# VERILUMA

## PATHS TO BETTER DECISIONS

September 2016

Gartner

Cool Vendor 2016

# Gartner ‘Cool Vendor in Analytics 2016’



- What Is A ‘Cool Vendor’?

  A small company offering a technology or service that is:

  Innovative - enables people to do things they could not do before

  Impactful - has or will have a business impact; it is not just a matter of "technology for its own sake."

  Intriguing - has caught analysts' interest or curiosity during the past 6 months or so

- Moe Ali (ANZ GVP) posted about cool vendors in the ANZ region:

  Gartner names 11 innovative companies from Australia

- Veriluma is 1 of 5 vendors recognised in this category in 2016 and the only Australian company

# Prescriptive Analytics Defined



"Although all types of analytics aim to improve decisions, only prescriptive analytics outputs a preferred course of action.

It takes predictive insights to the next level by suggesting the optimal way to handle a future situation and can be applied to strategic, tactical and operational decisions, each of which has different traits.

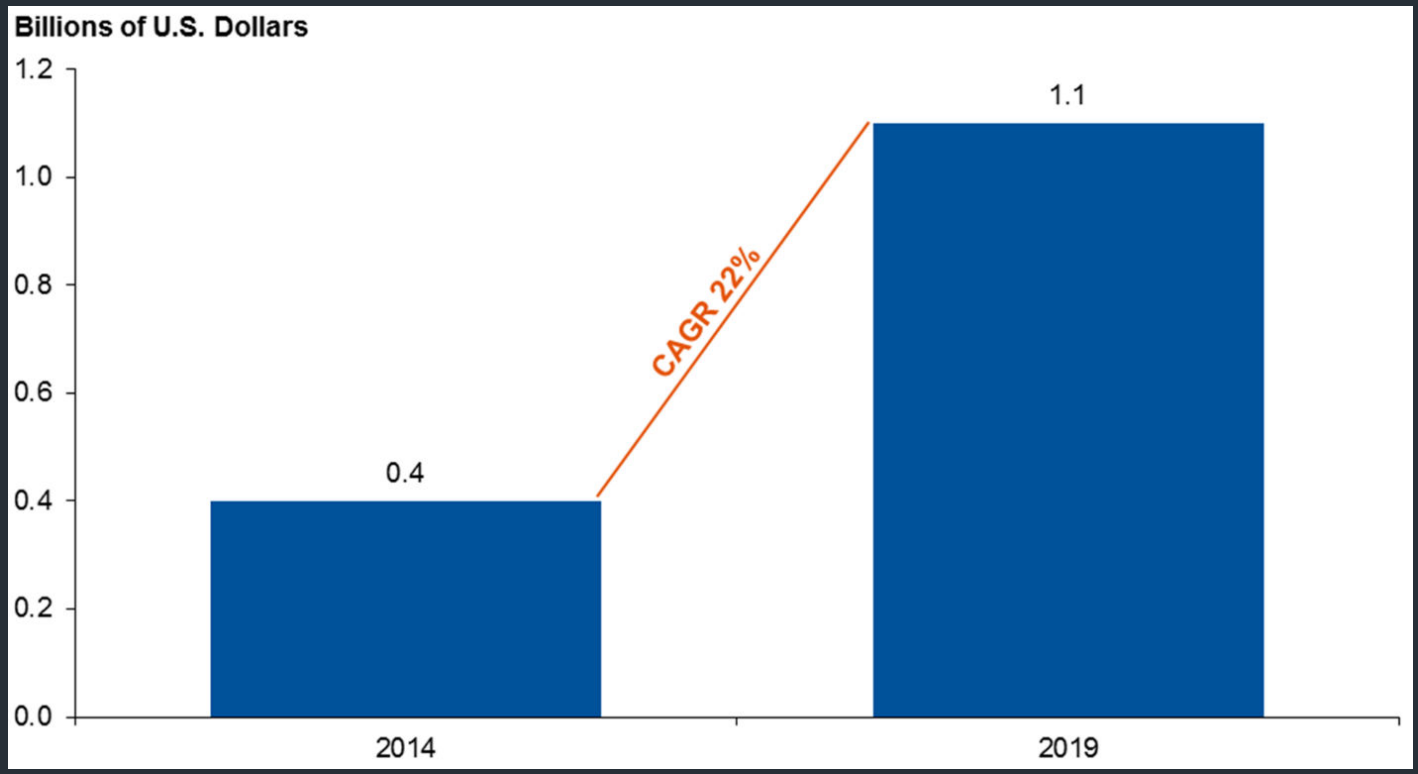
The recommended decision can be delivered to a human in a decision support environment, or it can be coded into a system for decision automation. "

