Virtual Worlds and Federal Government Uses for Information Delivery

March 23, 2010

Ms. Marjorie Powell, Moderator

Information for the Defense Community **DTIC**

Virtual Worlds

DoD Field Activity Since 2004 DoD Field Activity Since 2004 DoD Field Activity Since 2004 DoD Field Activity Since 2004 DoD Field Activity Since 2004

Dr. Michael J. Piller

Director of Academic Computing

Information Resources Management College (iCollege),
National Defense University (NDU)

Mr. Frank DiGiovanni

Deputy Director, Readiness and Training Policy, and Programs

Office of the Deputy Undersecretary of Defense Readiness

Ms. Pat Alderman

Emerging Technologies Librarian

National Defense University Library

Virtual Worlds and
Federal Government Uses for Information Delivery

Michael Piller, Ph.D.
iCollege, National Defense University
pillerm@ndu.edu

"The global hub for educating, informing, and connecting Information Age leaders."

Virtual World Technology

Massively Multiplayer Game

1st Person Shooters

What is Virtual World Technology?

Generic Virtual World Characteristics:

1. *Information is arranged in **3-D and accessed via geo-spatial/spatial referencing.***
2. User is **immersed in information with unique representation in common virtual space.**
3. Experience is **social where users interact with** each other (visual, chat, voice).
4. Content is **user generated and maintained.**
5. Experience is **user controlled.** Visiting a virtual world can be compared to visiting a new country. When a user arrives, they decide what to do next.

➢ **Federal Consortium for Virtual Worlds (May 2007-present)**
   - Conference (May 12-14)
   - Wiki knowledge-base
   - Email announcements

➢ **Sci Lands (Second Life)**

➢ **Mil Lands (Second Life)**

➢ **Team Orlando**

➢ **Federal Virtual Worlds Challenge (Army—Gametech)**

➢ **VW.Mil – Train (DoD Effort)**

➢ **vGov Project**

IRMC
Information Resources Management College

Virtual World Benefits

- Collaboration
  - Across agencies
  - From anywhere
  - Synchronous communication (voice, text, body)
  - Asynchronous social media & recording
  - Visualization and manipulation of real-time data
  - Shared documents with collaborative editing
  - Unpredictability of human interaction
- 3-D representation of objects
- Intelligent agents and bots
- Avatar personalization
- Presence and Transference (Snow World)
- Green IT
  - Save on travel expenses
  - Meeting spaces online

- Emerging Technology
- Learning Curve: Movement and actions are not intuitive
  - Input devices (Army Brain Research, Emotiv)
- Access:
  - Software Client on agency/organization desktop image
  - Security (working across agencies)
    - Network level
    - PC level
    - Avatar level
- Content
  - Cost of development
  - Ability to share content
- Worlds are not interoperable
- Identity
- Privacy

Examples of Army Projects

TRADOC
> Army World Center
> Virtual Warrior University in Active Worlds (partnering with Logistics Innovation Agency (LIA)
> Future Soldier Training Program
> TOPSS *(Transitional Online Post-deployment Soldier Support in Virtual Worlds)(*RDECOM, STTC)
> STTC's VADER
> Federal Virtual Worlds Challenge

Virtual Ramp Ceremonies
> Chaplain Center and School (US Army Chaplain Center and School (USACHCS))

FITE *(Future Immersive Training Environment)* US Army RDECOM, STTC*)*

METER *(Multinational Experimentation for Training, Evaluation and Research for the* Coalition Warfare unit.*)*
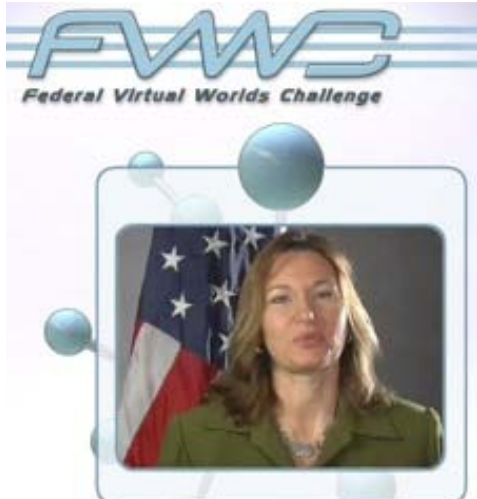> International Programs, Alternate Foreign Disclosure Officer (U.S. Army RDECOM, STTC)

