



I A R P A

BE THE FUTURE

# *Reynard Proposers Day*

## *IARPA-BAA-09-05 Overview*

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Office of the Director of National Intelligence (ODNI)



## *Disclaimer*

**This presentation is provided solely for information and planning purposes.**

**The Proposers' Day Conference does not constitute a formal solicitation for proposals or proposal abstracts.**



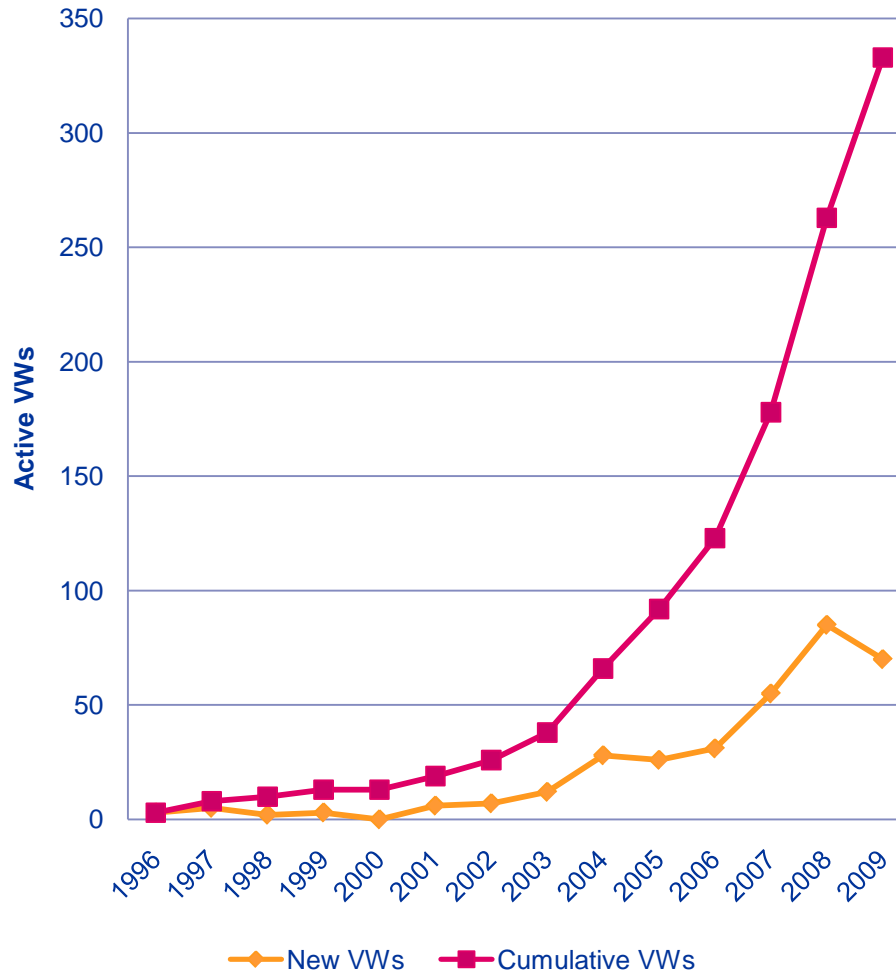
## *Today's Topics*

- Program Overview**
- Program Metrics and Milestones**
- Award Information**
- Eligibility Information**
- Application Review Information**