Gartner's Forecast Snapshot:
Prescriptive Analytics, Worldwide 2016
Published: 5 February 2016

# Prescriptive Analytics Market



"The prescriptive analytics software market will reach $1.1 billion by 2019, with a 22% CAGR from 2014. Currently, 10% of organizations have some form of prescriptive analytics; this will grow to 35% by 2020."




Enterprise Spending on Prescriptive Analytics, Worldwide, 2014 and 2019
Source: Gartner (February 2016) Analysis

# Built for Critical Decisions



Created in a Commonwealth Research Centre for Defence Intelligence Analysts who are tasked with rapidly assessing threats from global security, foreign military and transnational terrorism.

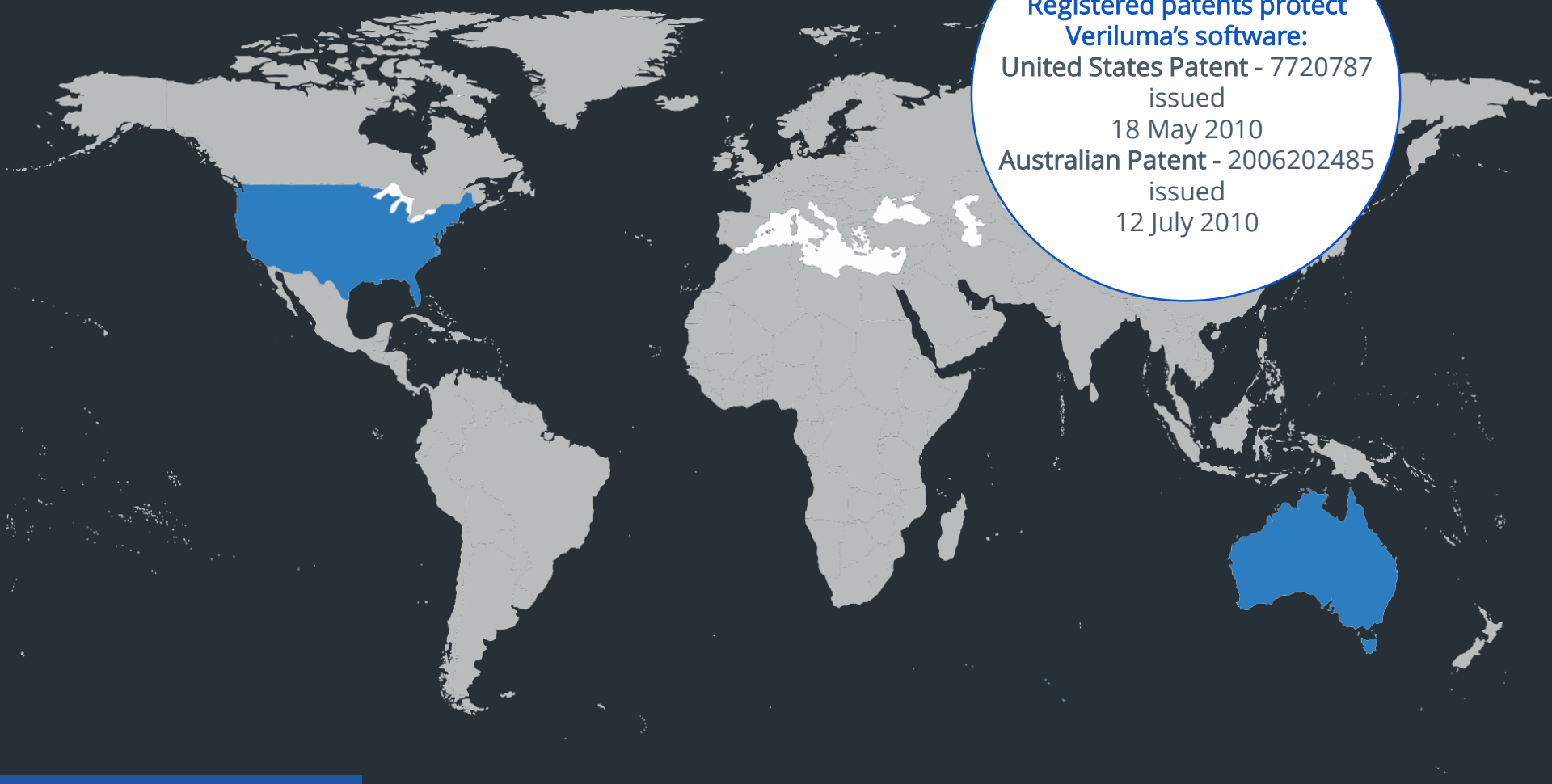
Veriluma's software provides decision makers with rapid and accurate assessment of threats with objective and reliable insights that they can act upon with certainty.

