Yes (o)	Yes	Yes	Yes	No	Yes				Yes			Yes			Yes	AviIT
no data	no data	no data	Yes	no data	no data		Yes									ARMAC
No	No	Yes	Yes	Yes	Yes	interface	Yes	interface								ClickCommerce
No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Component Control
no data	Yes	Yes	Yes	Yes	Yes				Yes							Corena
No	Yes	Yes	Yes	No	No	Yes										EFPAC/TES
no data	Yes	Yes	Yes	No	No	Yes				Yes	Yes					EmpowerMX
Yes	No	Yes	Yes	Yes	Yes	Yes			Yes		Yes		Yes			Enigma
No	Yes	Yes	Yes	No	No				Yes	Yes			Yes			Euroscript International
no data	no data	no data	Yes	no data	no data	Yes					Yes					iBaseT
no data	Yes	Yes	No	No	No	Yes			Yes		Yes					IDMR Solutions
no data	Yes	Yes	Yes	No	No				Yes				Yes			Infotrust
Yes	Yes	Yes	Yes	Yes	Yes					Yes	Yes					MINT Media Interactive
Yes	Yes	Yes	Yes	No							Yes					Omega
no data	Yes	Yes	Yes	no data	no data				Yes				Yes			Openconnect
Yes	Yes	Yes	Yes			Yes			Yes							Perceptive
No	Yes	Yes														Superstructure
Yes	Yes	No	No	No	No	Yes										Waviatech
no data	Yes	Yes	Yes	No	No				Yes				Yes			X-hive
ERP SOLUTIONS																
Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	IFS
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	LHS
Yes (1)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	2MoRO
no data	no data	no data	no data	no data	no data	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Oracle
no data	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	no data	no data	no data	SAP
EFB/ETL SOFTWARE SOLUTIONS																
Yes	Yes	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes	no data	no data	AMT Flightman
no data	Yes	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes	Yes	no data	Boeing/Jeppesen
Yes	Yes	Yes	Yes	No	No	Yes							Yes	Yes		OSyS
no data	Yes	no data	No	Engine	Component	Engineering	Supply	Purchasing	Native	Manpower	Manpower	Native	Electronic	no data	no data	Skypaq
no data	Yes	Yes	No	No	No	Yes	No	No	No	No	No	No	Yes	no data	no data	Teledyne

Swiss Aviation Software provides a Java-based product. It has teamed with Singapore Technologies Aerospace to market AMOS to the Asia Pacific region.

number of third-party maintenance and original equipment manufacturer (OEM) support service installations. The company's website says it offers solutions for aerospace, defence, power systems, electronics, metals/raw materials trading, automotive and heavy duty parts.

Russell Adams (RAL)

No data was returned by RAL, so this entry is gathered from public sources. The company continues to grow on the back of the success of its .NET Enterprise product suite. This offers a complete range of functional modules for commercial aviation, including its own electronic techlog (ETL) software. The company recommends the Panasonic Toughbook for the ETL. The Enterprise suite includes the product functions for an airline, an MRO facility, corporate operators, flight training schools and general asset management.

The company is under the Rusada group; still in the owner's hands. Its head office is located in Switzerland, with satellite offices in the UK, Dubai, Singapore and Australia. VTS Politie Nederland (the Dutch Police force) was the last announced deal for RAL's Enterprise:sfo software in November 2008. The company continues to compete in the 'pure-play' segment.

Ramco Systems

RAMCO offers one of the widest ranges of integrated MRO, finance and EFB solutions available on the market today. The company continues to grow strongly and win many high profile deals. With 260 staff focused on the MRO application for aviation maintenance, the company has also grown the live

customer base from eight last year to 23 at the end of 2008. RAMCO also added 10 new deals during the year.

The technology is also one of the most advanced, offering its aviation solution in either .NET or Java. Its DecisionWorks™ solution wraps around whatever mix of functional modules a customer chooses. Fitting a standard product to each individual aviation company is a key challenge for any software vendor.