# Introduction

## Growth in Virtual Worlds by Year





# *Reynard Hypothesis*

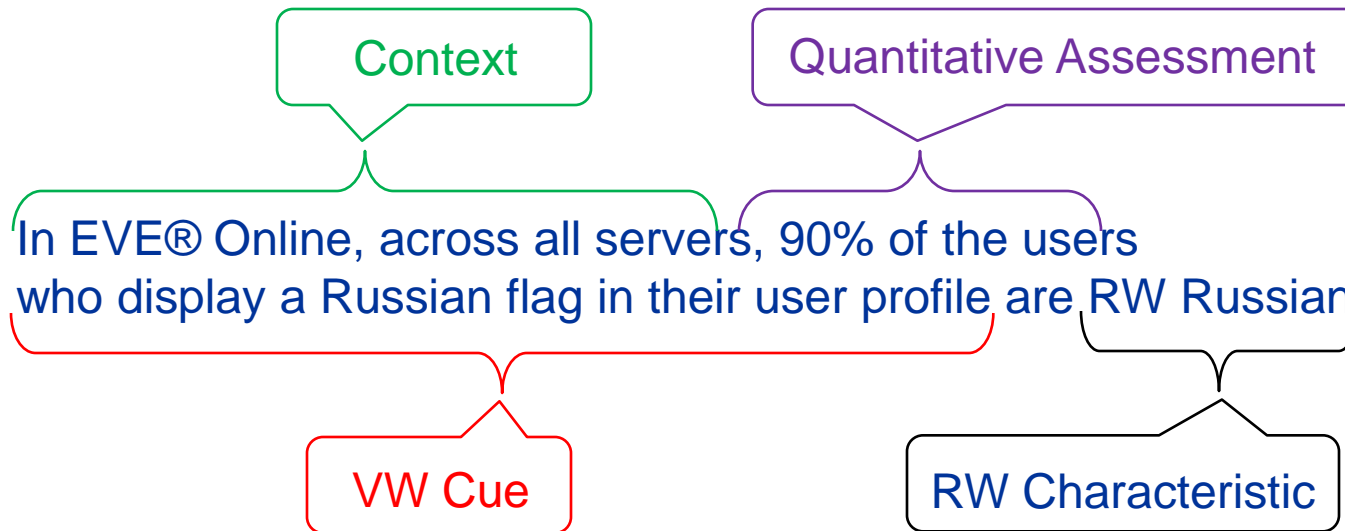


**Starting from the premise that Real World (RW) characteristics are reflected in Virtual World (VW) behavior, the Reynard program seeks to determine behavioral indicators in the realm of Massive Multiplayer Online Games (MMOGs) and VWs that are predictive of RW characteristics of the users.**



## *Behavioral Indicators*

- Quantitative statements regarding RW characteristics of the user, based on VW cues in a given context



### Example:

- In **Second Life™**, **Just Leap In™**, **World of Warcraft™** and **Warhammer™**, across all servers, 80% of users who chat in punctuated, English sentences are 35 years or older and have at least a high-school education



## *Reynard Virtual World Definition*

- ❑ “Virtual Worlds” or VW will be used to refer to both MMOGs and VWs
- ❑ **MMOGs**
  - typically quest-oriented
- ❑ **VWs**
  - primarily social







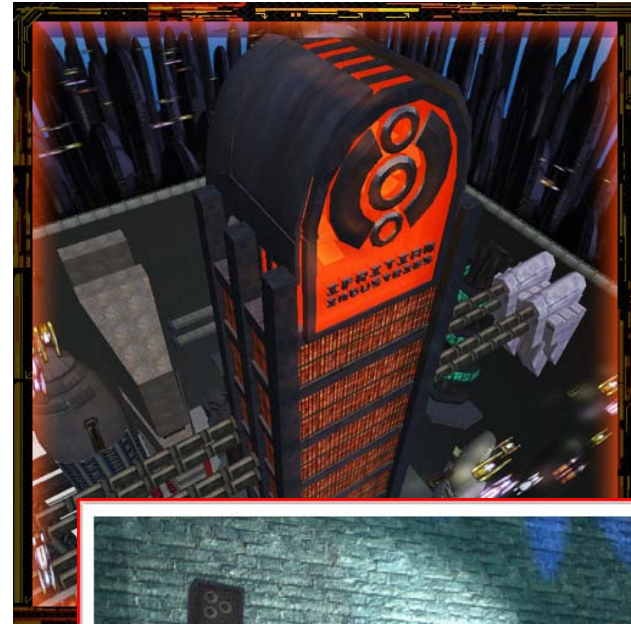
## Reynard Virtual World Definition

### □ Has the following characteristics:

- *graphical landscape*
- *avatars*
- *persistent*
- *massive*
- *goals*

### □ Not constrained by client hardware

- PCs, consoles, mobile phones
- Enables, or inhibits, expression of user behaviors





## Related Research

- Recent research indicates that RW behaviors do emerge in VWs (e.g., the norms for politeness)
  - Much published research is qualitative
  - Peer-reviewed, quantitative research just emerging