Used by Australian Defence since 2012.

VERILUMA

# Patents





**Registered patents protect Veriluma's software:**

**United States Patent -** 7720787 issued 18 May 2010

**Australian Patent -** 2006202485 issued 12 July 2010

# Company Overview



Veriluma's software takes into account quantitative and qualitative information and uses a patented engine to assess likely outcomes with degrees of certainty whilst identifying contributing risks.

Such is the velocity of data generation and decision making, the need for a product that can comprehensively manage incomplete or uncertain inputs in decision making is important for Individuals, businesses, governments and their agencies.

# Why Veriluma Works



- Considers all factors without emotion, bias or prejudice
- Weights factors appropriately according to their level of importance
- Assesses and track problems over time as information changes
- Identifies risks for which action can be taken
- Depicts a preferred approach
- Increases the chances of a successful outcome

# The Veriluma Methodology



### 1st Step: Question or Hypothesis

Start by understanding the primary 'question' to be solved; Identify the 'issues' that might provide insight or evidence in reaching the answer

### 2nd Step: Relationships

Describe the relationships between the 'issues' ie how they interact, influence or direct one another

### 3rd Step: Inform

Add the information - quantitative and qualitative, evidence, opinions or assumptions to 'inform' the identified 'issues'. Known unknowns and uncertainty can be considered.

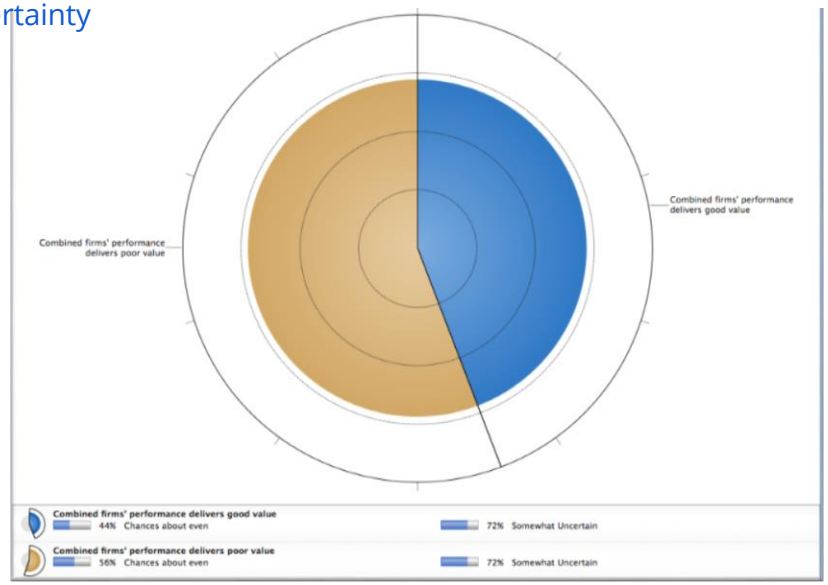
### 4th Step: Assess

Produce the outcome ie the result showing likelihood and certainty for the question posed.