Headquartered in Lawrenceville, New Jersey, USA Ramco Systems' aviation division is part of the larger Ramco group, selling ERP solutions into finance and manufacturing sectors as well as aviation. With the first customer, Indian Airlines, Ramco is catching up some of the other vendors in terms of sheer numbers of commercial MRO customers.

With 180 software developers in the aviation division, Ramco is also one of the largest vendors in the market today in terms of research and development. For example, it is twice the size of MXi. Functionally, the modules on offer include: customer management; quoting; part sales management; customer order management; engineering; materials procurement; maintenance projection; planning & scheduling; maintenance operations; hangar maintenance engine/shop maintenance & line maintenance; quality control/quality assurance; maintenance human resources; licences & certifications; maintenance financials; tools & special equipment management; and EFB. New for this year is Ramco Aviation Analytics, a powerful key performance indicator tool.

RAMCO has a marketing relationship with Sabre Airline Solutions to sell the Ramco application as part of its own portfolio of solutions.

SaSIM

This is a 16-person company based in Ireland with a product that dates back 13 years. Previously at the top end of tier-two, the company is in tier one this year because it has 35 customers worldwide, including six new ones in 2008. It also has a global presence in Europe, Australia and Canada.

The product, SaSiMS, is published by Maintenance Support Systems Ltd. Sweden is where the company's main software development office is located. The system runs on SQL and is offered for smaller customers as a hosted ASP. Currently there are 14 ASP customers.

Modules offered include: maintenance and engineering; aircraft configuration; component maintenance inventory module; component control; AD & SB control; publication/library control; tool management; staff recording; the log book; planning module; operations planning; and maintenance planning. There is no link as yet to Boeing AHM or Airbus Airman/airN@v. Customers include third-party MROs and low-cost carriers (LCCs).

Swiss Aviation Software

Swiss-AS remains one of the dominant vendors in the 'pure-play' software market in 2008 for airlines. This is in spite of growing from 50 employees last year to just over 60, which puts it at the smaller end of the company scale compared with Ramco and MXi.

The company continues to grow strongly, with 14 new customers in 2008, adding to the live base of 62 airlines and MRO providers. The company has teamed with Singapore Technologies Aerospace (ST Aero), its implementation partner for the Asia-Pacific.

Customers include Ryanair, easyJet, Swiss, Austrian and TUI group, making Swiss-AS a formidable software vendor. In late 2007, Swiss-AS signed a co-operation agreement with Lufthansa Technik. Both LHT and Swiss-AS will now be able to offer their customers pre-configured linking of their systems (AMOS and manage/m), capable of being activated at the click of a button. The chosen trade name is 'connected to manage/m'. Swiss-AS also teams with CrossConsense for implementation and ASP provision.

AMOS is the name of the product sold by Swiss-AS. It is a Java application, and is built in a modular construction.

TRAX has moved from client-server to .NET and continues to add customers, with nine new airlines in 2008, including Royal Jordanian.

The functional blocks include: material management; maintenance & engineering; maintenance planning; financial management; personnel qualification system; component maintenance; maintenance operations control; and interfaces (including flight scheduling, finance and HR). A new AMOS shift planning/capacity planning module was added last year.

The functional scope of the product is very wide, but also deep. The AMOS product is used right across the spectrum of commercial aviation, from airlines to third-party MROs and engine shops. Swiss-AS sells exclusively in the commercial aviation market.

TracWare

Responding to our survey for the first time, there is more detail this year about this relative newcomer to the bigger market of tier-one pure-play MRO software. The UK-based company has 13 staff and 40 sites, which include 16 flight-based maintenance organisations and operators. The product, Aerotrac, is an affordable client-server application based on Microsoft tools. Customers are a variety of commercial MRO facilities and operators, including companies like FR Aviation, NetJets Technical Services, Police Aviation Services, and Sloane Helicopters. It also has overseas sites including the small engine overhaul division of Abu Dhabi Aircraft Technologies (ADAT) and JetAsia in Macau. Its oldest customer, Inaer, went live with AeroTrac in 2001.

