Spin-on and Spin-off Challenges of Commercial Technologies

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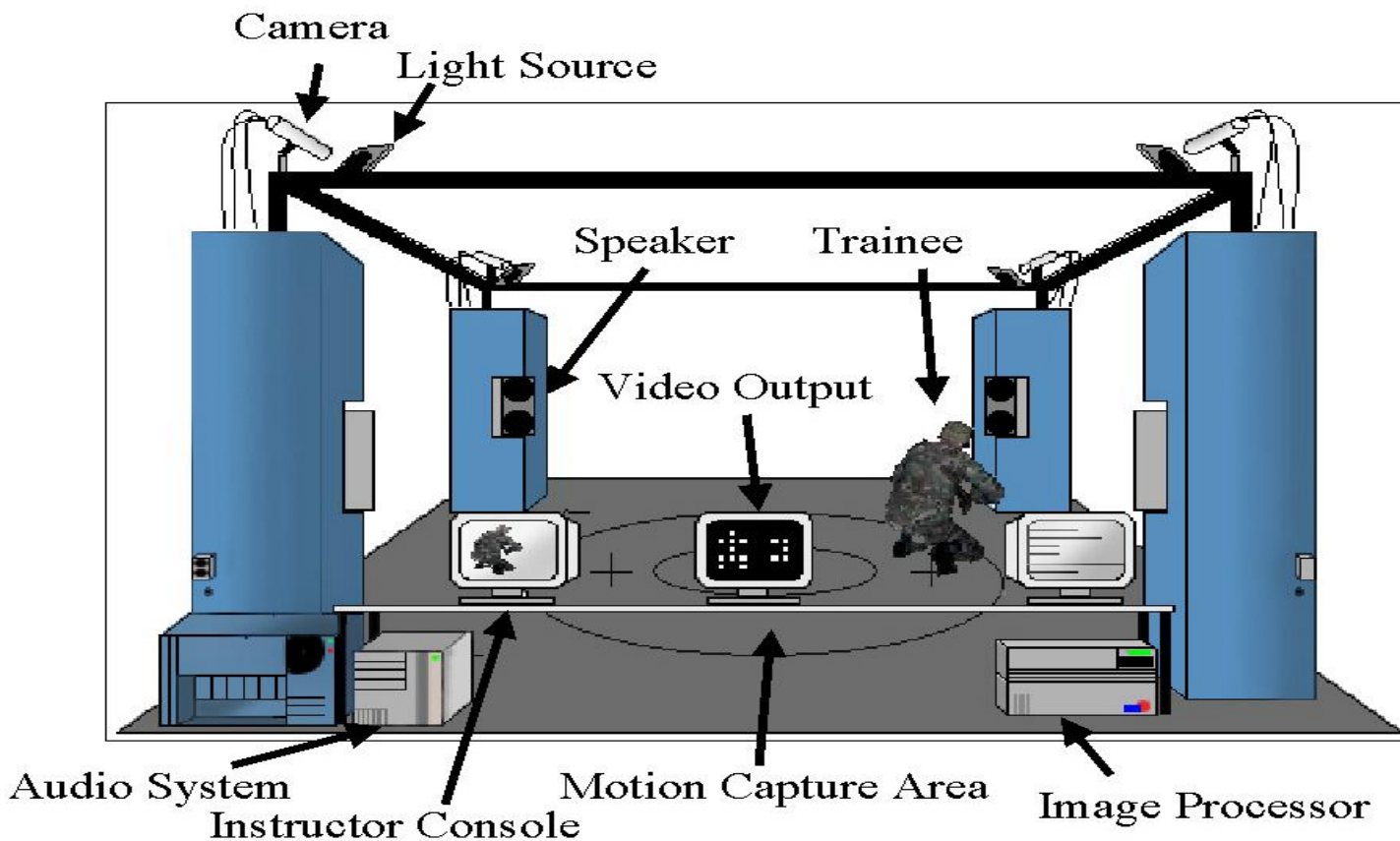**Ken.Kelly@Veridian.com**
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- **Commercial to DoD**
  - **Technologies , Challenges, Lessons Learned**

- **DoD to FedCivil (other Government agencies)**
  - **Technologies, Challenges, Lessons Learned**

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- **Commercial Entertainment technology ('95) - used optic sensors to track an individual's (actor's) position in the real world and visually display a computer graphics representation of that person on the computer …but NOT in real time, with no terrain database…for the purpose of producing special effects for the movie industry**

Camera
Light Source
Speaker   Trainee
Video Output
Audio System
Instructor Console
Motion Capture Area
Image Processor

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Commercial to DoD – Technology Transfer

- **Technology Transfer Vision – Use the technology to track the position of a person in the real world (soldier, police officer, fireman, student), and then immerse that individual in a military type virtual environment …in _real time_ for the purpose of training and testing**

- **Technical Challenges**
  - **Convert the entertainment system from non-real time to real time**
  - **Convert the system to be DIS (and HLA) compliant to allow interaction with other simulators**
  - **Develop detailed terrain databases of terrain/buildings**

- **Other challenges – find the R&D funds to allow us to solve the technical challenge**

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Commercial to DoD – Technology Transfer

- **Solution**
    - **US Army STRICOM funded the R&D.**
    - **Technical challenges were basically solved.**
    - **Dismounted Soldier System (DSS), later renamed "Real Guy", was successfully developed.**

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Commercial to DoD – Technology Transfer

- **Success Story**
  - **The OSD Live Fire Test and Training program and STRICOM are utilizing the DSS/"Real Guy" for testing of the next generation Soldier weapon, or OICW -Objective Individual Combat weapon.**

