Innovative Use of Competitions to Help Solve Warfighter Problems

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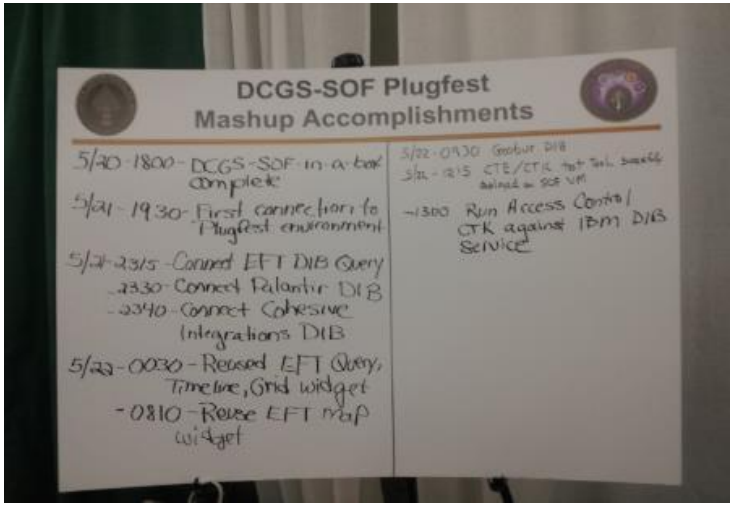
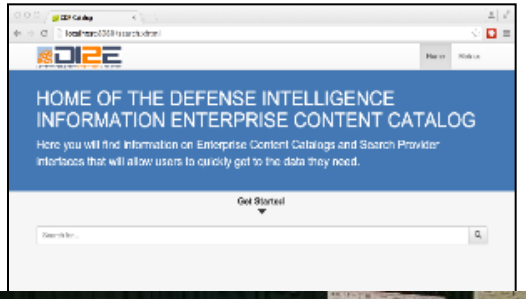
DCGS-SOF Mashup History

2013: Interns quickly create interoperable app from Technical Profiles

2014: Hackathon, SOF style

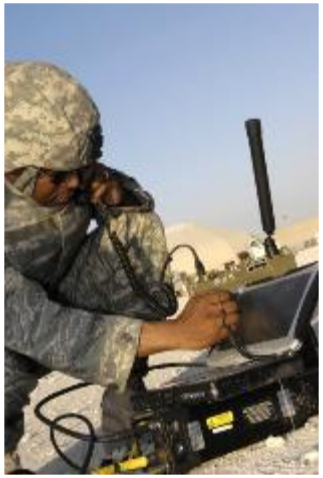


2015: Winner!
Operation Enterprise Discovery

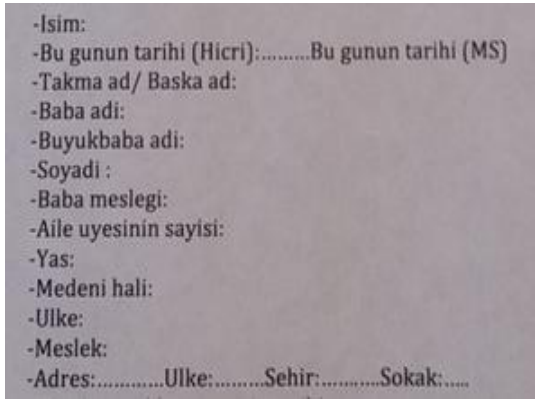


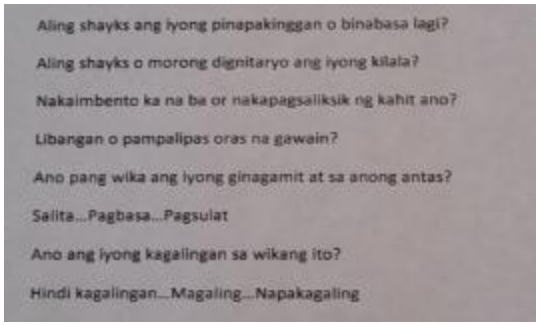
DI2E Plugfest Mashup: *OUSD(I) mandated demonstration event designed to increase interoperability through sharing/reuse of specs, services, software and data*

