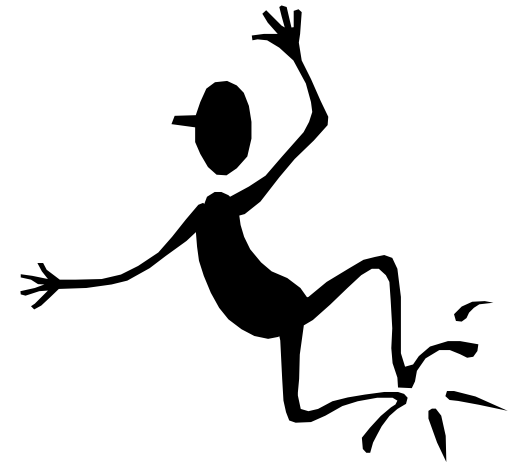


The Intelligent Systems & Information Management Laboratory

Costas Tsatsoulis, Director



University of Kansas



Research Goals

- Develop new methodologies and theories in Artificial Intelligence, Intelligent Agents, Information Retrieval from Heterogeneous Sources, and Data Mining
- Implement these new methodologies and apply them to real-world problems of information management



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Current Projects

- Agent-based information dissemination
- Automated characterization of information sources
- Corpus Linguistics for IR
- Learning user information need profiles
- Adaptive multiagent systems
- Evolutionary agent architectures
- Data mining of very large databases
- Temporal segmentation of video sequences
- Content-based searching of digital video and image libraries
- Multisensor data fusion
- Performance of CORBA-based agent systems
- Systems-level implementation of physically distributed agent systems



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Current Sponsors

- DARPA
- NIH
- NSF
- NRL
- US Dept. of Education
- KEURP
- State of Kansas (KTEC)
- Sprint Corp.
- Lucent
- WBN



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Affiliated Faculty

- Arvin Agah (USC, 1995)
 - Software agents, evolutionary and biologically-inspired agent architectures, robotics, telepresence, enhanced reality, multimedia
- John Gauch (University of North Carolina, 1989)
 - image processing, computer vision, data fusion, video segmentation, computer graphics, motion analysis
- Susan Gauch (University of North Carolina, 1990)
 - Corpus linguistics, information retrieval, multimedia, distributed information sources



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Affiliated Faculty

- Douglas Niehaus (University of Massachusetts, Amherst, 1994)
 - high performance networks, real-time systems, operating systems, systems-level issues of distributed agents
- W.M. Kim Roddis (MIT, 1988)
 - Artificial intelligence applications to engineering, qualitative, quantitative, and causal reasoning
- Costas Tsatsoulis (Purdue University, 1987)
 - Multiagent systems, artificial intelligence, KDD, CBR, intelligent image analysis and recognition



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Intelligent Agents for Information Dissemination