Brain Computer Interface Research
> U.S. Army Research, Development and Engineering Command

War Simulator

Federal Virtual Worlds Challenge

CHICOMA EXCHANGE

TOPSS—Coming Home

Team Orlando

AVESS Amputee Virtual Environment Support Space

Recruiting

Amputee Recovery

"The global hub for educating, informing, and connecting Information Age leaders."

➢ **Chaplain Center and School**

- US Army Chaplain Center and School (USACHCS)

> *Future Immersive Training Environment (Irregular Warfare)*

Computer Based Corpsman Training System

NUWC Command Centers

LAX Airplane data

Live Data mashups in 3D

2006-11-01: Japan: 1.41288842E7 kgs

2006-06-01: Portland OR: 1.68286589E8 kgs
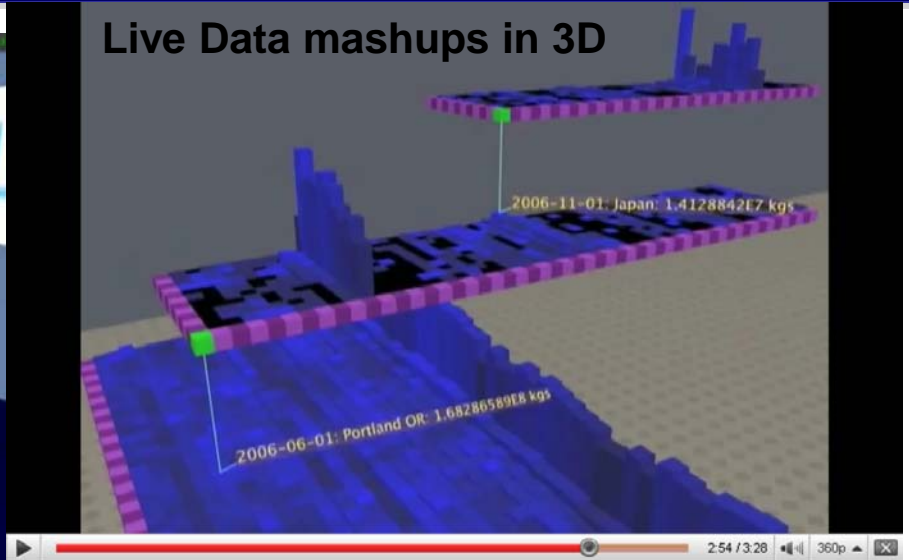
Firewall log data
Horizontal date/hr
Vertical by country
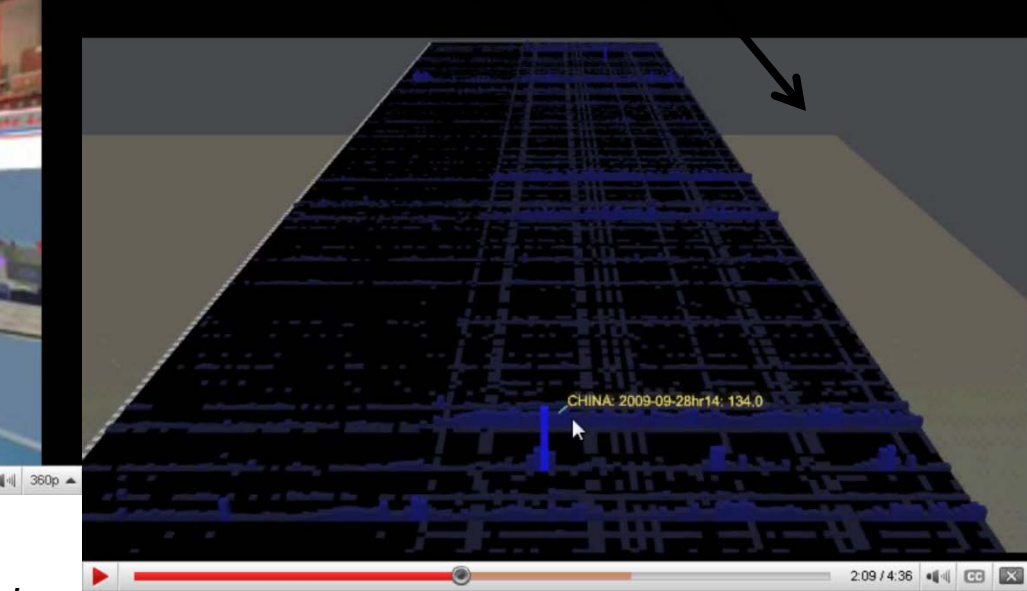
Group Collaborative
Spaces

