IntegratedEA Conference '08

Enterprise Architecture

Conference Programme
6th & 7th February 2008

One Birdcage Walk, Westminster

www.integrated-ea.com

Welcome to Integrated-EA '08

This is the first time we've run the Integrated EA Conference. We've got some really great presenters, and some very interesting presentations. Many thanks to all those who submitted abstracts, and I hope those who didn't make it this year will try again next year. I'd also like to express my gratitude to the invited speakers. We've been really lucky to have speakers of this calibre in an inaugural conference, and this is reflected in the level of attendance and sponsorship.

This conference came about because there was a need for the MODAF user and vendor communities to have a forum for discussion and learning. However, as we began to collate the abstracts, it became obvious that our remit should be wider than just MODAF. Integrated EA is aimed at enterprise architects who believe in a cohesive, model-driven approach to architecture.

There is a strong Government theme to the event and we've balanced this with presentations from commercial organisation such as Shell, BAE Systems & IBM. Although EA is at the core of all the presentations, we've aimed for variety. There are Systems Engineering and SOA themes on Day One, and Day Two is focussed on case studies and international updates. In addition, on Day One we have two parallel sessions (workshops on SE & SOA), and a tutorial on Ontology from one of the world's leading experts – Chris Partridge.

Finally, I'd like to thank the sponsors and exhibitors – in particular GCHQ & PA for sponsoring the champagne reception. I hope you enjoy the conference.

Ian Bailey, Model Futures Ltd.

Programme – Day 1

Time	*LECTURE THEATRE*	*COURSES ROOM*
09:00-09:30	**Welcome and Registration** (Marble Hall)	
09:30-09:35	**Conference Introduction** - Ian Bailey	
09:35-09:45	**Session Introduction** Hillary Sillito, MOD Integration Authority and former president of INCOSE UK	
09:45-10:30	**KEYNOTE: Applying Enterprise Architecture and Systems Engineering in GCHQ** Rob Stevens, GCHQ	
10:30-11:00	**Coffee Break** (Marble Hall)	
11:00-11:20	**A Case Study in Using SysML for Model-driven Enterprise Architectures** Ron Williamson, Engineering Fellow at Raytheon	**Workshop: Realising the Promise of SOA in Defence** Run by Salamander & IBM
11:30-12:00	**De-risking future MOD capability using MODAF to support Warfighter Experimentation** Steve Hitchins, Lead Battlespace Architect, NITEworks	
12:00-12:30	**Redefining Functional Requirements through Human Views for MODAF: An Application of Enterprise Architectures to ensure Human Factors Integration** Anne Bruseberg, Human Factors Consultant, Systems Engineering & Assessment Ltd., UK	
12:30-13:30	**Lunch** (Marble Hall)	
13:30-14:00	**Standards-Based SOA in the MOD Logistics Enterprise** Capt. Bob Leeming (RN), AD Log Architectures, UK MOD	**Workshop: Systems engineering and Enterprise Architecture** Run by Artisan Software
14:00-14:30	**The NATO Architecture Framework SOA Views** Lt Col Mikael Hagenbo, Swedish Armed Forces	
14:30-15:00	**Coffee Break** (Marble Hall)	
15:00-15:30	**Analyzing and Presenting Multi-Nation Process Interoperability Data for End-Users** Dave McDaniel, Silver Bullet inc.	**Systems engineering workshop** continues
15:30-16:00	**An Open Standard approach to model Enterprise Architecture, DoDAF and MODAF** Peter Bahrs, Paul Bahrs, Fred Mervine, IBM	
16:00-16:30	**Afternoon Tea - Sponsored by 42SBS (Marble Hall)**	
16:30-18:30	**42SBS Sponsored Tutorial - AN INTRODUCTION TO ONTOLOGY** **Chris Partridge**	
18:30-21:00	**Champagne Reception - Sponsored by GCHQ & PA Consulting** (held in IMechE Library)	

Programme – Day 2

Time	*LECTURE THEATRE*
09:00-09:30	**Welcome and Registration** (Marble Hall)
09:30-09:45	**Conference Introduction** Dave Chesebrough, President Association for Enterprise Integration
09:45-10:30	**Opening Keynote** Mr. George Wauer, Director, Architecture & Interoperability, Office of the Department of Defense Chief Information Officer (invited)
10:30-11:00	**Using Enterprise Architecture to manage complexity in the UK Armed Forces personnel delivery programmes** Brigadier Robin Bacon, Director: Strategy and Programmes, Service Personnel and Veterans Agency, UK MOD
11:00-11:30	**Coffee Break** (Marble Hall)
11:30-12:00	**Information Management Maturity and Enterprise Architecture** Matthew West, Reference Data Architecture and Standards Manager, Shell International Petroleum Company
12:00-12.30	**An Update on DoDAF 2.0** Brian Wilczynski, Assistant to the Director of Architecture and Interoperability, DoD OSD(NII)
12:30-13:30	**Lunch** (Marble Hall)
13:30-14:00	**An Overview of Enterprise Architecture Activities in the Home Office** John Wailing, Head of Architecture & Chief Technology Officer, the UK Home Office
14:00-14:30	**MODAF - a Practical Application of an Architecture Framework** Peter Hotham, Stephen Winter, NATS (UK Air Traffic Service)
14:30-15:00	**Coffee Break** (Marble Hall)
15:00-15:30	**Aquisition - a "recognised picture"?** Bob Barton, Director of Capability Development, BAE Systems
15:30-16:30	**Panel Session** Chair: Dave Chesebrough, President Association for Enterprise Integration

Abstracts

Keynote Address (Day 2) - Department of Defense Enterprise Architecture Initiatives — **INTERNATIONAL KEYNOTE**

