A New Approach to Industry-Government Dialog

Mission Modeling & Simulation as an Approach for
Developing and Distributing Knowledge

Brian Seagrave and David Bridgeland

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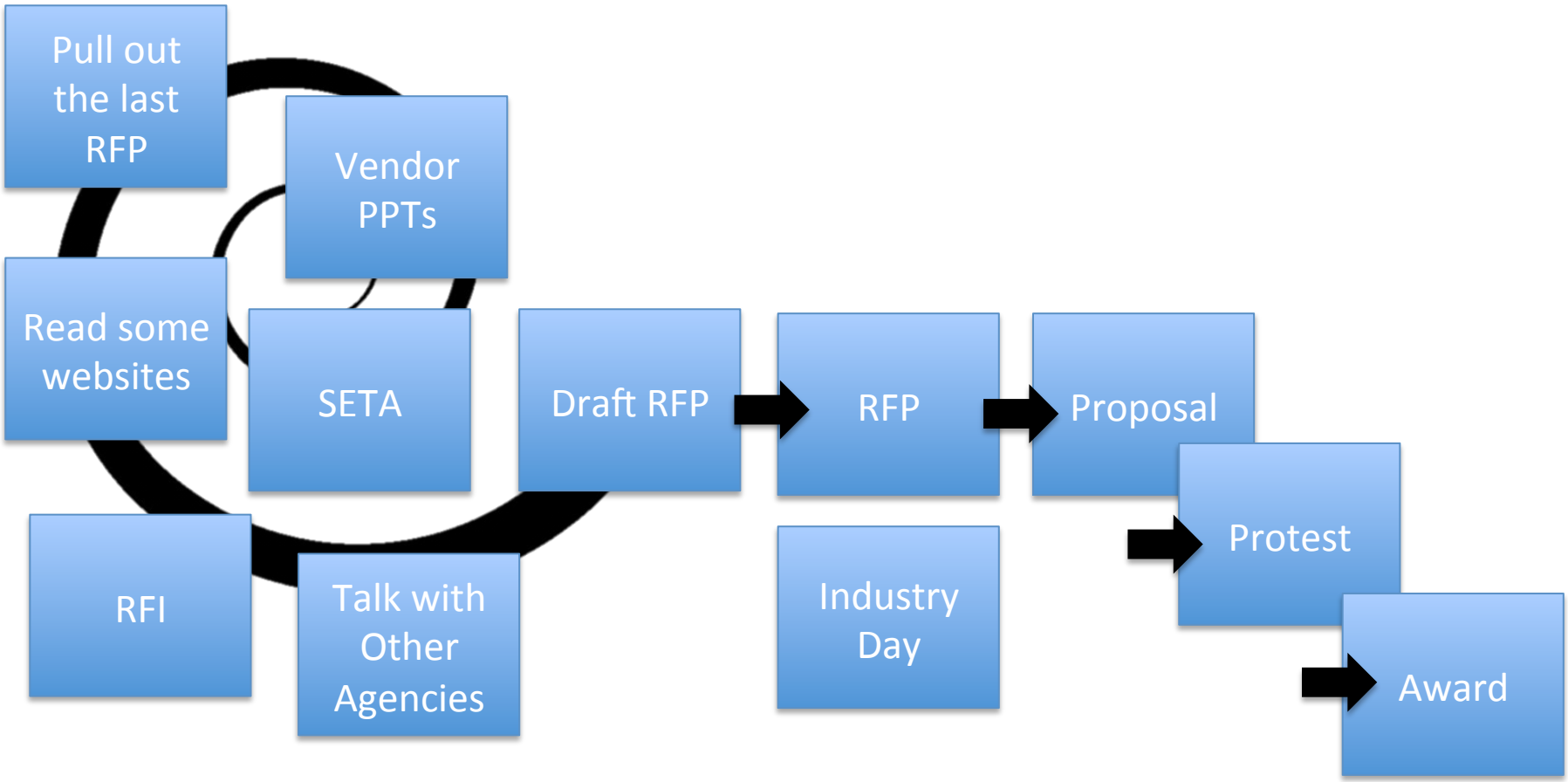
The federal acquisition process for solutions has a poor track record of producing successful programs

Incomplete knowledge discovery and transfer is a substantial root cause

Modeling of missions with solution alternatives will develop more complete knowledge and facilitate more effective transfer

During operations, conditions will change. Models can be used for timely, ongoing decision support

Typical Market Research & Dialog Today



For Government, Effective Dialog would Produce:

A common and comprehensive understanding of the mission:

- What factors can be changed to improve results
- Factors beyond control and their impacts
- Impacts and consequences of hundreds of alternative mixes of changes
- Common expectations for the results of a change
- Consensus on objectives and scope of change
- Precise scope of work and success measures

The Solution known before conducting the procurement.

For Industry, Effective Dialog would Produce:

- A better, more precise RFP
- Complete understanding of the solution required, the priorities, and the outcomes to be delivered
- Risk reduction
- Cost reduction
- More successful programs
- Fewer unintended consequences

Modeling and simulation is familiar

Used for more than 60 years (!) in weapons system development

"Millions of missiles are tested in simulation for every single missile tested at White Sands."