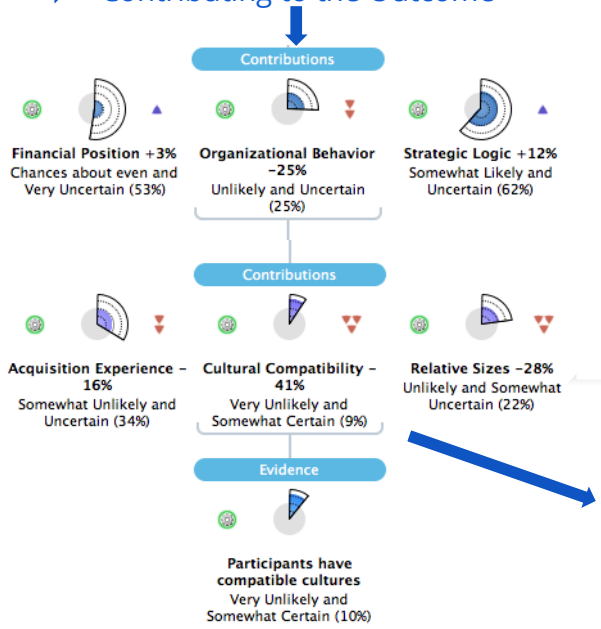
# The Veriluma Decision Tree



Post acquisition, there is a 44% likelihood of success with 72% certainty

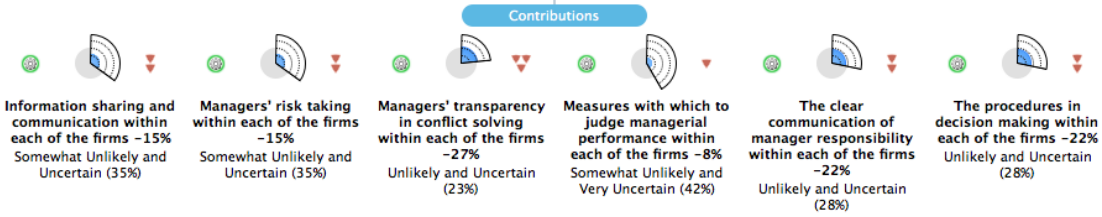



Contributing to the Outcome




Organisational behaviour contributes in a negative way

Cultural compatibility is one of the red flags (or risks) to the success of this acquisition



# COMMERCIAL APPLICATIONS

# Global Applications

- Government Departments
- Defence Agencies
- Law Enforcement
- Counter Terrorism
- Merger & Acquisition
- Legal Services
- Resources
- Banking & Finance
- Insurance
- Environmental Agencies
- Healthcare
- Marketing
- Research
- Cyber Threat
- Strategic, Operational, Tactical

# Multiple Industries & Applications

## Financial services

- Mergers & Acquisitions: Harvard Business Review valued global M&A at $US3.6 trillion in Q4 2014 with 70-90% failure rate
- AML & CTF
- Credit Risk Rating
- Fraud Detection
- Wealth Management
- Asset Management
- Strategic Planning
- Track and predict market trends: likelihood of property bubbles bursting

## Industry

- Criticality of parts within a production line/mining operation
- Risks and threats to future development sites:
  - Political/Cultural
  - Environmental
  - Financial
- Project Management – risks obstructing successful delivery
- Strategic planning & competitive positioning
- Predicting impacts of weather, politics, crises

## Professional services

- Assess and analyse complex cases with multiple lists of suspects and multi-layered evidence
- Track long term operations for example organised crime, requiring transparency and oversight
- Criminal law – strategy tool for prosecution or defence
- Assessing success of personal injury, family law settlements and estate claims

# Partnerships



| | |
|---|---|
| GLOBAL BUSINESS RESILIENCE | Initially Veriluma's software will be used to better understand the ever-changing global, regional and local threat environments providing significant insights into emerging issues, and helping structure and inform mitigation strategies. |
| ONIQUA | Oniqua's software will embed Veriluma's engine to assess the criticality of parts and their business impact to minimise production downtime for Oniqua clients in asset intensive industries such as mining, oil, gas, utilities. |
| Marketlend | Marketlend is a peer to peer lender for SMEs who Veriluma software to assess the likelihood and certainty of an applicant repaying the loan. |
| LEGALLOGIX | A Joint Venture to create disruptive legal applications for a global market initially with a focus on Family Law settlements to support the self represented as well as produce a rapid, objective assessment (brief) of the case for lawyers. |
| RPM Group International<br>Revenue Performance Management | The leader in revenue performance analysis and optimization will use Veriluma's software to help RPMG customers enhance decision-making capabilities in the area of revenue performance management and sales acceleration. |
| Defence Consultants | Reselling and delivering services for Veriluma primarily within Defence and Intelligence agencies in Canberra. |