George Wauer, Director of the Architecture and Interoperability Directorate in the OSD(NII) Office, US DoD

Keynote Address (Day 1) - Applying Enterprise Architecture and Systems Engineering in GCHQ — **SYSTEMS ENGINEERING**

Rob Stevens, GCHQ

The UK's Government Communications Headquarters (GCHQ) has to continuously innovate and change its information systems (IS) to counter the ever growing and changing threats to national security. In April 2006 GCHQ recognised that to have a chance of keeping pace with the threats it had to fundamentally transform how it implemented changes to its IS. Analysis showed radical skills improvement was needed in the Systems Engineering (SE) and Enterprise Architecture (EA) function, to lead and catalyse the development of its end-to-end intercept, processing and reporting systems. As a result the EASE change initiative was commenced, with the core objectives:

- Establish best practice SE and EA to achieve pace, agility and innovation
- Professionalise the GCHQ SE workforce to lift the whole team performance
- Drive through business and culture change to put SE and EA at the heart of delivery

At the core of the EASE approach are two main methodologies: a business driven EA that provides governance to all change to the IS and an architecturally-based SE process that ensures effective and integrated change is delivered. Both the EA and SE elements of EASE are conducted using appropriate elements of the MODAF framework that are realised through modelling in a COTS environment underpinned by a tailored meta-model that permits the required: integration, behavioural and performance analyses to be performed.

A Case Study in Using SysML for Model-driven Enterprise Architectures — **SYSTEMS ENGINEERING**

Ron Williamson, Engineering Fellow at Ratheon

The need for model driven approaches to address the challenges in Enterprise and System of Systems Architectures is addressed in this case study of SysML and MODAF. Alternative viewpoints are illustrated for Business and Solution Architecture descriptions, Logical and Physical Architecture descriptions in the context of a SysML based structural and behavioral model respresentation. The importance clearly separating the model element definition from the model element usage is explained and illustrated by example.

Each of the SysML features (Block, Continuous Activity, FlowPort, Allocation, Parametrics and Requirements) is mapped to the MODAF metamodel and illustrated via usage examples derived from the MODAF documentation. The benefits of using a SysML approach to Enterprise Architecture modeling are explored in the context of both the model library specification in SysML and the transition of Enterprise models to system models and subsequentlyto service, software and hardware models.

The overall points are discussed in the context of a case study comparing and contrasting SysML features with domain specific languages tailored for Enterprise Modeling.

De-risking future MOD capability using MODAF to support Warfighter Experimentation — **SYSTEMS ENGINEERING**

Steve Hitchins, Lead Battlespace Architect, NITEworks

NITEworks is a partnership between the 10 leading Defence Contractors, MOD and DSTL. NITEworks examines NEC integration issues, identifies candidate solutions, undertakes experimentation to validate the solutions, and then delivers evidenced options that will improve operational capability across the Defence Lines of Development. In 2007 NITEworks conducted a research program to assess what Maritime C4ISTAR system capability is needed in 2015-2020.

Steve Hitchins was the Battlespace Architect for the Maritime ISTAR experiment; he will describe how MODAF Strategic, Operation and System views were used to support the conduct of the experiment and illustrate the report. The talk will also feature some research work on using extended MODAF views for human factors and social network modelling. The actions resulting from this experiment will result in a projected cost savings of £30M.

Redefining Functional Requirements through Human Views for MODAF: An Application of Enterprise Architectures to ensure Human Factors Integration

SYSTEMS ENGINEERING

Anne Bruseberg, Human Factors Consultant, Systems Engineering & Assessment Ltd., UK

Human Factors Integration (HFI) needs to be understood and practiced as an integral part of Systems Engineering (SE). It cannot be conducted in isolation. By modelling an Enterprise as a whole, MODAF (the Ministry of Defence Architectural Framework) provides an overview perspective that aids acquisition management. MODAF has the potential for fulfilling essential objectives of HFI: integrating the different HFI domains; integrating with other engineering disciplines; managing the need for HFI activities; informing trade-off analyses.

To achieve effective HFI, it is important to clarify the scope of the formal HFI design decisions areas to be influenced by suitable HFI activities. MODAF provides models to reason about acquisition decisions for future systems early, in the absence of real systems that can be observed. It supports high-level reasoning behind requirements by mapping the effects of change on other elements. It provides a common reference through a shared model, and by providing standardised representations. It is an essential tool to support capability-based acquisition.

MODAF can support HFI, as much as HFI can support MODAF. Military systems often operate in distributed environments and collaborative settings. They require the specification not only of the information systems (i.e. software and hardware), but also the social, organisational, procedural, task, and skill structures that support complex information flows and information sharing.
In order to address these concerns, a set of Human Views (HVs) is proposed, as complementary to the existing MODAF Views. HVs model the 'soft systems' human elements, without which future systems are likely to fail. To be able to specify all Defence Lines of Development (DLOD), they need to be specified explicitly. HVs clarify the HFI design elements of socio-technical systems. They support the change of focus from technology-focused functional requirements to capability requirements.

The HVs emphasise a model-based approach by specifying conceptual data elements for each View that can be integrated into the MODAF Meta-model. Each HV is supported by a small meta-model, showing how the HV data elements relate. An overview meta-model of all HV elements is included. Moreover, visualisation options are specified.

The HVs aim to bring together SE and HFI as two related disciplines. Whilst SE and HFI depend on each other, each is grounded in a set of approaches and philosophies not immediately compatible. By choosing a SE approach to express HFI design decision areas, HFI professionals are provided with means to communicate to Systems Engineers. On the other hand, the HV elements have the potential of changing traditional SE approaches that can be overly technology focused. Enterprise Architectures are being conceived to overcome this problem and specify requirements and solutions for all DLOD. MODAF version 1.1 has already significantly modified many of its underlying definitions. The HVs further expand on this development. The presentation discusses the nature of these differences and changes. It presents some of the HV concepts and applications.

