

15th ICCRTS
“The Evolution of C2”
June 24, 2010



Priority Intelligence Requirement Answering and Commercial Question-Answering: Identifying the Gaps

Brian Ulicny, PhD

Christopher J. Matheus, PhD

Michael Coombs, PhD

VISTology, Inc.

Framingham, MA USA.

[b](mailto:{bulicny,cmatheus,mcoombs}@vistology.com)

Gerald M. Powell, PhD

U.S. Army Research

Laboratory Fort Monmouth,
NJ, U.S.A

gerald.m.powell@us.army.mil

Mieczyslaw M. Kokar, PhD

Northeastern University

and VISTology, Inc.

Boston, MA USA

mkokar@ece.neu.edu

Outline

- Disclaimer
- Priority Intelligence Requirements
- Question-Answering Technologies
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- Conclusion

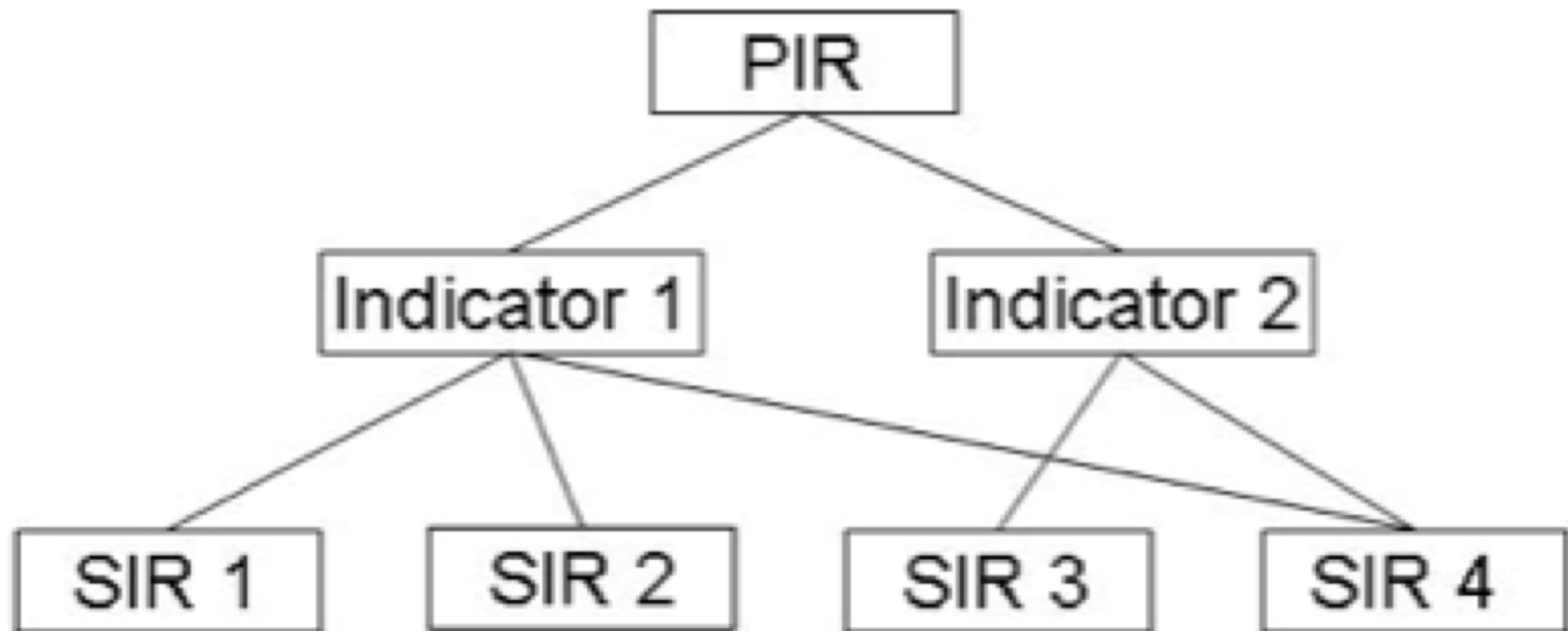
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This paper does not represent an endorsement by the Army Research Laboratory of any of the commercial products discussed.

