

Exploiting Commercial Games and Technology for Military Use – Technical Evaluator's Report

1.0 SUMMARY OF PROCEEDINGS

Purpose: The purpose of this summary of proceedings is to document the NATO Modelling & Simulation Group (NMSG) MSG-108 Workshop on Exploiting Commercial Games and Technology for Military Use QinetiQ

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2.0 OBJECTIVE OF THE WORKSHOP:

As with past workshops, this workshop is being planned to share national experiences, explore commercial and games technologies, understand best practices, and to identify barriers to further exploitation and ways these might be overcome. As well, this workshop will attempt to articulate a technology road map for the possible future of commercial technologies and games.

3.0 3. WORKSHOP AGENDA

Tuesday 25 Oct 2011

- | | |
|------|---|
| 1300 | Administration |
| 1320 | Welcome and Introductions |
| 1400 | Stu Armstrong Wayne Buck "COTSUE Latest Issues M&S State of Play in ACT" |
| 1440 | Andy Fawkes "A CapJTES Update" |
| 1520 | Administration |
| 1540 | Frank Anders Developing good-enough War-games and research on Gaming the game |
| 1620 | Karl Johan Simonsen Danish use of Commercial Games |
| 1640 | Chairmen "Daily Recap Daily Adieu" |

Wednesday 26 Oct 2011

- | | |
|------|--|
| 0845 | Administration |
| 0900 | Recap from Day 1 |
| 0920 | Pete Morrison, Bohemia Interactive The Battlefield 3 Effect: Do graphics matter for Serious Games? |
| 0950 | Jerry Heneghan, HumanSim "HumanSim and other stuff" |

1020	Administration	
1100	Johnny Garcia, SimIS Inc	Next Generation LVC Architecture
1140	Bob Hayes, Microsoft Fellow	getting ahead of the game!
1220	Administration	Lunch
1300	Graham Longley-Brown	"LBS Consultancy
1330	Hilde Hafnor	"Joint 2013" An Exploring Activity
1400	Prof Agostino Bruzzone, Genoa	Simulation Team Happenings
1440	Paul Thurkettle, HQ SACT	"Immersive Environments Implementation
1520	Administration	
1540	Richard Radmacher, Havoc	Using games technologies for training and simulation
1620	"Stu Armstrong Wayne Buck"	An Introduction to a Possible Future
1630	All	"Daily Recap Daily Adieu"

Thursday 27 Oct 2011

0845	Administration
0900	Recap from Day 2
0920	Syndicate Work Brainstorm the Future
1000	Syndicate Work Brainstorm the Future
1040	Administration
1100	Syndicates Syndicates Present
1140	Debate probable future
1220	Adieu

4.0 PARTICIPANTS

Stu Armstrong	Wayne Buck	Jim Flaherty
		Jim Carr
	Marcus Dahlberg	Jan Ward
	MG Skare	Staffan Granberg
	Nico Bau	Robert Viriding
	Roger Schane	LTC Vincenzo Calicchio
	Roy McNee	LTC Jan Beaumont
	Johannes Denijs	Major Jeremy MacDonald
	LTC Christian Bell	Clark Rich
	LTC Eriks Naglis	David Unrau
	Maj Richard Nowinski	Curtiss Murphy
	LTC JP Cormier	Dan Henkel

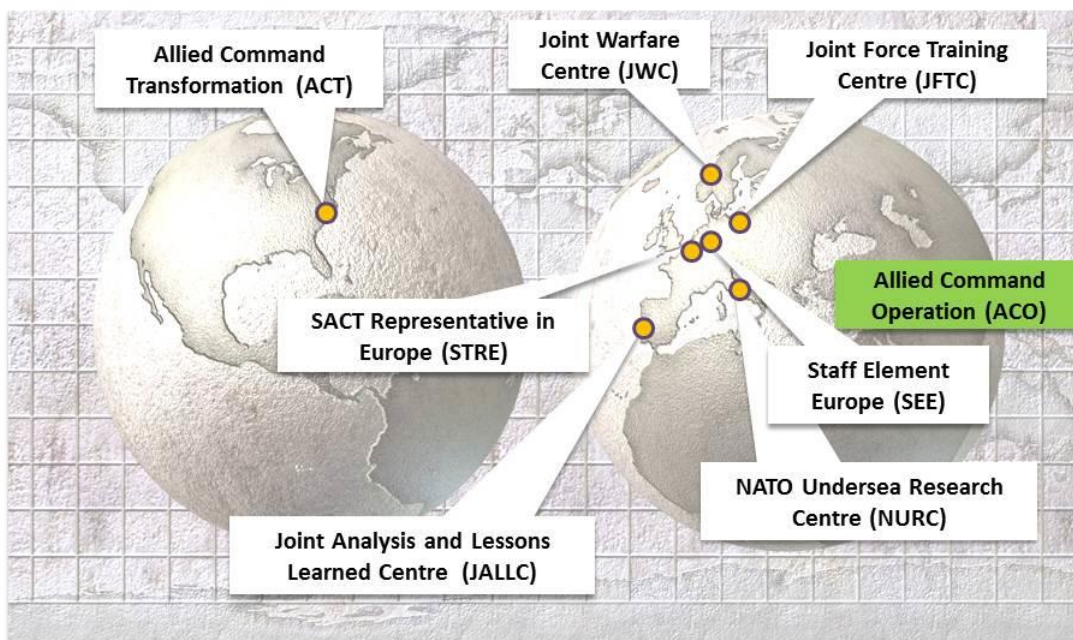
	LTC Istvan Ocskay	Colin Bigg
Peter Morrison	Murray Taylor	Jacek Sumislowski
Stacy Elliott	Eric Pouliquen	Walter Hader
Michael Emonts	CAPT Carlos Alberto Belinchon Pinedo	Maj Kuido Pettai
Julien Mallet	Gianluca De Leo	Jens Malmquist
Amy Grom	Col Andrea Solymar	Geoff Johnston
Doug Whatley	Dan Berry	LTC Mike Patchett
Bharat Patel	RADM Christian Canova	Maj Geoff Smith
Andrew Brown	Nathan Carreiro	Joe Armstrong
MSGT Cleon Skeete	Jaymie Caplen	