# Key Differentiators

- At the core of the patented engine is a mathematical calculus based on Subjective Logic
- Subjective Logic is suitable for analysing situations involving uncertainty and incomplete knowledge
- Our engine can deal with what we know AND can also consider what we don't know
- Known can be an opinion - a belief about something
- Assessments provide insight of the likely outcome (with confidence) about a situation based on the information available at that time
- Assessments can be repeatedly executed - as new information or opinions arrive or change
- Our software can run 'headless' i.e. be embedded within others technologies and processes
    - Information is passed to the software engine, an assessment produced and the results returned
    - The software is invisible running behind others applications

# Summary



1

Patented Prescriptive Analytics Software

2

Currently used by Australian Defence Intelligence to assess national security, foreign military, transnational and terrorism threats to provide accurate assessments for defence decision makers

3

Delivers clear forecast outcomes to individuals, businesses and governments with degrees of certainty and risks

4

Commercialisation strategy underway with international patents secured

5

Targeting what is currently on trend to be a $1.1 billion market in 3 years with 22% compound annual growth

6

Multiple global applications across defence, banking and finance, M&A, government, legal and insurance industries already identified

# PRESCRIPTIVE ANALYTICS: PATHS TO BETTER DECISIONS

VERILUMA

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# APPENDICES



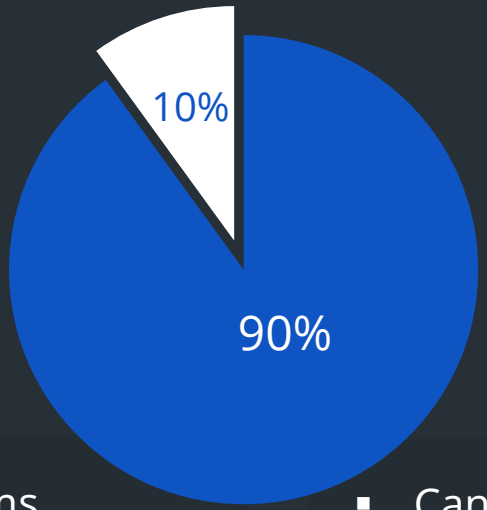
ANALYTICS SPACE

VERILUMA APPROACH

CASE STUDIES

# COMPLEMENTS DATA ANALTICS






*Rear Vision Mirror*
*Consider the past*

**'Traditional'**
**Analytics**

- Best for data-rich problems
- Requires large amounts of data
- Does not gracefully cope with unreliable or missing information
- Typically slow to build models and derive results

Best for problems when you are not time-bound and when large amounts of data are available

*Foresight*
*Consider the unknown*

**Veriluma**
**Prescriptive Analytics**

- Can produce outcomes even in data-poor problems
- Works with the data that is available
- Handles uncertain, unreliable and unknown information
- Fast to build models and derive results

Best for problems when you need answers fast or when data availability or quality is variable

# THE VERILUMA APPROACH



Veriluma's prescriptive analytics software is designed to help organisations gain greater insight into problems, questions and hypotheses leading to better decisions in shorter timeframes

- First, the problem is dissected and the factors affecting the outcome understood
- The application provides a workbench where the problem is mapped and information added
- Models can be built by clients, partners or by Veriluma consultants
- The engine runs assessments of the identified problem
- The likelihood of the outcome and the level of certainty (confidence of the result) are calculated
- In addition, the assessment shows the factors contributing to the outcome with risks, missing information and conflicts highlighted
- Assessments can be executed at any time but most often when data is added or changed
- The engine can also be called from within client/partner's technologies, applications or processes

# CHINESE PROPERTY MARKET 2010



BLOOMBERG NEWS 20 JUNE 2014:

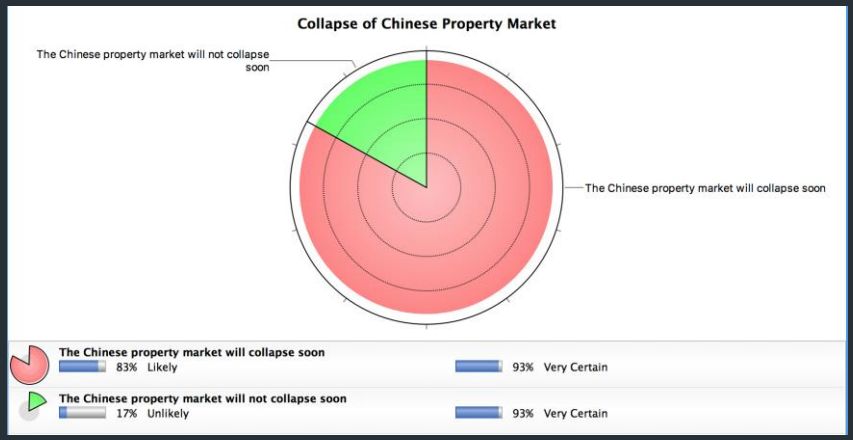
"Chinese property trusts face record repayments next year as the real-estate market cools, fueling speculation among bond funds that more developers will collapse.