2016 Vision Statement



The Warfighter needs quick turn
(under 20 minutes)
image, text, audio or video
translation summaries (gists)
from anywhere in the world
at any time





Language Translation/Gisting Today

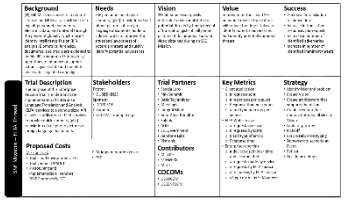
- Image translation
  - Identifying handwritten characters in images is extremely difficult
  - Machine ICR/IWR technology is immature
- No Gist standard
- Solutions
  - Stove-piped
  - Use text as an input
- No Gold data
- Enterprise (Cloud) Language Translation services don't exist
- Quality translations for all languages still require humans
- Massive language transitions going on

2016 Collaborations

- DI2E Operation Upshot Mashup
  - Government/Industry Team
    - Kick off and scenario review 14-15 March, Tampa
    - 9 Partners + 3 Contributors + 2 COCOMs + 11 Weeks
  - Demonstration 1-2 June, George Mason University
  - Demonstration 7 June, SOFWERX, Tampa, FL
    - Customer feedback
- Mil-OSS SOFIC Operation Upshot Hackathon
  - Competition and demonstration 21-22 May
  - Use same Customer's problem to showcase out-of-the-box thinking

The Process

- Find a User that has a problem
- Create a Vision



- Create a distributed architecture that supports the Vision
- Create a scenario that demonstrates a small slice of the Vision
- Look for demonstration partners and cloud environment
- Kick-off
- 8-12 weeks of prototyping
- Demonstrate scenario to Customers at Event
- Reflect and decide next steps

Mission Canvas

SSE Mission – ELTA Thread

Background

(U) SSE Missions consist of a related series of activities at a sensitive site to exploit personnel, documents, electronic data, and material through the power of globally synchronized Identity Intelligence Fusion (IIF) analysis. Biometrics, forensics, documents, and media are exploited to enable IIF in support of interagency operations to influence or support actions against state and non-state adversaries in global campaigns.

Needs

SSE personnel need quick summary (gist) translation of cell phone pictures of foreign language documents, audio or video in order to improve the situational awareness of potential threats and quickly identify potential adversaries

Vision

SSE personnel can quickly determine adversarial status or potential threats by timely receipt of translation gists of cell phone pictures of documents, audio or video obtained during an SSE Mission

Value

Improvement in the speed SSE personnel receive translations will reduce the time it takes to identify potential adversaries and identify potential imminent threats

Success

- Decrease in translation response time
- Increase in translation responses per request
- Increase in number of identified adversaries
- Increase in number of identified imminent threats

Trial Description

The purpose of this Enterprise Mission Trial is to demonstrate implementation of Enterprise Language Translation and Analysis (ELTA) services to a standardized API as well as utilization of ELTA services to provide quick summary (gist) translation of cell phone pictures of foreign language documents.

Stakeholders

Patron:
- OUSD(I) DI2E

Sponsor:
- DCGS-SOF

Customers:
- SOCOM – multiple orgs

Proposed Costs

Mission Trial:
- Trial cloud environment: EFT
- Trial venue: OUSD(I)
- Prototyping and implementation: Vendors, DI2E Framework, EFT

ELTA implementation costs:
- TBD

Trial Partners

- Sandia Labs
- Pink Summit
- Basis Technology
- MarkLogic
- Integral Mind
- Booz Allen Hamilton
- Splunk
- AGIS
- SDLGovernment
- Aerstone Labs
- Vistronix