The company took on five new customers in 2008. Functionality is lighter than some of the other tier-one companies, but continues to grow. Functional modules include: FliteTrac for flying school and charter operations; Time Clock for time recording; PartsTrac for parts distribution and sales order processing; Status Board for inter-active management reporting; and ProTrac for manufacturing. TracWare implements the system, but also gets support from an alliance partner, Access Accounting.

TRAX

TRAX continues to be a leading tier-one vendor. Starting in 1997, it has grown to nearly 80 people with about the same number of live customers. 2008 saw nine new customers being added to the TRAX family. The company moved technologies from client-server to .NET last year to secure its future position.
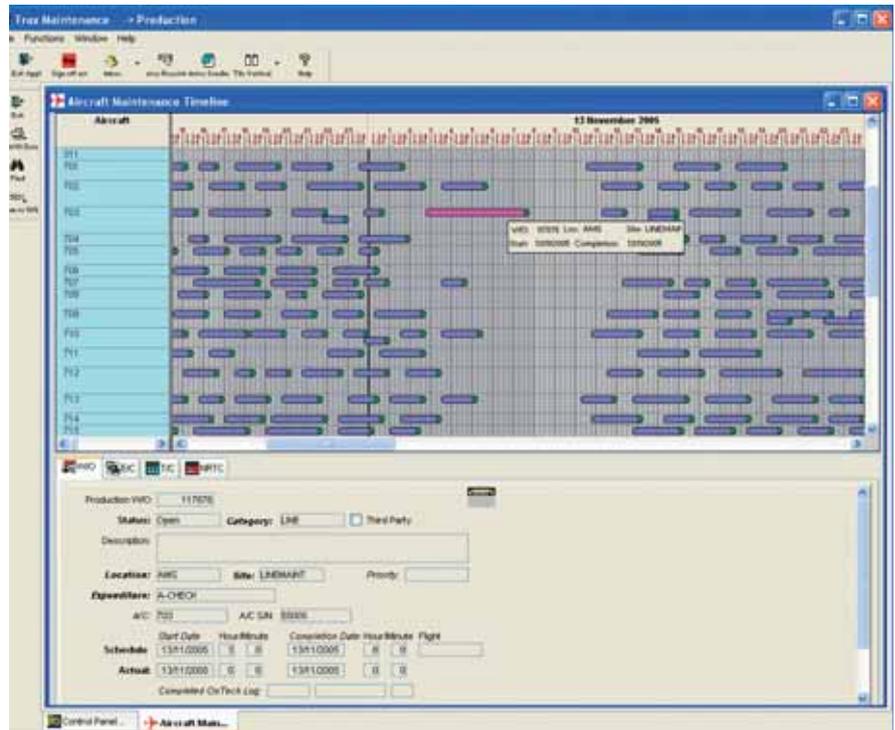
TRAX implements its own product, and is one of the few vendors without a relationship with another system integrator or channel partners by choice. The TRAX product is deep and broad. Many functions have been developed in conjunction with customers. Modules include: fleet maintenance and planning; quality assurance; materials management and planning; compliance audit and reporting; technical records online; SGML manual distribution; airline purchasing and finance system link; large MRO management; technical publications management; site capacity planning; EFB; and reliability tracking. It says it has developed an interface to both Boeing AHM and Airbus AirN@v/Airman.

TRAX sells exclusively to the airline market, and its prestigious clients include JetBlue and Alaska Airlines. Its last sale was to Royal Jordanian in late 2008. Trax has a global customer base, ranging from airlines to independent MROs.

Ultramain

No data was returned by Ultramain, so this entry is gathered from public sources. Ultramain has three of the biggest airline names in the business as customers: Virgin Atlantic, Cathay Pacific and Emirates. The company grew in the early part of this decade installing integrated supply and maintenance solutions for airlines and mass transit companies. It is also unique among MRO software vendors in having its own software development environment, XPONENT, which it developed.