Standards-Based SOA in the MOD Logistics Enterprise

SOA

Capt. Bob Leeming (RN), AD Log Architectures, UK MOD

A case study, describing the SOA pilots in the MOD Logistics area, using MODAF, the NATO SOA views, OAGIS and PLCS.

The NATO Architecture Framework SOA Views

SOA

Lt Col Mikael Hagenbo, Swedish Armed Forces

Version 3 of the NAF was approved by NATO on November 22 2007. The main aim in developing version 3 was to create an architecture framework that could be used to Support NATO Networking Enabled Capabilities (NNEC) and service oriented architectures. NAF Version 3 extends version 1.0 of MODAF and its meta-model (M3), and the NAF Meta Model (NMM) is a backwards compatible extension of M3.

Swedish Armed Forces (SwAF) is in the process of evaluating MODAF with a view to adopting it as the national defence architecture framework, but with the addition of the NATO SOA Views. SwAF have conducted a Network Based Defence (NBD) experiment using an in-house service description framework developed in 2002. This framework was further refined in the Ledsyst T Experimental Programme, and successfully tested during several Proof Of Concept Experiments. The experiments clearly showed that SOA is achievable for the purpose of integrating legacy systems. The NMM and M3 v 1.1 SOA extensions are based on the Swedish Service Description Framework and thus Swedish Armed Forces feel confident to mandate the NAF SOA views.

The SOA viewpoint in NAF version 3 describes 5 new standardised views that are to be used to specify services. The views that have been defined cover with service taxonomy, service definition, service orchestration and service behaviour.

This presentation will describe the NAF version 3 apporach to SOA by making use of an example taken from the Swedish Health care service. In this case study, different geographical areas of Sweden, each with responsibility for its health care, have joined in a consortium to agree on a shared infrastructure and a shared set of services in order to manage access control, authorisation and transfer of medical patient data. The presentation makes use of the shared service descriptions published by the consortium and exemplifies the NATO SOA elements and views. Based on these examples it is possible to draw some general conclusions regarding the benefits of the NAF / MODAF(proposed) SOA approach.

Analyzing and Presenting Multi-Nation Process Interoperability Data for End-Users **STANDARDS**

Dave McDaniel, Silver Bullet inc.

Often in international missions it is valuable to be aware of any process dis-interoperabilities prior to mission commencement. For example, for Coalition Operations, it is important to know how battlefield casualties will be handled by the participants, in the event one's own casualty soldier is being taken care of by another nation's medical corps, or vice-versa, where one is caring for another nation's casualty. There may be legal and cultural requirements, notification, reporting, timeline, or event response expectations, and so forth that we would not want to discover during the mission, but, rather, be aware of ahead of time so the processes can be adjusted or so that commanders are aware of how their casualties will be taken care and can adjust their expectations. The United Kingdom, United States, Canada, and Australia are working on just such an experiment as part of the International Defence Enterprise Architecture Specification (IDEAS) project. While the focus of the project has been on the architecture data ontology, there is also recognition that the process mismatches need to analyzed and displayed to commanders in a way that alerts them to significant issues and that makes their jobs of planning for the Coalition mission easier and more thoroughly thought through. This presentation reports on IDEAS experimentation progress to date, describes analysis algorithms being worked on, and shows various notional and real presentation options that would be meaningful and useful to commanders. It describes issues in multi-source EA data analysis and possible remedies. Issues with end-user display of EA data analysis results are also discussed along with various alternatives being experimented with by the IDEAS project.

DoD Architecture Framework (DoDAF) version 2.0 Development **STANDARDS**

Brian Wilczynski, Assistant to the Director of Architecture and Interoperability, DoD OSD(NII)

On overview of what DoDAF 2.0 seeks to achieve, what is likely to be in the specification, and a general indication of the direction that EA is going in the DoD.

An Open Standard approach to model Enterprise Architecture, DoDAF and MODAF **STANDARDS**

Peter Bahrs, Paul Bahrs, Fred Mervine, IBM

This talk will discuss UML Profile for Department of Defense Architecture Framework (DoDAF) and Ministry of Defence Architecture Framework (MODAF) (UPDM), how it relates to DoDAF, how it relates to MODAF, an approach for reuse and the future of open architectures.

EA is a comprehensive approach to understanding and managing an organization's structure, plans and processes. Its purpose is to assure that the vision (mission), strategies, tactics and operations can, are and will be realized by its technical architecture and processes. UPDM is an Object Management Group (OMG) open standard for creating semantically consistent models of an EA. The OMG is an internationally recognized body supported by industry that defines standards and specifications for modeling architectures. The UPDM standard refines and integrates the original meta-models behind DoDAF and MODAF as well as standards so that enterprise architects and systems engineers will have a consistent, rigorous modeling language for modeling complex systems and systems of systems.

The Ministry of Defence (MOD) has moved to adopt UPDM as the open standards profile for use in Modeling MODAF architectures. UPDM customizes the Unified Modeling Language (UML) and Systems Modeling Language (SysML) to express MODAF EA definition concepts for a truly integrated, model-centric approach and uses Model Drive Architecture (MDA) principles. UPDM affords the MODAF architect and program manager with several options for modeling EA, integration with other open standards, exploiting an integrated model, importation and exportation of architecture artifacts, tool interoperability and use of a variety of modeling methodologies and approaches.

Information Management Maturity and Enterprise Architecture **CASE STUDY**

Matthew West, Reference Data Architecture and Standards Manager, Shell International Petroleum

Information Management is about assuring the quality of information so that it is fit for purpose. This presentation outlines an approach for ascertaining Information Management Maturity as a way of identifying the quality of information management in an enterprise.