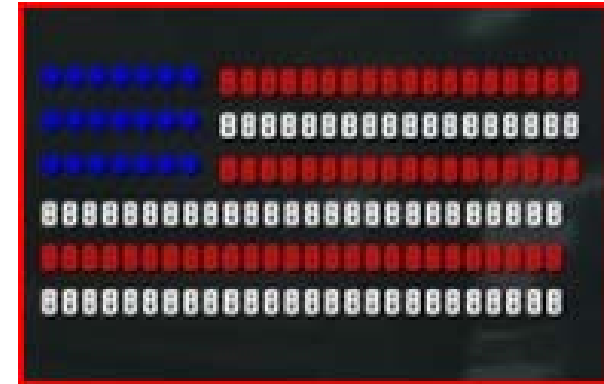




## Heuristics

### □ Example heuristics:

- Person is a RW adult or a RW child, based on complexity of their vocabulary
- Person is a technologist or scientist in the RW, based on names of groups or guilds
- Person is Russian, based on the national flag shown in their user profile



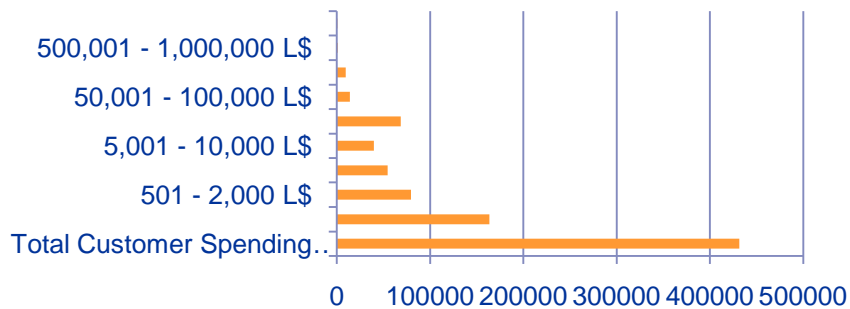
## Example Research

### Three example quantitative studies:

- Personal space use in Second Life™
- World of Warcraft™ guild size
- Economic decision making in Second Life™



Customer Spending In-World 2/09



<http://secondlife.com/statistics/economy-data.php>



## *Program Research Areas*

### ❑ **RW Attributes of interest:**

- **Gender**
- **Approximate age (child/young adult/older)**
- **Economic status (low/middle/upper)**
- **Educational level (primary/secondary/college)**
- **Occupation (management, technical, service, labor, educator, military, student)**
- **Ideology or “world view” (e.g., pacifist/militancy, multilateralism/unilateralism, etc)**
- **Degree of influence**
- **Digital native vs digital immigrant**
- **Approximate physical geographic location (e.g., North America, South America, Europe, Asia, Australia)**
- **Native language (e.g., English, German, French, Chinese, Japanese, Korean, Arabic, Russian, other)**
- **Culture (e.g., Western, Asian, Middle Eastern, Russian)**

