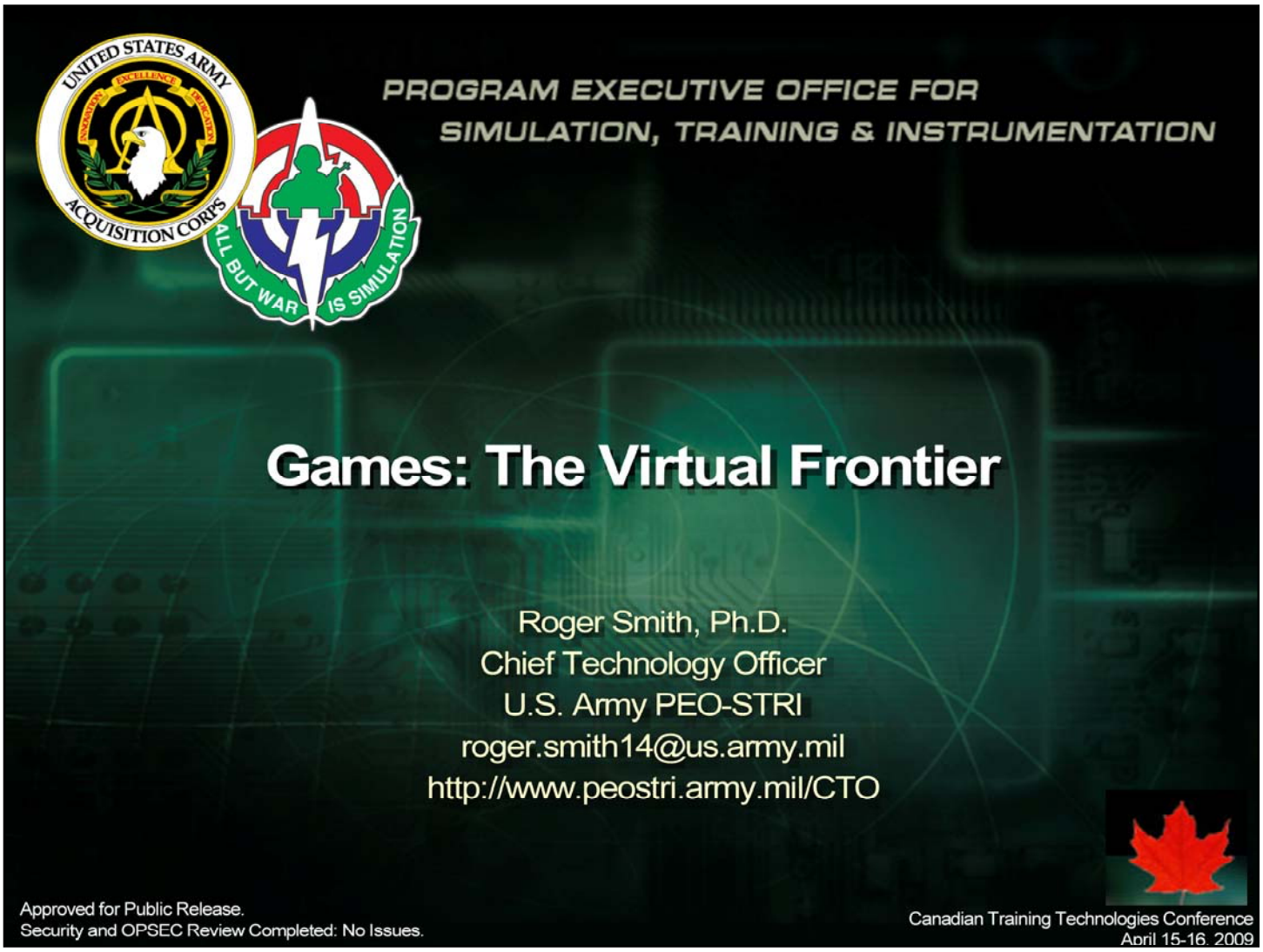
PROGRAM EXECUTIVE OFFICE FOR
SIMULATION, TRAINING & INSTRUMENTATION
Games: The Virtual Frontier
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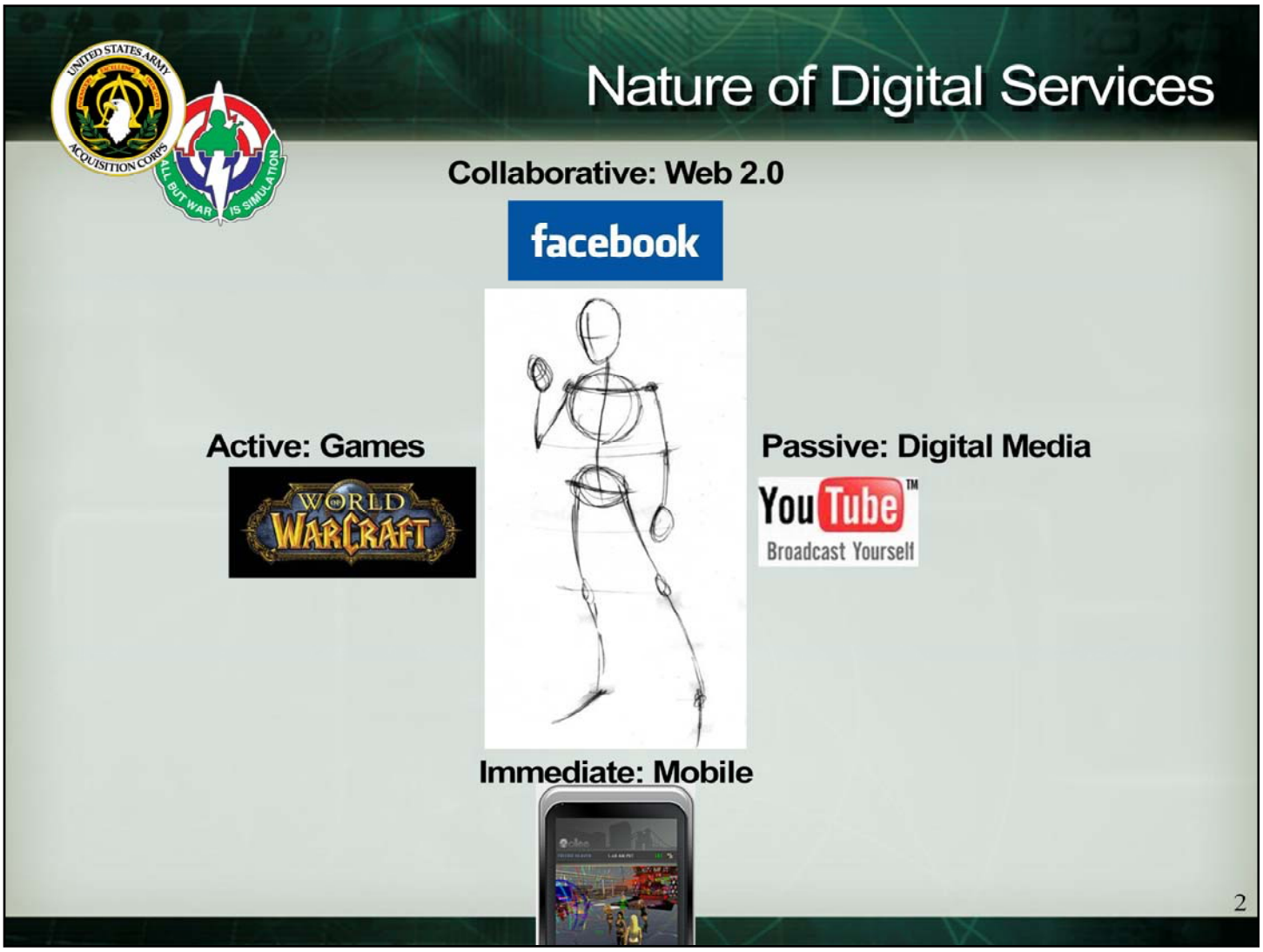
NOTES