An organisation cannot leap from having poor information management to having great information management in one go. There are a number of stages you need to go through, and you have to consolidate at each stage before moving on. Each stage delivers incremental business benefits - you can work out what stage you are at and see what you need to do to move to the next level. A part of improving information management maturity is about putting elements of the enterprise architecture in place, and using it. The other part is in changing practices and attitudes to information in the enterprise so the infrastructure is used when it is in place

Home Office Information, Systems and Technology Strategy (HOIST) **CASE STUDY**

John Wailing, Head of Architecture & Chief Technology Officer, the UK Home Office

An overview of the EA approach being adopted in the Home Office.

MODAF - a Practical Application of an Architecture Framework CASE STUDY

Peter Hotham, Stephen Winter, NATS (UK Air Traffic Service)

An overview of how NATS is using the MOD Architecture Framework to support their enterprise architecture programme.

Creating an Inclusive Trading Environment CASE STUDY

Bob Barton, BAE Systems

TLCM (through-life capability management) represents a major change to acquisition practices for both MoD and Industry alike. It is vital that we have consistent methods, data and processes which enable a common view to be taken, and pragmatic trading options to be generated, to meet the needs of Military Capability - within any constraints. A systems approach, bringing together the best of what is already available, within a clear information centric and architectural approach has led to a practical decison making environment. It has been shown that this is both essential and practical. "Evidenced information for informed decison making" is the maxim underpinning an inclusive partnering approach which has been instigated to develop a framework and toolset. This has been gradually evolved and demonstrated.

The paper will describe how this has been conceived, trialled and implemented to date.

Enterprise Architecture to Manage Complexity in the UK Armed Forces Personnel Delivery Programmes CASE STUDY

Brigadier Robin Bacon, MOD SPVA

Delivering effective and sustainable change in a complex organisation requires collecting, connecting, managing and exploiting a wide range of information including drivers and objectives, target capability outcomes and benefits, business process and organization, resources and risks. Exploiting such resources can allow change scenarios to be contextualized, with implications rationalized in quantitative and qualitative terms, to inform and validate decision making and plan delivery with confidence.

This presentation draws upon experience of applying such an approach in the context of the UK Armed Forces personnel delivery programmes, offering key learning points and insights.

Workshops & Tutorial

Realising the Promise of SOA in Defence — SOA

Run by the Salamander Organisation and IBM

The aim of this workshop is to inform participants of practical progress and achievements with Service Oriented Architecture (SOA) within MOD and to stimulate discussion of key topics that are emerging from experiences to date.

SOA is about aligning business outcomes and technology platforms by shifting the focus clearly on what needs to be done, rather then how it is done. The approach offers the real opportunity to put the business in control if its operations. And there is increasing evidence that those organizations that are not migrating towards SOA are already losing competitive advantage or money by the continuing requirement to manage expensive, siloed systems with limited ability to re-configure.

The MOD is committed to moving towards SOA adoption, especially in those process-intensive areas such as logistics. Salamander and IBM have been working together to demonstrate how the approach can work within the MOD – applying MODAF, with the proposed NAF SOA extensions, to create and demonstrate a service view of capability and operations, connecting through to live web service "orchestrations" of defence processes.

This workshop will showcase a sample of the work to date, demonstrating how the benefits of agility, transparency and customer control can be achieved, and prompting discussion of the key implications that arise. Participants are assumed to have an elementary appreciation of architecture principles and of SOA.

Systems Engineering & Enterprise Architecture — SYSTEMS ENGINEERING

Run by Artisan Software

Typically we create Enterprise Models in order to understand 'what' and 'how' we go about our business, to uncover and confirm 'why' the business does what it does today. Once we know 'what' we do now, 'how' and 'why' we do it, we can start to identify areas of the business change to fulfil future strategies or business capabilities. In an ideal world Enterprise Modelling is followed by Systems Engineering with information from one model (enterprise) flowing down into the other (system) resulting in systems being developed that are aligned to the business needs. However, reality is quite different, systems already exist, organisations (and their associated behaviour) already exist and are sometimes slow to change, planning and managing business transitions is critical to a successful business change. Succinctly, before we plan where we want to go, we need to know where we are now.

This workshop will elaborate a process framework showing how to model an Enterprise in the real world of existing systems, organisations and organisational behaviour; how to identify areas or properties of the existing Enterprise that need to be changed to and finally identify a number of techniques to flow information from the Enterprise Model into and out of the one or more evolving or new system model(s).

The workshop will use DoDAF (Department of Defense Architecture Framework), the evolving UPDM (UML Profile for DoDAF and MODAF) and SysML™ (Systems Modelling Language) to show how a single source of reference (a model) can capture all the properties of the Enterprise ('as is' and 'to be') evolve legacy systems and the develop of new systems.

Ontology Tutorial (Day 1 16:30-18:30, Lecture Theatre) — TUTORIAL

Chris Partridge, 42SBS

Speakers & Panel Members

Ian Bailey (Conference Organiser), Model Futures

Ian is the managing director of Model Futures Ltd., and this is the first time he has run a conference. He was part of the team that originally developed the MOD Architecture Framework (MODAF), and is the subject matter expert on MODAF for the MOD EA Programme under DG-Info IX. He is the lead modeller for the IDEAS Group (see Dave McDaniel's presentation) and co-developed the NATO SOA views (see Lt Col Hagenbo's presentation). He has also provided consultancy and training on EA matters to customers such as Shell, NHS, Cabinet Office, CESG and NATO. In addition to EA work, he also has a strong background in the practical implementation of ontologies for data integration. Ian is an expert in modelling languages - UML in particular. He developed the MODAF Meta Model (M3) and the UML profile for IDEAS. He represents MOD on the OMG UPDM project.