OICW

Commercial to DoD – Technology Transfer Problem

- **Problem with Dismounted Soldier System – mid 90's**
  - **As built, the system was too costly for training**
  - **Expensive IG to process/display terrain**
  - **Expensive main host computer**
  - **DoD services did not immediately embrace the technology for training… due to cost, fidelity, and cultural reasons**
    - **Easier and less $ to send the troops out to a range with MRE's to train**

Commercial to DoD – Technology Transfer

- **Where did we go with the technology?**
  - **Using IR&D, re-hosted the terrain and software onto PCs - "Real Guy"**
  - **Visual fidelity improved each year as PCs became more powerful**
  - **Higher fidelity SAFs being developed for individual combatants**
  - **Developed "partial immersive" desktop simulator (vs full immersion) – more customer appeal - much lower cost**
  - **Training community working to define which training tasks are best trained in a 3D environment**

Partial Immersive/Desktop Version

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DoD to FedCivil – Technology Transfer

- **Challenge – migrate this DoD individual immersive technology to commercial & Government customers**

- **New customers must be able to fund the conversion of the technology to their application…. Commercial, Law Enforcement, Education, Transportation, and Entertainment**
  - **Conversion includes developing new terrain databases, new SAFs, new "models" (police cruisers or school buses versus tanks) and new scenarios**

- **We knew commercial customers do not generally fund R&D**

- **Solution: federal government agencies (DoT, DoEd, DoE) could fund the development necessary to modify the technology to their application**

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- **How did we go about securing these new customers?**

  - **Demo, demo, demo**
  - **Established partnerships with local, state and federal education, law enforcement, and transportation organizations**
  - **Submitted papers/proposals**
  - **Found champions in each of these organizations**

DoD to FedCivil – Technology Transfer Results

- Over the past three years, received funding from customers in Education, Energy, and Transportation

⇒ **Education - VR system for Orange County Public Schools to teach deaf children social/academic skills. Expanding to other states**

⇒ **Transportation – VR system to teach transit police officers correct procedures in case of a WMD attack on a subway**

⇒ **Energy – developing a VR system to teach correct handling of radioactive waste materials from a Nuclear Energy plant**

DoD to FedCivil – Technology Transfer

- **Lessons learned in transferring DoD technology to FedCivil:**

  - **Customers do not have large R&D budgets …conversion to their application must not be too costly**
  - **New market for DoD firms. Lack of understanding of their buying habits and methods and lack of understanding of M&S by the potential customers (e.g. DoT sends typically buys buses and trains…not simulators)**
  - **Requires years to understand the FedCivil market and develop the relationships**
  - **Customers are spread out (e.g. thousands of local, state law enforcement agencies) so marketing tends to be geographically dispersed and fragmented**

DoD to FedCivil – Technology Transfer

- **Where are we going with this?**

  - **Continue the same business model and permeate more FedCivil customers (e.g. Medical, Education, Homeland Security)**
    - **PC Hardware costs has leveled off, but the PC capabilities continue to increase each year**
    - **Result – fidelity improvements**
  - **Continue to have DoD fund the state-of-the-art in VR technology (SAF, terrain databases, networking, etc.)**
  - **Transfer the technology with minimal cost**

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Veridian Transition Model

Commercial

DoD

FedCivil

Gov't R&D $

Gov't R&D $

Corp IR&D $
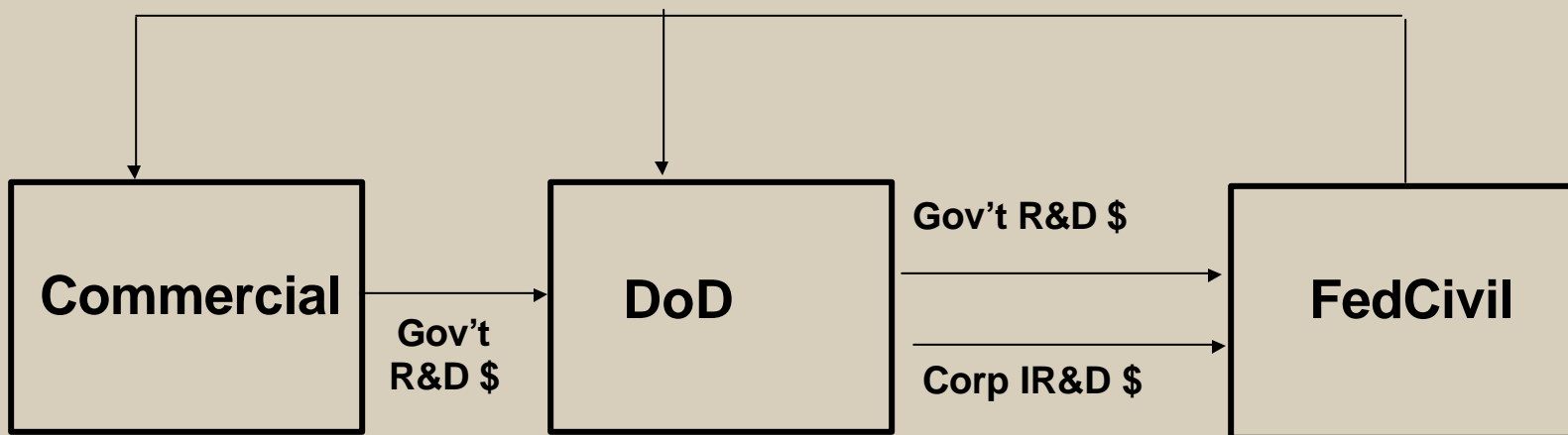
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