Contributors

- Mil-OSS
- SOFWERX
- Mitre

COCOMs

- USSOCOM
- USCENTCOM

Key Metrics

- Client application
  - # requests sent
  - # responses per request
  - Response time per request
  - # and type of errors per service
- ELTA Web service
  - # requests received
  - # requests by EDMI
  - # and type of errors
  - Response time
- Enterprise reporting
  - # devices used (over time and accumulated)
  - # requests made by devices
  - # requests by ELTA service
  - # responses by ELTA service
  - #/type errors by ELTA service

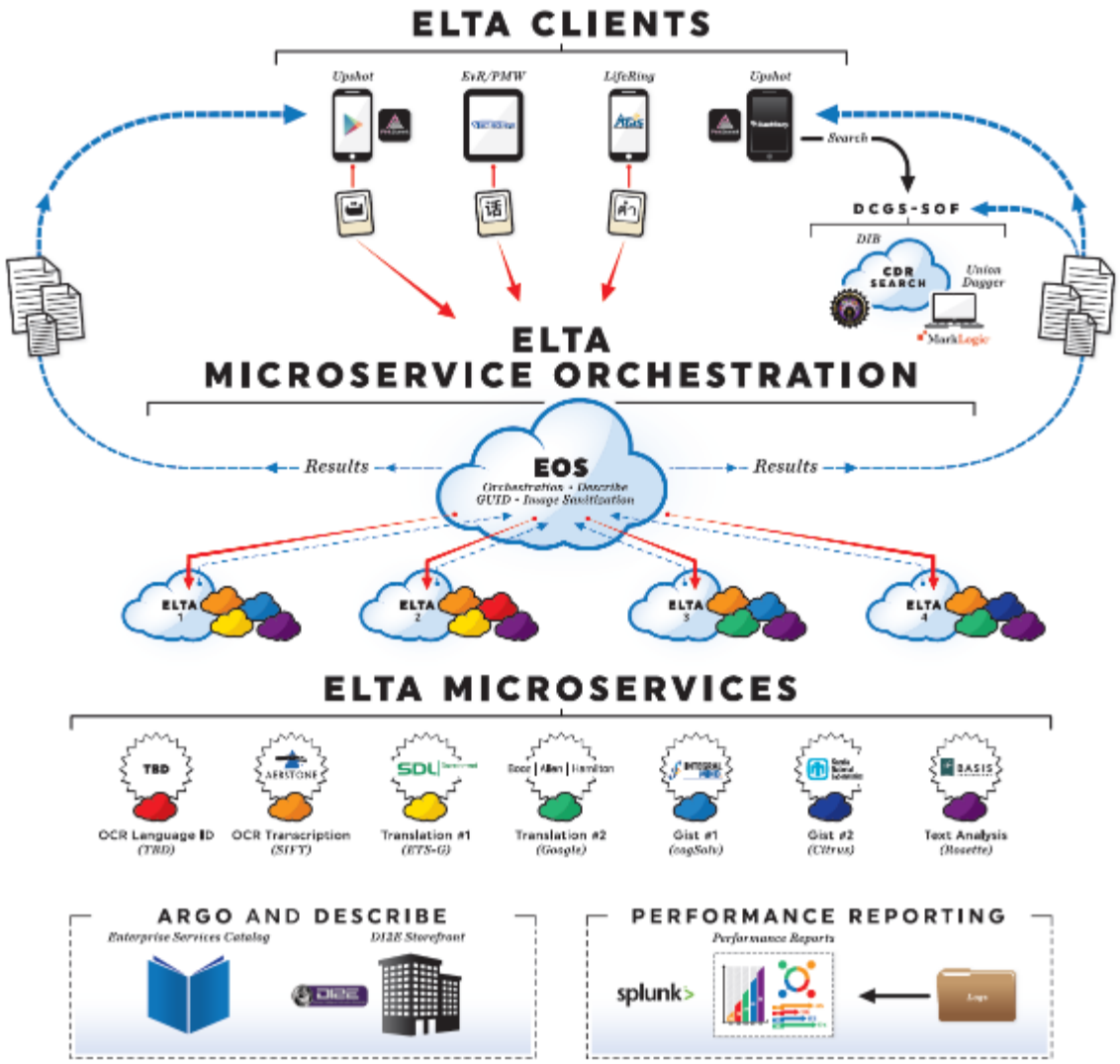
Strategy

- Identify User and problem
- Create Vision
- Create architecture that supports the Vision
- Create scenario that demonstrates small slice of Vision