In a previous life, Ian was editor of the ISO/INCOSE AP233 standard, and part of the SysML Partners development team (on behalf of NASA JPL). He has a first degree in Mechanical Engineering and a PhD in model-driven software systems. He likes old cars, snowboarding and pub quizzes.

Robin Saklatvala (Conference Manager)

Robin has over ten years experience as an event manager. Her career began at the Imperial War Museum, working on diverse events such as the James Bond 'GoldenEye" premier party, 1940's fashion shows and a Commonwealth Carnival. She has been working as a freelancer since 2002 organising a diverse range of fundraising events and conferences for organisations such as the RNLI, Kings' College London and University College London. In September 2007 Robin began a Masters by Research at the University of Bedfordshire, looking at Festival Design and Development. This includes coordinating a large Arts Festival in the centre of Luton.

Brigadier Robin J Bacon MBA, FCIPD, FCMI, CMILT, Director Strategy & Programmes Service Personnel and Veterans Agency, UK MOD

Brigadier Bacon is the Strategy and Programmes Director for SPVA. His responsibilities include managing the competition for the Agency's outsourcing contract in 2009 – the largest of its kind in Europe, and the Defence Recruiting and Individual Training Management (DRITM) programme. He joined the Agency in February 2006, having previously been in the policy arena as the Strategy Director for Deputy Chief of Defence Staff (Personnel) in MOD. He is a strong advocate of personnel delivery being IT-enabled rather than IT-driven and, as a non-technical officer, tries to avoid "IT Speak".

Originally a logistician, commissioned in 1978, he served worldwide as a junior officer in all the usual 'exotic' places. After Staff College, he was a logistic planner in the first Gulf War, and then commanded the only British Army Chinese RCT squadron in Hong Kong. After a spell as an Assistant Secretary to the Chiefs of Staff, he escaped MOD in 1995 to be the UN Chief Logistics Officer in Angola. In 1996 he took command of 3 Close Support Regiment RLC, deploying to Bosnia with the NATO Stabilisation Force.

Brigadier Bacon completed an OU MBA in 1997, with the emphasis on distance learning, being deployed overseas for the majority of his study time. He is active in both CIPD and CMI circles. He is also a school governor, an advisor to the Hong Kong Ex-Servicemen's Association and an Advisory Board Member for the Centre for Applied HR Research in Oxford. He is married to a speech therapist, lives in Hampshire, and much enjoys sailing big boats and diving in warm waters.

Paul Bahrs, IBM

Paul Bahrs recently joined the IBM team in the summer of 2007. Paul holds a graduate degree in Mathematics from the University of Florida. Since joining IBM, he worked with teams across IBM, and several partner companies on various initiatives including introducing open standards as a solution to modeling and managing architectures for the US Department of Defense and the UK Ministry of Defence. Since 2004, Paul played a key leadership role in the Object Management Group open standards development effort that produced the Unified Modeling Language profile for Department of Defense and Ministry of Defence Architecture Frameworks (UPDM). Before joining IBM, Paul owned a successful engineering business in the northern Virginia area. Paul's experience includes 27+ years of US DoD, NATO and other allied communities domain and C4I architecture frameworks. He led or supported several architecture projects to support acquisition strategy decisions, support communities of interests and systems design/development. Paul also led US DoD, NATO, multinational and inter-agency teams to develop architectures for deployable adhoc C2 systems and networks and DoD combat systems integration. Paul specializes in innovating approaches to introducing new technology solutions and best practices to organizations within the public sector.

Peter Bahrs, IBM

Dr. Peter C. Bahrs is an IBM Distinguished Engineer, Senior Certified IT Architect, Master Inventor, Member of the IBM Academy of Technology, and CTO Government Solutions in IBM. He has 18 years experience in the IT industry and holds a PhD, MS and BS in Computer Science from the University of Louisiana. Peter is the team and architecture lead for the OMG UML Profile for DoDAF and MODAF (UPDM), the 1st international open standard for Architecture Framework Modeling. He has led the combined team for over three years. He was a founding member of the Network Centric Operations Industry Consortium and led the creation of its open standards strategy. He has also participate in standards activities at the IEEE (open firmware) and Open Travel Alliance (XML interchange). Peter specializes in delivering large scale IT Transformations based on IBM SOA technologies. His clients include UBS Switzerland, KBC Belgium, USAA America, CIBC Canada, Northrop Grumman Mission Systems and several classified projects. Peter holds 16 US patents and has over 50 publications. He spent years in the IBM product labs developing operating systems, streaming media, interactive television and user interfaces. Peter serves on numerous IBM activities including the Software Group Architecture Board, Asset Architecture Board, GTS Architecture Board, Software Group Technical Resource Leaders Board, and AIM Technical Resource Leaders Board. Peter also is the leader of IBM's Academy Conference on SOA Deployment Lessons Learned and Best Practices.

Bob Barton, BAE Systems

Bob graduated from Loughborough University with a first in Electronic and Electrical engineering in 1975. He joined Plessey where he specialised in radar, real time signal processing, his last "real engineering job" being the development of the Rapier Field standard "C" Radar. In 1990 he became head of Sensors Engineering in Plessey Radar, before their acquisition by Siemens took him into a new role as Change Director for the Siemens - Plessey Corporate Change Programme covering all 3000 employees. He subsequently became head of Command, Control and Information Systems (CCIS), before joining Integrated Systems in AMS, where he was Strategic Systems Director, and latterly Sales Director. He rejoined BAE SYSTEMS in 2000 as Operations Director for the Manoeuvre/IS area of Future Systems and was appointed Managing Director of Future Systems in April 2002. Future Systems played a key role in pioneering "Capability Based Acquisition" methods through the Indirect Fire Precision Attack programme.