Priority Intelligence Requirements: Doctrine

- Priority Intelligence Requirements (PIRs) are “those intelligence requirements for which a commander has an anticipated and stated priority in his task of planning and decision making”
 - FM 2-0 “Intelligence, section 1-32
- Ask a single question.
- Are ranked in importance.
- Are specific: Focus on a specific event, fact or activity.
- Are tied to a single decision or planning task the commander has to make.
- Provide a last time by which information is of value (LTIOV).
- Are answerable using available assets and capabilities.
 - McDonough, LTC W. G., Conway, LTC J. A., “Understanding Priority Intelligence Requirements”, Military Intelligence Professionals Bulletin, April-June 2009.


Priority Intelligence Requirements: Structure




Question-Answering Technologies by Data Representation Type

Information Source Representation	Common Application	Advanced Application
Tables (Relational databases, spreadsheets, etc.)	Structured Query Language (SQL)	Wolfram Alpha
Text	Web search engines (Google, Ask, etc.)	TREC QA track; Aquaint (Advanced Question-Answering for Intelligence) systems
Tagged Text	Google Patent Search	Metacarta; Semantic MediaWiki; Palantir
Logic Statements	Prolog	Powerset (Microsoft Bing); Cyc
Trusted Teammates (Personal Knowledge)	Personal communication	Yahoo! Answers; Army Intelligence Knowledge Network Shoutbox

Structured Data Q-A: Wolfram Alpha

 computational... knowledge engine

Where was Elvis born? 


Input interpretation:
Elvis Presley place of birth

Result:
Tupelo, Mississippi, United States

Populations: [Show history](#)

city population	36 233 people (2008 estimate) (country rank: \approx 1115 th)
urban area population	37 365 people (2000 estimate) (country rank: 543 rd)
metro area population	134 161 people (2009 estimate) (country rank: 305 th)

Location: [World map](#) | [Show coordinates](#)



[Satellite image >](#)

Country data source information

▼ Primary source:

- Wolfram|Alpha knowledgebase, 2010.
- Wolfram *Mathematica* CountryData »

► Background sources and references:

People data source information

▼ Primary source:

- Wolfram|Alpha knowledgebase, 2010.

▼ Background sources and references:

- BrainyMedia.com. *BrainyHistory*. »
- Charles Scribners Publishing. *Concise Dictionary of Scientific Biography*. (2nd ed.) The Gale Group, 2000.
- Encyclopedia Britannica Company. *Britannica Concise Encyclopedia*. Encyclopedia Britannica, Inc., 2007.
- Encyclopedia Britannica Company. *Encyclopedia Britannica* Vol. XXVI. (11th ed.) Cambridge University Press. 1911.

Text: Google

[Advanced Search](#)

Web [+ Show options...](#)

Results 1 - 10 of about 8,200,000 for where was elvis born. (0.26 seconds)

[Where was Elvis Presley Born?](#)

Frequently asked questions about **Elvis** and his birthplace.

[memphis.about.com/od/elvis/ff/elvisbirth.htm](#) - [Cached](#) - [Similar](#) - [Comment](#) [Share](#) [Close](#)

[Where was Elvis Born?](#)

Question: Was **Elvis** Actually **Born** in Memphis? Answer: No. **Elvis** was **born** in a two room house in Tupelo, Mississippi. He and his family moved to Memphis in ...

[memphis.about.com/od/memphismusicfaq/ff/elvisborn2.htm](#) - [Cached](#) - [Similar](#) - [Comment](#) [Share](#) [Close](#)

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[Elvis Presley - Wikipedia, the free encyclopedia](#)

Elvis Presley was **born** on January 8, 1935, in Tupelo, Mississippi, to Vernon **Elvis** and Gladys Love Presley. In the two-room shotgun house built by his ...