NOTES

Digital services are being created to meet absolutely every need and every niche where customers can be enticed to go.

Games are the most active of these because they require constant attention and rapid input in response to events generated in the game.

Digital media like YouTube and Flickr have an interactive component, but they are largely passive. YouTube and Flickr enhance this with recommendation, tagging, and geolocation services that add some Web 2.0 flavor to them.

Collaborative services like Facebook, MySpace, Twitter, Blogger, and Ning focus on the exchange of information with other people. The social services are also adding links or widgets to pull simple games from sites like Kongregate into their collaboration spaces. These games are generally not collaborative experiences, but add reasons for a customer to visit the site.

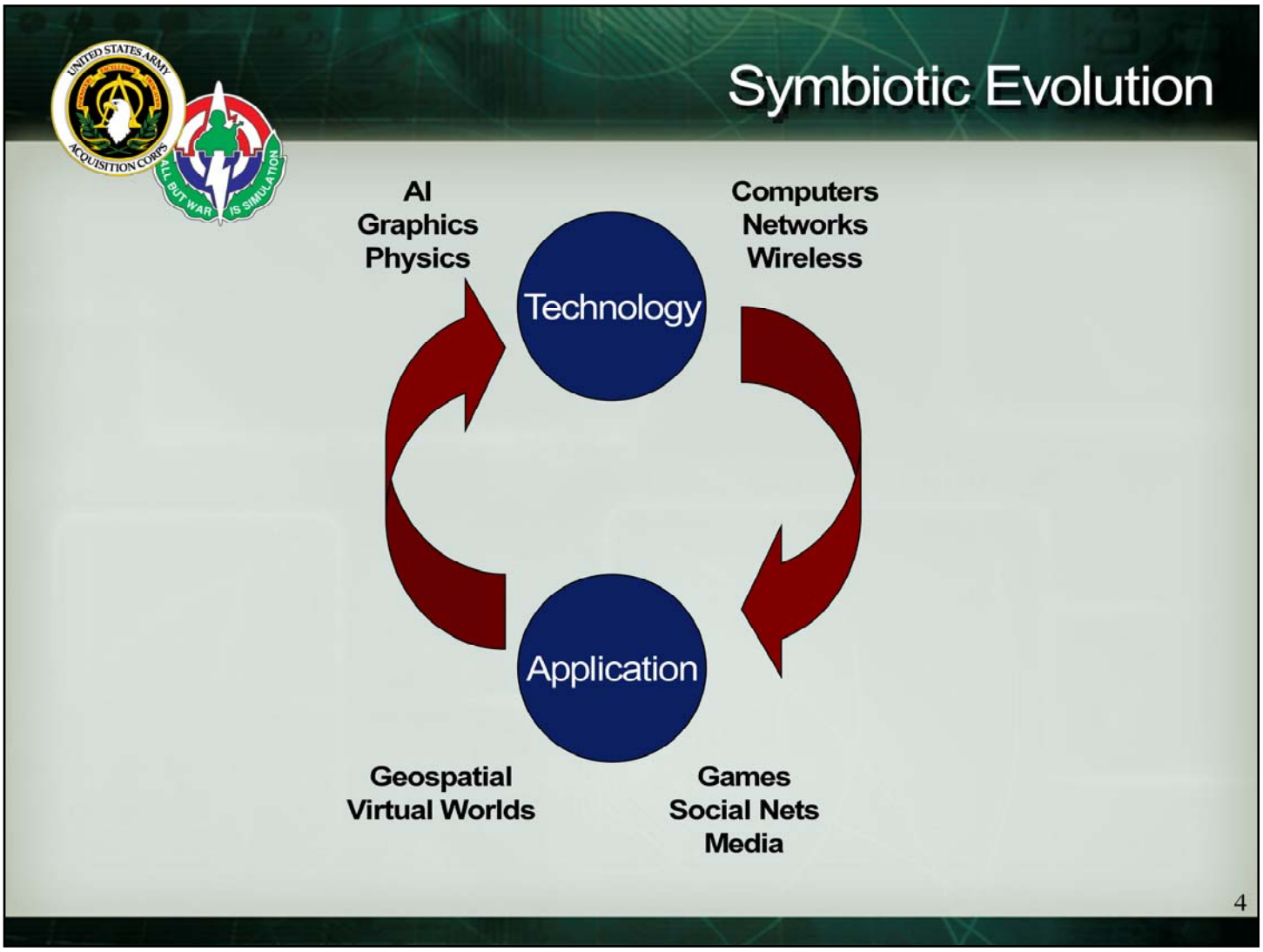
Immediate services are available via mobile devices. Usually these are scaled down versions of games, media, and collaboration that can fit the small screen, keyboard, and processor of the cell phone. Their focus is on providing immediate stimulus or response at any time.