In 2003/4 Bob played a formative role in establishing "NITEworks". He was appointed Director, Capability Development in April 2005, a consultative group in BAE Systems set specifically to address the challenges of Capability acquisition. He represents BAE Systems on a number of joint MoD-Industry bodies many with an acquisition focus. As co-chair of the previous Equipment Capability Group (ECG) he played a major role in establishing the successful "Pathfinder" programmes on SAVC and S2C2. He continues to play an influential role in improving the front end of the acquisition process through the development of TLCM, and as part of the new TLCM Strategy Group.

He is married to Anne and has two children (James 29 and Joanne 30) and lives in Chandlers Ford in Hampshire.

Anne Bruseburg, Systems Engineering & Assessment Ltd., UK

Anne Bruseberg is a Human Factors Consultant at Systems Engineering & Assessment Ltd. (SEA). She holds a PhD in Ergonomics from Loughborough University (1998), and a degree equivalent to an MSc in Human Factors Engineering from Dresden University, Germany (1994). She has over 10 years experience in applied research in a variety of domains including aviation, defense, industrial design, automated mail sorting, metal industries, and assembly production. At SEA Ltd. she develops HFI tools, methods, and guidance materials.

Dave Chesebrough – Chair

Dave is the President of the Association for Enterprise Integration. Under his guidance the association has established itself to become the leading industry group dealing with enterprise information issues. He has led the association into important contributions to information sharing, architecture, information assurance, net-centric operations and identity management.

Mr. Chesebrough has over 30 years experience with technology, business management and strategy, including Defense acquisition, international information technology consulting, aerospace, nuclear power, and education. He has lectured, taught and consulted extensively in the US, Asia, Europe and Africa.

Dave has experience in a diverse range of industries including commercial nuclear power, aerospace, communications and information technology.

Lt Col Mikael Hagenbo, Swedish Armed Forces

LtCol Mikael Hagenbo works for the Swedish Armed Forces (SwAF) Joint CIO as responsible for the development of SwAF Enterprise Architecture Framework and also as co-ordinator regarding international co-operation within the architecture area.

Mikael has a background as an Air Force C4ISR officer and has been working with Enterprise Architecture since January 2003 after graduating from the Advanced Technical Programme at the Swedish National Defence College.

Mikael represents Sweden in NATO C3 Board/SC-1/Policy Working Group - responsible body for NATO Architecture Framework, and has been involved during the whole development process of 2 ½ years of the NATO Architecture Framework (NAF) version 3 that was approved by NATO in November 22 2007.

Mikael also acts as an alternate representative in NATO C3 Board/SC-1/NATO Open Systems Working Group (NOSWG) - responsible body for NATO Interoperability Standards and Profiles (NISP).

Finally, Mikael acts as a Swedish observer representative in International Defence Enterprise Architecture Specification (IDEAS) group and also co-ordinates the bilateral co-operation with MOD UK within the EA area.

Steve Hitchins, NITEworks

Way back in the mists of time, Steve trained as an aircraft engineer. This engineering background and the disciplines learned have proved to be invaluable when working in a whole range of industries. Trained as an Enterprise Architect by John Zachman, Steve has advised Banks, Insurance Companies, Telecom, Transportation, Manufacturing and Pharmaceutical companies on how to achieve a step change in business performance by managing the complexity within their businesses using Enterprise Architecture techniques.

More recently at Thales and currently at EDS, Steve is applying the same skills to design and de-risk defence programs through the use of the MODAF framework. Steve is currently Chief Battlespace Architect at NITEworks, a joint venture between the MOD and Defence Industry which provides “man in the loop” warfighter experimentation for the MOD.

Peter Hotham, NATS

Peter Hotham is the Chief Architect for NATS. He started with NATS in 1979, and 6 months ago was instrumental in establishing the Technology Strategy Group, & played a significant part in implementing an Architecture framework.

He has acquired significant experience as a System Architect and Chief Engineer on Air Traffic Management projects that require effective cross business and international co-ordination.

Fariba Hozhabrafkan, Serco Consulting

Fariba is a thought leader and professional systems engineer with over 19 years experience working for IBM, THALES and Hughes through all phases of private sector and government project lifecycles. Fariba specialises in International Defence Procurement Practices, Enterprise Architecture (EA) and Service Oriented Architecture, where she is recognised as a thought leader on the development and implementation of EA Frameworks nationally and internationally. Fariba is accustomed to working at the strategic and decision making level and has an effective international network of professionals and decision makers in the area of Complex System Acquisition. She is also an influential leader in the International Council on Systems Engineering (INCOSE), holding the position of International Ambassador.

Lars-Olof Kihlstrom, Generic Integration AB

Lars-Olof Kihlström works for Generic AB as a senior consultant. His main work area has, since he joined to company in 2003, dealt with architecture framework handling, UML modeling, SOA and requirements management. He has worked extensively with DoDAF, NAF and MODAF. He acted as modelling support in the NAF revision syndicate. He has also actively participated in the IDEAS group and has worked extensively with the development of the web based MODAF primer (the primer describes MODAF, a general architecture process that makes use of MODAF, and an architecture process exemplification based on a casualty tracking scenario) as part of a bilateral co-operation agreement between Sweden and the UK. He has also spent a lot of time dealing with SOA and was involved to a large degree with the development of the proposed MODAF views and accepted NAF views for SOA. He actively contributes to the ongoing maintenance of MODAF and has commented UPDM and UPMS approaches extensively.