Researchers are encouraged to propose additional attributes



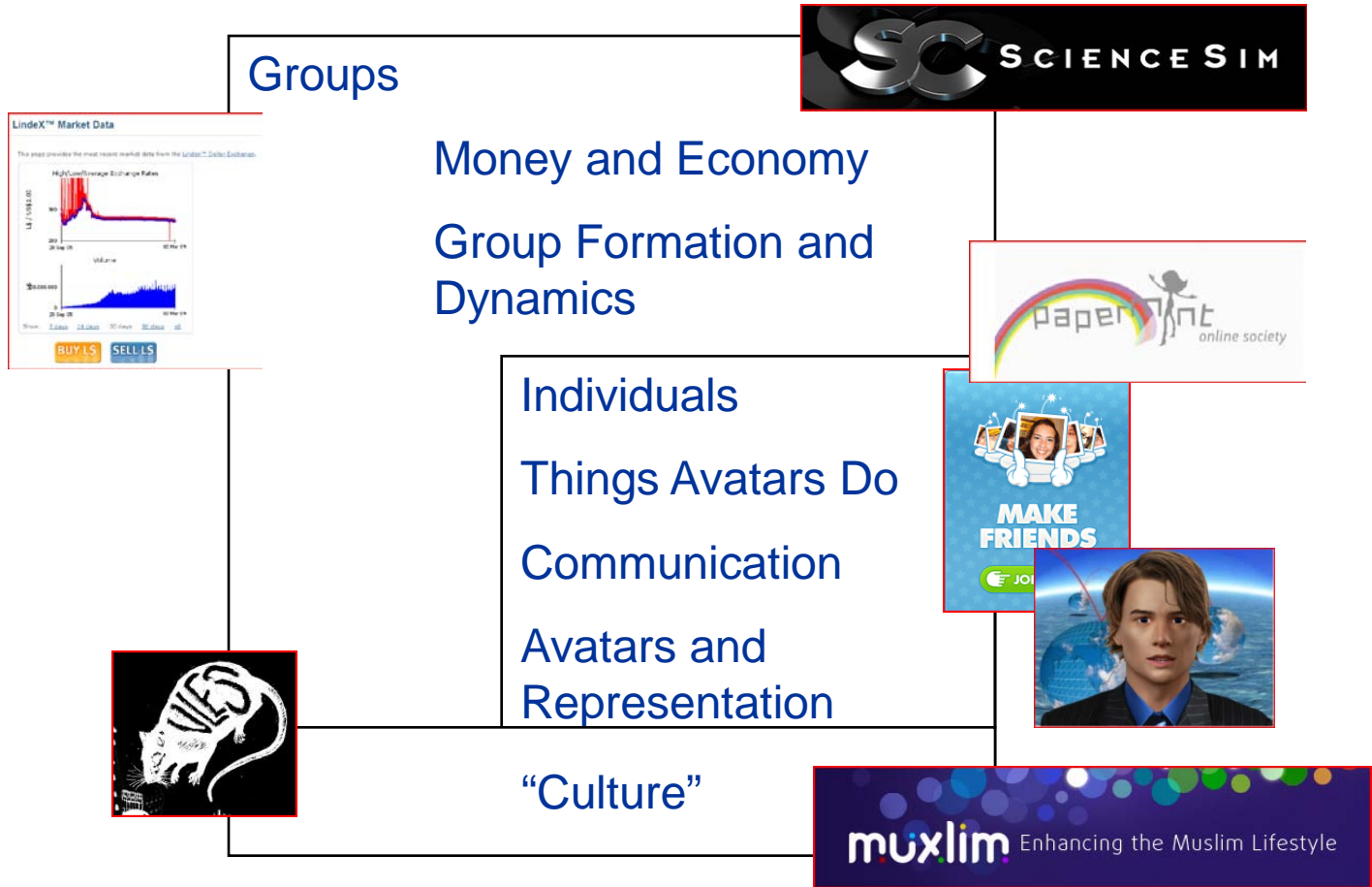
## Program Research Focus

- ❑ Literal mapping between RW and VW not always expected.
- ❑ Example: “Furries” in VW may never dress as animals in the RW!
- ❑ But: furries in VWs may have occupations in the creative arts



<http://francisanderson.wordpress.com/2008/01/28/links-for-2008-01-29/>

# Framework for Reynard Research Questions





## Understanding Cultural Differences

- ❑ Looking for study of non-U.S.-based players
- ❑ Compare similarities & differences in motivation, usage patterns, and behaviors across multiple cultures.







## *Specific Research Questions--Individuals*

### □ Avatars and Representation

- What characteristics of an avatar may reveal something about the real-life person behind it?
- What motivates avatar choice?
- Can we predict when an individual might select certain characteristics over others?
- Does avatar selection reveal something about an individual's real-life personal characteristics, attitudes, customs, groups, or culture?

### □ Verbal Communication

- Can we determine whether the person is a native-language speaker of the language (e.g., English) being used?
- Is the use of language in text chat characterized by a “signature,” similar to that found in other studies of authorship?
- Can the path of “viral ideas” be traced through the chat history of the residents, as it apparently can in exclusively text-based media, which may then allow inferences about the degree of influence of the propagators of the ideas?

# Specific Research Questions--Individuals

## ☐ Nonverbal Communication:

- When and why is nonverbal communication used?
- Does the use of nonverbal communication cues in VWs vary from RW culture to RW culture?
- What, if anything, might the use of VW nonverbal communication reveal about the RW person?



## ☐ Things Avatars Do

- To what extent might cues in activities provide indicators about the RW person?
- Do individuals from different RW cultures choose to engage in different sorts of VW activities?



## Specific Research Questions--Groups

### □ Group Formation

- What types of groups form, what are their characteristics, and what supports their continuance?
- Does group membership reveal anything about the RW individuals who belong to them?