The trusts, which channel money from wealthy individuals to smaller builders that have trouble obtaining financing elsewhere, must repay 203.5 billion yuan ($32.7 billion) in 2015, according to Use Trust, a Chinese research firm. That's almost double the 109 billion yuan due this year. New issuance of the products slumped to 40.7 billion yuan this quarter, the least in more than two years,

"Trust loan defaults will rise substantially," said Fiona Cheung, head of Asia credit at Manulife Asset Management's fixed-income team which oversees $44 billion globally. "It won't be surprising if there are more collapses of China's property companies. Those companies that suffer from weak sales, that bought land too aggressively last year funded by debt and that have poor access to capital markets will potentially experience cash flow pressure."

JPMorgan Chase & Co. says the real-estate industry poses the biggest near-term risk to growth in the world's second-largest economy after new home prices dropped in the most cities in two years last month. China's banking regulator said on June 6 it will monitor developer finances, a sign of concern defaults may spread after the March collapse of Zhejiang Xingrun Real Estate Co., a builder south of Shanghai."

Collapse of the Chinese Property Market



# IRAQ'S POLITICAL FUTURE 2014



The Washington Post

Middle East

## Iraq's political situation appears dire as prime minister fiercely digs in

By Loveday Morris August 10 Follow @LovedayM

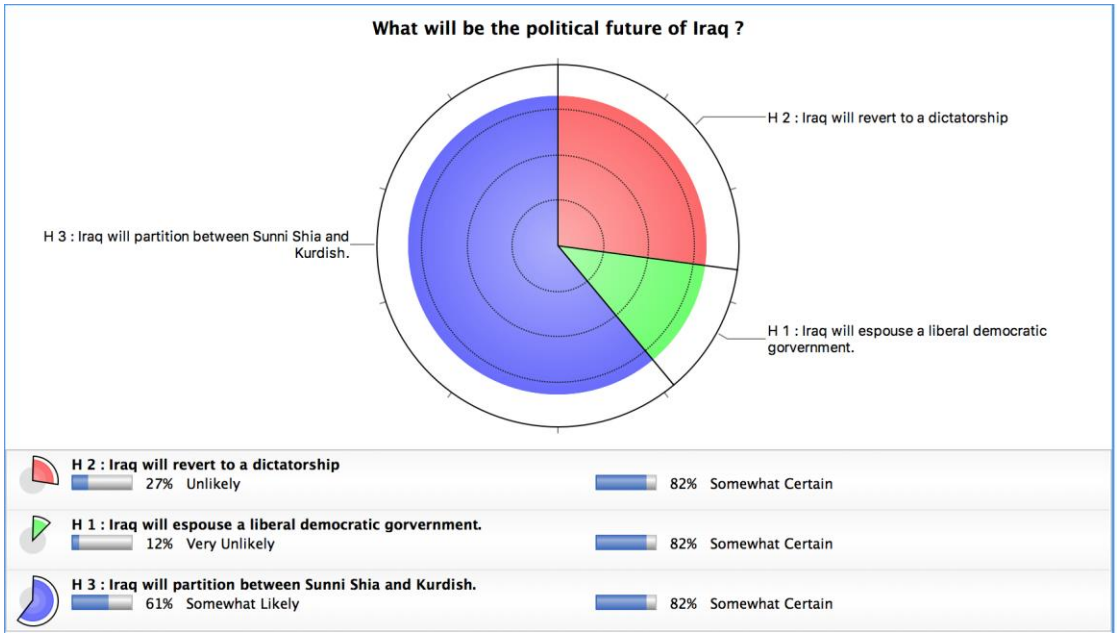
BAGHDAD — Special forces teams and army tanks surrounded the Green Zone housing Iraq's government as Prime Minister Nouri al-Maliki fiercely clung to power Sunday, taking the stability of the country to the brink at a moment when it is already facing a lethal challenge from radical Islamist fighters.