Lars-Olof has a Master of Science degree in Physics Engineering from the Royal Institute of Technology in Stockholm. He has worked as a development engineer, development manager and as a consultant at different companies prior to joining Generic AB,

including Swedish Telecom (now Telia-Sonera), Cap Gemini, Enator (now Tieto-Enator), LHS and Telelogic AB. He has a long background in the use of formal specification techniques, object-oriented development (UML) as well as requirements management. He has worked extensively with radio communications and has worked on standardisation, specification and development of different things starting from the embedded arena (communication protocols and automotive applications) up to business processes for larger organisations.

Captain RJ (Bob) Leeming, BSc, MIMarEST, CEng, CMarEng, MBCS, FCMI, Royal Navy.

Captain Bob Leeming, RN is a Chartered Engineer and joined the service in 1972 on a full career commission. He completed his degree and post graduate training at the former Royal Naval Engineering College where he returned twice on the staff, latterly being the senior engineer office in the establishment. Currently on the staff of Assistant Chief of the Defence Service (Logistic Operations) as Assistant Director Architecture he is heading a project to introduce Enterprise Architecting (EA) methods and the MOD Architectural Framework (MODAF) across the Defence end-to-end Logistics Process and, to de-risk the introduction of Service Oriented Architecture (SOA). His work interfaces closely with the MOD Centre, in particular with the staff of Director General Information, internal MOD customers and with industry and has been a leading advocate in the development and utilisation of Open Information Standards.

Captain Leeming has served in a variety of operational appointments including Marine Engineer Officer of the frigate HMS Brilliant and, in his last sea appointment as Commander (Engineering) of the aircraft carrier HMS Invincible. Other appointments included an operational tour in Northern Ireland as Base and Squadron Engineer where he was Mentioned in Despatches and, as the Branch Manager for Marine Engineer Officers and Ratings on the staff of the Second Sea Lord. Selected for promotion to Captain in 1999, he had an extended tour as the Head of Integrated Logistic Support (Navy); this included the role of equipment project scrutineer and adviser for the Warship Support Agency ensuring project coherence with endorsed support and information strategies, whole life affordability and value for money.

Married to Carol and living in Bath, his daughter Lizzie (13) and son James (10) attend schools in the city. In what spare time is left after the rigours of running the children's taxi service, he is deputy chair of Governors at Bathford Primary School, Chairs a local educational charity and is Chairman (and a coach) of the minis section at Avon Rugby Club; for some reason, playing the piano seems to have taken a back seat except when his daughter needs an accompanist for her singing! In his early career he represented the Navy at U23 Hockey. He is a Member of the Institute of Marine Engineering, Science and Technology, a Member of the British Computer Society and a Fellow of the Chartered Management Institute.

Dave McDaniel, Silver Bullet inc.

Mr. McDaniel has been developing Command and Control, weapons, and surveillance systems for nearly 30 years. His focus for much of that period has been on sensor and data fusion – algorithms, data, and architectures. Much of his work has been with the US Navy – aircraft carriers, guided missile cruisers and destroyers, submarines, and airborne early warning aircraft. The need for data interoperability has drawn Mr. McDaniel into many data initiatives from enterprise data management to data modeling workgroups to data translation technologies. Similarly, appropriate elements of Mr. McDaniel's C4ISR architecture work have been extended to IT and enterprise application. Mr. McDaniel's fusion algorithms work started in multi-source tracking and correlation, leading to Bayesian Networks and to the role of ontologies in informing reasoners. Mr. McDaniel has been a principal contributor to the US DoDAF and its underlying data model. He is currently working on the IDEAS project and a next generation fusion architecture for the US Navy and is involved in research projects on the use of ontologies in data fusion. Mr. McDaniel's degrees are in Math, Physics, and Computer Science. He lives outside Washington, D.C., in McLean, Virginia but is still fond of San Diego, California, where he worked for the Navy laboratories there and where his three daughters were born and raised. His hobby is bicycle riding, usually 100 miles a week in just about any weather.

Fred Mervine, IBM

Mr. Mervine is an IBM Executive IT Architect in the Office of the CTO, Software Federal, specializing in UML modeling and its application to Enterprise and IT Architecture. He is past chair of the Net Centric Operations Industry Consortium NCAT where he was instrumental in developing the Netcentric Analysis Tool. He also chaired the Ground Systems Working Group developing a Reference Architecture Model using UML for Ground Systems based on Event-driven Service Oriented techniques in high volume, hard real time environments. He was technical lead on the IBM and Joint Submission teams for the UML Profile for DoDAF and MODAF (UPDM), an OMG standard and is currently the chair of the UPDM Finalization Task Force. Fred has more than 40 years IT experience developing database systems and database applications across many industry and government areas. He has worked in Object Technology and Modeling since 1985. He has developed extensive MDA generation facilities converting UML models to production code covering up to 90% of the testing and production system generation.

Major General (Retd) Bill Robins CB, OBE, BSc(Eng), M Phil, C Eng, FIET, FBCS, CITP

Bill Robins led tactical communications units in parachute, mechanised, armoured and infantry formations of the British Army. His ability to screw up friendly communications led to his being given command of the Army's Electronic Warfare regiment in the hope that he would do the same to the UK's opponents. During a spell in Whitehall, he led the requirements team for a strategic protected Whitehall bunker, directed Command and Information Systems for the Army and as Director General of Information and Communications Services, attempted to unify UK Defence information services across MOD, Cabinet Office and other Government systems and into the theatres of operations.

On leaving the Army in 1998, he was appointed Chairman of the Royal Signals Institution and worked as a consultant for HM Treasury before joining Marconi and then BAE Systems where his last appointment was as Director of Advanced Concepts for the newly formed C4ISR Group. He left BAE Systems in July 2003 and now runs his own consultancy specializing in Defence and Security Information Management. He chairs the Board for the Defence Fixed Telecommunications Service PFI programme for both partners, MOD and BT.