Based in New Mexico, USA, Ultramain is believed to have 40-50 staff with offices in the UK and Hong Kong. The Ultramain product offers modules including: configuration management; maintenance requirements; maintenance procedures; planning and forecasting; production planning and control; flight logs; maintenance alerting and analysis; labour management; asset management; materials management; procurement; warranty management; and quality assurance.

VOLARTEC

Edging into the tier-one pure-play category is new-entrant Volartec from Argentina. This 23-person company has been in business just over five years and has already sold the Alkym maintenance suite to 15 airlines. In 2008 it signed five new customers. Its longest-standing customer is PLUNA from Uruguay.

The main market for the product at present is South America, but the company has ambitions to expand. The Alkym product has full coverage of all major airline maintenance and supply processes. These include: engineering module; planning module; maintenance control module; reliability module; purchase and repairs module; receiving and shipping module; inventory module; human resources module; sales module; quality assurance module; and system configuration module. Finance capabilities are provided through interfacing with ERP and accounting systems. There is no link to Airbus or Boeing systems like AHM.
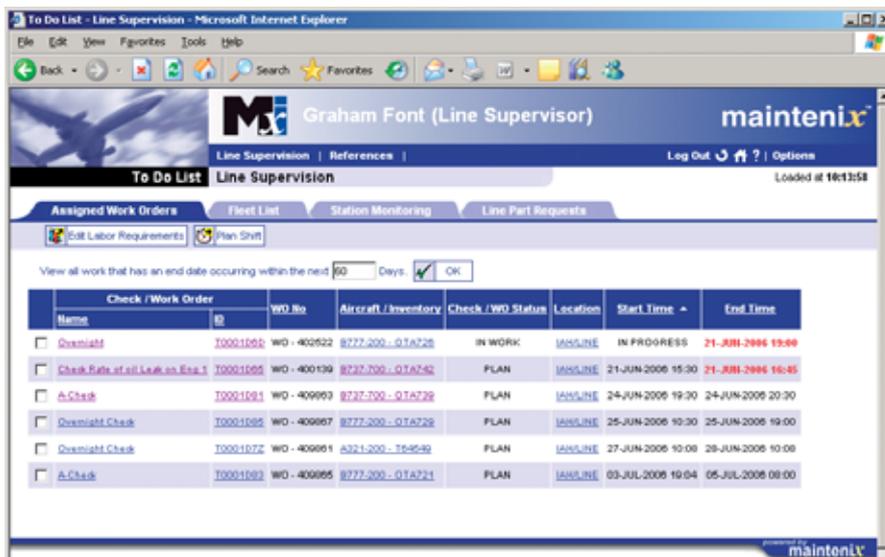
Point solutions

This group of software is defined as those solutions that typically address a specialist need in the MRO software market. They can be installed standalone, or integrated with pure-play or ERP solutions.

4sight

4sight Technologies offers specialist solutions for improving the scheduling of maintenance work. Its em360 software provides company-wide integrated project scheduling, long-range planning and scheduling, advanced constraint scheduling and optimisation, and maintenance and production scheduling.

The benefits include continuous process quality and productivity improvements by optimising resources and minimising waste in areas such as time-delays, poor processes and inadequate strategic planning.

4Sight has a number of teaming agreements in place with some tier-one pure-play vendors, but it can also be implemented standalone, alongside existing MRO legacy systems.

AviIT

eMan is the solution from UK-based AviIT aimed at providing airlines with a single, centralised storage of all electronic documentation and applications. It includes a full library system. A second product, Archimedes, is a low-cost aircraft communication and reporting system (ACARS) message decoder that connects to an airlines' ACARS environment. Archimedes is a configurable tool that automatically identifies and decodes ACARS messages and performs user-defined tasks. It can identify post-flight reports and put them into a readable format, issuing them via email or fax to end-user departments.

Out, Off, On, In (OOOI) data can be decoded and used to feed engineering and crew management systems. No data were received from AviIT.