- Look for partners
- Kick-off
- 8-12 weeks Prototyping
- Demonstrate scenario at Event
- Reflect
- Decide next steps

Upshot Architecture Goals

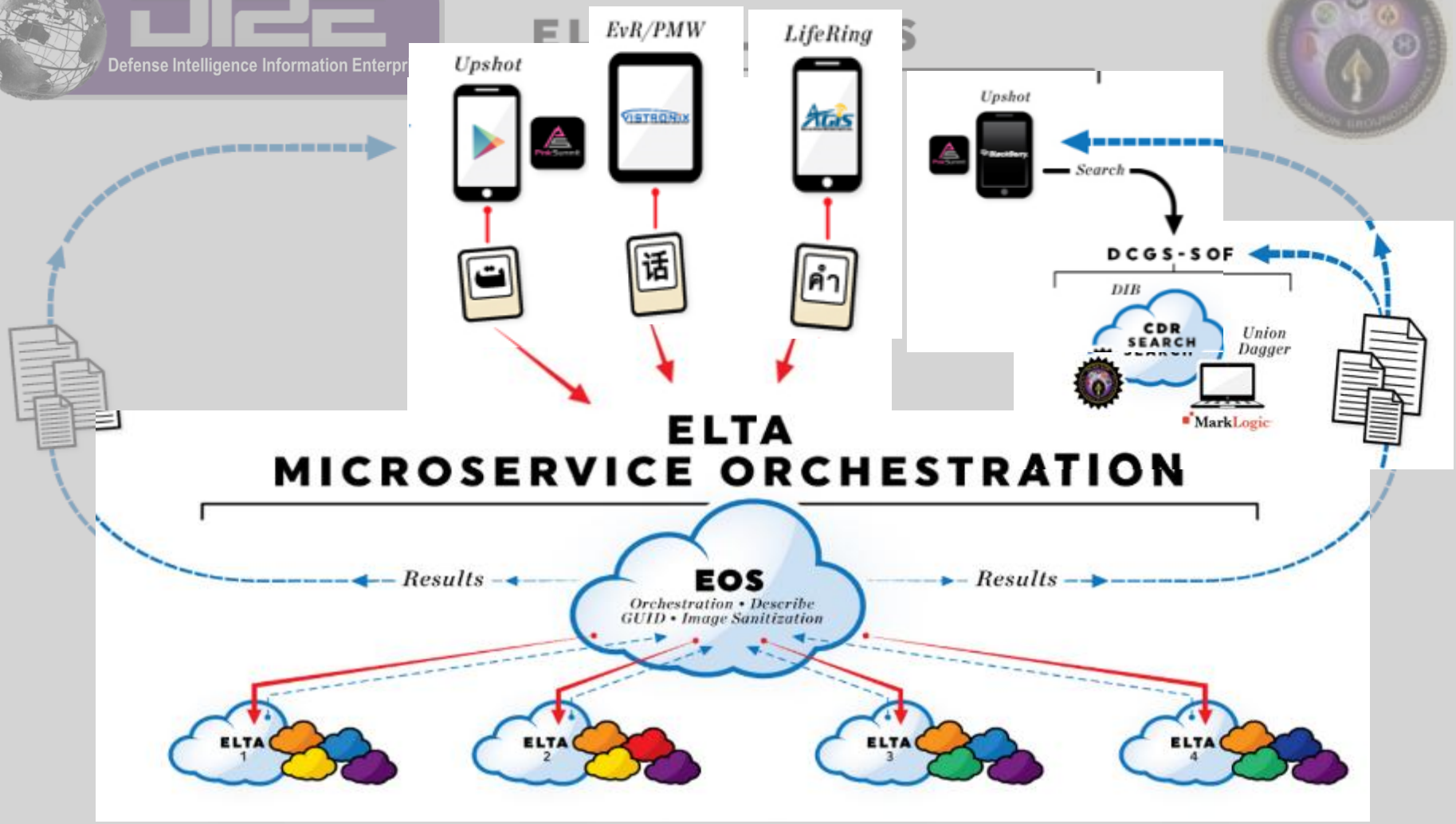
- Scalable, adaptable, distributed Architecture
- Deliver language translation/gisting services to the warfighter from anywhere in the world at any time
  - Threshold: 20 minutes
- Cloud of Enterprise Language Translation and Analysis (ELTA) services
  - ELTA services utilize microservice orchestration
  - Applications utilize ELTA services
- Sharing/Reuse DI2E specs, software, services and data
- Track application and service performance
- Automated enterprise service discovery and description