There are some thoughts that all of these service may merge in the future. This is unlikely because of the major differences in focus and the demands they place of the hardware devices. However, all four might meet at the edges to complement each other. Collaboration spaces are already used by WoW guilds to plan quests. Facebook is including games and game connections in their social spaces. YouTube and Flickr are accessible via mobile devices. Gamers create video capture movies to distribute via YouTube – and subsequently over mobile devices. These services meet the needs of customers and these needs create intersections based on customer demand.

NOTES

The demand of computer devices is driven by the relevancy of the software applications available. This demand and existing applications provides funding for R&D to create new computer and software products. "Killer Apps" are pursued in this industry because they have the ability to increase hardware sales as much as 10X. The apps create the demand that generates profit and enables the funding of new technology like faster chips, audio cards, graphic cards, smaller disk drives, and network infrastructure.

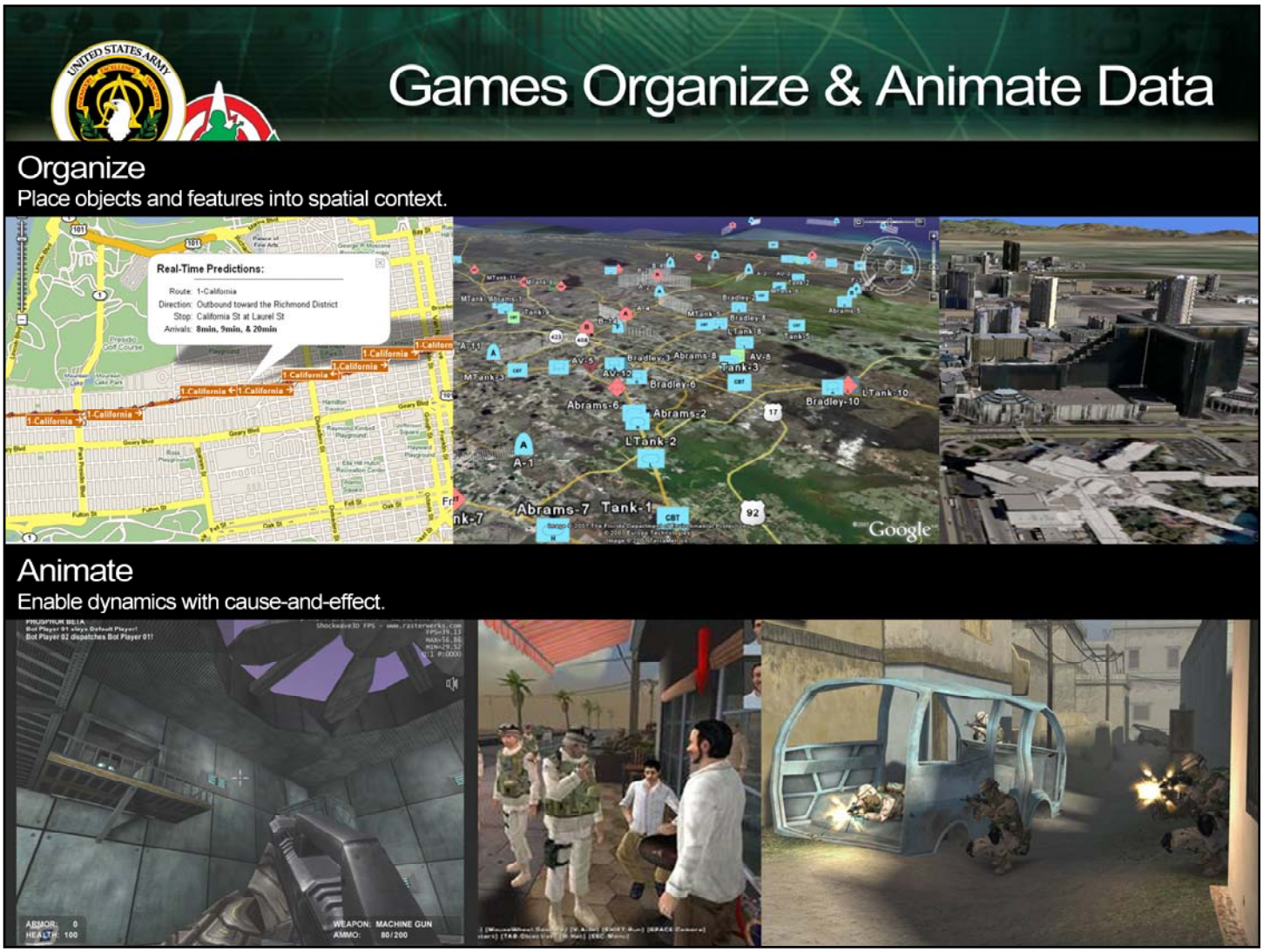
In the business domain the Spreadsheet and Word Processor were some of the most powerful killer apps. Email and Web Browsers emerged to serve non-revenue generating users, but quickly became valuable and essential business applications as well. The consumer 3D Game Engine was created to provide entertainment to a small niche of computer users. But it spread virally and became an entertainment Killer Apps that rivals business applications in its ability to generate hardware sales. The current multi-billion dollar entertainment game industry is built on the back of the 3D Game Engine. It is just now being adopted for serious applications or "Serious Games" by business and government organizations.