ARMAC

Irish-based ARMAC provides a specialist point solution for inventory optimisation. There is a lot of government and academic backing behind the company. Using the RIOsys solution from Armac, companies with a substantial investment in spares inventory can work to reduce their investment while increasing their fill rates. The system works with existing material planning systems and the company claims that installation, integration and training can be completed in days.

ClickCommerce

US-based ClickCommerce, formerly Xelus, is a market leader in advanced supply chain optimisation. With customers as diverse as British Airways and BAE Systems, the solution is usually aimed at the larger end of the market. The company has a number of partnering arrangements with some of the tier-one pure-play vendors and ERP providers.

Component Control

Component Control responded for the first time this year. Aimed squarely at fixed-base operators, component management companies, parts brokers and smaller-scale air operators, it has an impressive list of 750 live customers in 50 countries. Last year it added no fewer than 110 new names to this list. The two main products, Quantum Control Aviation Enterprise Solutions and StockMarket.Aero, are produced in San Diego. The company has 52 employees, including seven software developers.

Corena

With no questionnaire responses, the following data has been obtained from the public domain. Danish company Corena claims its major strength is the ability to transform airline domain and business knowledge into structured XML/SGML content and deploy it to a long-term 'company-efficient' industrial solution. Corena also offers consulting services covering systems integration, programming through to project management. Its LifeSTAR technology is based on the XML/SGML open standard technology, and is used by airlines for job card and check management through to centralised electronic document management. Corena has a number of partnerships with other MRO software vendors, from Aerosoft to SAP.

EFPAC/TES

UK-based EFPAC, a wholly-owned subsidiary of TES, provides engine planning and maintenance management software. With no questionnaire returned, the limited data here come from the public domain.

Apart from being used by TES for the management of all its customers' engine fleets, it is used by a growing number of airlines, engine leasing companies and maintenance organisations in North America, Latin America and Europe.

EmpowerMX

FleetCycle from EmpowerMX is classified as a point solution by *Aircraft Commerce* to ensure a differentiation with other core integrated MRO solutions with both maintenance and supply in one product. Again no questionnaire was received, so the data are only from the public domain.

Although limited to engineering and maintenance planning and work recording, FleetCycle can be an effective point solution, particularly for large airlines with large legacy systems. For these customers it can be painful, expensive and take many years to replace all the elements of a complete MRO software solution. The EmpowerMX solution may be a solution to this problem. FleetCycle aims at the production environment, whether line or hangar, and encompasses the task card management function as well as point-of-maintenance work recording. Other modules include reliability management.

Superstructure provides the quality and safety management tool ADQ to airlines worldwide. With close to one hundred customers, ADQ provides a way for airline maintenance departments to manage human factors effectively.

Enigma

US-based Enigma is featured here for the first time. The 100-strong company markets a range of products aimed at automating the management of technical document revisions and job card generation. These include Enigma 3C, InService MRO, InService EPC, InService Job Card Generator, and Revision Manager. Half the business is airline-based with four major operators using Enigma, including KLM, FedEx and JAL.

The product suite also aims to improve scheduling of resources and links to ETLs and EFBs. The company says it works with implementation partners like Altech, Oracle and SAP.

Euroscript

Euroscript gets a listing for the first time this year through its questionnaire response. It is a large Luxembourg-based company with 180 staff focused on the aviation market, 60 of which are developers.

The products marketed include E-FOS for Flight Ops division and TPSS for M&E division. The product is live with two airlines, Air France being the largest. The products are aimed at technical document management and browsing, for example of an EFB. They are also used for job card authoring and accessing the OEMs' manuals.

IDMR Solutions

New for 2009, IDMR is a US-based job card authoring and document management solution. Developed in Israel with a team of three developers, the 12-person company has four live customers for the InForm & eMAT products. This includes Atlas Air, which has been using the systems for 10 years.