# Specific Research Questions--Groups

## □ Group Dynamics

- Given the multi-national nature of some VWs, are individuals from different countries more likely to form relationships than in the RW?
- Do individuals recognize others as from the same culture or different cultures?
- Do VW residents establish more or less numerous relationships than in their RW relationships?
- To what extent are VW relationships driven by RW relationships?



# Specific Research Questions--Economics

## □ Economics

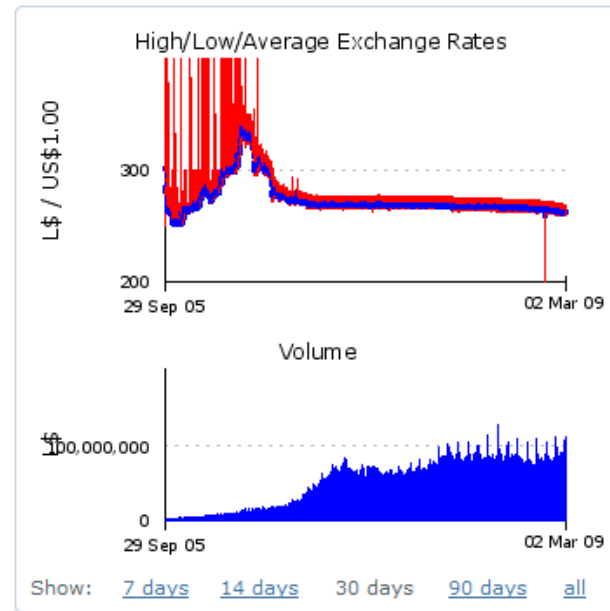
- Do certain economic decisions or activities vary depending on the culture or nationality of the user?

## □ Money

- Does handling of VW currency vary depending upon the RW culture of the user?
- What inferences can be drawn about the RW individual based on their treatment of VW goods and currencies?

### LindeX™ Market Data

This page provides the most recent market data from the [Linden™ Dollar Exchange](#).



BUY L\$

SELL L\$



## *Other Research Proposal Considerations*

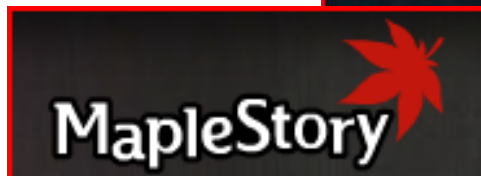
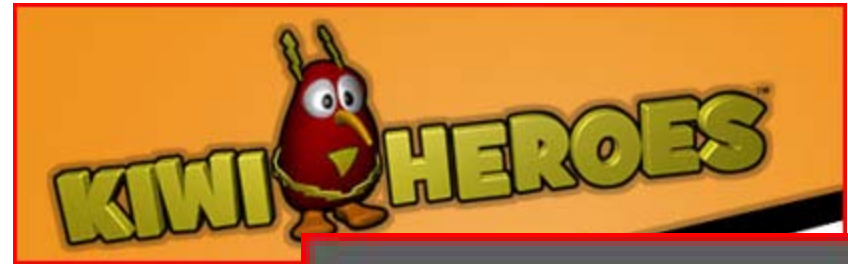
- Demonstrate knowledge of VW and its suitability for the research
- Non-U.S.-based players – data sources
- Overall demographics of the VW
- Demographically heterogeneous set of VWs vs single demographically homogeneous VW.





## Other Research Proposal Considerations

- ❑ Minimum of 4 RW attributes
- ❑ Multiple hypotheses or approaches for deriving behavioral indicators





## Out Of Scope

- ❑ Large investment in construction of new VWs.
- ❑ New VW software applications.
- ❑ VW software architectures.
- ❑ Development of new interface mechanisms, such as hardware peripherals that are alternatives to the keyboard and mouse.
- ❑ Research on PC, console, or mobile platform improvements for VWs.
- ❑ Enhancing the game or VW experience through use of artificial intelligence or improved graphics.
- ❑ Study of the impact of the VW environment on RW attitudes, beliefs, and behaviors.