In actions that had all the markings of a political coup, Maliki gave a defiant late-night speech in Baghdad saying he would lodge a legal case against the country's president, who has resisted naming him as the candidate for another term as prime minister.

Tanks rumbled onto major bridges and roads in the capital as security forces were put on high alert, with militiamen also patrolling Shiite neighborhoods. The special forces teams surrounding the Green Zone were taking orders directly from the prime minister, security officials said.

Maliki's critics blame him for overseeing the de facto fragmentation of the country, with extremists from the Sunni-dominated Islamic State [illegible] through territory in the north and west and threatening Baghdad. They say Maliki, a Shiite, has persecuted and alienated members of the Sunni minority, driving them into the arms of radical groups.

The United States began airstrikes in northern Iraq on Friday as the al-Qaeda-inspired Islamic State threatened previously stable Kurdish territory, sending thousands of minority Christians and Yazidis fleeing for their lives.




With an objective assessment, decisions to act can be taken sooner or different decisions can be made.

# CYBER ATTACK - IRANIAN NUCLEAR PLANT



The New York Times

## Obama Order Sped Up Wave of Cyberattacks Against Iran

By DAVID E. SANGER
Published: June 1, 2012 | 360 Comments

WASHINGTON — From his first months in office, President Obama secretly ordered increasingly sophisticated attacks on the computer systems that run Iran's main nuclear enrichment facilities, significantly expanding America's first sustained use of cyberweapons, according to participants in the program.

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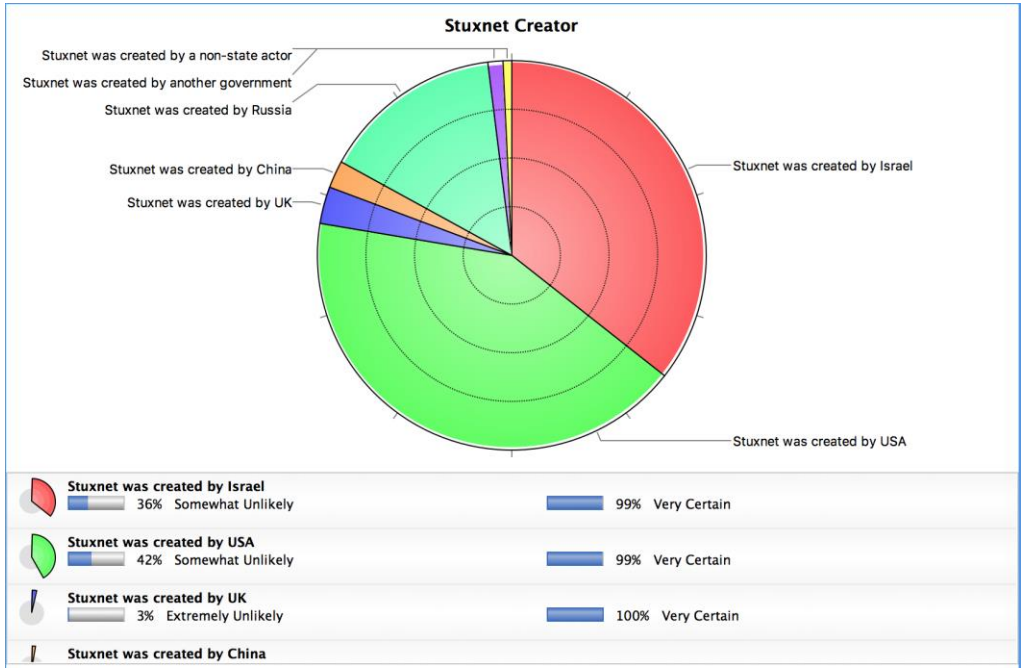
Hasan Sarbakhshian/Associated Press
Iran's nuclear enrichment facility at Natanz.

Mr. Obama decided to accelerate the attacks — begun in the Bush administration and code-named Olympic Games — even after an element of the program accidentally became public in the summer of 2010 because of a programming error that allowed it to escape Iran's Natanz plant and sent it around the world on the Internet. Computer security experts who began studying the worm, which had been developed by the United States and Israel, gave it a name: Stuxnet.