CHINA: 2009-09-28hr14: 134.0

- ❑ [Virtual Iraq](#)
- ❑ [Snow World](#)
- ❑ NUWC Projects
- ❑ [MyBase](#)
- ❑ [Huffman Prairie](#)
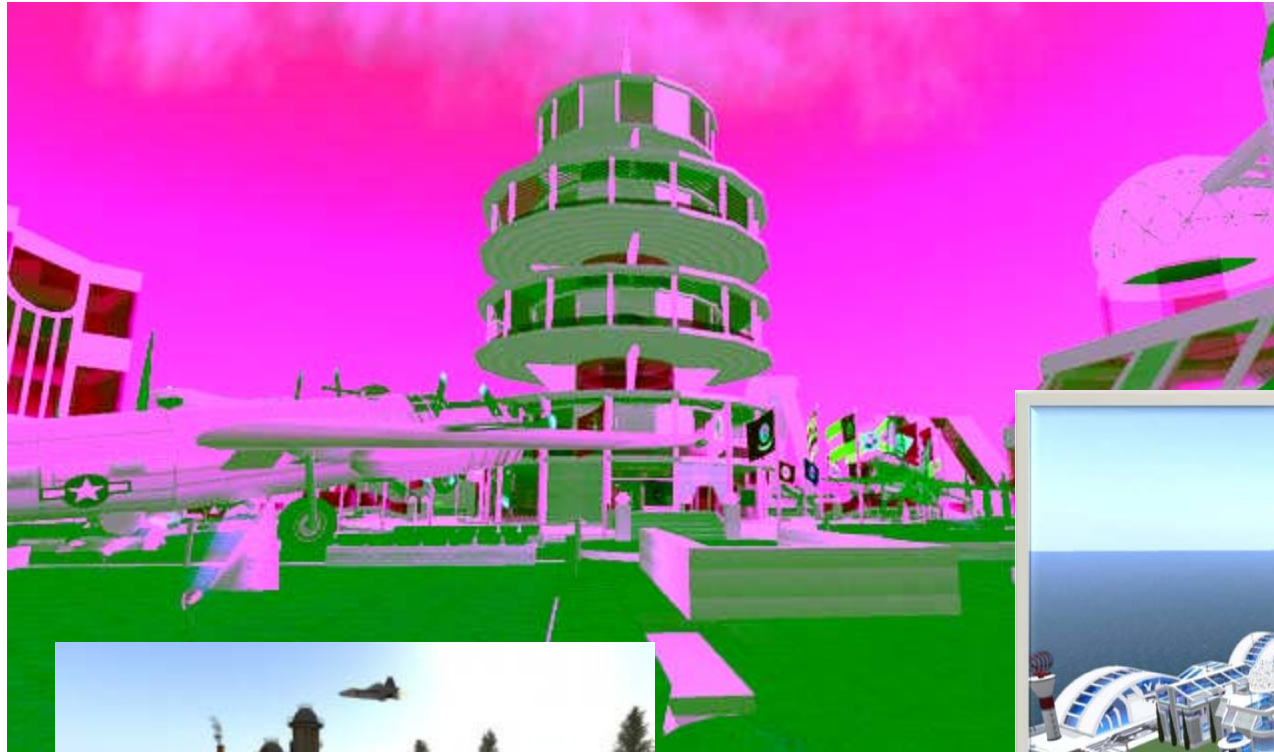
MyBase