NOTES

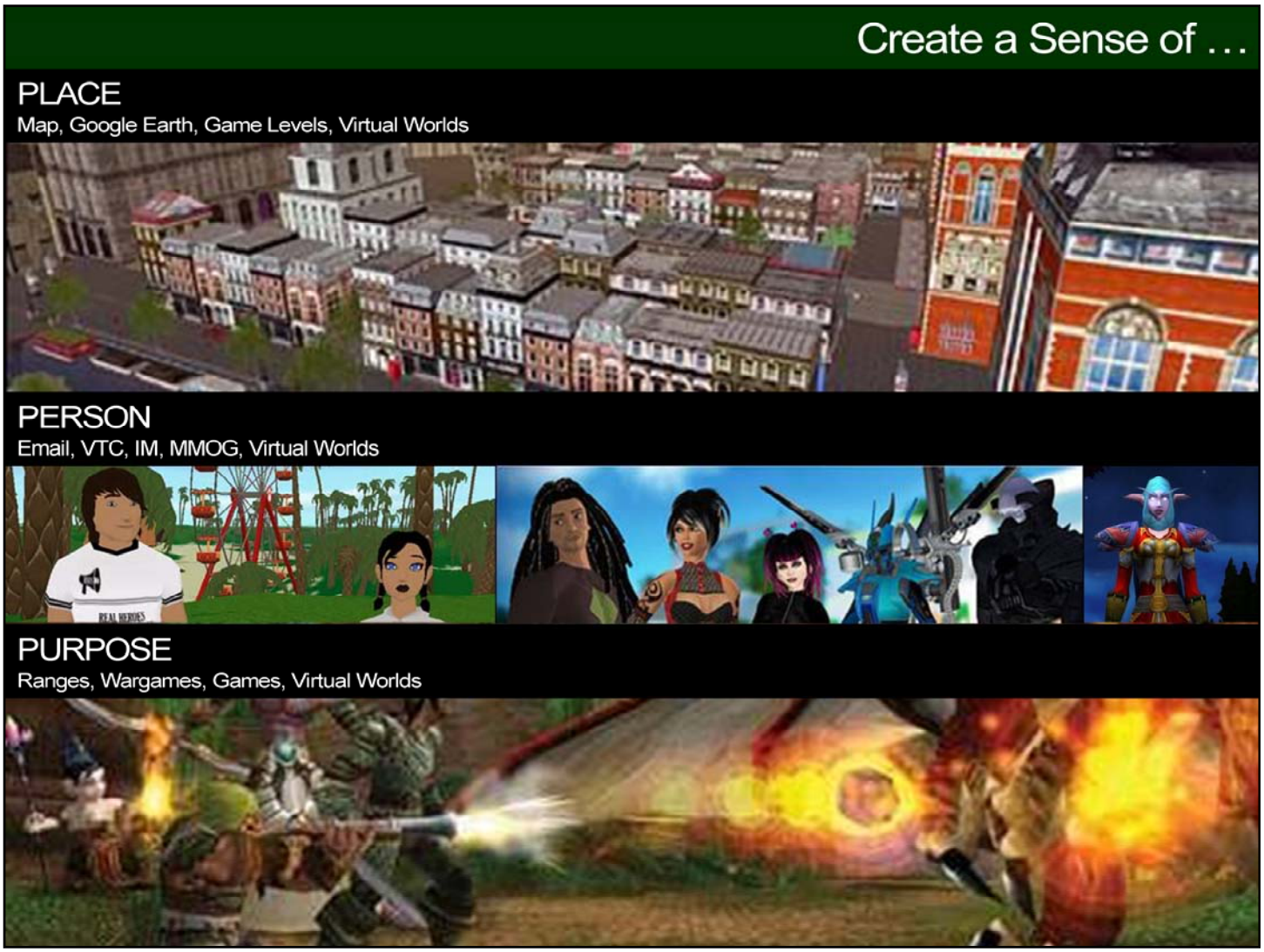
Computer technology evolves symbiotically with the applications that can put it to good use. Without the applications, the technology stagnates without direction or demand. Computer Games like id Software's Wolfenstein 3D, DOOM, and Quake have often been dubbed computer programming experiments because they were created specifically to find out what could be accomplished with the existing hardware systems. John McCormack created Wolfenstein at a time when most developers and users did not know how to get that kind of performance out of the 386 computers. This type of "edge" application creates customer-level demand for more and better capabilities. McCormack and id repeated their "on the edge" application development with DOOM on the 486 and Quake on the Pentium class chips and the new graphics chips/cards.

See: Kushner, D. (Aug 2002). "The wizardry of id". *IEEE Spectrum*, 39(8), pp.42-47.



NOTES

Games are spatial environments that allow dynamic behavior. Most applications contain one of these, but not both. A spreadsheet contains models that illustrate dynamic behaviors of finances or other systems. Maps create spatial orientation of information. But games provide both a spatial organization of many different objects (static) and then animate them with behaviors (dynamic). They allow users to see how information is arranged, but also how it interests with other information. Given accurate cause-and-effect models games can provide a window into the future of situation that is more detailed and more consistent than a human can imagine and animate in their own mind. The game also communicates this information in a clear visual sense that is much easier to assimilate than the tabular and textual output of many models and simulations.