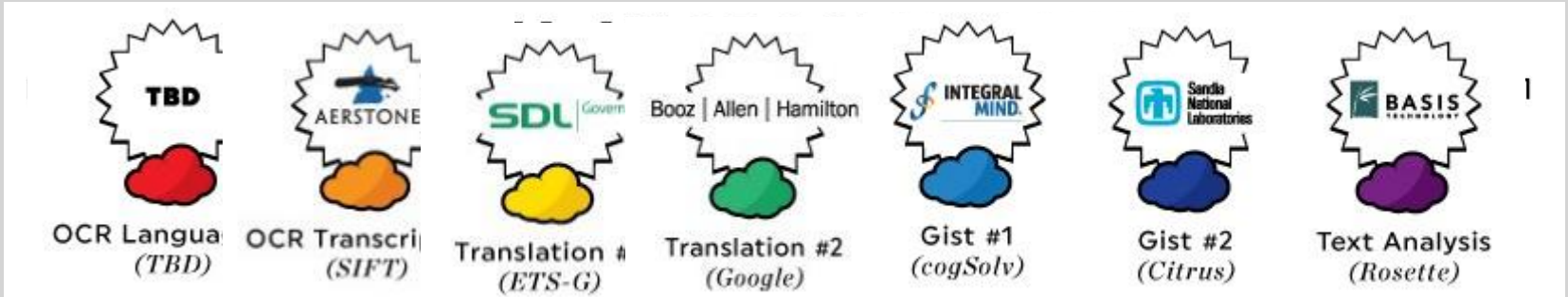
Operation Upshot



11 Partners + 3 Contributors + 2 COCOMS + 11 Weeks =
Operationally Relevant Enterprise Language Translation and Analysis (ELTA) Services, Microservices and Applications

- Scalable, distributed cloud of ELTA services
- ELTA Microservice orchestration
  - OCR Language ID
  - OCR Transcription
  - Language Translation
  - Text analysis
  - Gisting/Document Topics
- 2 ELTA services
- 3 ELTA applications
- ELTA performance reporting
- DIB search and discovery
- Union Dagger
- Argo and Describe
- GUID


Upshot
EvR/PMW
LifeRing
Upshot
Search
DCGS-SOF
DIB
CDR SEARCH
Union Dagger
MarkLogic
ELTA
MICROSERVICE ORCHESTRATION
Results
EOS
Orchestration • Describe
GUID • Image Sanitization
Results
ELTA 1
ELTA 2
ELTA 3
ELTA 4


TBD
OCR Langua
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SDL
Translation #
(ETS-G)
Booz | Allen | Hamilton
Translation #2
(Google)
INTEGRAL MIND
Gist #1
(cogSolv)
Sandia National Laboratories
Gist #2
(Citrus)
BASIS
Text Analysis
(Rosette)

Defense Intelligence Information Enterprise

ARGO AND DESCRIBE

Enterprise Services Catalog

DI2E Storefront

PERFORMANCE REPORTING

Performance Reports

splunk>

RESEARCH

Mil-OSS HACKATHON

Anything Goes!