**Afghan Compound at MyBase Zeta

❑ Federal Consortium for Virtual Worlds

❑ MilLands

❑ Team Orlando

❑ SciLands

❑ VW.Mil – Train

❑ vGov Project

➢ Silos between agencies that inhibit multi-agency collaboration at all levels of government (federal, regional, state, local)
➢ Business Models
- ➢ Funding mechanisms for multi-agency efforts
  - ➢ Costing models to get economies of scale
- ➢ Development of software tools to benefit all of the government
- ➢ IT (e.g., security, databases, etc.)
➢ Sharing digital resources (e.g., content)
➢ Organizational cultures within and between agencies
- ➢ Sharing information
- ➢ Missions & Goals
- ➢ Strategic Planning
- ➢ Policy
- ➢ Procedures
- ➢ "How it has always been done"

Project

1. **Over 90% of government workers can not access virtual worlds from their desktop.**

2. **No interagency access to virtual worlds beyond public spaces such as Second Life.**

3. **Functional requirements for multiple virtual worlds do not exist across government.**

Government "trusted source" hosting solution for virtual worlds

- Security
  - Secure government network (by government for government)
  - E-authentication level 2—identity of users controlled
  - Trusted source of client software
  - Levels of access
- Economics
  - Multiple virtual worlds to meet user requirements
  - Economies of Scale
  - Enables Collaborative Projects
    - Shared 3D Content Repository
    - Software development pool

- **Two virtual world vendors were selected by the NDU iCollege for the pilot**
  - Vendor 1—iCollege CoP for CFO Community
  - Vendor 2—iCollege develop Education simulation and role play
- **USDA installed, hosted and managed software**
- **Vendor 2 created interface with eAuth level 2**
- **Enrolled pilot users into eAuth System**
- **Identified initial virtual world functional requirements**

Developing a Prototype: Stage 2

- **Investment Partner Process:**
  - Transfer funds to USDA
  - Create use case
  - Advise USDA on functional requirements, RFP, business processes and procedures
  - Establish governance
- **Contracting Process**
  - USDA creates and issues multiple year (3) and multiple award RFP (January, 2010)
  - Awards similar to Primes
  - IDIQ
  - Virtual world tools are selected Spring 2010
- **Testing COTS virtual worlds capabilities**
  - Security
  - Interagency collaboration
  - Development of four use cases
- **Identifying additional functional capabilities**

- ➢ **NDU iCollege-Community of Practice and knowledge management**
- ➢ **USDA-Continuity of Operations exercise**
- ➢ **DHS-Cybersecurity (2 short vignettes)**
- ➢ **USAF-Orientation to armed forces medical training facility**

➢**Initial Pilot Group (USDA & NDU iCollege)**

➢**Prototype User Group (USDA, NDU iCollege, DHS, USAF)**

➢**Advisory Group (working group)**

➢**Senior Leader Group (policy group)**

➤ **Economics**

- Cost models & economies of scale
- Acquisition

➤ **Security**

- Agency and organization CIOs (ports and clients on desktops)
- Enrollment of critical mass into eAuthentication level 2

➤ **Governance**

- Development of partner use cases & internal processes
- Development of interagency processes and procedures

- ➢ **Expand Access to more government workers across agencies**
- ➢ **Expanding capabilities**
  - ▪ Testing additional functionality (e.g., connecting worlds to databases)
  - ▪ Adding tools to capabilities (e.g., 3D Analytics)
  - ▪ Users expand their use cases
  - ▪ Develop additional use cases
- ➢ **Expand services to shared content repository**
- ➢ **Add investment partners to Prototype**

Michael Piller, Ph.D.