NOTES

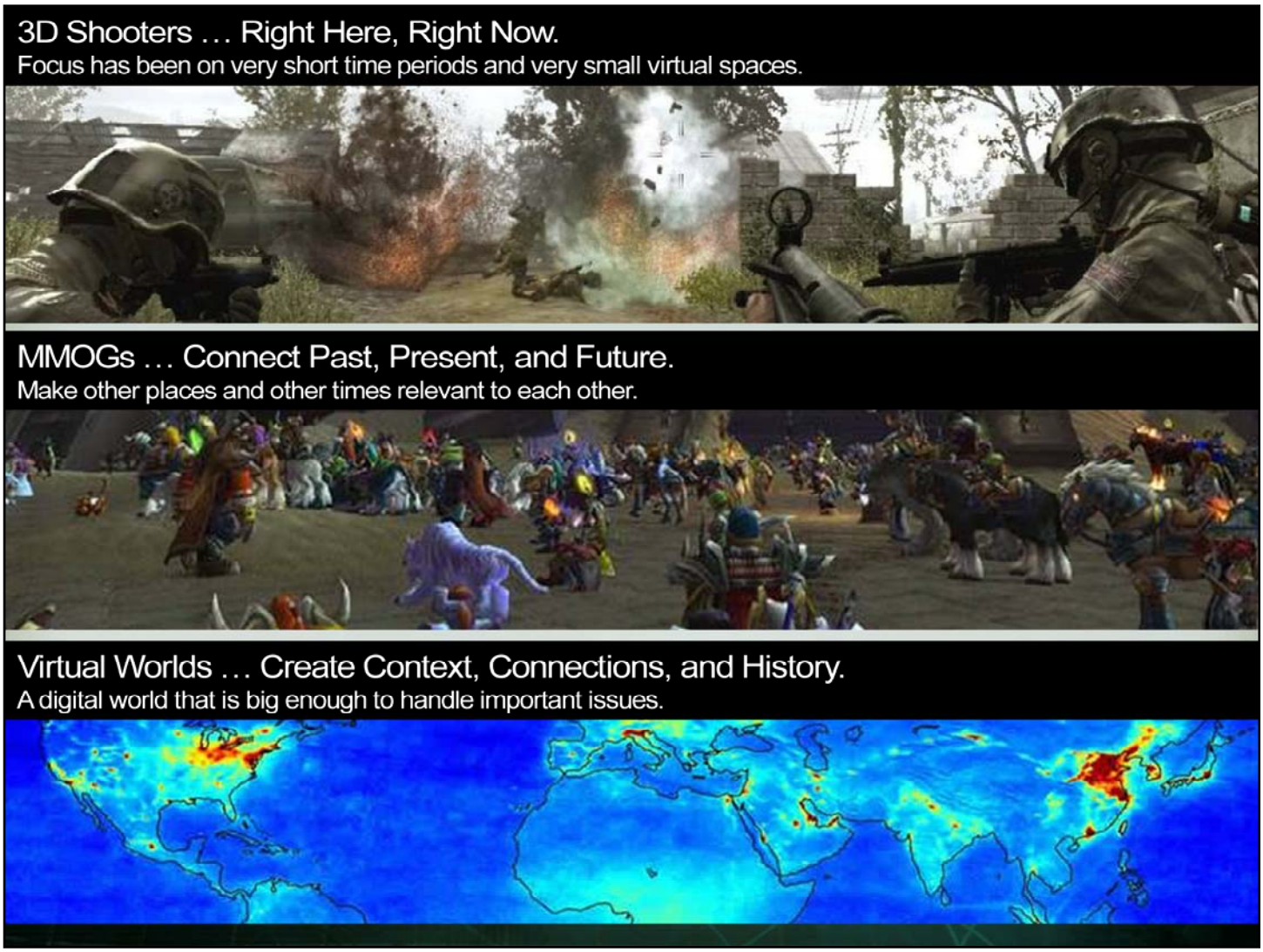
Game developers have taken the raw hardware and software technologies from university and government research as well as their own earlier projects and turned it into a compelling story-telling medium. Within these digital environments the player can get a sense of …

PLACE where he or she understands how the world is put together, what it has to say about that place, and where the player fits in. With just a quick tour of the digital space the player gets the feeling of dark threatening danger, light open social encounters, or historic time machine.

PERSON in which other characters create a society of with norms for personal interaction and the formation of groups.

PURPOSE for being in the space, a definition of the mission, personal vs. group activities.

All of these have been portrayed with previous tools like maps, email, and wargames. But no environment has brought all three together in such a clear, accessible, and compelling package in the past.



NOTES

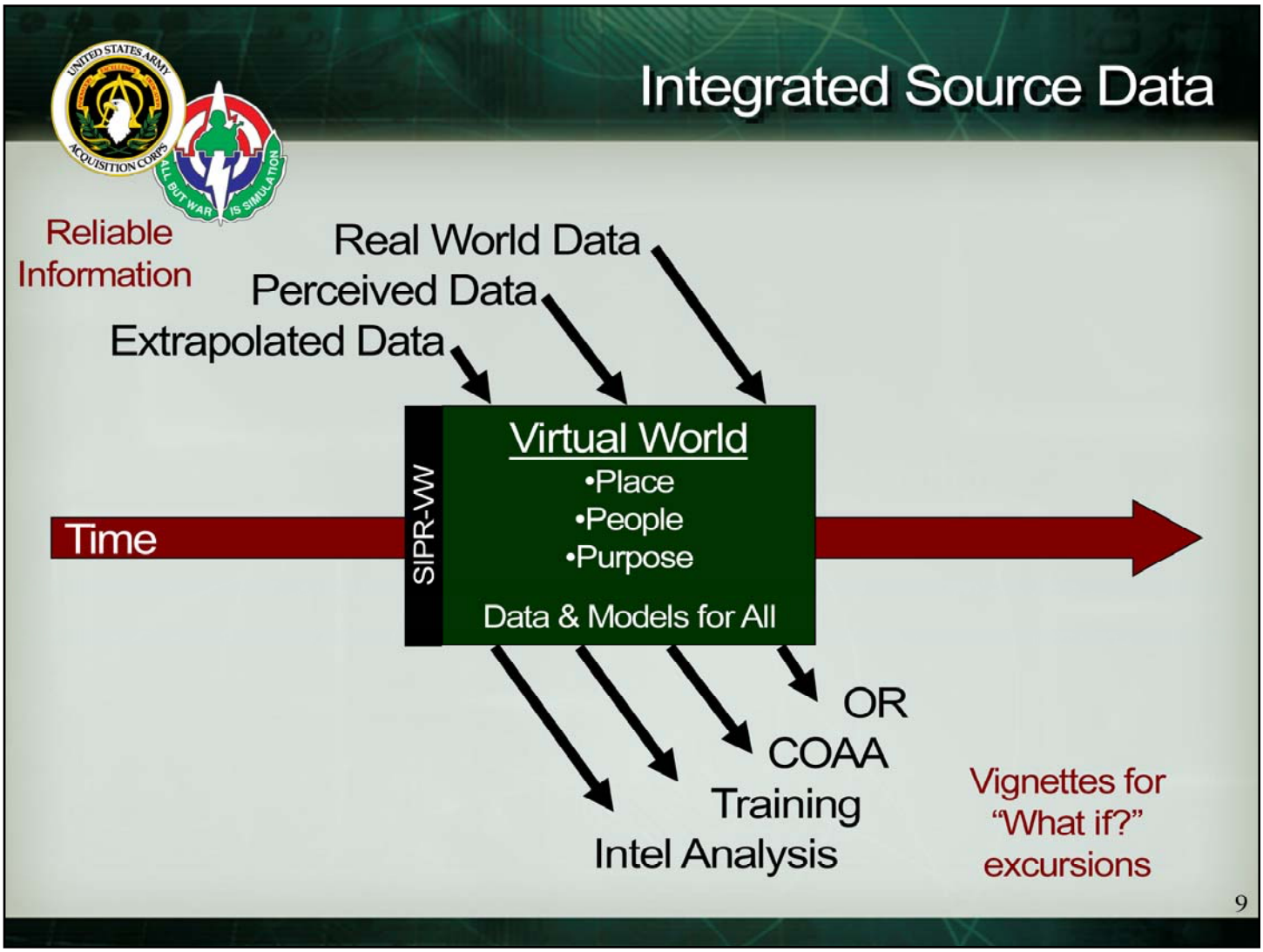
3D Shooters are the most prominent form of game system and environment in the consumer and the defense space. These portray conflict, combat, and deadly threats. They immediately plunge the player into a simulating environment with urgent problems to solve. They also mirror some of the most important engagements that real people and real societies engage in. However, these environments are extremely limited in time and space. The battlefield is a relatively small area – usually just large enough to contain a specific vignette, and never so large that the players can wander far enough to miss the entire point of that piece of the world. These vignettes and geospaces are linked together in such a way that the player can move immediately from one "hot spot" to the next. There is no room in these for intervening relationship building, downtime learning, AAR, or planning for the next engagement. For entertainment this hot-spot-hopping is exactly what you want. But as a venue for wrestling with real problems, this is a very small and single-focused experience.