Costas Tsatsoulis, PI

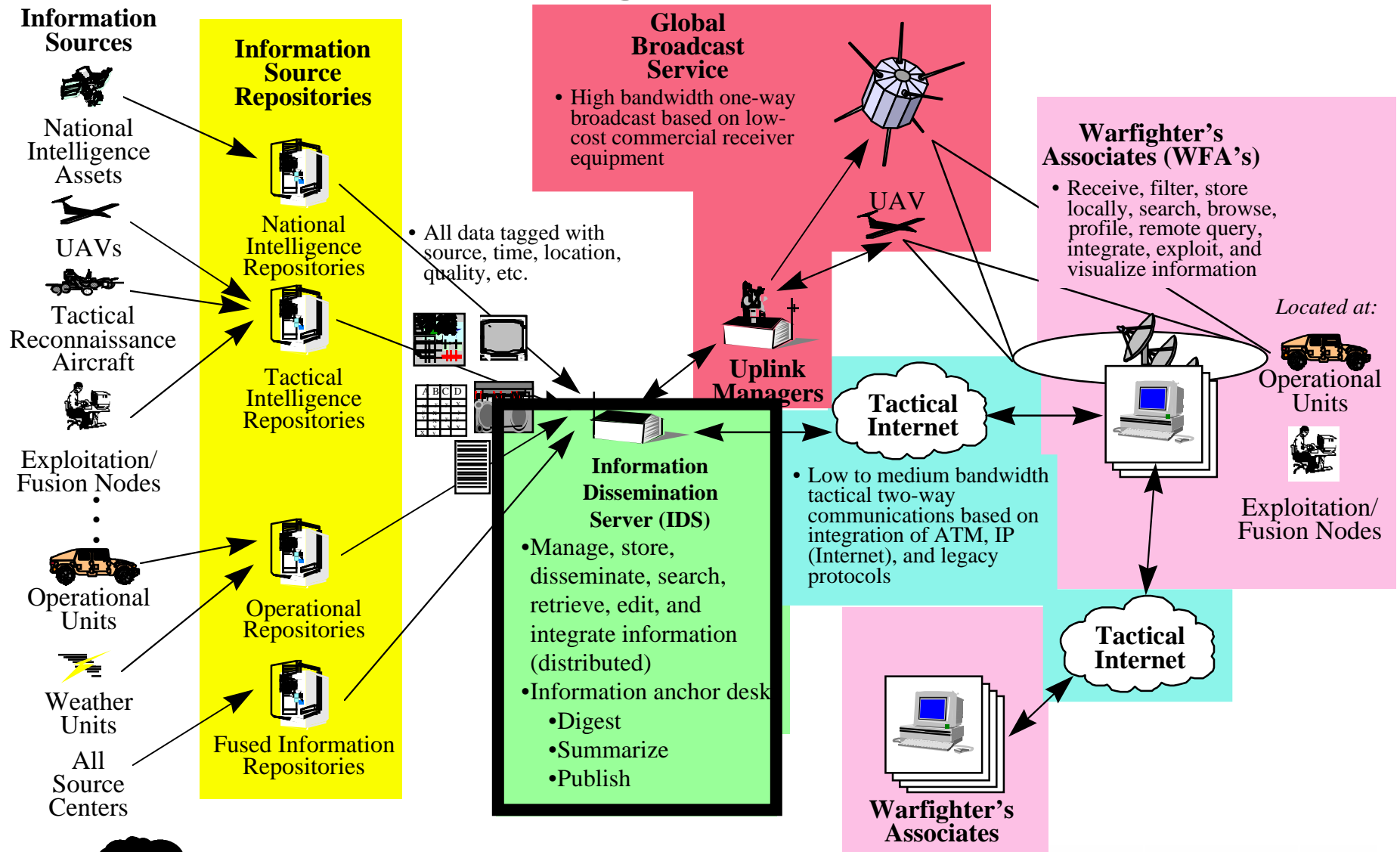
**Supported by DARPA
I3 (IIDS) and BADD projects**



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BADD Program Concept



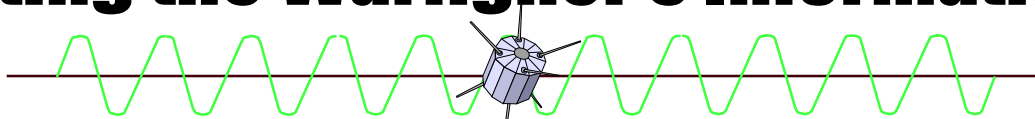
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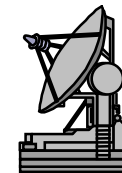
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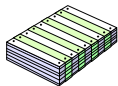
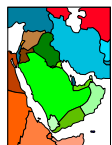
Supporting the Warfighter's Information Rqts



Global Broadcast Service

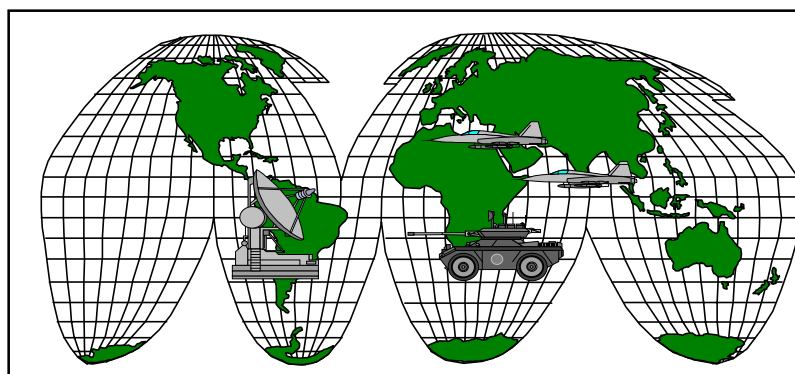


- *Assemble Information from Heterogeneous Sources*
- *Tailor Content for User Role and Task*
- *Update Information as Situation Changes*
- *Organize Information based on Semantic Relationships*