Director of Academic Computing

iCollege, National Defense University (NDU)

202-685-4862

pillerm@ndu.edu

Federal Consortium:

http://www.ndu.edu/irmc/fcvw/fcvw10/index.html

Office of the Deputy Undersecretary Of Defense for Readiness

Virtual Worlds—A Discussion

Defense Technical Information Center Conference

March 23, 2010

Frank DiGiovanni SES
Readiness and Training Policy and Programs
Office of the Deputy Under Secretary of Defense (Readiness)

Strategic Trends/Pressures

- **Operational Realities**
  - Afghan/Iraq Pre-Deployment training
  - 150,000 troops out of Iraq by 2011
  - 100,000+ troops out Afghanistan by 2011

- **BRAC/Global Repositioning**
  - Base Closings
  - Consolidation of forces from overseas to CONUS

- **Grow the Force**
  - Army end strength increase 74,000 by 2013
  - Marine Corps end strength increase 27,000 by 2011

- **Confluence of Energy Security and National Security**
  - Renewable Energy "Gold Rush"

"The Perfect Storm is coming"

Virtual World—Future Training Enabler

- Virtual world with a two-way interface to the live environment
  - Training audience immersion in common virtual space
  - 24/7 availability from home station
  - Ad-hoc collective training

OSD VW Vision

Implementation of a single, secure DoD virtual world training environment, in which each of the DoD Components build their specific pieces of a larger federated, virtual replication of the contemporary operating environment, that can be used in either stand-alone or interactively in near real time with external live and virtual platforms.

*DoDI, 1322,mmm, *"Implementing DoD Training"*

VW Attributes for Training

(1) Training available 24/7, via the global information grid across the spectrum of training audiences; from individual home station users and small units to a large force Combatant Command users.

(2) Possess a high level of realism.

(3) Use common applications, references and operational capabilities.

(4) Is rapidly scalable and composable by the training user without the need for specialized skills.

(5) Can be rapidly modified to replicate new operational capabilities or changes in the real operating environment. Supports mission rehearsals.

VW Attributes for Training (Continued)

(6)   Has a two-way interface between live and virtual training systems and their virtual replications (avatars) in the federated virtual world. Operations in the federated virtual world and live and virtual training systems can be synchronized in near real time so as to enable stimulation of sensors, visual replications and interactions between platforms operating within and outside of the federated virtual world across the spectrum of training environments or systems securely.

(7)   Support information operations, cyberspace, nuclear or catastrophic warfare, space, civil affairs, language and culture, and other soft skills training requirements across the globe.

(8)   Be interoperable with interagency partners and multinational capabilities in order to train to a comprehensive approach.

(9)   Include an automated collection of key learning objectives that highlight areas for the instructor to address in the debrief/after action review. In addition to this capability, the virtual training environment must display ground truth in a manner that permits detailed debriefing of training audience performance (both soft and kinetic skills), the ability to isolate and freeze individual and unit actions, and the ability to be reproducible and archivable.

Where we are...

- Growing number of VW research and experimentation "cylinders of excellence" in DoD

  - Developing independently without an overarching strategy. . .by chance they may use similar software or architectures

  - Lack of synchronization trending toward unnecessary duplication or lack of integrated functionality

  - Initiatives at present do not have focused investments

- Growing Senior leader interest
- OSD(R&T). . .driven by strategic pressures is taking action to leverage and address topics above

DoD Technical Constraints

- The DoD Information Assurance environment is challenging
  - Individual training is typically unclassified
  - Collective training is normally at SECRET level or higher

- GIG Net-Centric Enterprise Services (NCES) capabilities a key to addressing the problems
  - CAC, Single Sign-on, NCES IA Services to assist

Some Closing Thoughts

- Business model
  - Crowd sourcing
  - I-phone Apps
  - Cloud computing
- Immersion—blending of reality and virtual
- Workforce demographics pushing us in this direction
- Synchronization—mega world and mirror worlds
- Special capabilities training
- GIG capacity and IA and security issues need to be addressed now

We need to stop admiring the problem and get to work!