5.0 EXECUTIVE SUMMARY OF PRESENTATIONS:

5.1 Opening remarks by Wayne Buck and Stu Armstrong

Mr Buck provided an update to the audience on ACT happenings and ACT’s role as NATO’s leading agent for change, driving, facilitating, and advocating continuous improvement of Alliance capabilities to maintain and enhance the military relevance and effectiveness of the Alliance as shown in figure below.

Allied Command Transformation



www.act.nato.int

Mr Buck further discussed areas that are benefiting from immersive technologies like:

- Meeting & Collaboration
- Rapid Prototyping
- Training & Education
- Skill building
- Data Visualization & Analysis
- Outreach

He further discussed Village Survey, Virtual Worlds and Borders Ahoy. He further discussed D54 Incorporation of Technological Advances through Modelling and Simulation strategic Decision making Training through games. Mr Buck discussed the M&S Centre of Excellence in Rome and its uses of Doctrine, concept development, lessons learned and training.

He discussed the ACT supported NMSG's for 2011:

- MSG-068 NATO Education and Training Network - Chair (JWC)
- MSG-084 Master Plan Update Co-Chair
- MSG-087 NMSG Symposium – Paper Presenter
- MSG-091 Identification of C2 M&S Gaps
- MSG-102 Simulation in Support of Operations - Chair
- MSG-103 NMSG Exploiting the COE (3) Co-Chair
- MSG-104 Simulation in Support of Operations Co-Chair
- MSG-105 Define the Support to Exercises ... Co-Chair
- MSG-106 CAX Architectures ... Co-Chair
- MSG-107 Human Factors in Military Training Co-Chair
- NSG-108 Exploiting Commercial Technologies Co-Chair
- MSG-ET-030 Interoperability Requirements for Immersive Environments – Chair
- MORS - Chair

Mr Buck further discussed the need to leverage MSG-108 as a forum to continue collaboration and he plans to conduct 2 more workshops in 2012.

5.2 Stu Armstrong on UK Research – QinetiQ – COTS

Mr Stu Armstrong provided a presentation on Research Areas that QinetiQ is conducting as it relates to commercial games he gave a quick review of the following:

- Horizon Scanning
 - Emerging technologies that haven't yet been commercialised
- Technology Quick Looks
 - Short investigation into commercial technologies
- Technical Demonstrators

- Purpose built technology demonstrations to meet a customer need
- Used to capture lessons on technology exploitation
- More frequently used to capture evidence to support business case

Mr Armstrong discussed that Synthetic training could save 100-600 million pounds a year. He further discussed the need for MOD to have a plug and play architecture as it relates to simulation and gaming. He gave more ideas on other capabilities within gaming as it relates to game theory, Cultural training and how to use Training and transformation architectures. Mr Armstrong further discussed the support of web enabled immersive environments like avatars levels of interoperability and training application for augmented reality – live fire against virtual targets.

5.3 Andy Fawkes Deputy Head of capability, Joint Training Evaluation and Simulation (JTES) – Transforming Defence Training through Technology

Mr Andy Fawkes provided a presentation on how the UK MoD is transforming Defence Training through technology. Mr Fawkes mentioned that the requirement for simulation is not a new requirement and the need for simulation and modeling has gone as far back as the early 1900's with the modeling of airplanes to development of gaming technologies that leverage the tenants of M&S. Mr Fawkes showed a video from 10 years ago – half life from 1998 – really involved in training – we are still saying that gaming is new when we have been doing it for over 15 years now. Mr Fawkes articulated in his presentation that - “This is not a serious game this is serious training”. He also discussed the trends in Simulation technology trends that enable change from mechanical in the 1980's, Bespoke in 2005 to Commodity in 2011 and Cloud thereafter. He provided and discussed a chart on numbers of trainees using simulation and 3D worlds from the 1990's to today from a few pilots to 100's of thousands. His point of the chart was that MoD and Defence is not driving innovation other industries like the entertainment industry has developed simulators that the Defence industry repurposed for pilot training. Mr Fawkes also mentioned that the UK MoD spent 7.2 billion on training which is almost 20 percent of the MoD annual budget. He went as far as showing 3 key benefits of simulation:

- Improve Training Effectiveness
 - Simulation is ideally suited to training “thinking skills”
 - The optimum blend of simulation and live training enhances overall training
- Reduce Defence Costs
 - Training in simulation is typically 5-20% cost of live training
 - A 25% transfer of live training to simulation could save 10% of the overall cost of training
- Reduce Defence Environmental Impact
 - Defence's total CO2 Emissions are 2.7 times that emitted by all domestic UK aviation (5.6m tonnes)
 - Reduce disturbance on local populations and impact on training areas

Mr Fawkes recommended that “Defence should embrace a step change in its exploitation of modern Simulation Training systems, driven by explicit targets for adoption, and supported by an enterprise focus on driving down the barriers to acquisition and use.”