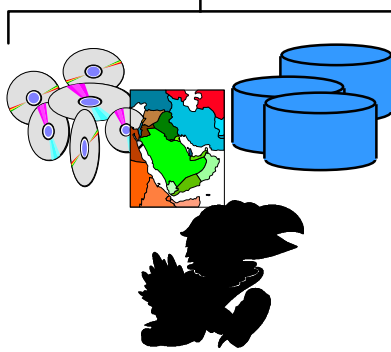
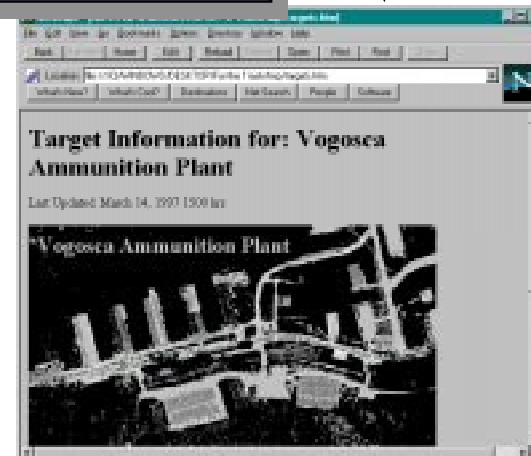


City	Cur Temp	Hi Temp	Lo Temp
Vogosca	54°	65°	33°
Naukice	36°	45°	25°
Proskice	40°	42°	35°

User Information Requirements



World Situation
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KU's BADD Team

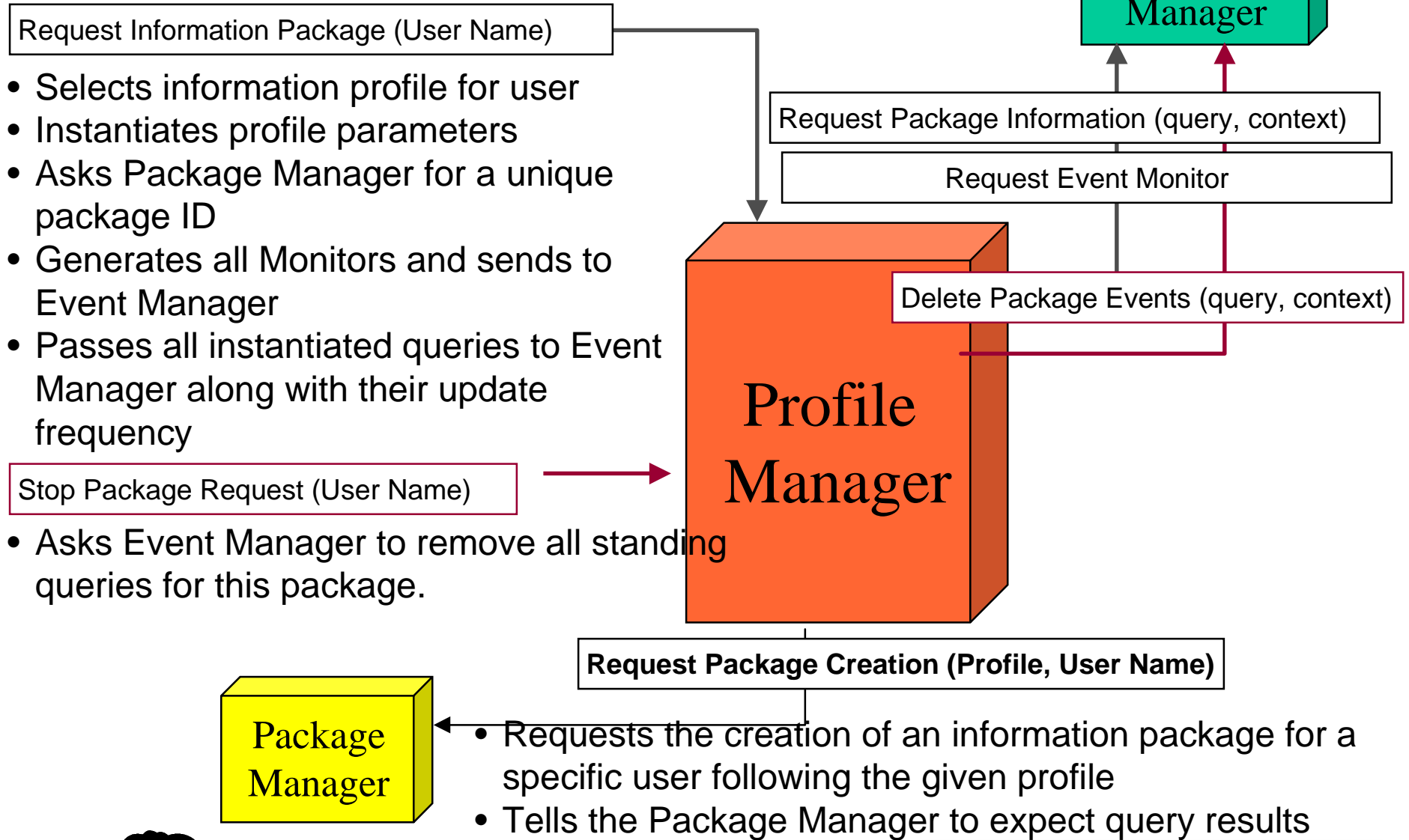
- KU, Stanford, and Lockheed-Martin
- KU's responsibility is the Profile Mgr
- Manages profiles, creates events for monitoring, anticipates information need changes, learns new profiles and anticipation rules