— missile simulation expert

Image courtesy of Birdie Jaworski.
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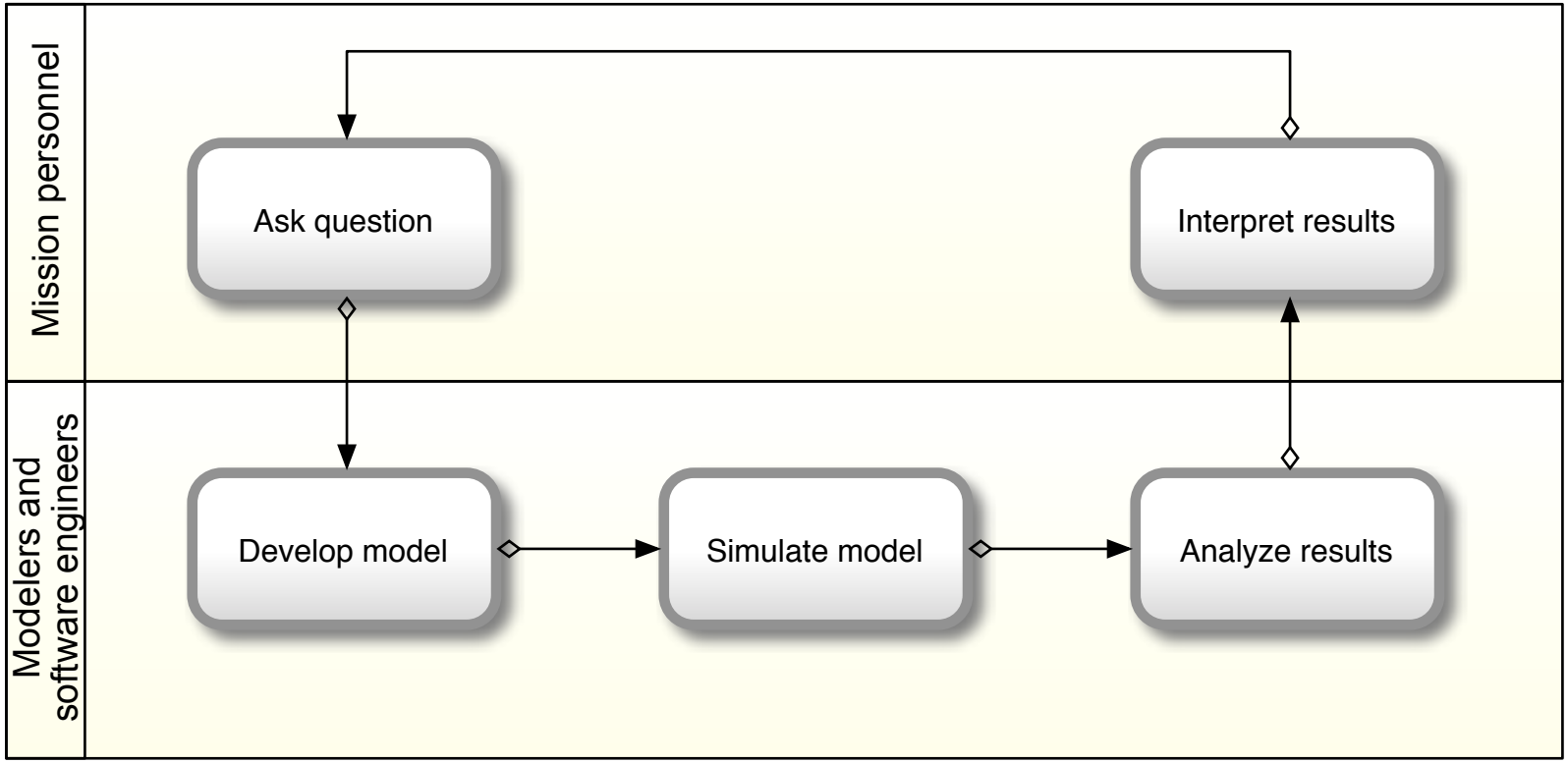
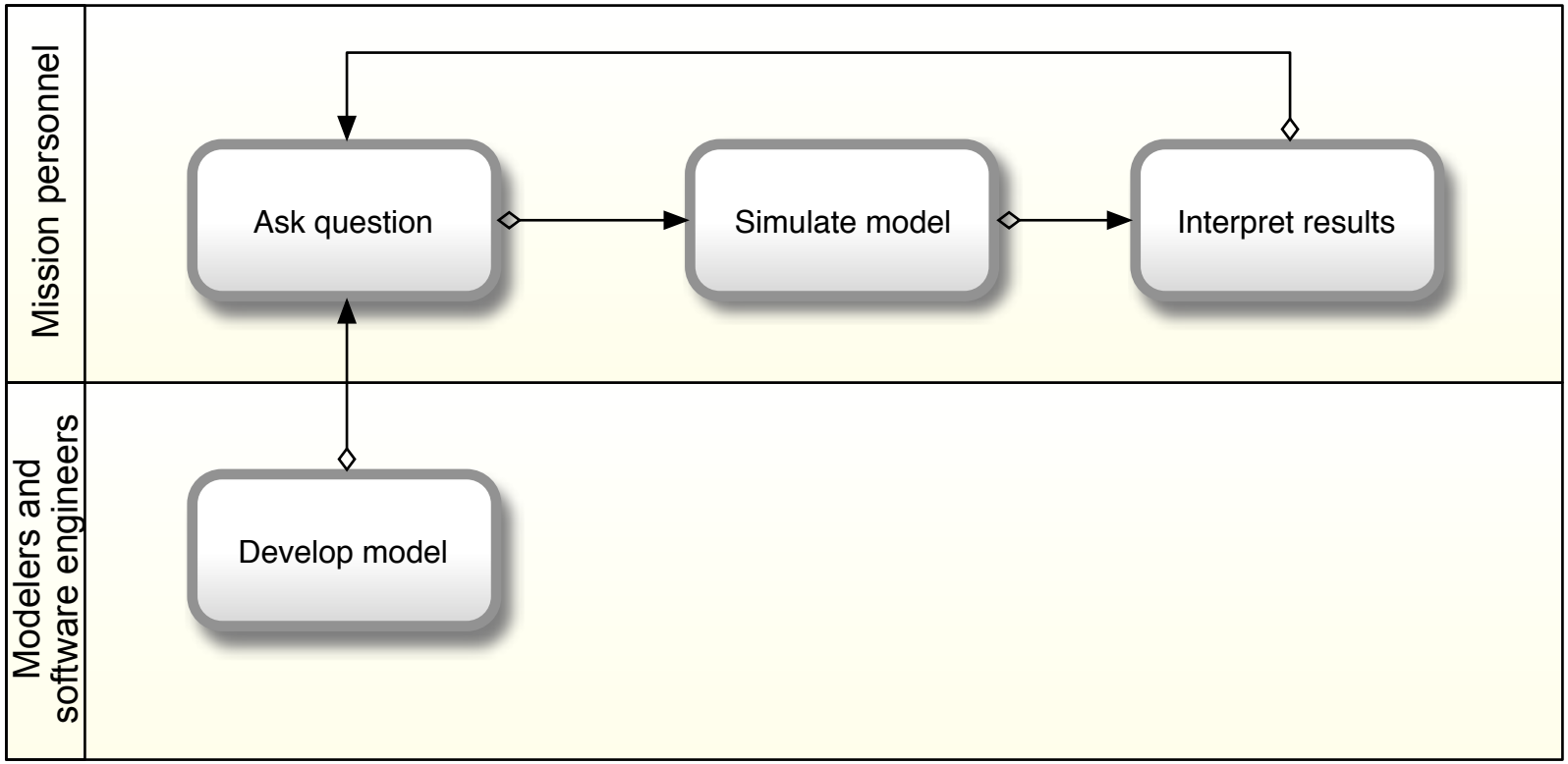
Traditional M&S usage