[en.wikipedia.org/wiki/Elvis_Presley](#) - [Cached](#) - [Similar](#) - [Comment](#) [Share](#) [Close](#)

[Elvis Presley biography: life of Elvis Presley: Elvis Aaron Presley](#)

Elvis Aaron Presley, in the humblest of circumstances, was **born** to Vernon and Gladys Presley in a two-room house in Tupelo, Mississippi on January 8, 1935. ...

[www.elvis.com/elvisology/bio/elvis_overview.asp](#) - [Cached](#) - [Similar](#) - [Comment](#) [Share](#) [Close](#)

[Elvis Presley](#)

Gladys, **Elvis** and Vernon Presley 1937. **Born** January 8, 1935, in East Tupelo, Mississippi, Presley was the son of Gladys and Vernon Presley, a sewing machine ...

[www.history-of-rock.com/elvis_presley.htm](#) - [Cached](#) - [Similar](#) - [Comment](#) [Share](#) [Close](#)

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Headline	Place	Date
Castro a success all along	Great American Ball Park	5/8/2010
Cinematic Titanic: Santa Claus Conquers The Martians	Bethlehem	5/8/2010
AFN honors Elvis-loving Fairbanks minister Anna Fra	1205 Denali Way Fairbank	5/8/2010
Morris Pert: musician and composer	Arbroath	5/8/2010
Interview: John Flansburgh of They Might Be Giants	Brooklyn,San Francisco	5/8/2010
Scotlands guiding Shand can be seen at every music	Prestwick Airport,Hebrides	5/7/2010
Letters: So glad we can feel safer	Memphis,Tennessee,Colli	5/7/2010
Hues of Deep Purple	Perth, Australia	5/7/2010
Explore Mississippi's Affordable Adventures	Clarksdale,Mississippi,Indi	5/6/2010
Can native son Uncle Sam raise a little cash for town	Arlington	5/6/2010
Katrina and all that jazz	New Orleans	5/6/2010
Scotland's guiding Shand can be seen at every music	Prestwick Airport,Hebrides	5/6/2010
Nobunny does it better	Tucson, Arizona	5/6/2010
Selling Uncle Sam	Arlington	5/6/2010
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The Features: Reviews of Features at the Maryland F	12th Street and Delaware	5/5/2010
Find out what these celebrities were called before the	England,Tallulah	5/4/2010
Interview: Willie Nelson	Austin, Texas,Buckingham	5/4/2010
LATEST NEWS: Ivory Joe Hunter's grave will receive	Port Arthur,Kirbyville	5/3/2010
Locals take Beach Blanket stage	Beach Blanket Babylon,Se	5/3/2010
Costello wraps up season, perhaps even series itself	Apollo Theater	5/3/2010

Map

Road Aerial Hybrid

Mississippi
Explore Mississippi's Affordable Adventures

Displaying articles 1 - 100 of 381

Logic-Based Q-A: Powerset

Powerset

Wikipedia Articles

Where was Elvis born?

Wikipedia Articles

- ▼ [Elvis Presley](#) Born in **Tupelo**, Mississippi, **Presley** moved to Memphis, Tennessee, with his family at the age of 13. ... Best received by critics **was Elvis Country**, a concept record that focused on genre standards.
- ▼ [Elvis \(disambiguation\)](#) Saint **Elvis** of Munster (5th century), Irish bishop **Elvis Brajković** (born 1969), retired Croatian football player
- ▼ [Kjell Elvis](#) Kjell Henning Bjørnstad (known as **Kjell Elvis** or **K. Elvis**) (born March 12, 1968), is a Norwegian professional **Elvis** impersonator: He is an **Elvis** look alike and has had plastic surgery to look more like **Elvis**. ... **Kjell Elvis** was born in **Farsund**, was raised in Vanse, and currently resides in Lyngdal.
- ▼ [Elvis Stojko](#) **Elvis** Stojko, MSC, MSM (born March 22, 1972) is a Canadian figure skating world champion. ... **Elvis** was born in **Newmarket**, Ontario and grew up in Richmond Hill, Ontario.
- ▼ [Ahyee Aye Elvis](#) **Ahyee Aye Elvis** (born 13 December 1983 in **Abidjan**, **Ivory Coast**) is an Ivorian footballer, currently playing for Sogndal Fotball. **Ahyee Aye Elvis** can play in both defence and midfield, and signed for Sogndal on 31 August 2004 after having played for Stella Abidjan in **his** homeland.
- ▼ [Elvis Costello](#) Declan Patrick Aloysius MacManus (born 25 August 1954), known by the stage name **Elvis** Costello, is an English singer-songwriter of Irish heritage. He came to prominence as an early participant in London's pub rock scene in the mid-1970s and later became associated with the New Wave musical genre.
- ▼ [Elvis \(TV miniseries\)](#) **Elvis** is a 2005 CBS mini-series. ... Nine months after Presley and Beaulieu are married, Presley's only child, Lisa Marie, is **born**.