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Profile Manager



Information Profile Definition

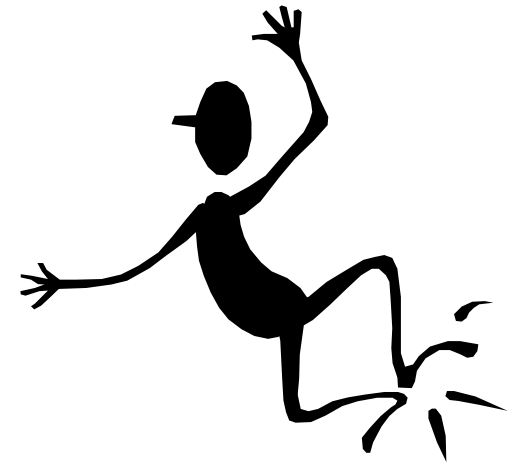
<i>Page Header</i>	IFOR Headquarters Information Package
<i>Page Body</i>	<i>Report</i> Get target information with resolution \$RESOLUTION
	<i>Query:</i> select xx from xx where xx
	<i>Package format:</i> image {inline}
	<i>Frequency:</i> Every 1 hour
	<i>Events:</i> 1. Every 1 hour 2. If unit moves more than 30 miles, then send alternate sensor data
<i>Rule:</i> If (\$LOCATION=city) then \$RESOLUTION=100 If (\$LOCATION=dessert) then \$RESOLUTION=300 If (\$LOCATION=mountain) then \$RESOLUTION=200 If (\$MISSION=night) then \$RESOLUTION=50 Default \$RESOLUTION=250	
<i>Page Footer</i>	Prepared on \$date