Interactive model hosting platforms bring M&S to mission personnel



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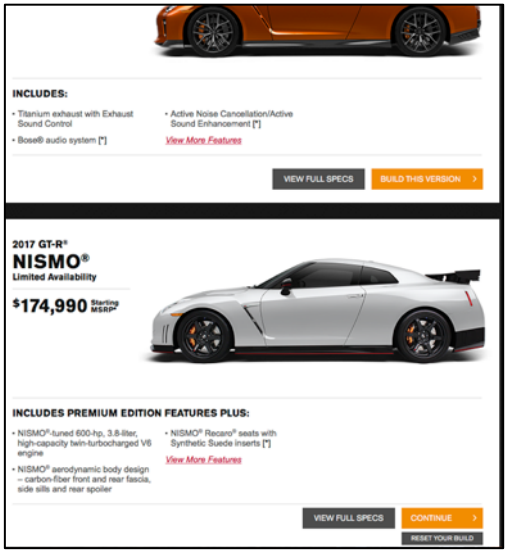
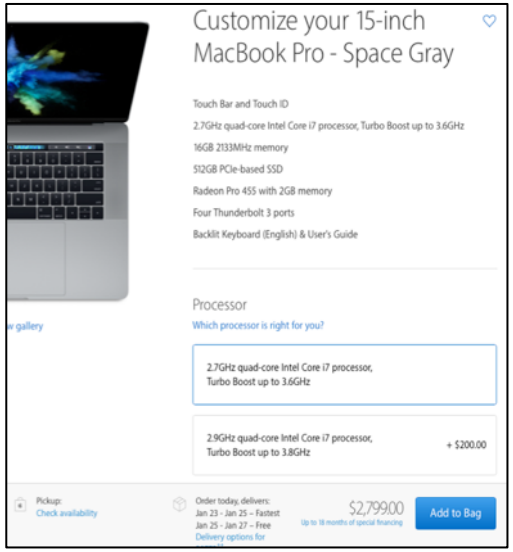
Shiny

REVOLUTION ANALYTICS

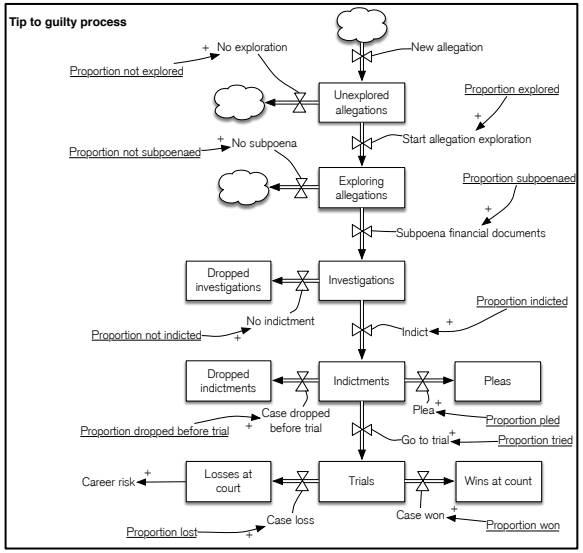
Models and User Interfaces: a great marriage