Largely focused on commercial airline business, the products include a range of capabilities. For technical publications and work cards, the system has card authoring with integration to updated OEM manuals, planning modules and aircraft maintenance manual (AMM) reuse. The system has engineering orders (EO) with full authoring capabilities with graphic integration. The maintenance subsystems include capabilities for a maintenance service items (MSI) module to maintain a full maintenance programme integrated with a planning module to print packages. It also has a technical library with complete control of where all documents are, with advanced tracking, monitoring and alerts for new, updated and expired items. Repair orders (RO) for on/off-site repairs can be entered into the system and synchronised, and then converted to EOs. The Planning Packages (PP) module includes printing packages and cost-saving reports with MH estimates and material consumption. The system handles non-routine (NR) cards. Another sub-system is Manual Viewers (MV), supporting SGML and PDF OEM manuals. The Manual Authoring (MA) subsystem allows users to author/edit OEM manuals and make them their own with the OEM update and compare tool.

Infotrust (formerly Jouve)

US-based Infotrust provides a range of products for the commercial airline market. No questionnaire was returned, but from the public domain information, the company offers AirGTI and Skysuite, designed to work together for seamless workflow from authoring to delivery.

Each module can stand on its own as a single application and can be acquired separately. AirGTI has been available for many years as an independent electronic job card management, check planning and document viewing tool for airlines and maintenance shops. It competes with the OEMs' in-house solutions (Boeing's Maintenance Performance Toolbox and Airbus's airn@v). The product is still a solution at the leading edge.

Built for the newly emerging EFB, the Intelligent Data Management System (IDMS) is powered by an advanced XML content server. This allows the delivery of the right information at the right time to the right person. IDMS is flexible and can provide a common user interface across fleets.

MINT MEDIA Interactive

MINT provides MROs with the tools to support them in achieving regulatory compliance. This 27-person German company also has offices in the USA and Middle East. With a current total of 16 live customers, including five new ones last year, MINT emerged from within the industry 11 years ago and offers standard software tailored to aviation requirements. The MINT WebAssistant is a staff record-keeping solution available as an ASP or regular installation. Multiple qualifications can be tracked for every employee, providing features to manage expiry dates and continuation training. Customers like Lufthansa Technik and Cathay Pacific use its flexibility.

WebAssistant can be combined with the web platform MyMint, where end users download their records or initiate the licence renewal workflow. If MRO organisations also manage their shift planning with MINT, technicians can view their duty plans in MyMint and bid for desired working hours. No matter if the organisation follows fixed or flexible shift rhythms, MINT Shifts ensures optimised resource utilisation and capacity overview.

MINT's second product portfolio, MINT TMS, is geared at aviation training organisations, which can manage all their technical training activities with the Training Management System (TMS). Customers include Qantas, SAS and

many others. Lufthansa Technical Training, for example, stores all specifications of local and international aviation authorities such as instructor qualifications, classroom configurations and technical facilities in the MINT database. These rules and limitations will be followed by the system when doing an automatic scheduling run or manual planning. MINT TMS provides a single solution to everything from the administration of training demands and course curricula, to automated scheduling and day-of-ops management to finally grading and sign-off.

Omega

Omega Airline Software is responding for the first time in this year's survey. This US-based company has been around for many years and is now a 10-person company with 12 live airlines. Squarely a point solution for scheduling hangar maintenance, it is perfect for large organisations with large legacy MRO systems that have yet to be upgraded. Large customers today include Continental Airlines and Delta.

Omega's longest-standing customer has been using the technology successfully for 17 years. Modules now include AmesLRP (long-range planner),

AmesSTS (short-term scheduler), Ames FleetPlan, Ames Budget, AmesMRO, AmesLine/RON, Ames Dashboard, Ames Reporter and Ames Administrator.

Open Connect

This Swiss company has a strong relationship with Lufthansa and Swiss AviationSoftware. With only public domain data to rely on, it appears that its eDOC solution competes with Infotrust and Euroscript as a document management solution. Already in service with Lufthansa Technik and Austrian Airlines, the solution suite is expanding.

Perceptive Inc

With no questionnaire data, it is difficult to comment further on last year's entry. Perceptive provides an innovative solution for non-routine card handling on handheld devices, integrated into MRO systems.