Mr Fawkes provided some insights where the MoD is seeking a Common Simulation Infrastructure as Driver for Change:

- Common Network
 - Enable Distributed Collective Training:- Single Service, Joint and Coalition
 - Provide Access to Common Services
- Common Simulation Software
 - Set of Common PC-based Software meets most Defence User’s Needs
 - Common CGF, visuals etc
 - Interoperability, reuse and cost effectiveness “out of the box”
- Common Simulation Data
 - Terrain, Equipment/Platform Characteristics
- Common Tools
 - Common AAR/Debriefing etc tools to facilitate distributed collective training

Mr Fawkes provided great insights on the MoD’s use and need of simulation for a Blended Training solution seeking the right balance between live and synthetic training with the use of commercial “credible” gaming technology.

5.4 Anders Frank– Sweden National Defence College – Developing good-enough Wargames Low Fidelity wargames for high quality education.

Mr. Frank provided a presentation on the uses of war-games at the Sweden National Defense with the focus on fidelity of training in particular uses of transformational capabilities (wargame research) to a new complex and global environment. Swedish armed forces Wargame research program focused on wargaming activities with low transaction costs, Theories of wargaming and Game Studies (commercial games domain). Some of the findings presented showed that low fidelity gaming is well suited for high level training as shown in figure 1 below.

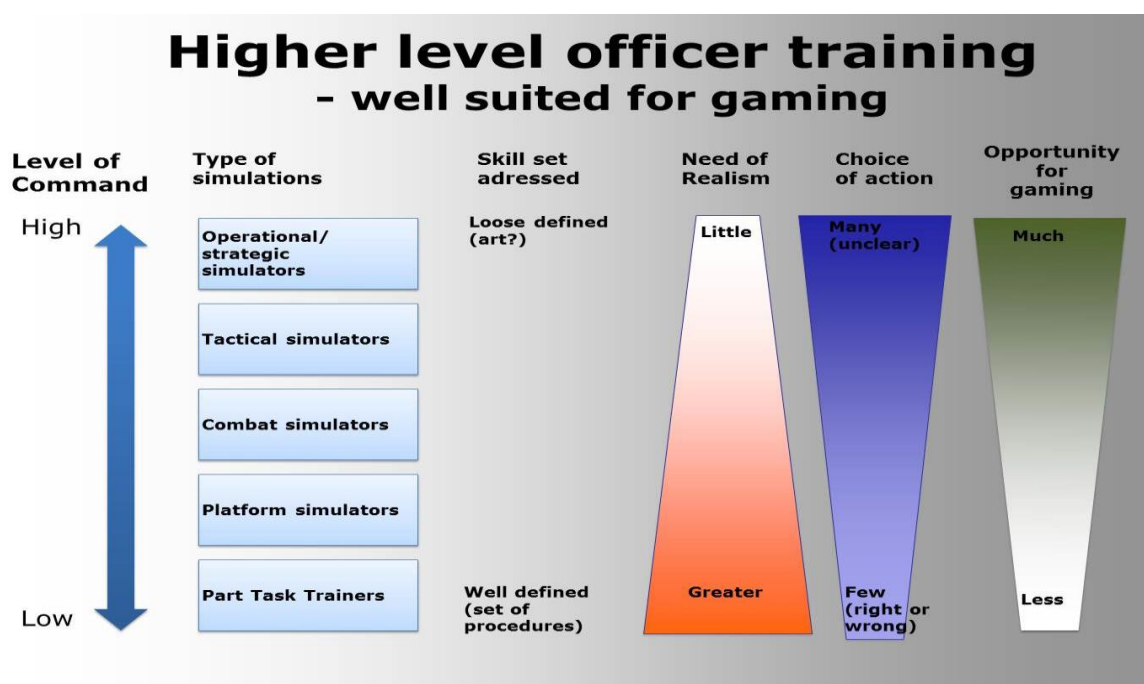


Figure 1 Swedish Defense Research on Gaming

Mr Frank provided one of the better quotes of the workshop "A [good] game is a series of interesting choices" – Sid Meier. Mr Frank also mentioned that Games and gaming (more) easily lend itself to a problem space characterized by many choices but especially in Sweden where capabilities that are "good enough" are used for intended purpose. He basically wanted to show how using low fidelity games simplify training by Capture major attributes of warfare without trying to encapsulate all details focused on aspects of warfare and purpose. The first pilot was a Cadet course in naval and amphibious warfare that showed basic tactics and test the plan under a tight time line and tight budgets. Mr Frank discussed concerns and issues with low fidelity games:

- Maintaining students suspension of disbelief
- Over-enthusiastic teams "**Gamer mode**"
- Not given enough time for iterative use
- The essential and delicate relation of gaming and debriefing

He provided a definition of "gamer mode" as - A player attitude where the game goals take precedence over the learning goals and player behavior becomes rational with respect to game rules but irrational with respect to the corresponding real-life situation."

As part of this part of the presentation Mr Frank described research conducted to show that "gamer mode" shows the following symptoms:

- 1) **Will to win, competition.**
- 2) **Symptoms in military educational wargaming**
 - Increased risk tendency
 - Short term goals
 - Reactive behavior
 - All units are engaged, even though they are not needed to
 - Unethical considerations
 - Game goals become predominant.
- 3) **Many face's and perhaps too harsh to say Gamer Mode is all bad.**
 - Depends on audience, learning objective and situation.