A user interface like these Configurators

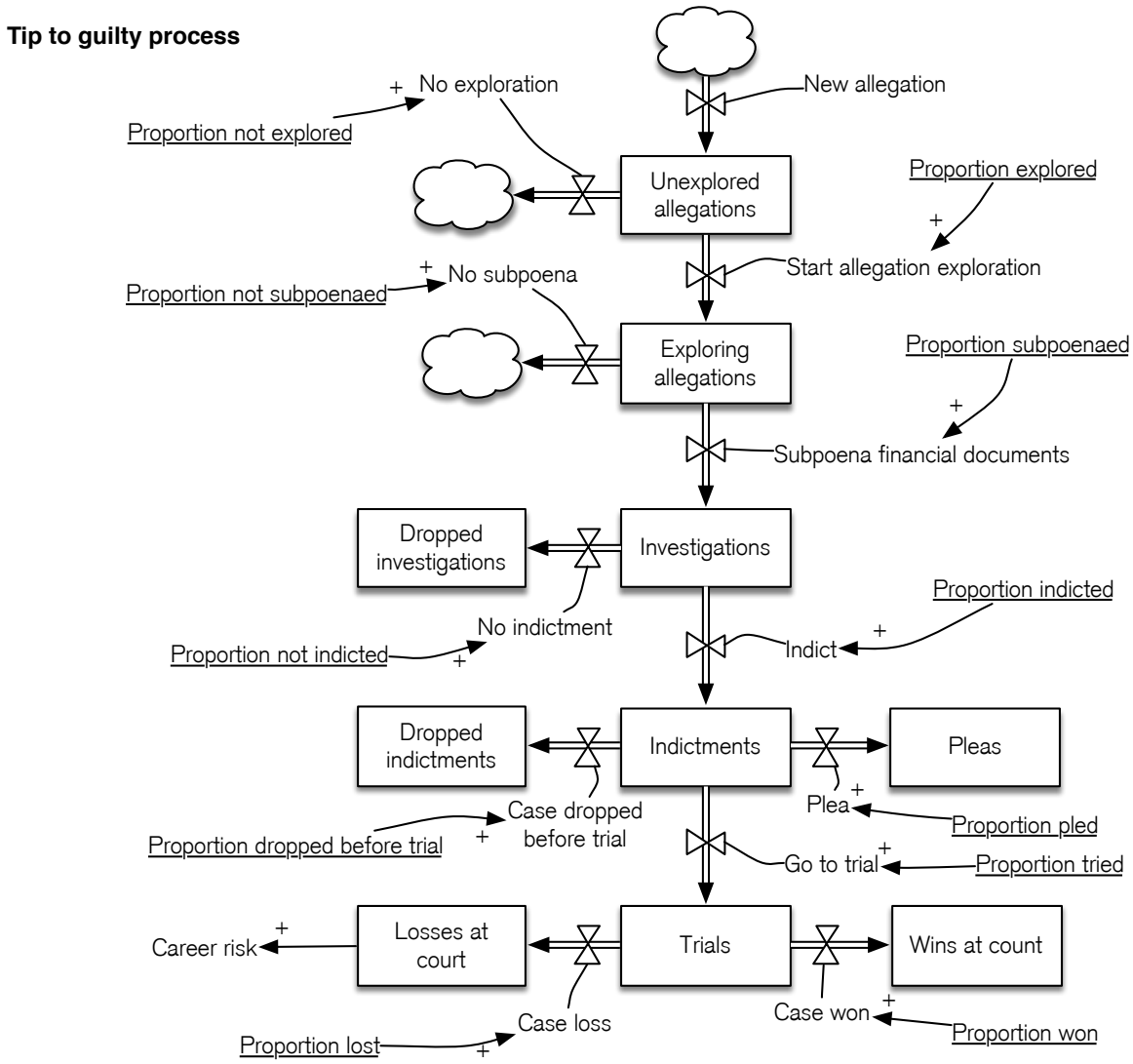




Driving *open book* mission models



Why “open book” models?



Interactive model hosting platforms deliver several benefits

- Question-answer cycle in seconds, instead of days, weeks, months
- Real-time discussion in workshop
- Better collaboration among mission personnel
- Discovery of benefits and consequences
- Consensus through crowd-sourcing of system details and solution tradeoffs
- Communication of system rationale to stakeholders
- Simple configuration of solutions by mission personnel

Mission modeling simulates the whole system

- Goals and strategies
- Policy
- People
- Processes
- Organization
- Infrastructure
- Equipment
- Information
- Location, terrain, weather, sea states, vegetation…

Example: Egypt Border Guards

What are the most important priorities for allocating limited resources to border security?