Superstructure

This New-Zealand-based software company provides the aviation industry with a specialised industry-specific quality assurance and air safety system. This combines both elements of air

incident/accident reporting and follow-up with proactive quality audits of flight operations and maintenance to provide a unique system for managing and enhancing maintenance safety and errors. It can be used remotely or on a central server, and is easily configured.

The company has been in business for 12 years and has grown to 24 people. It has offices in New Zealand and the UK. With close to 100 airlines around the world now using this unique tool, the company is set to continue to prosper. The largest customer is Delta, but others include Qantas and Cathay Pacific. Using a risk-based analysis approach, founded on the reason model of organisational accident prevention, it enhances human factor management in maintenance error improvement.

Waviatech

Now in its seventh year, Waviatech is a 12-strong company based in the UK. Supplying an innovative digital aircraft records management solution called STREAM, the company now has seven customers, including five new additions in 2009. The first company, Compass, still uses the system.

The STREAM product is one element of the company's success. Equally important is the airline technical and maintenance domain expertise in terms of the document scanning service provided either on site or remotely. In this time of economic downturn, the ASP option is a welcome way of using the technology without significant up-front outlay on hardware or software.

X-hive

Founded in 1996, X-hive is headquartered in The Netherlands. No questionnaire data is available for X-hive. The aviation product suite, AMDS, is based on the S1000D V3.0 standard for civil and military aviation. AMDS-CMS is one of the integrated systems for importing, managing, authoring and publishing maintenance tasks, job cards, engineering orders, and structured and unstructured manuals.

AMDS-DS is a class 4/5 Interactive Electronic Technical Publication (IETP) for delivering job cards, maintenance visits and maintenance manual content at both hangar/base level and line. Customers include Fokker Services and Boeing.

ERP solutions

These products offer complete end-to-end enterprise-wide software package, hence the name enterprise resource planning (ERP) solutions. This large end of the market yielded the lowest response rate to the questionnaire.

Advanced inventory optimisation from ClickCommerce can save airlines and OEMs millions of dollars in annual costs of operating a MRO facility.

IFS

Largely a finance and banking market player, IFS is heavily involved in the defence aviation market through IFS Defence, a 50:50 joint venture with BAE Systems. Commercial aviation customers include Finnair and Bristow Helicopters Group. The IFS application is particularly strong for third-party MRO facilities, with deep functionality for financial management and sales/invoice preparation. Modules include: engineering; maintenance planning; maintenance execution; production management; supply chain; purchasing; human resources (HR); and finance. There have been few announcements on airline deals from IFS since the last survey, perhaps indicating that in the current climate, one of the first casualties are the more expensive ERP vendors.
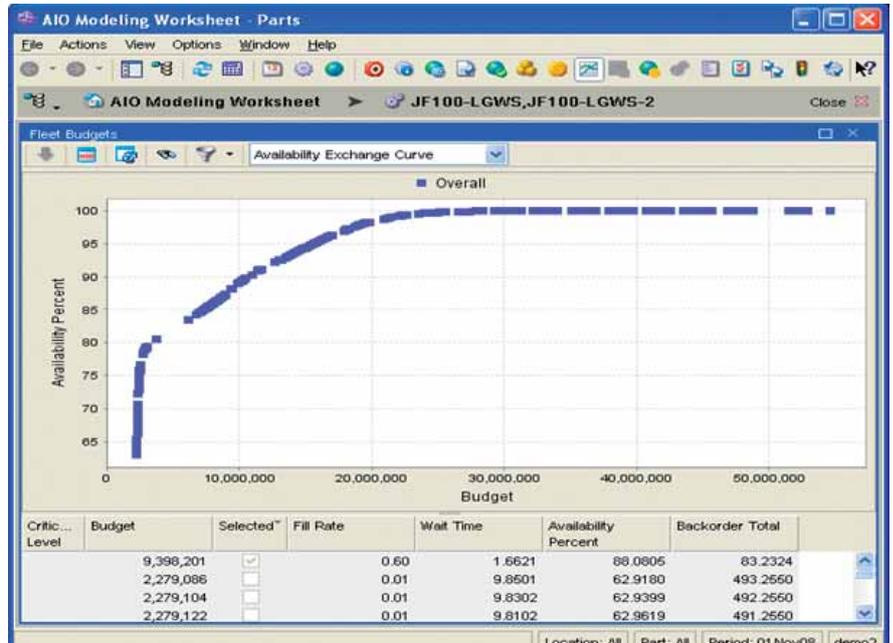
Lufthansa Systems (SAP)