He is an Associate Fellow of the Royal United Services Institute, a Freeman of the Worshipful Company of Information Technologists and a Visiting Professor at Cranfield University, assigned to the UK Defence Academy. He is absurdly proud of his ability to breed and nurture the best garden compost in Buckinghamshire. He reads a lot and limps up and down hills.

John Wailing, BSc, MSc, MBCS, CEng, CITP, Chief Technology Officer, UK Home Office

Mr. John Wailing is Head of Architecture and Chief Technology Officer in the Office of the Chief Information Officer at the Home Office. He is seeking to get a common Enterprise Architecture Framework adopted across the department to enable a holistic view of Home Office business to be taken. His goal is to allow processes to be joined up, information to be shared and assets to be reused. Prior to returning to the Home Office he led the development of a Cross Government Enterprise Architecture at the Cabinet Office.

George Wauer (Keynote), Director of the Architecture and Interoperability Directorate in the OSD(NII) Office

Mr. Wauer is the Director of the Architecture and Interoperability (A&I) Directorate in the Office of the Assistant Secretary of Defense for Networks and Information Integration (OSD[NII]) office. He has over 42 years of leadership and management experience, including 16 years of service in a Deputy Assistant Secretary of Defense position. He holds a Master's Degree in Astronautics. Mr. Wauer:

- Enlisted in the Air Force in 1962
- Graduated from the Air Force Academy in 1968
- Worked in the NRO space programs for several years
- Pioneered the operational test and evaluation of space systems
- Served as Director, Operational Test Organization for the Strategic Defensive Initiative
- Served as the Deputy Director of Operation Test and Evaluation for C3I, MAIS, and Strategic Programs

Mathew West, Shell

Matthew has worked for Shell since 1978, and since 1987 on the computing/business interface with a particular interest in Information Management and Data Modelling and is currently responsible for Shell's Downstream Data Model. He is a key technical contributor to ISO 15926 – "Lifecycle integration of process plant data including oil and gas production facilities" and is participating in the development of ISO 8000 – Information Quality. Matthew is also the Shell Visiting Professor in the Keyworth Institute at the University of Leeds.

Brian Wilczynski, Assistant to the Director of Architecture and Interoperability, Assistant Secretary of Defense (NII)/Department of Defense Chief Information Officer

Mr. Wilczynski has held a broad range of information technology positions within the Department of Defense (DoD) at the agency, Military Department, and Office of the Secretary of Defense levels in his 21 years of service. He currently serves as an Information Technology Specialist in the Architecture & Interoperability Directorate within the Office of the Assistant Secretary of Defense for Networks and Information Integration/DoD Chief Information Officer. He is leading the development of architecture federation strategies across the DoD Components and Mission Areas and also serves as the Chief of Staff to the Director of Architecture & Interoperability.

Prior to his current assignment Mr. Wilczynski served as the Chief Technical Architect and Assistant Deputy Director for Enterprise Architecture in the Transformation Support Office, Office of the Undersecretary of Defense for Acquisition, Technology & Logistics. Prior to that assignment, he served for seven years on the staff of the Department of the Navy Chief Information Officer (DON CIO). While on the DON CIO staff, he led architecture and data management efforts and, along with the Navy and Marine Corps staff, led efforts to implement software application management across the Department. He was awarded the Department of the Navy Meritorious Civilian Service Award in November 2002.

Prior to joining the DON CIO, Mr. Wilczynski served in several assignments at the National Imagery and Mapping Agency (NIMA) and its predecessor, the Defense Mapping Agency (DMA). Leveraging a background in natural resources and surveying, he began his DMA career as a cartographer developing digital terrain and feature products to support military operations, including Operation Desert Storm. He was promoted to a position within the Agency's Production Engineering Branch, where he helped to test, deploy and manage the Digital Production System; at that time one of the most complex and state of the art digital cartographic systems in the world. His last assignment with NIMA was in the Data Architecture Branch within the United States Imagery and Geospatial Information System (USIGS) Architecture Division, where he participated in the development and publication of the USIGS Conceptual Data Model. He was selected for the DMA Outstanding Employee of the Year Award in 1993.

Mr. Wilczynski received his Bachelor of Science in Forestry from Michigan Technological University in 1980 and his Master of Science in Information Systems from The George Washington University in 1996. He is a graduate of the Federal Executive Institute and has earned a CIO Certificate in Federal Executive Competencies from the Federal CIO Council's CIO University.

Ron Williamson, Raytheon

Ron has over 25 years experience in aerospace systems architecting, design and implementation. He has supported several large system of systems and enterprise level development efforts in several domains including DoD defense and surveillance, FAA Air Traffic Control, NASA Earth Science Remote Sensing / Space Exploration and Homeland Security. He is currently an Engineering Fellow and Certified Architect (Raytheon and TOGAF certified) at Raytheon's Network Centric Systems business unit based at the Raytheon engineering center in Fullerton, California. He conducts training classes in and applies the Raytheon Enterprise Architecture Process (REAP) across Raytheon. He is a member of the Object Management Group's UML Profile for DoDAF/MODAF (UPDM) finalization task force. He also participates in several professional societies including INCOSE, ACM, and the IEEE Computer Society. He has graduate degrees in Applied Mathematics and Computer Science from UCLA and USC.

Steven Winter, NATS

Steve Winter is Chief Technologist and leads the Technology Strategy Group, which is responsible for developing NATS Enterprise Architecture and Technical Strategy.

Steve has more than 30 years of experience in complex software and systems development, including 20 years delivering Air Traffic Management solutions for the US and International markets with Raytheon Company in Boston, Massachusetts. In recent years, he has specialised in strategic aspects of technology and the field of Enterprise Architecture, which seeks to improve the alignment of systems and technology to business needs.

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