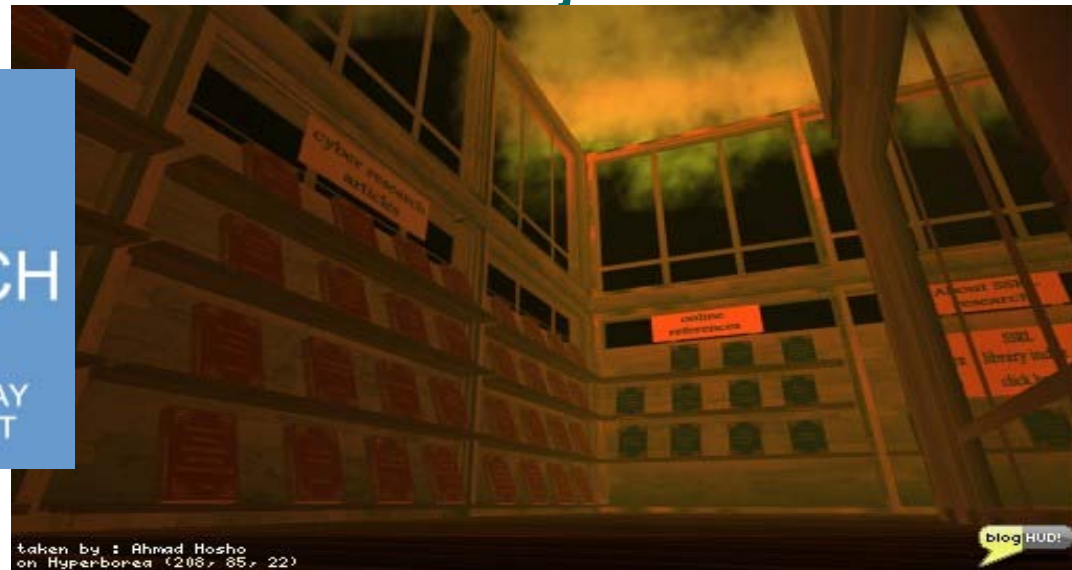
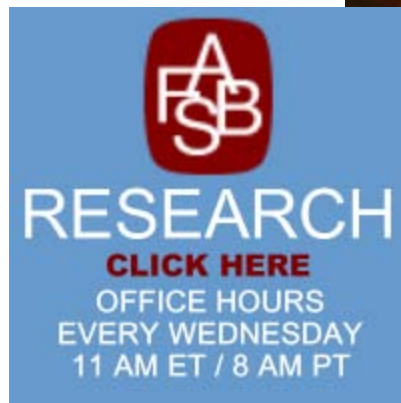






## Acceptable Research Methodologies

- ❑ **Some example research methods include:**
  - Ethnographic methods, such as participant observation or interviews, in VWs
  - Experimental studies in VWs
  - Experimental studies in a Real-World laboratory environment with a stand-alone VW(s)
  - Analysis of log data from VWs
  - Large-scale survey research
  - Case Studies
- ❑ **Specify mitigation strategy for the weaknesses of chosen method**
- ❑ **Validate the RW characteristics of subjects.**



taken by : Ahmad Hoshu  
on Hyperborea (208, 85, 22)



## *Other Research Method Considerations - 1*

- Must provide own virtual and/or real laboratory facilities**
- Specify:**
  - **Number of human subjects**
  - **Number of unique characters and/or end-users**
  - **Planned length of the data gathering period**
- Quantitative research methods**
  - **Qualitative methods may be used as an adjunct, to inform the direction of the quantitative research, or to help interpret the results of the quantitative research.**
- Sample size**
- Control for “experiment farming”**



## ***Other Research Method Considerations - 2***

- Technique(s) for safeguarding privacy**
  - **An important evaluation criteria in proposal review**
  - **Safeguard data sets from accidental release or malicious intrusions.**
- Must comply with all U.S. laws, End User License Agreements (EULA), Terms of Service (ToS), and Privacy Policies of the VW(s)**
- Must include appropriate techniques for safeguarding Personally Identifiable Information (PII), including avatar names**

See the section on Civil Liberties and Privacy Protection Measures for more details



## *Other Research Method Considerations - 3*

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- IARPA will not receive any raw data
- National Institute of Standards and Technology (NIST) is Reynard's Validation Team.
  - Data set access may be provided to NIST as needed
- NIST will retain data access no longer than 12 months after the conclusion of Period of Performance



# *Civil Liberties and Privacy Protection Measures*

- Must address the following (as applicable):**
  - **Comply with federal policy for protection of human subjects in research**
  - **Receive approval from their Institutional Review Board**
  - **Obtain informed consent from subjects of active experimentation**
  - **Employ techniques to protect privacy and confidentiality**
- Compliance with the End User License Agreement (EULA), Terms of Service (ToS), and Code of Conduct (CoC)**
- Annual review by Reynard PM and ODNI Civil Liberties and Privacy Office**