Raytheon

Border security

◉ rarified threat ○ recurring threat

threat intensity

1 / 2 years

vulnerability

30%

successful occurrences

consequences

human loss

5 lives lost
or
100 serious injuries

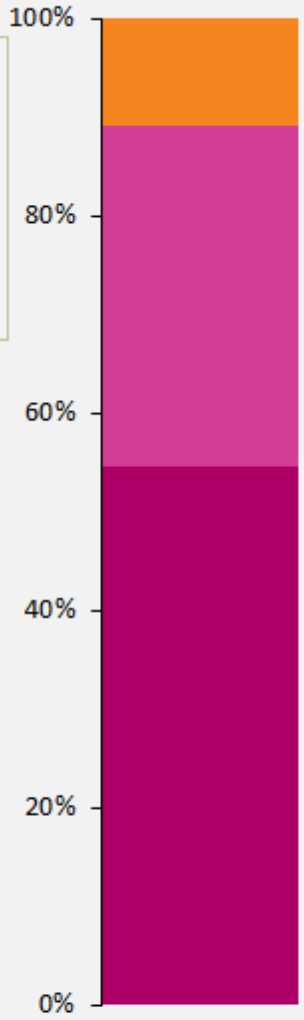
monetary loss

$200,000

national loss

unacceptable activity level
for political or economic reasons

risk profile



top-5 risks

3	Terror attack via tunnel
2	Illegal immigration from poor neighbor
1	Weapons smuggling

risk scenarios

Terror attack via tunnel

new name

Example: Cloud Analyzer

What is the best Cloud Service Provider (and that CSP's bill of materials) to handle each data center workload?

GOVPLACE®
Enterprise IT Integration

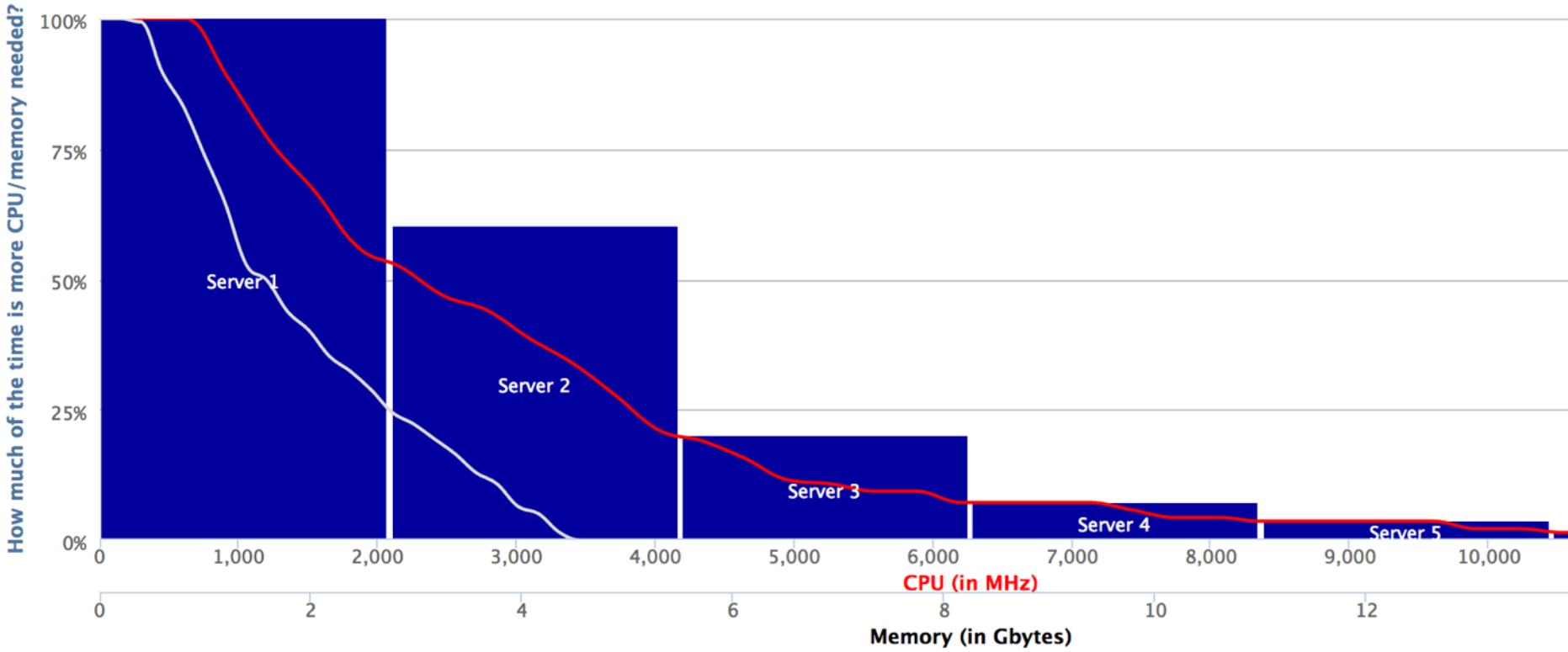
gFlex Cloud Analyzer™

CONFIGURE | RESULTS | PROVIDERS | SAVED CONFIGURATIONS | ASSUMPTIONS

Show: Server detail Provider: Amazon Web Services Server size: M1 Medium

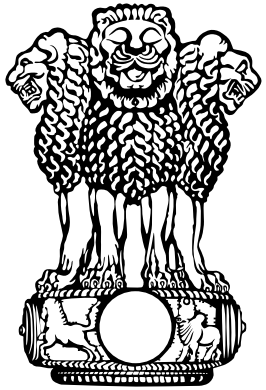
Application: LNG terminal auth

Server: app server



Example: Terrorism Risk Buydown

What are the best investments to speed the mitigation and reduce the consequences of a commando attack on a city or critical infrastructure facility?