Mr Frank went on to discuss the approach to making a methodological shift for games and learning:

- 1) From isolating the artifact
- 2) ...to media effects.....
- 3) ...to the context where it is used.
- 4) Learning is seen emanating from the players when interacting with the game

In conclusion Mr Frank provided evidence that gaming in a military environment was successful as long as the game is placed in context, is a natural part of the course and the students are familiar with the theme of the game.

5.5 Karl Johan Simonsen – Danish Defence Acquisition and logistics Organization- Danish use of commercial games.

Mr Simonsen provided an excellent presentation on the Danish use of commercial games. He provided examples of simulation models and serious games used for events:

- 1) Steel Beasts Pro
 - a) Tactical trainer (Squad to Company size exercises)
 - b) Platoon Trainer (Leopard 2A5)
 - c) Crew Trainer (Leopard 2A5 , OHW)
- 2) VBS2
 - d) Video Feed from UAV (BDE / DIV staff exercises, JCATS)
- 3) IFACTS
 - e) FAC trainer
- 4) IRAS*Comm / IRAS*Trainer
 - f) Simulated radios (eg. Intercom)
- 5) JCATS

Basic connection to BMS / C2 systems – needed in order to “Train as we Fight”

Mr Simonsen provided an example of a simulation gateway to Danish Army BMS / C2 Systems integration using gaming technologies and simulated radios. The results of this events proved that simulated training and games save ammunition and efficient use of capabilities. Plan for C2 and Simulation full integration will leverage MSG-085 with BML

Wednesday Oct 26th 2011

5.6 Pete Morrison Bohemia Interactive -

Did not share his slides for this presentation –

Mr. Morrison started his presentation with a movie trailer for ‘Operation Arrowhead’, a commercial game to be used in conjunction with the commercial game ‘ARMA.’ The theme of Mr. Morrison’s presentation was that fundamentally what was important to him and his company was providing measurable training value to users of the VBS (Virtual Battle Field Systems) technology. Morrison stated, ‘although photo realistic graphics are one of the least important requirements for military training, however glitz and graphics sizzle are what sell games for interactive entertainment.’

To support his assertion, Mr. Morrison referenced a book by Dennis A. Vincenzi called: ***Human Factors in Simulation and Training*** in which Vincenzi states that ‘visual fidelity is expensive’ and ‘reaching the point of diminishing returns with increased graphics fidelity is certainly possible.’

Mr. Morrison showed graphics images from VBS 2 (~2007) and stated that trying to attain the same graphical fidelity that games have requires five times more resources now than when VBS2 was released. He stated that a big key to the success of the VBS2 portfolio is the amount of customization that is possible with the editing toolset embedded in the applications. According to Morrison, other success factors include having used small team for development, a successful business model (selling via enterprise licenses vs. single seat licenses) and end user acceptance in several military organizations around the world.

Morrison concluded by referencing an open solicitation, released on Oct. 13, 2011 valued at \$25 million for the U.S. Army called ‘Games for Training.’ Morrison stated that this opportunity would be hotly competed among multiple qualified vendors and that he was surprised at the emphasis on graphics in the U.S. Army solicitation description. See:

https://www.fbo.gov/index?s=opportunity&mode=form&id=3577a466e567d4a589656af708bcde70&tab=core&_cview=1

Increased training capability –

Graphics = “visual fidelity”

5.7 Jerry Heneghan – HumanSim For medical education and training

5.8 Dr. Johnny Garcia – CEO SimIS Inc. – Next Generation Architectures – commercial games

Dr. Garcia provided a presentation of the ACT M&S Vision and Next Generation Modeling and Simulation Architectures.

What is the ACT M&S Vision “*exploit M&S to support NATO transformation wherever it can enhance capability, increase interoperability, save resources or reduce risk in the application areas of training, operations, defence planning and capability development*”.

Dr. Garcia provided a chart of NATO stakeholders and explained the difficulty NATO has in supporting this vision as it relates to support, coordination, and requirements for Modelling and Simulation throughout NATO in particular:

- Promote the sharing of tools, data, and information across the enterprise
- Foster common formats
- Are readily accessible and reliable
- Promote interoperability and the use of common M&S capabilities
- Minimize duplication and encourage reuse of M&S capabilities
- Encourage research and development to respond to emerging challenges
- Limit the use of models and data encumbered by proprietary restrictions
- Leverage M&S capabilities across international partners, industry, and academia.
- Support the full range of NATO and national interests

Dr. Garcia then discussed Next Generation Live Virtual and Constructive Architectures. He started with the current challenges of current LVC environments:

- Federation becoming increasingly large and unmanageable
- Costs increasing to upgrade existing and new federate additions
- Resource-intensive integration of new federates and support
- Tightly-coupled simulations
- Bridges and gateways often required to integrate new and emerging technologies
- Many redundancies and inconsistencies in data representation

He then talked about the next generation LVC architecture as a capability to conduct:

- Rapidly utilize real-world source data
 - Cloud-based Rapid Data Generation (RDG) and distribution capability
 - Support operational COA development
 - Support Concept Development with Training
- Abstract User Interfaces to lower the barrier to use

- Invoke only services needed by user
- On demand access to scenario repositories
- Users interact with common terms and symbols (Military & Civilian systems)
- Interact with C2 systems
- Make simulations smarter / more capable
 - Open Architecture Principles
 - Navigate terrain / interpret physical environment and effects
 - Attempt to apply orders more effectively
 - Allow faster than real-time simulation without intervention
 - Dynamic Intelligent Control Agent (scalable in cloud)
 - Reduce role-player dependency

Dr. Garcia then discussed the need to shift the paradigm of M&S as it relates to training, experimentation, Analysis – “we need to stop putting M&S in a category by itself it needs to be an operational capability” Dr. Garcia then recommended some changes to leverage commercial games that would enable better transformation of NATO operations:

- Develop Business Models –
 - Government
 - Industry
- Large vs. small business
- Changing environment
 - Governments and industry going to adapt?
- Show me the goods “government desire to see the games in action”

5.9 Robert Hayes – Being ahead of the Game.

Microsoft institute of

MSI –

Technology trends –

The internet of things –

Relies on two things – information services accessed from the cloud.