Data Discovery in Very Large Databases of Blood Events

Costas Tsatsoulis, PI

Supported by NIH



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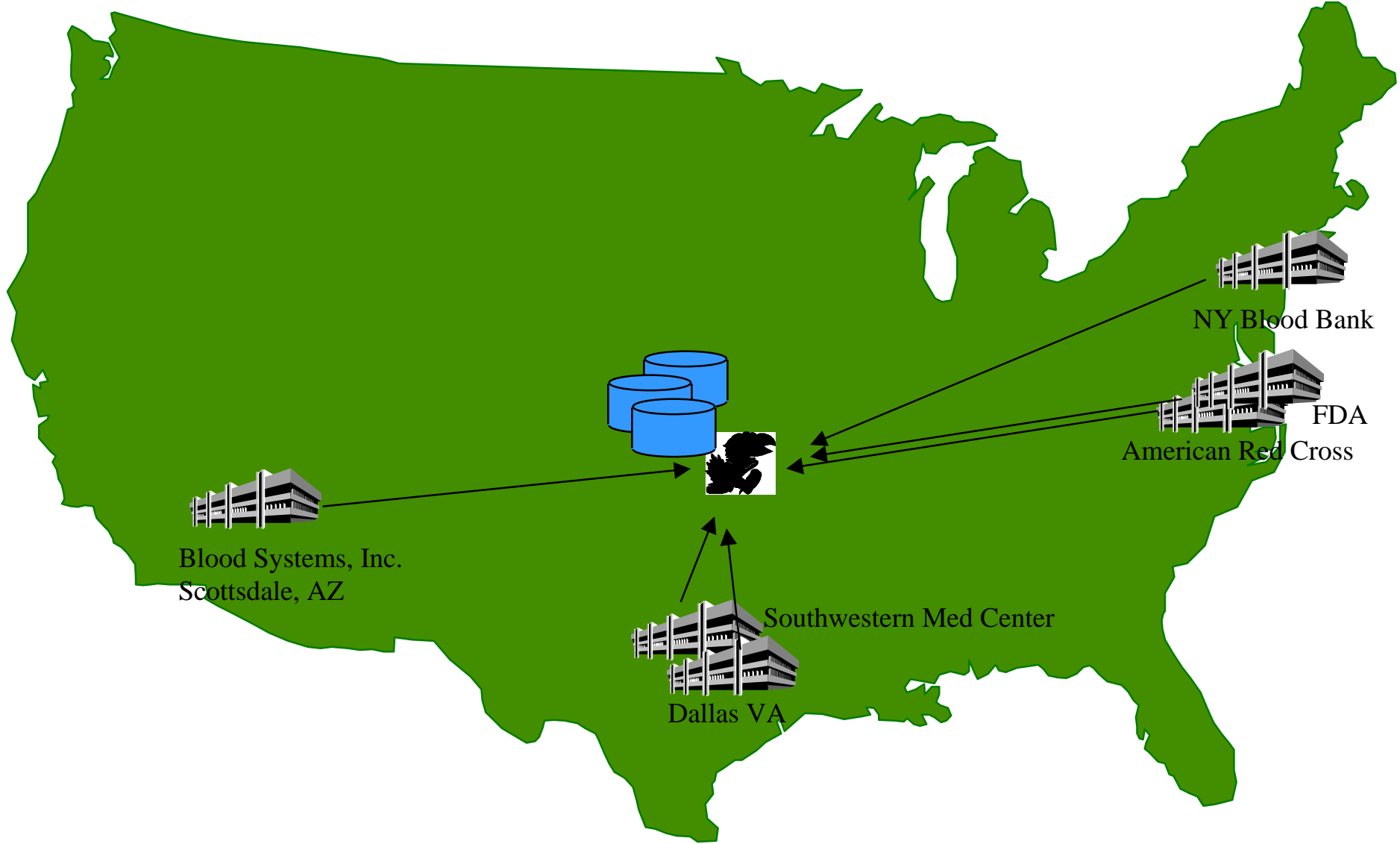
Goals

- Collect large database of blood handling events
- Use machine learning and data mining tools to discover novel, useful patterns
- Interact with blood banks and hospitals to identify knowledge from these patterns



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Blood Systems, Inc.
Scottsdale, AZ

NY Blood Bank

FDA
American Red Cross

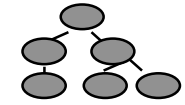
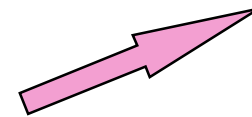
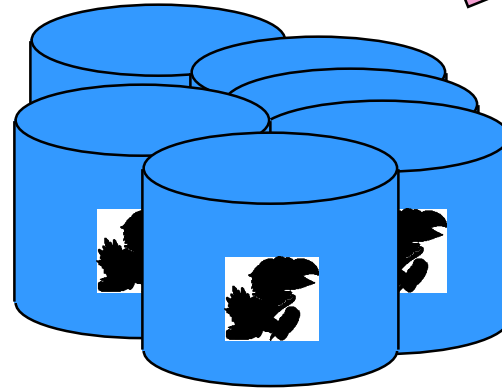
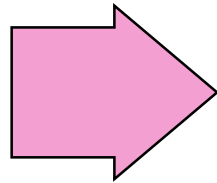
Southwestern Med Center
Dallas VA



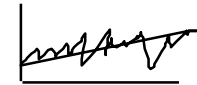
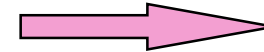
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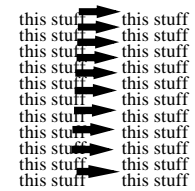
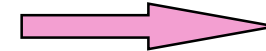
Cobweb
ID3
C4.5
Bayesian
Autoclass
SNOB
Apriori
ANN



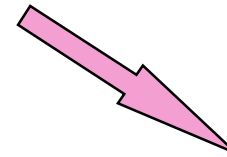
Clusters



Trends



Causality



this is a rule
this is a rule
this is a rule
this is a rule
this is a rule
this is a rule
this is a rule
this is a rule

Rules



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