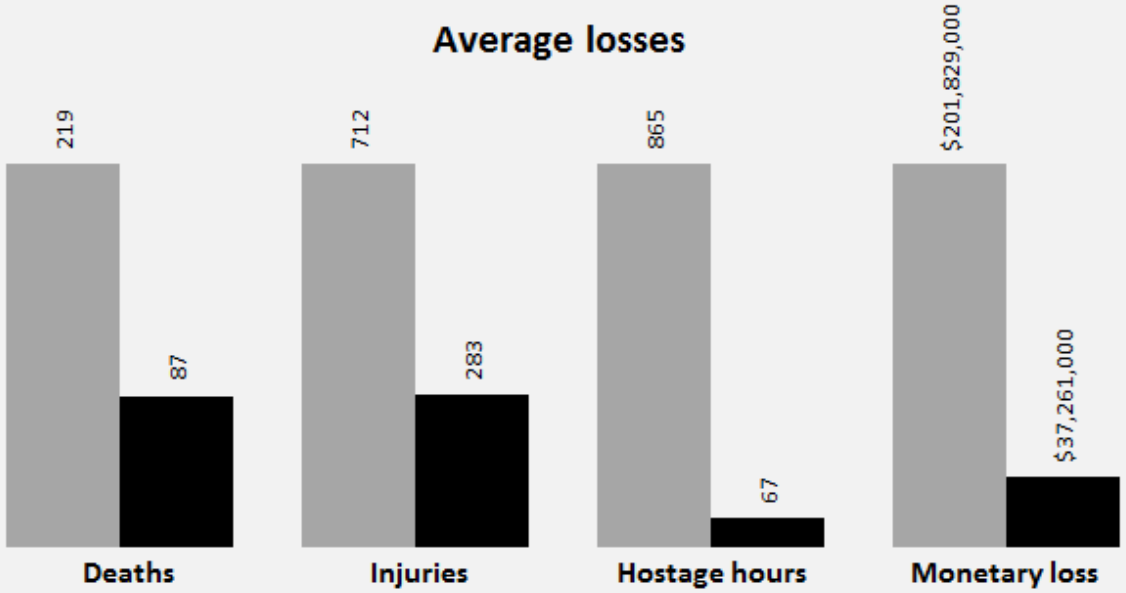


Run model and view results

Run

Individual scenarios

Set as baseline

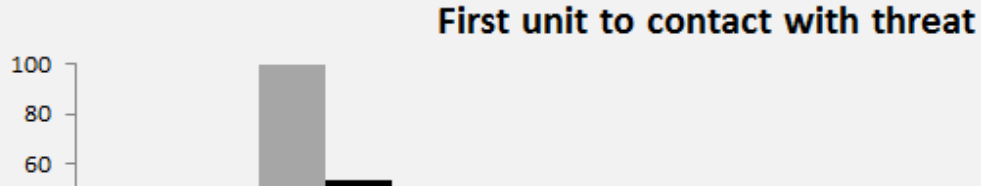


Stand up new responders:

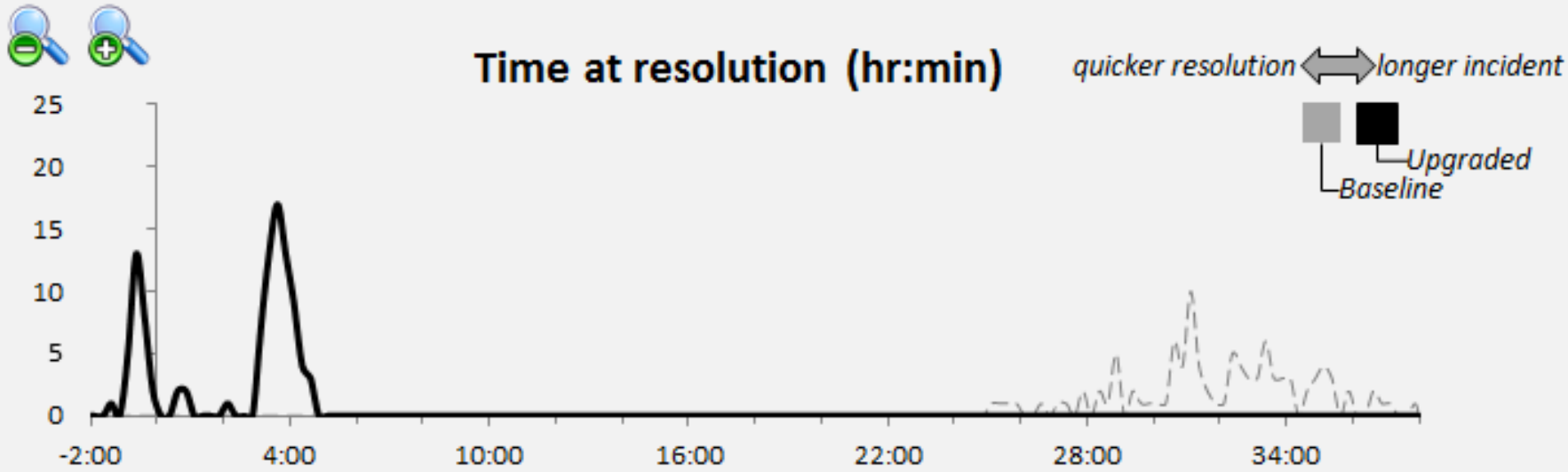
- [x] Maritime law enforcement
- [x] Land-based law enforcement
- [x] Special operations team
- [ ] Airborne special operations
- [ ] Airborne surveillance
- [x] National security guard
- [x] Military