Virtual Worlds: Focus on Libraries and their Potential for DoD

Ms. Pat Alderman

Role of Libraries

- Place

- Collections/Resources

- Service
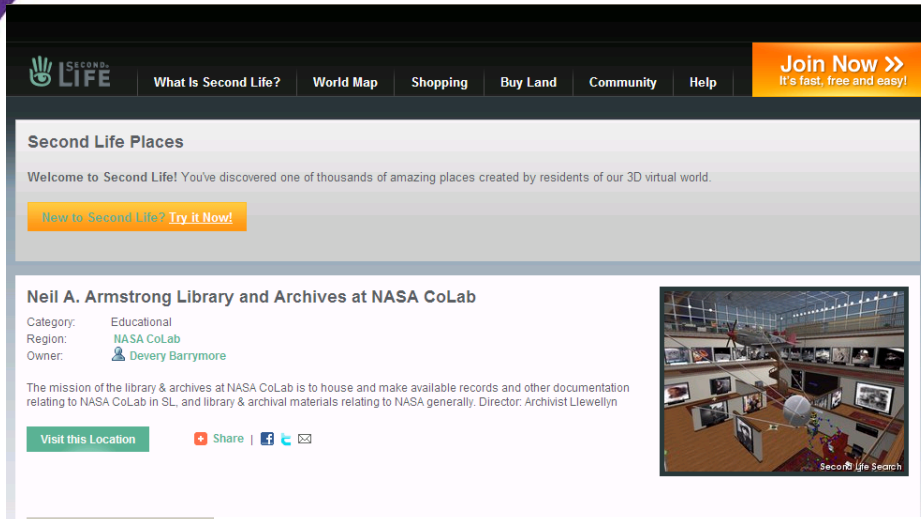
The Neil A. Armstrong Library and Archives at NASA CoLab

http://world.secondlife.com/place/fc04 2c1c-ea7f-b9c6-1b5e-28e8ab59a0bd

DoD Libraries in Virtual Worlds

- **National Guard US Nexus Virtual World**

- **http://www.ngaus.org/content.asp?bid=14851**

- **US Naval Undersea Warfare Center**

- **https://blogs.secondlife.com/community/workinginworld/blog/tags/nuwc**
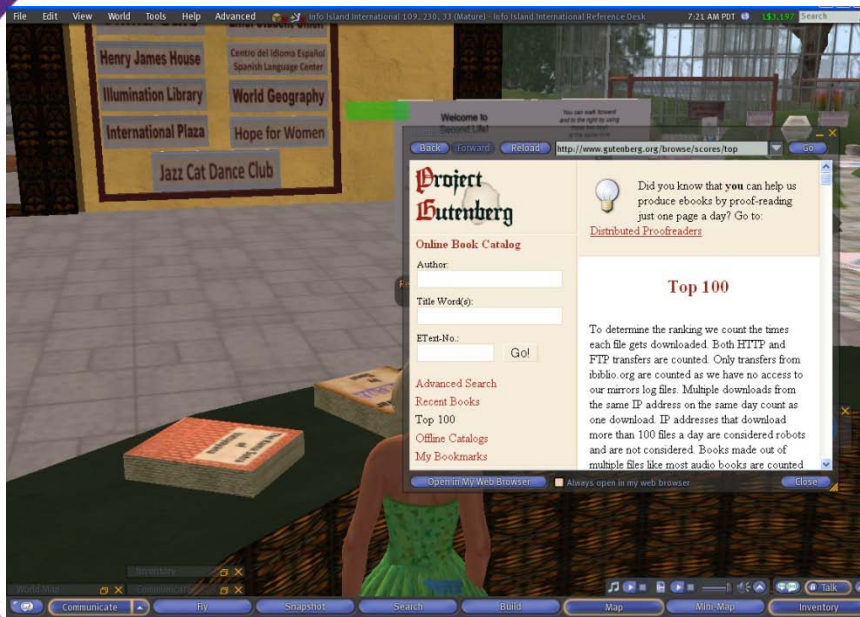
Information Seeking Behavior in Second Life