ELTA GROUPSHOT

Vetted Crowdsourcing

ELTA CROWDSHOT

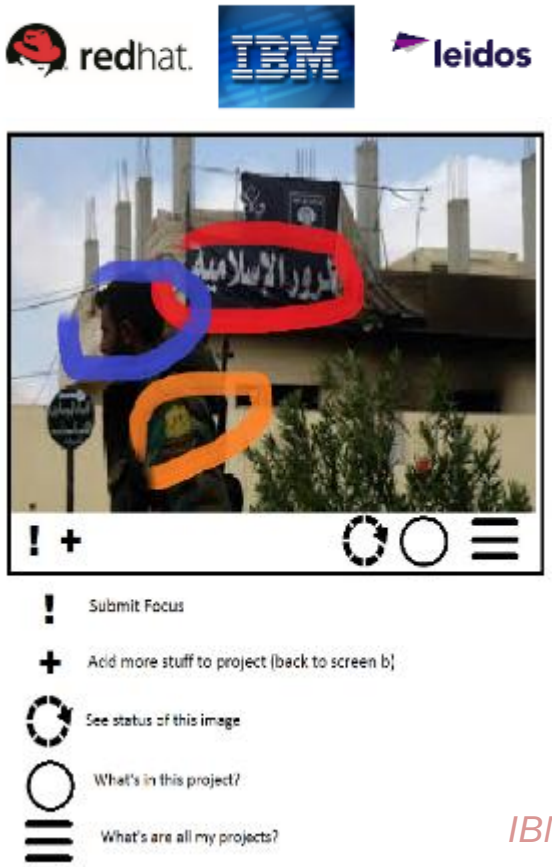
Commercial Crowdsourcing

ELTA MLSHOT

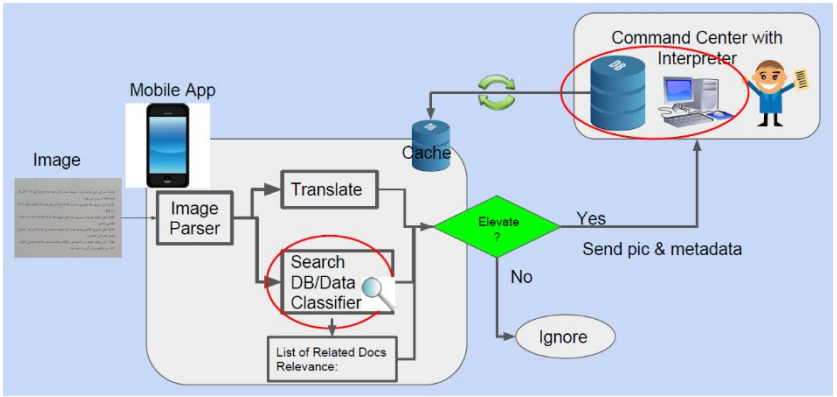
Machine Learning

Mil-OSS Upshot Hackathon

Tampa SOFWERX Team: *Upshot*



Dayton Wright Brothers Institute Team: *Found in Translation*



Presented an end-to-end solution with options for Image Parsing, Data classification and decision making:

- Google Search concept to find related documents
- Neural Network techniques
- Machine Learning techniques

Winner!

IBM Watson used in both

http://upshot.strikingly.com/

Lessons Learned

- Identifying problems to use in these events
- Forming and leading teams of Industry/Academic/Government volunteers
- Using team collaboration to create a microservices architecture and document service APIs
- Iterative prototyping, test and validation process
- Demonstrating results
- Acquisition challenges moving from innovation to operations

Questions?

2016: Winner!