Services accessed on a variety of devices – handheld – etc

The cloud

Criminals are using these things to do crimes using clouds for this –

Migration of Data to the cloud.

No data center in UK.

Cloud based services

Gave a based service that follows the person where there tweets are coming from. This is a C2 capability. It mapping this information

Looking at data that is contextual to the person searching for that data.

Application

Tweetheat –

Flickr and MS Bing

Windows live the platform

Kinect – story how it came up – computer vision folks with object recognition – alternative way of working with the connect sensor.

Avatar Kinect.

Kinect Fusion – WOW

Camera is software coded – june released an SDK for the non-commercial sector will release and SDK for commercial in 2012.

Distribution and networking

How many people know this exists – unknown

Location of services that don't know where the data is going. Pedigree of data – who owns it and trade controls.

Defense is not driving any of the technology – how does significant in the ESP – services will remain around – engagement is the way to leverage the technology. MOD – is not aware of what goes on in the geo-space. Third-party is the approach with small and medium enterprise

5.10 Graham Longley-Brown M&S Issues challenges and recurring errors.

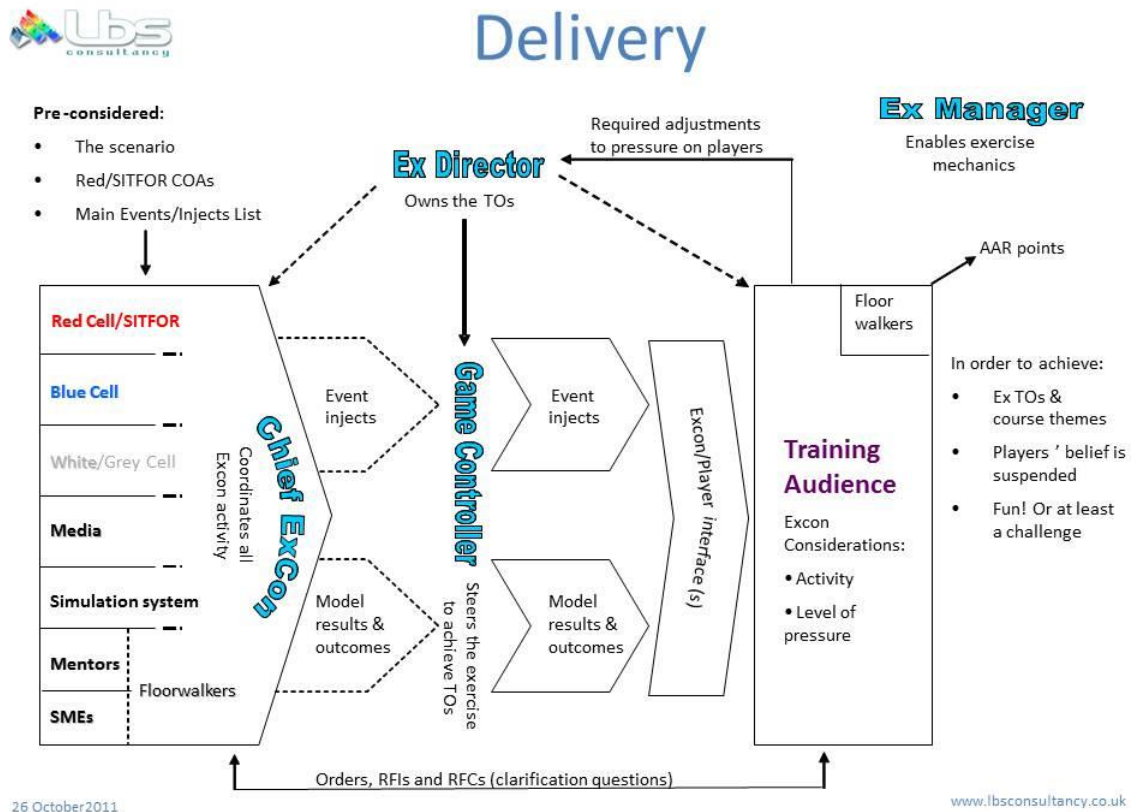
Mr Brown provided a presentation on To present issues, challenges and recurring errors made when designing and delivering simulation-based training and analytical events. He wanted to make sure the audience understood the definition of scenario: “*The background story that describes the historical, political, military, economic, cultural, humanitarian and legal events and circumstances that have led to the specific current exercise crisis or conflict. The scenario is designed to support exercise and training objectives and, like the setting, can be real, fictionalised or synthetic as is appropriate. A scenario will be composed of specific modules, event and inject serials and technical data essential to the accomplishment of the exercise objectives or of the seminar/academic/experiment objectives.*”

Wargame: “*A simulation, by whatever means, of a military operation involving two or more opposing forces, using rules, data, and procedures designed to depict an actual or assumed real life situation.*”

Mr Brown wanted to get his point across that its all driven by the process of design or the ‘The successful conduct of a CAX depends more on the correct composition of exercise components (Ex Control, Ex Support and Training Audience) than on the efficient tackling of technical issues’.