Continuing as one of the specialist commercial airline SAP implementation partners, Lufthansa Systems provides a tailored solution for the airline market. Its latest new customer is Saudi Arabian Airlines, which selected LHS in mid-2008 to implement SAP for its MRO facilities.

Other large projects include Thai Airways. It is clear that large airlines continue to favour large ERP solutions, despite the capital needed to implement these systems.

2MoRO (SAP)

One of the only ERP responses came from another SAP implementation partner, 2MoRO. This French-based consulting company of 51 people has four commercial airline MRO facilities live on SAP, and won another customer in 2008. The company says it works together with CapGemini and B4 Consulting in the US for implementation. While it specialises in implementing SAP R/3, it has also added functionality around the edges of the solution and provides the end result as a hosted ASP option.

The company started in 2004 and has secured contracts with Snecma Services. SAP capabilities include inspector workbench, configuration control, fleet management, eLogbook, CRM, and asset availability optimizer. 2MoRO provides complete capabilities across all airline and MRO shop business processes, including links to Boeing AHM and Airbus AirN@V and Airman.

Oracle

Little is known about Oracle's progress in the airline market. It is believed that the complex MRO product (cMRO) has customers live on Oracle cMRO, including OGMA Portugal, Siberian Airlines and American Eagle. Oracle secured deals in 2008 with Korean Air and Mexicana.

SAP

No response was received to the questionnaire. SAP is believed to be live at a number of large airlines such as British Airways and Singapore Airlines.

Tier-two solutions

There continue to be a number of smaller-scale aviation MRO solutions available. Most are only applicable to small air taxis, executive operators and small component shops. Tier-two providers include: Aircraft Maintenance Systems, Airline-Software Inc (SPECTRUM), Amelia, Aviation InterTec Services, C.A.L.M, Cambridge Online Systems (OpenAIR), and Continuum Applied Technologies (Corridor).

EFB/ETL

EFBs and ETLs continue to make progress in the market with some of the LCCs and charter carriers leading the way. Optimised Systems and Solutions (OSyS, and formerly DS&S) is one of the leading EFB suppliers, alongside AMT.

OSyS is headquartered in the USA and has a staff of 400. The company's solutions include Class 1 and 2 EFBs, including ETL. This creates a paperless flightdeck, and provides a bridge into engineering data and maintenance, repair and overhaul systems. OSyS equipment health monitoring (EHM) services are now provided for more than 8,000 engines in 3,000 aircraft.

OS&S has over 300 live airlines, with 40 new customers in 2008. The company continues to prosper and expand, with original customers American Airlines and Cathay Pacific. OS&S operates mainly in the commercial market segment, working with Pitney Bowes on some implementations. The company does offer its solutions as a hosted ASP option, enabling lower initial investment by customers. At present the company is trialling a link to Boeing's AHM airplane system. The EFB market is still maturing, but the OEMs are taking more of the market from the independents by building the capability into the aircraft.

Summary

The market for commercial aviation maintenance, engineering and supply software is changing. It was expected that there would be a 'shakeout' of the tier-one pure-play MRO vendors during the last few years but this has failed to materialise. Indeed, in a time of economic downturn it is somewhat strange to report that new entrants continue to emerge. There are still no clear winners, but a few seem to be edging ahead.

The EFB/ETL market continues to develop slowly and certainly can complement a core MRO software solution. **AC**

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