Social Q-A: Yahoo! Answers



ozgurmul...

Resolved Question

[Show me another »](#)

In Turkish wikipedia it says Elvis Presley was born in izmir and was dead in İstanbul. Is it true?

2 months ago

[Report Abuse](#)




TheBrain

Best Answer - Chosen by Voters

He was born in Tupelo, Mississippi and died in Memphis Tennessee. The bad thing about wikipedia is that anybody can anter basically whatever they feel like. You can go and change it yourself if you like, just press where it says "Değiştir" and you will be able to edit the article.

2 months ago

 **100% 2 Votes**

[Report Abuse](#)



Is this what you are searching for?

18%
Best answer

72 answers

Member Since: November 16, 2009

Total Points: 396 (Level 2)


Points earned this week: 0

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Social Question-Answering: Vark

Share this link: <http://vark.com/t/8ffcd7>  Post to Twitter  Post to Facebook Allow sharing

May 15, 2010 | Question about **Elvis** [edit label](#)


 You Does anybody know where Elvis was born? I don't need the date, just the location.

[delete conversation](#)

Answer 1
+ 1 minute

 **Gregory W.**
30 / M / Oakland, CA Tupelo, Mississippi

 You Thanks!

 You [Send](#)

 Was Gregory's answer helpful?
[Yes](#) • [Kind of, but not for me](#) • [No](#) [Flag as inappropriate](#)

PIR Answering Requirements

Source (Reporting Data)	Each element of information in a PIR answer should have a determinate source, time and location detailing who provided the information.
Reliability/Credibility/Accuracy/Confidence	Each element of information in a PIR should have an assessment of the accuracy of the information provided, how certain it is, and how reliable the source is. The overall answer provided should be provided with an assessment of the analyst's confidence in it. (STANAG 2022)
Activity/Unit/Size/Equipment/Time/Location	PIR answers often involve analyzing what happened. This requires a representation of data in terms of events, when they happened, how they happened (by means of what equipment), who made them happen and so on

PIR Answering Requirements (cont'd)

SIR to PIR Answer Fusion	Answers to multiple SIRs must be fused into an answer to the overarching PIR.
Query Persistence	PIRs are standing queries, and any new relevant information must be considered in answering them
Partiality	Partial answer elements must be identified and combined across data sources
Incrementality	PIR answers may require an assessment of how things have changed with respect to an information request over the last specified interval

Gaps: COTS Q-A and PIR Answering

PIR Reqs.	Tables	Text	Tagged Text	Logic/Triples	Teammates
Source	At most, source document URL or reference source.				Maybe
Reliability/Credibility	“Curated” data	PageRank & Similar information quality metrics		“Curated” data	Yes
What/When/Where	None known	No	Possibly, but no known systems		Maybe
SIR to PIR Fusion	No				
Persistence	Periodic Scheduled Requerying, not forward-chaining inference				No
Partiality	Yes*	Only List Questions		Yes*	Yes
Incrementality	Timelines, incremental Term Clouds, Trendlines, as change over time, etc.			No, Triples atemporal	Yes

*Cross-document coreference issues a problem.

Conclusion

- There have been many innovations in automated question-answering by computers in recent years.
- Computer-*assisted* social question-answering systems like Vark and Yahoo! Answers are increasingly popular, too.
- Significant gaps remain between COTS question-answering systems and what PIR answering requires.