Erdal Çayirci. ‘Computer Assisted Exercises: A Reference Guide’, p.16

In conclusion as shown in figure below Mr Brown was described the need to control training environments with agreed to definitions, distinctions design and delivery.



5.11 Hilde Hafnor –

JOINT 2013 “an exploring activity” Norwegian Defense” helping the way people think and work together.

Focus is to develop a new contact for network based military training – the ability to collaborate.

Background of the pilot – joint 2013 was established

Key elements of the methodology for the design of the concept – leverage gaming solutions for collaboration,

Balancing Joint

5.12 Dr. Agostino Bruzzone – university of Genoa The Potential of Reusing

Serious Games Engine from Business to Homeland Security.

Dr. Bruzzone provided a great presentation on the uses of serious games for homeland security. He gave the workshop a brief description of who the research team is from a range of Universities, Research Centers and Companies operating worldwide in synergy for developing Innovative Solutions with a particular focus in Modelling and Simulation.

He further described SIBILLA which is a Serious Multi-Player Web Game for teaching on cooperative and competitive environment of distributed teams (i.e. prevention and intelligence against terrorists):

Why to use Serious Games:

- “Serious game is a term used to refer to a software or hardware application developed with game technology and game design principles for a primary purpose other than pure entertainment. Serious games include games used for educational, persuasive, political, or health purposes.
- Serious Games provide an opportunity to improve performances with reduced efforts to professional simulation with great attention to Interfaces, Graphics, Scenography and

He then described major issues on serious game framework from:

- Professional People “Talking with” Game Developers
- Professional Software “integrated with “Game Engines”
- Professional Hardware “vs.” Game Devices
- Scenario Definition “vs.” Game Level
- High Fidelity “vs.” High Physics
- Training “vs.” Playing
- Cost/Unit: High “vs.” Low
- Few Users “vs.” Many Users

Dr. Bruzzone further discussed the coupling of human behavior in serious games:

- Serious Games usually have a Stronghold in Graphics, Usability, Interfaces and Multiplayer capabilities.
- Games Frameworks needs to guarantee proper Fidelity and correct Models for their specific Purpose
- The potential application areas usually introduce the necessity to add Artificial Intelligence (AI) able to add realism by introducing Human Behaviors and Intelligent Agents (IA)

He further discussed human modeling challenges as they relate to rational decision making and instinctive and emotional behaviors. He also defined human behavior Simulation is the reproduction of the Humans by using computer models. Usually this requires simulating aspects related to Emotions, Rational Thinking, Psychology, Ethology and Sociology with the detail required by the specific Modeling & Simulation Project.

Dr. Bruzzone concluded that Multiplayer Games introduce new opportunities for Serious Applications integrated with Intelligent Agents

- Human Behavior Models enhance this potential providing new Opportunities
- There is a great potential in using Serious Game as technology enabler to enlarge Installations, User Community and Utilization Modes
- It critical to define reference baseline for fidelity and detail level that characterize Serious Games considering the expected benefits and use modes.

5.13 Paul Thurkettle HQ SACT Immersive Environments

Mr Thurkettle provided a brief on the Present and future technology to support Education, Training & Exercises in NATO, dreams and practicalities. He discussed where we are today as it relates to NATO ACT. Mr Thurkettle talked about training technologies “inside the NATO box” of Advanced Distributed Learning – Servers on all NATO networks – over 25,000 users completed online courses developed to SCORM Standards. NATO leverages Blended learning, virtual classrooms online and classroom study and then of course death by PowerPoint. He mentioned the challenges and current issues:

- Increased demand for NATO support throughout the world
- Decreasing resources and funding
- Limited education and training resources
- Multinational (NATO/non NATO nations and Area of Operations (AOR) outside of NATO boundaries
- Younger generation – new learning styles

He mentioned the re-thinking of NATO Education and Training polices:

- Just enough”...“Just when I need it”...“Just in time”
- Provide education and training just before deployment
 - Current knowledge, relevant to mission
 - Realistic mission rehearsal exercises
 - “New Generation ready” – Multigenerational acceptance

Mr Thurkettle showed some examples of integration of live training, man to machine interfaces and how we get there. He mentioned in order to get to these immersive environments we need to have senior leader buy in enters the Joint Force Trainer Role at NATO ACT new post established in 2010:

- Break the “old model of NATO ETE” (Education, Training and Exercises) Re-think the objectives, capabilities and needs. More effective both in cost and achievement.
- Utilise modern technology to assist in:
 - Individual Education and Training (eLearning, Immersive Learning, Mobile Learning, Small Team Training)
 - Collective Training – Distributed Training, Simulation, replication as near as possible of operational situation

NATO has to invest more in idea generation from industry and NATO Panels – “take risks”. ACT should leverage its agreements with the likes of Microsoft, IBM, Oracle ...but not much filtering down. NATO accounting & contracting models have to adjust and be flexible (one year advanced notice to buy a mobile device is ridiculous). Industry has to help the lower levels by less “Smoke and Mirrors” to Generals “*I must have that*” syndrome.