- Learning through Exploration—Self guided

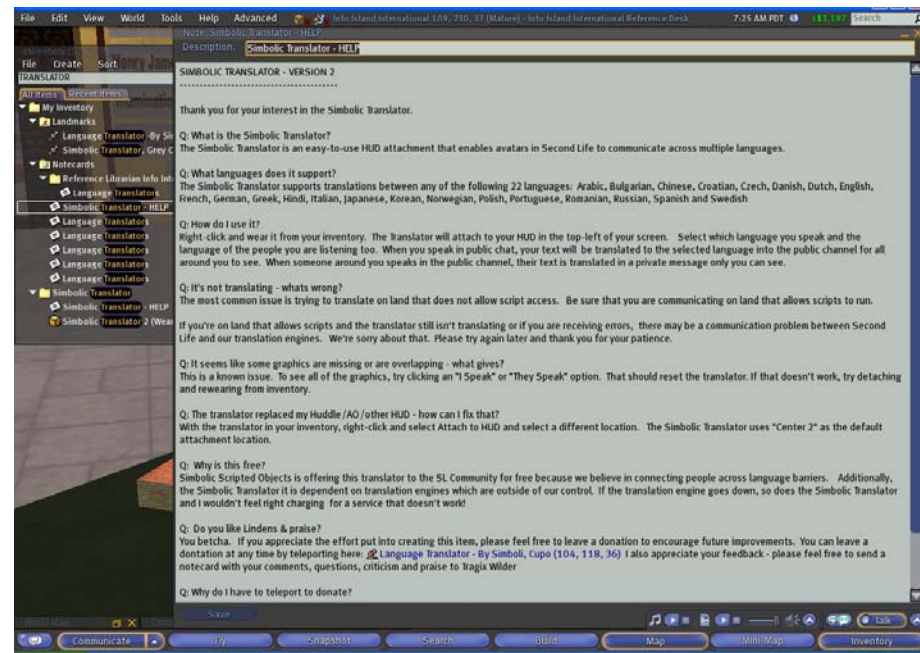- Traditional Reference in a 3D environment—Asking Someone

- Immersive Learning

•Avatar can learn by exploring—cross that bridge when he/she gets to it.

•Providing 2-D Reference in a 3-D World

•Specially developed reference tools help.

2009 Reference Statistics for the AVL

- Visitors – 3373

- SL Directional Questions—2184

- SL Reference Questions—1723

- RL Directional Questions—257

- RL Reference Questions—216

- Griefers---3   Voice ---57

- Non-English--89

Immersive Learning may be one of the best advantages of Second Life

What are the roles for libraries and librarians in Virtual Worlds? Would this role work for DoD?

- Present—collaboration, community, cooperation—training, meetings, activities, simulations

- Future---New service models for providing information, creating a new knowledge metaphor

COMMENTS

Pat Alderman

Systems Librarian

National Defense University Library

Washington, DC 20319

202-685-2384

aldermanp@ndu.edu

DoD Field Activity Since 2004 DoD Field Activity Since 2004 DoD Field Activity Since 2004 DoD Field Activity Since 2004 DoD Field Activity Since 2004

Questions?

Points of Contact

Dr. Paulette Robinson

National Defense University, iCollege

RobinsonP@ndu.edu

Mr. Frank DiGiovanni

Office of the Deputy Undersecretary of Defense Readiness

Frank.DiGiovanni@osd.mil

Information for the Defense Community **DTIC**®

DoD Field Activity Since 2004 DoD Field Activity Since 2004 DoD Field Activity Since 2004 DoD Field Activity Since 2004 DoD Field Activity Since 2004

Dr. Michael Piller

Information Resources Management College (IRMC), National Defense University (NDU)

pillarm@ndu.edu

Ms. Pat Alderman

National Defense University Library

202-685-2384

aldermanp@ndu.edu

Information for the Defense Community **DTIC**

Point of Contact

Ms. Marjorie Powell

DTIC

(703) 767-9107, DSN: 427-9107

mpowell@dtic.mil

Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government, and shall not be used for advertising or product endorsement purposes.