Capability improvements

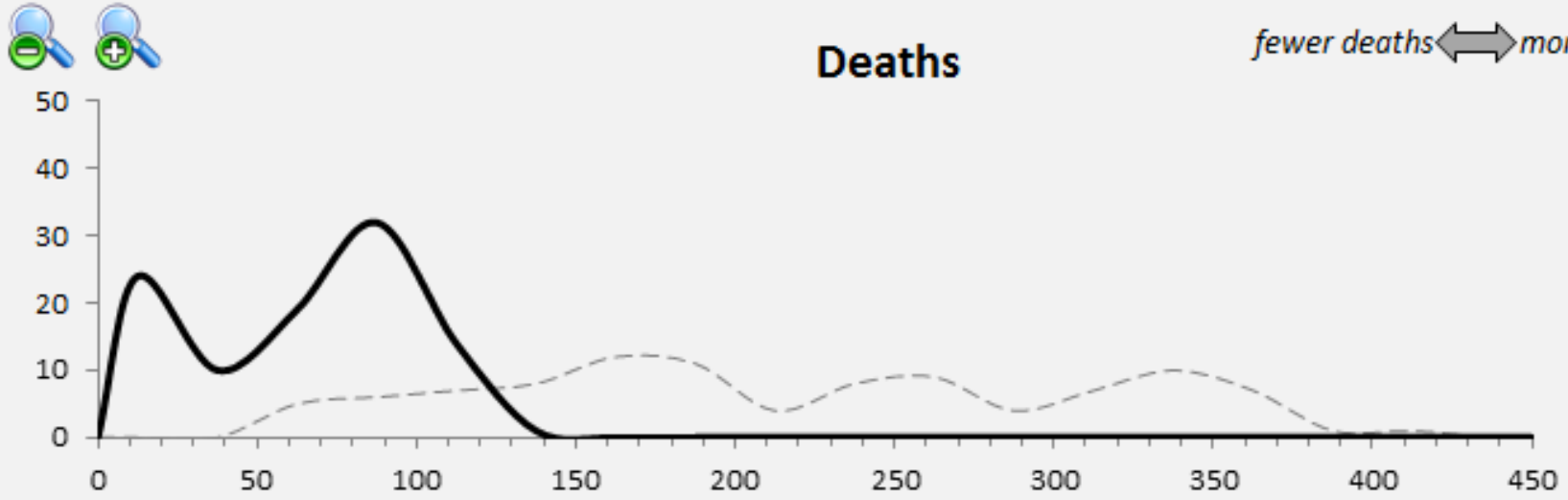
- [ ] Maritime domain awareness
- [ ] Interoperable communications
- [ ] Blue force tracking
- [ ] Command and control
- [ ] Urban video surveillance
- [ ] Gunshot detection
- [ ] Crowd / traffic mgmt, public address
- [ ] Behavior modeling and analysis
- [ ] Inter-agency working relationships
- [ ] Response planning
- [ ] License plate recognition
- [ ] Geo-tagging and facial recognition



Time at resolution (hr:min)