MMOGs create a much larger space in which player spend more time wandering, conversing, building relationships, and joining clans that will participate in specific battles. It includes spaces for combat, socialization, trade, and exploration. This size and diversity enables a much broader and somewhat richer experience of the world and the other players in it. Specific battles may still be the focus for many players, but they can also plan, rehearse, and regale in stories surrounding these as well. The algorithms that determine engagement outcomes, but battle and trade, are simple – often just subtracting and adding points to a player's health.

Virtual Worlds create an world that can be smooth and continuous like the real world. They can create context, connections, and history that is similar to what exists in the real world. But in their current state they are only slightly different from MMOGs. Second Life, and others like it, are unique in that the content is created by the users, not by the development company. This begins to allow the users to shape the world to meet their needs. But to really become distinct and useful, these spaces need to allow the users to upload/link their own models into the world. The VW needs to provide an infrastructure that can accommodate heterogeneous models provided by users and allow these diverse models to interact with each other. Business and Government problems cannot be represented by generic one-size-fits-all models provided by an entertainment company.

NOTES

Each game designs a set of models that meet the needs of that game. The preference is to create sparse models that are computationally inexpensive and that fit together to allow interactions across all of the objects in a space. As virtual worlds are adopted to the needs of real government and intelligence customers, there is going to be a need to (1) add much more complex models that require more computational power, (2) bring together a very diverse set of models that were not originally meant to work together. A government Virtual World cannot align these models one at a time, that is an N-squared problem that will very quickly become impossible to manage. There needs to be an infrastructure that allows heterogeneous models to be integrated into the world and to work with the existing models without requiring customer model-to-model modifications. This would be a big environment with an underlying software infrastructure that present real value to the government.



NOTES

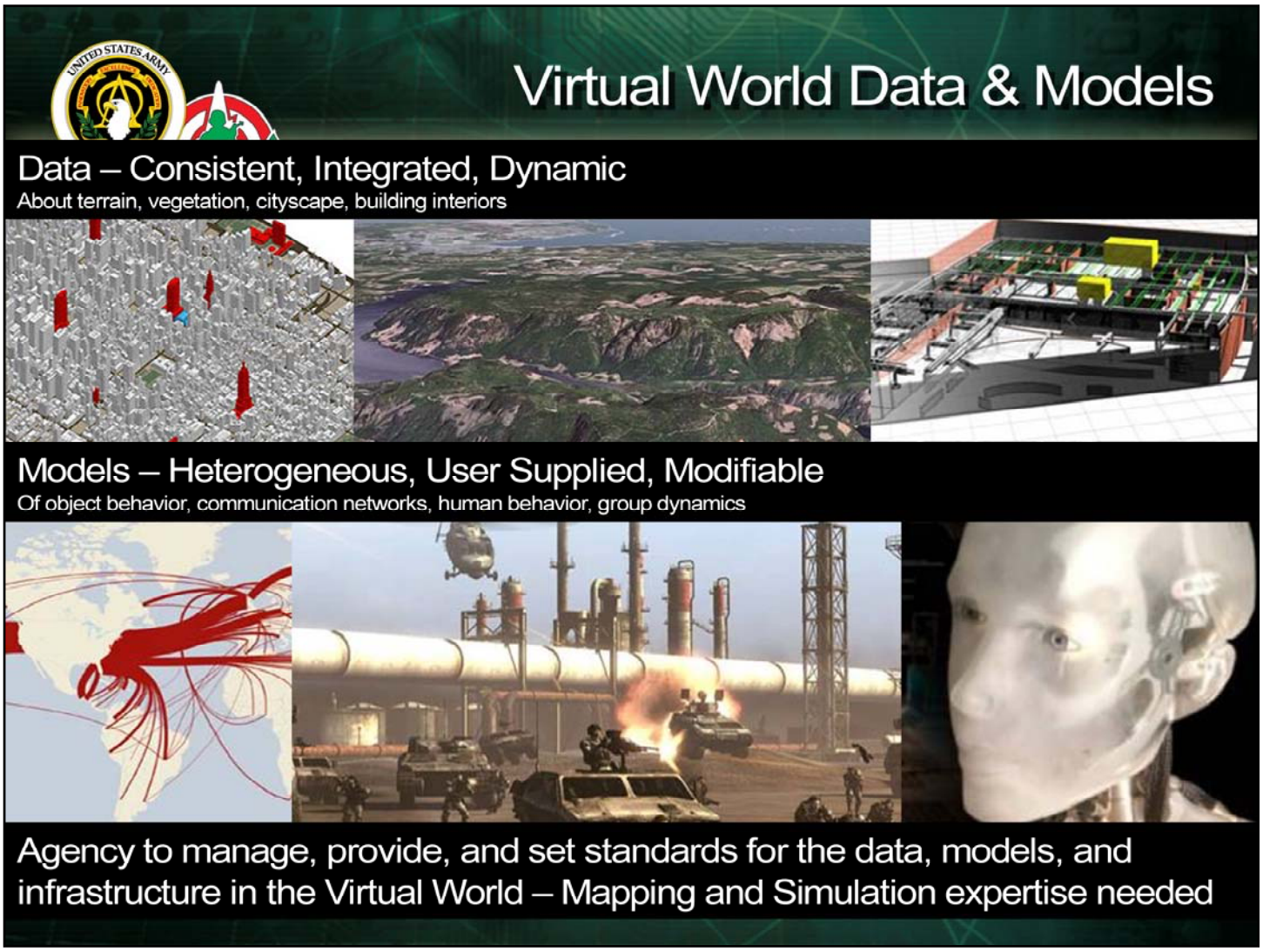
A virtual world is big enough to ingest real information about the physical world, perceptions provided by sensors, and our extrapolations of that data. The VW would be an living, breathing data-space that represents the state of the real world, with some lag for processing and validating the data that was entered. As such it would provide a source from which many simulations, models, and studies could extract a state and do "what if?" excursions of their own. These kinds of excursions are already being done. But they all do their own independent database generation right now.