In conclusion Mr Thurkettle mentioned we need to think “Out of the box” on Exercises, *how should we do it*” “not *this is how we do it*”. *NATO needs to also:*

- No better time in NATO to float new ideas, limited budgets, nations wanting cuts and value for money, willingness to accept changes and collaboration with new systems, interoperability.
- Technology moving faster than NATO can address – change NATO adaptability or freeze in time
- Go beyond MSG / RTA / NTG meetings and have labs and “play time” (Get involved in TIDE SPRINT / CWID)
- Break down the stove pipes that still exist in NATO even within same headquarters C4ISR / ETE / Planning
- **Collaboration, sharing, talking across NATIONS**

5.14 Cory Kumm HAVOK game technologies for Training and simulation

US/Intel owned

Design of middleware – model into defense space.....

Possible future for M&S and commercial games 5 years 10 years.

Equate money to quality –

Barrett –

UK – MOD I can’t just buy something because its good.

Security obstacle – transformation process.

National perspective and put our money together.

Differences of cultures –

Terrain Generation

UID – more actively

Interoperability – software agnostics

Pinpoint enthusiasm for uses of games technology.

What do we can elite technology – advanced technology – develop the types of effects self enforcing effects of the training....

Recap session.

Government -

6.0 SYNDICATE BREAKOUT

A syndicate session without presentations was formed during the conference to allow open discussion of topics and ideas for NATO Commercial gaming Technologies (Modelling and Simulation). COTS games technology breaks down into many areas. Here we focus on 5 characteristics

- 1) Network Technology and Architecture
- 2) Automation of Processes
- 3) User Interface Devices
- 4) Interoperability
- 5) Mobility and Portability

Each characteristic is selected for its relevance and applicability to the four ACT capability domains capabilities related to operations, capability development, training, and defence planning. We also divided the group into 3 distinct groups:

- 1) Industry
- 2) Academia
- 3) Government

6.1 Industry

Syndicate work – Industry

Topic 1 Network Technology & Architecture

- 1) Sensitive of users and relation to security
- 2) Commercial technologies – deep approach with using one off compartmentalized durative of this using Commercial Games – possibility of cost savings
- 3) Empire Strikes Back - the use of latest technology – hologram –
- 4) Kinect architecture and high fidelity - Hologram of teleporting the security
- 5) Accreditation applications – how to conduct security certificate of noteworthiness,...
- 6) Does NATO have the authority to create a NATO only domain – how could this domain be leveraged to enhance gaming technologies

Topic 2 – Automation of Processes

- Automation of processes as it relates to entertainment
- Rapid generation of terrain – LIDAR
- High fidelity – will have options in the future – the government is lacking whats good enough. How to define what is good enough.
- Adobe photo fly culture divide between military and industry. Interaction between
- Achieving training objectives – “how do we get to where we need to be” – what do you need -
- What is the desired end state – what does success look like.
- Crowd sourcing – HLS dilemma – not taking advantage of those resources...compilation of data – we have not taking advantage of this in the future and industry is driving the – content generation (Microsoft – Google ETC).
- Who should drive technology/implement – Industry or Government – Industry develops the technology and government develops the fit for purpose-
- Processes – TRL enhancement
- What is the role of Government – should not be developing games for funding opportunities

Topic 3 – User Interfaces Devices

- Clouds – what about interfaces for hardware not just software
- Head ups displays –
- Gaming industry has driven the UID evolution –
- Disabled soldiers use of UID's – go back on active duty
- Multi-touch -

Topic 4 – Interoperability

- Issues – with gaming – propriety to protect content
- Platforms are web-browsers the natural interface to the mobile devices (ipad, slates etc)
- Go from interfaces –
- research when you lose something from a big screen to
- NATO M&S profile –
- Create a gaming standards profile as an addendum NATO M&S profile.
- Composability – models from information based to knowledge based analysis

Topic 5– Mobility and Portability

- With the use smart phone – development of solutions
- Conveniences which enables operations
- Encourage open systems – game technology –
- Mobile devices are good for personal training
- Not good for team training today.
- Strategic messaging – how do we use technology with people who cant read – Information warfare (IW)
 - Natural language translation.
 - Culture Awareness
 - AIDS ETC.

META Ideas

- 1) Cognitive tasks –
- 2) Human interfaces-
- 3) Autonomous interfaces
- 4) Model Based Data engineering
- 5) Cultures – immerse senior leaders in a culture in order to make analysis 2-3rd orders effect – awareness to think multi-awareness

6.2 Academia

Syndicate work – Academia

Topic 1 Network Technology & Architecture

- Nobody here from the security perspective which could be the real obstacle for further exploitation.
- We are and live in a classified world
- Approaching the systems (making use of commercial technology) more modular or as layers stepping out to more open system as we move further from the core.
- Start talking to change people, security people to get them involved early on in the process.
- You can either do it by yourself or be in bed with the industry and thus be involved.
- Perhaps we need to leave the national perspective and spend our research and development money together with other countries to solve security and architecture challenges.

Topic 2 – Automation of Processes

- Many of the goals within the AI community can be solved by just playing together in a multiplayer environment. For instance regarding cultural awareness the real goal is not to learn about a specific culture but learn that it **is** a difference between cultures.
- Higher fidelity does not necessarily lead to more training. This is an insight we need to communicate to customers and stakeholders by for instance educate them. To make them aware of the differences between verification and validation. And that validation is just relative to the intended purpose.
- As of terrain generation – sit back and enjoy the ride. Many organization and industries outside the military are interested in driving change to make terrain generation possible. The only question left for us is to make use of this and understand where and how to put in military sensitive data to the terrain.

Topic 3 – User Interfaces Devices

- More **actively** follow the industry developments. For instance start talking to Microsoft before they release the next SDK to their products and start development on specific solutions to minimize loss of time.