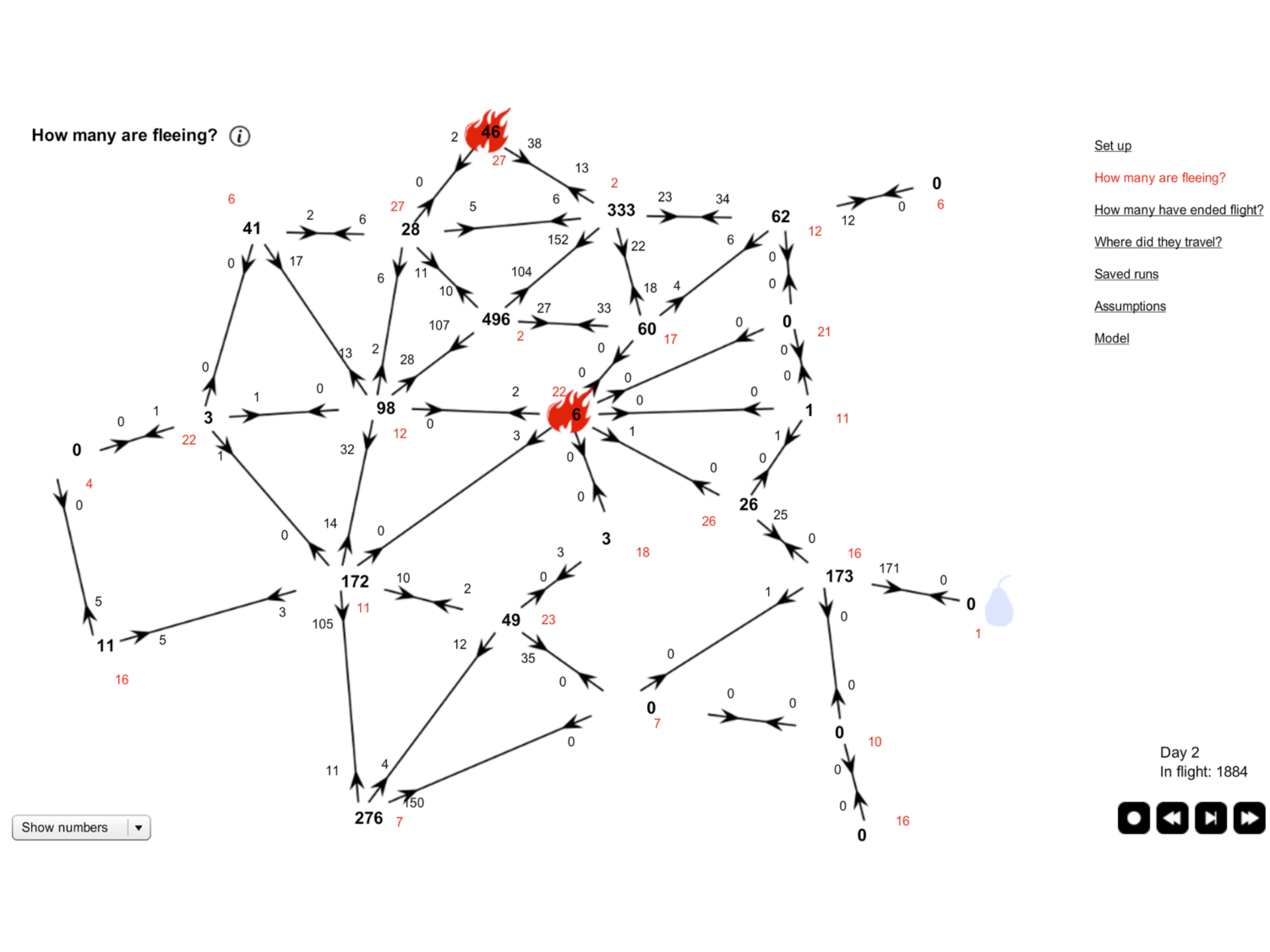


Deaths



Example: Forced Migration

In the event the war comes to these villages, where should we position food, water, and shelter?


How many are fleeing?
Set up
How many are fleeing?
How many have ended flight?
Where did they travel?
Saved runs
Assumptions
Model
Day 2
In flight: 1884
Show numbers

Example: Montenegro Maritime Security

Image courtesy of Nick Savchenko.
www.flickr.com/photos/nsavch/26871774051/

Mission modeling fits any mission

- Hospital discharge dynamics
- Fracking processes
- R&D success and failure impacts
- Criminal justice investigations
- Secondary migration dynamics
- Marketing communication creation
- Foreign exchange trading
- Health insurance investigation processes
- Employee talent retention
- Pharma usage effects
- Unemployment claim fraud investigation
- Broadband adoption dynamics
- ...

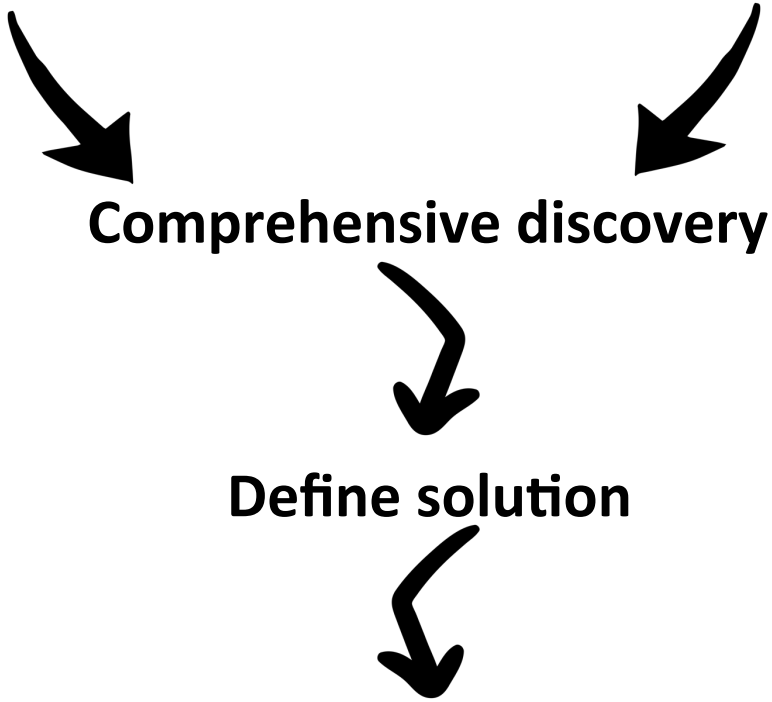
Better dialog through models

Government

Replace the current approach with contracting for a mission model, simulator, configurator

Industry

Replace slideware and whitepapers with a mission model, simulator, configurator



For More Information

Brian Seagrave
Seagrave & Associates
www.seagrave.solutions
+1.703.472.8106
brian@seagrave.solutions

David Bridgeland
Hanging Steel Productions
www.hangingsteel.com
+1.703.405.1197
dave@hangingsteel.com