Certainly putting all of the information we have into a single place creates risks. But we handle those risks now with classification levels and compartments. Some modified version of that should work for a virtual worlds as well. Imagine SIPR-VW and NIPR-VW.

NOTES

Today we see the virtual world as a very broad, but shallow, pool of experience. Everything is very superficial. Most products expect that avatars will be controlled by a human, not using the AI that drives threat forces in a computer game. But as computing on the client side and the server side becomes much more powerful via multi-core chips, the richness of experience will increase. A civilian may turn to VWs to participate in company meetings, hang out with a team or group of friends, assemble members of his family (which does or does not match his real family), and interact with a digital buddy.

There are corresponding corporate, defense, and intelligence applications for all of these. In many cases the VW acts as an integrating environment for specialized and independent simulations, models, and studies that are already being done. The rich, integrated set of data and models in the VW provide a foundation from which to launch excursions in all of these domains.



NOTES

Virtual Worlds that match the real world call for a great deal of data and a large number of models. Just as with geospatial data and simulation models, there need to be coordinators, providers, and standards bodies to make it possible for all of this to work together. The commercial version of these bodies would lack the depth of understanding on how these worlds could be used in government. If it grows then this is an area that will face a number of challenges similar to those addressed by NGA combined with those of the simulation domain.

Army Model Exchange

- All Canadian Ministry of Defence personnel are authorized access to the PEO STRI Army Model Exchange
- The Army Model Exchange contains models of military equipment to support visualization, infrared analysis, and radar analysis simulation
- The Army Model Exchange is available at: https://modelexchange.army.mil
- Major Jeremy MacDonald should be listed as the sponsor for Canadian Forces personnel
- For additional information contact Robbin Finley, robbin.finley@us.army.mil, or Stephanie Brown, stephanie.e.brown1@us.army.mil

NOTES

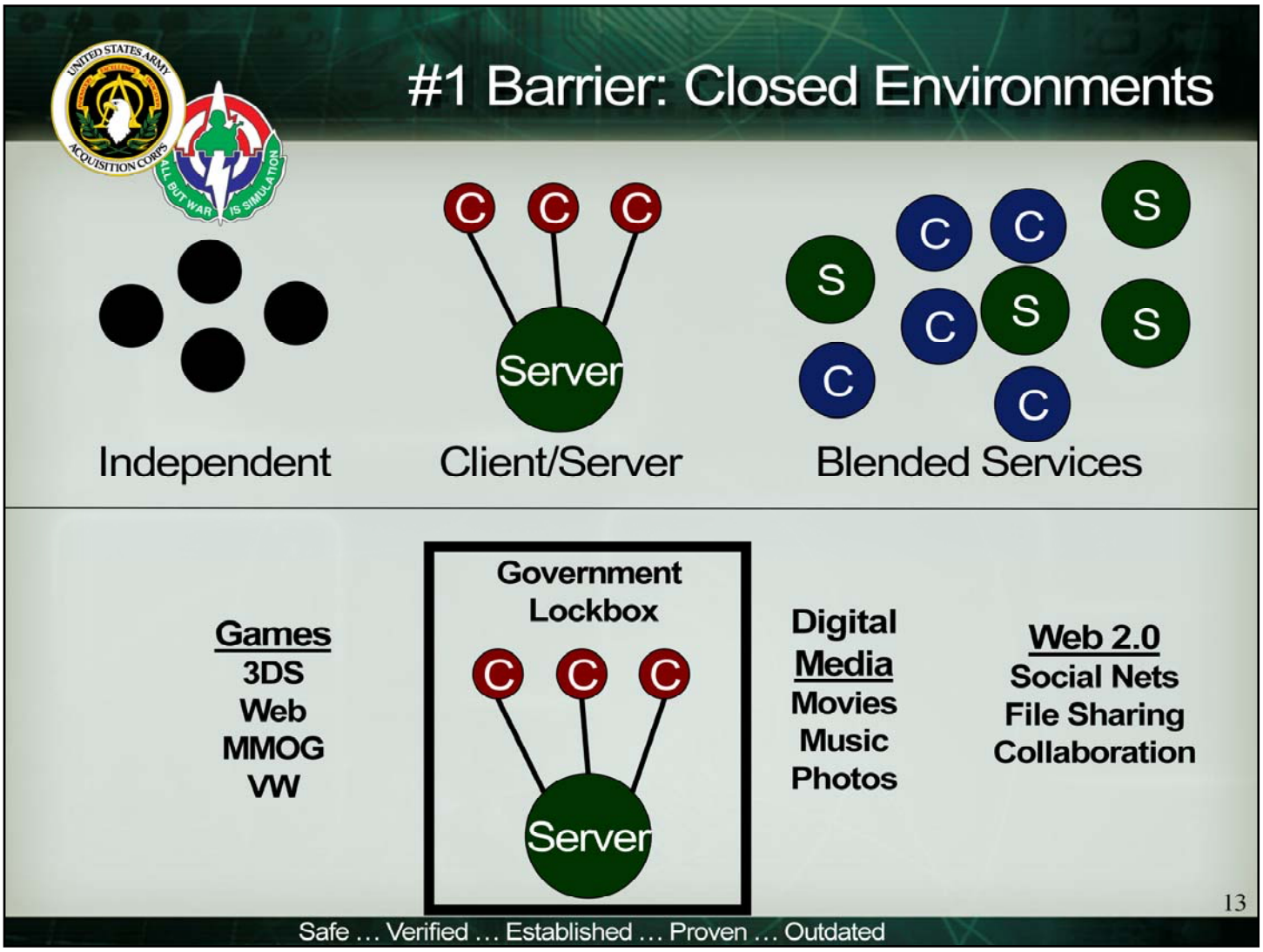
The PEO STRI Army Model Exchange is an on-line target model repository of U.S. Government owned simulation target models.