Topic 4 – Interoperability

- The drive got to be software agnostic
- Interoperable is highly engineered driven which tries to pinpoint an anticipated effect. But what exactly value are they talking about? Can we really talk of interoperability as value added on a general level?

META LEVEL comments

- The real challenge is to make the defence sector more adaptive to changes. The perhaps new technologies and trends from the commercial games industry will be more easily exploited and used.
- Incentives for technology and cultural change need to be above the problems associated with the hierarchical command systems. Does it matter who carries a message for use of new technology?

- We need to address the real enthusiasts and encourage them. Support them and study their uses and make use of their competencies elsewhere where it is applicable. This will generate best practices and ease of transfer this experiences.
- Hire technology savvy people to important positions (i.e. close to customers and M&S use). Then magic can happen as they can leverage new uses of M&S to their particular domain.
- Work toward making M&S be an integral part to all military activities.
- Stop spending a lot of money on a few people and spend a lot of money on many people. Games and gaming and other commercial available tools can be used for this purpose.
- Hire programmers to develop modules and or middleware solutions **inspired** by developments and trends from the commercial games industry. Or they will make the necessary **changes** to existing products to fit the military purposes. Real enthusiasts can be fostered by this approach and as above, best practices, can be brought from this.

6.3 Government

Syndicate work – Government

Topic 1 Network Technology & Architecture

- Will we reach a limit ?
 - No - New technology 3G/4G/GSM - Wireless improvements
- Physical- Mainframe/backbone always hardwired but all substations wireless
- Communication – “pingers” transponders linking people / objects together
- Security - Cloud (Huge change in policy / international law Less physical security at the workplace home as dumb device but more required at cloud and encryption. “Degree of trust”
- Accreditation : Human embedded chip, body recognition, less password more physical (DNA?)

Topic 2 – Automation of Processes

- Terrain – UAV will create “on the fly” terrain mapping. Less development time , less human other than “sensible” checking.
- 3d Model – Automatic process – Kinect, scanners, Imax type mapping device.
- Scenario – Computer assisted less human in the loop, real or mythical
- AI – limited Value creates a “uncontrolled” element in the situation, human intervention required, new trends player on player, system can learn from real players to build AI

Topic 3 – User Interfaces Devices

- Interactive – “Holodeck” Can feel, touch, medical virtual patient you work on, suits that give feedback.
- Inputs – Brain control “Firefox”, “Think and do” Stephen Hawkings, better interface, Voice Control (computer, house, car)
- Outputs – Immersive headsets, “HAL”, All senses included in feedback.

Topic 4 – Interoperability

- Communication Standards – Never get single standards but middleware required to translate.
- Language Standardization - Possible if requirements are clear during procurement, agree on doctrine in international world.
- System Architecture – SOA Server orientated Architecture, try and stay to same methods
- International agreement , naming convention. Repositories, “open source model”

Topic 4 – Mobility and Portability

- Reliability - huge danger of loss of information “all eggs in one basket” weakest point of failure. Use commercial practices for safeguarding / backup
- Performance - Better hardware but networking and point of failure raised, reliability on wireless “lost if unavailable”
- Security – as before increased dependability on security to allow us to operate, will they?
- Quantity growing, will it be condensed or reach saturization?
- Power – Better batteries, physical power , solar, ability not to need to plug in. When battery fails “lost”

7.0 CONCLUSION AND RECOMMENDATIONS

7.1 Central Themes throughout the workshop

During the course of the workshop, several themes or “hard questions” were identified including:

7.2 Conclusion

With the aim of the workshop to provide a venue to explore through and develop a commercial games roadmap for NATO related to exploiting commercial games and technology, to provide updates on the nations’ current application of commercial technologies, and to provide capability briefings and demonstrations of commercial technologies with immediate potential for use in a distributed manner through VTC, virtual worlds or other means then the workshop was a success. The only objective not met was to conduct a plug-up using a common multi-national scenario. Most of the hard questions, while asked throughout the workshop, were highlighted during the open panel discussion at the end. The open panel discussion was one of the most beneficial portions of the workshop as it provided the mechanism for the participants to begin to shape the “hard questions” into manageable topics for further discussion at future workshops.

It is clear that NATO nations are currently using commercial games and technologies, and based on the remarks from the group, there is a need and a desire to continue to pursue commercial games and technology solutions even given current procurement guidelines. NATO and ACT have the organizational infrastructure to facilitate these types of workshops and should continue them.

7.3 Recommendations

- For future Exploiting Commercial Gaming and Technology for Military Use workshops, analyze the outcomes / unanswered issues from this workshop to shape the agenda and presentations of the next workshop.

- Continue to sponsor and conduct the Exploiting Commercial Gaming and Technology for Military Use workshops as it provides an enterprise view of new games and technology as well as individual nation's applications of them. Using workshops in this manner facilitate NATO and ACT's role in standards, interoperability, and best practices as well as highlighting new technologies.
- Use the NATO Research and Technology Organization to cast a wider net for participation amongst the countries not represented at the workshop.
- Develop a deliberate plan to conduct a plug-up of the latest commercial games and technologies within the NATO M&S roadmap to offer opportunities to innovative companies while providing valuable information to national representatives.
- Develop a mechanism to involve academia into the agenda for future workshops. Numerous academic institutions are developing new and innovative technologies and techniques and should be included in a public / private workshop such as MSG-108.
- Continue to be an example in the application of new technologies by offering a distributed, collaborative means to participate in the conference from remote locations.