# Questions?

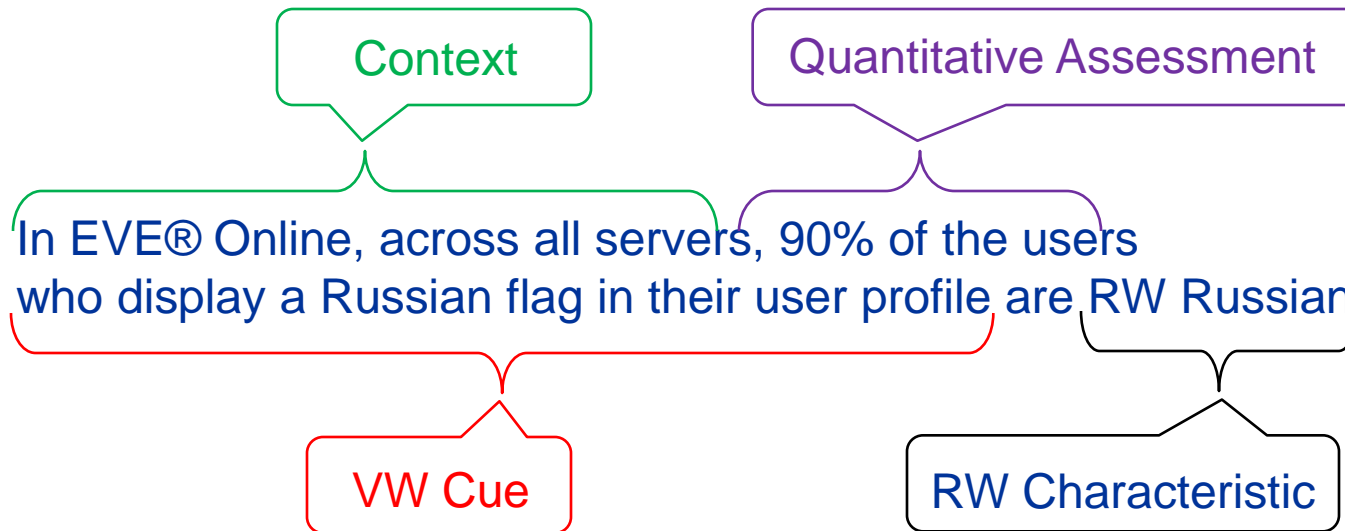


# Reynard Program Proposers Day Program Metrics & Milestones



## *Behavioral Indicators, again*

- Quantitative statements regarding RW characteristics of the user, based on VW cues in a given context



### Example:

- In **Second Life™**, **Just Leap In™**, **World of Warcraft™** and **Warhammer™**, across all servers, 80% of users who chat in punctuated, English sentences are 35 years or older and have at least a high-school education





## Research Program Metrics

- 3 years: 2 Phases of 18 months each
- Phase 1 and Phase 2 Metrics:

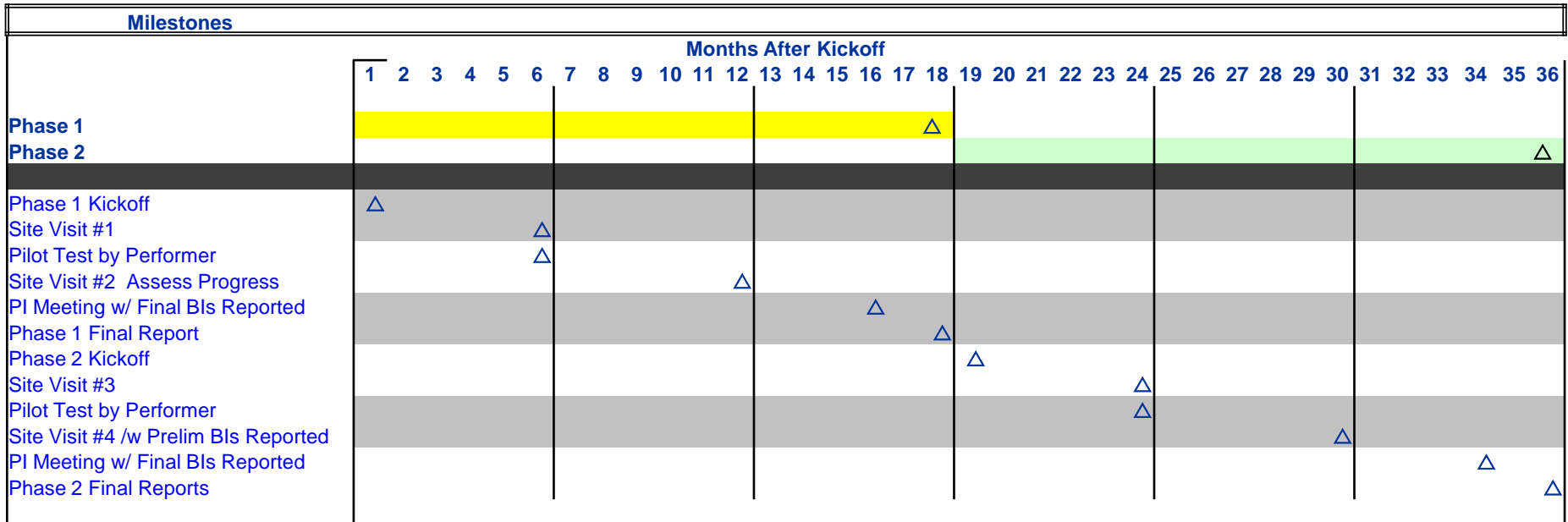
RW Characteristic	Target Minimum Probability Value: Phase 1	Target Minimum Probability Value: Phase 2
<b>Gender</b>	<b>0.75</b>	<b>0.90</b>
<b>Approximate Age (minor/young adult/older)</b>	<b>0.70</b>	<b>0.85</b>
<b>All other RW Characteristics</b>	<b>0.60</b>	<b>0.75</b>

Performers should also report on the confidence limits associated with the estimated probabilities

Proposers should suggest additional specific metrics that will enable the program manager to assess their progress



# Reynard Research Milestones



The Reynard Program is envisioned to begin in the fourth quarter of Fiscal Year 2009 and end by 2012



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# Questions?



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# AWARD INFORMATION



## *Award Plan*

- ❑ **3-year Program starting FY4Q2009**
  - Phase 1 - Base Period - 18 months
  - Phase 2 - Option Period - 18 months
- ❑ **Criteria for moving to Phase 2: sufficient progress in achieving Phase 1 metrics**
- ❑ **Multiple awards anticipated, depending upon**
  - quality of the proposals received
  - availability of funds



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# ELIGIBILITY INFORMATION



# *Eligible Applicants*

- ❑ **Collaborative efforts/teaming strongly encouraged**
  - **Content, communications, networking, and team formation - responsibility of proposers**
- ❑ **Foreign organizations and/or individuals may participate**
  - **Must comply with Non-Disclosure Agreements, Security Regulations, Export Control Laws, etc, as appropriate**



## *Ineligible Organizations*

- ❑ Other Government Agencies, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and any organizations that have a special relationship with the Government, including access to privileged and/or proprietary information, or access to Government equipment or real property, are not eligible to submit proposals under this BAA or participate as team members under proposals submitted by eligible entities.**





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# APPLICATION REVIEW INFORMATION



## *Evaluation Criteria*

Evaluation criteria in descending order of importance are:

- Overall Scientific and Technical Merit**
- Effectiveness of Proposed Work Plan**
- Relevance to IARPA Mission and Reynard Program Goals**
- Relevant Experience and Expertise**
- Cost Realism**



# *Meeting and Travel Requirements*

- Plan for 1) Program Kick-off meeting and 2) Program Review in each phase**
  - in Metropolitan DC area
  - to facilitate an open exchange among all Program participants
- Each meeting 2-3 days**
- Periodic site visits**



# *Human Subjects*

- Must provide evidence of, or a plan for, review by an Institutional Review Board (IRB) upon final proposal submission to IARPA**
- Allot ample time to complete the approval process**
- No IARPA funding can be used towards human subjects research until ALL approvals are granted**



# *Publication Approval*

- Pre-publication approval may be required for sensitive information**
- Any award may include a requirement for pre-pub review**
- Soft copy to:**
  - **the IARPA Reynard Program Manager and**
  - **the Contracting Officer Representative (COR)**



## *Reporting*

- Minimum requirement: monthly technical and financial status reports**
- Final report**



## *Point of Contact*

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Thank You!  
Any Final Questions?



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