Access to the Army Model Exchange was authorized to members of the Canadian Forces on 27 Jun 02 under the authorization of American-British-Canadian-Australian (ABCA) Standardization Agreement.

The Army Model Exchange contains models of military equipment in a variety of modeling formats and fidelities to support simulation inputs for visualization, infrared analysis, and radar analysis.

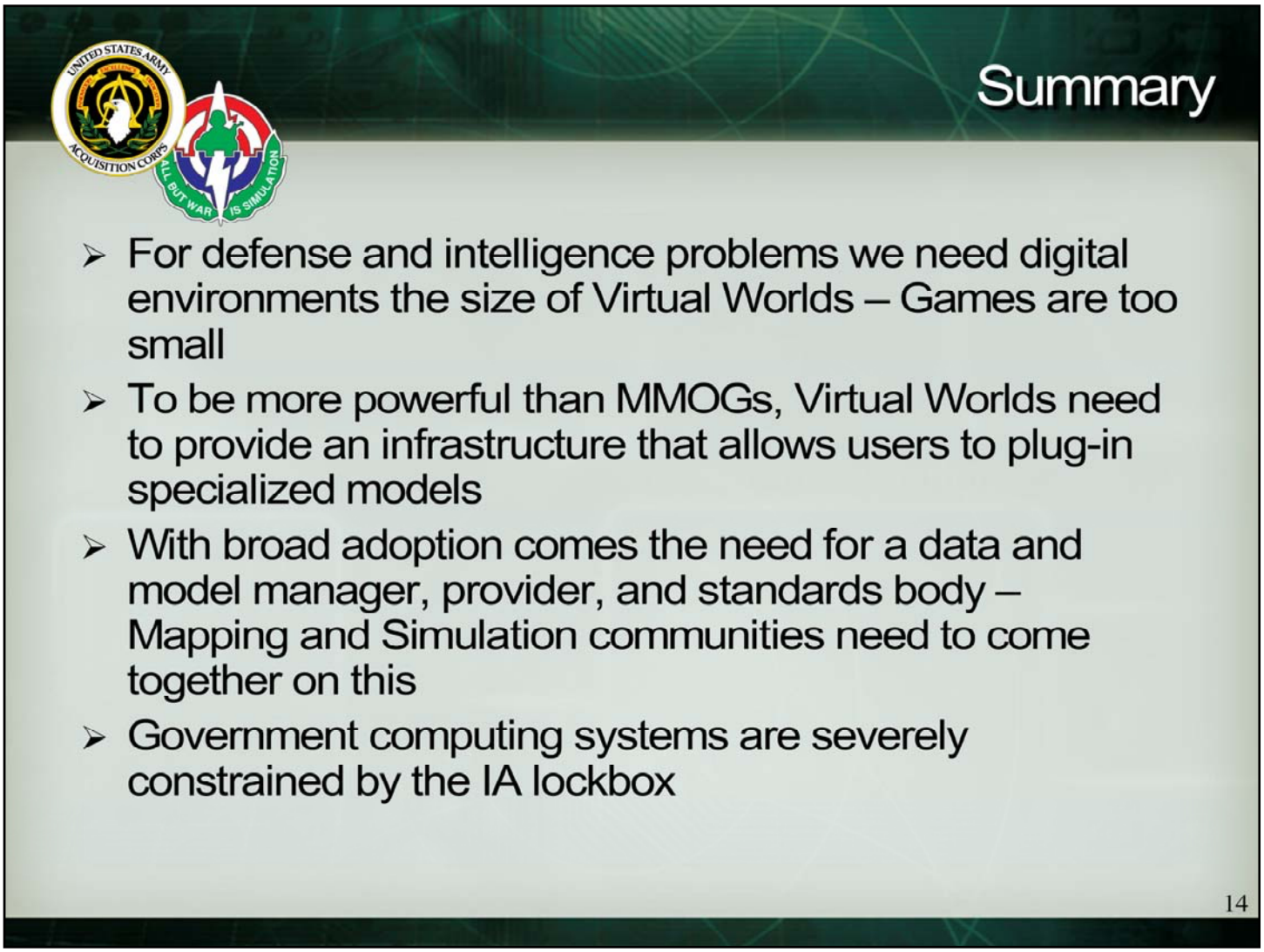
Access to the Army Model Exchange can be obtained at the web site listed. When registering for an account please list Major Jeremy MacDonald as your sponsor.

If you have questions please feel free to contact our Virtual Targets Project Director or our Virtual Targets Center Technical Manager listed on the slide. You may also discuss the Army Model Exchange with Ray Lowman who is attending the symposium.



NOTES

The primary barrier to government exploration and application of these technologies is the security lockbox that we have put ourselves into. We operate in a closed IT environment and force all of the interesting new ideas to evolve without us and remain outside of our walls. Our fears prevent us from being on the leading edge of using and understanding Games, Virtual Worlds, Web 2.0, and Digital Media services. Like a village disconnected from the outside world, we live in an small insulated community, our tools are becoming outdated, and we do not even know it until we come out into the light and see that the world has created new tools and gone off in new directions without us.



NOTES

Games are wonderful software tools. But they are very small. They create small environments that have limited applicability to large government problems. Virtual worlds are the beginnings of a game environment and game technologies that are large enough to be useful for major government problems. But today's Virtual Worlds are not that much different from MMOGs. They need to be environments in which the users can integrate their own data and models – and those will interact with thousands of others without special point-to-point software changes. If these environments do proliferate there will be a need to manage, create, and distribute the data, models, infrastructure, and standards that make them work. Who has the necessary expertise to do this? Finally, we are all constrained by living in a locked IT box. It does not allow us to explore new technologies as rapidly as we should be doing.