At a tense meeting in the White House Situation Room within days of the worm's "escape," Mr. Obama, Vice President Joseph R. Biden Jr. and the director of the Central Intelligence Agency at the time, Leon E. Panetta, considered whether America's most ambitious attempt to slow the progress of Iran's nuclear efforts had been fatally

Multimedia

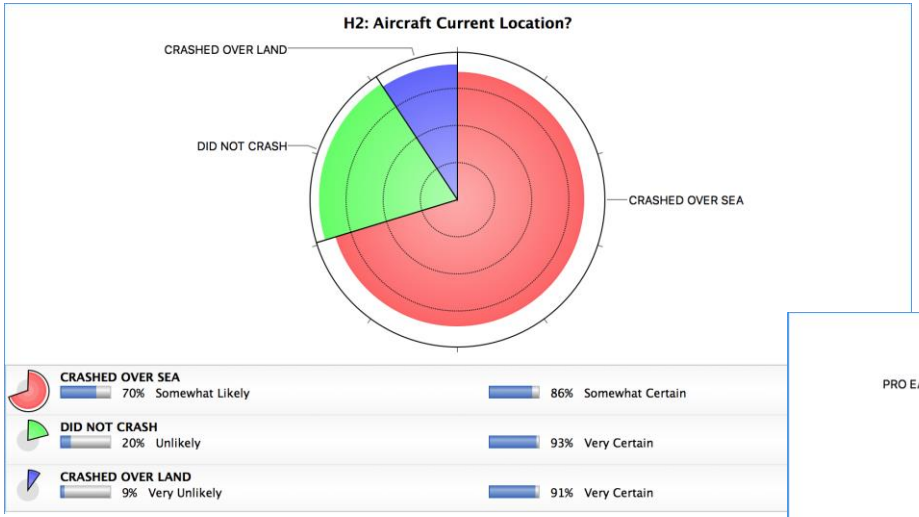
### In 2010, who created the Stuxnet Worm that shut down Iran's nuclear plant?



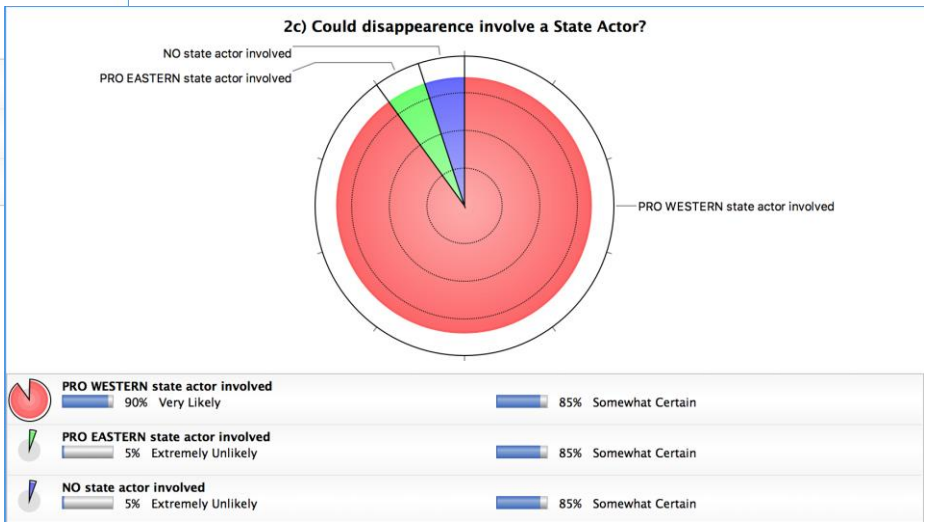
# DISAPPEARANCE OF MH370



## POSSIBLE SEARCH AREA




## STATE ACTOR INVOLVED



# CASE STUDY:
# REAL TIME CREDIT ASSESSMENT FOR MARKETLEND



Veriluma's software calculates the likelihood and probability of default for all unsecured SME loans screened and funded by innovative Australian market place lender, Marketlend.

Real-time assessment capability at inception and on demand throughout life of loan

Incorporates multiple quantitative and qualitative information inputs

Credit algorithms and metrics readily adjustable

Veriluma's benefit to Marketlend:

Unique prescriptive analytics capability incorporates unknown/partly known inputs and eliminates subjective bias in loan grading

Delivers enormous efficiency benefits over manual or partly manual grading systems

Audit feature enables tracking and revision of key inputs

**Result:** *Real-time, dynamic credit assessments, zero net credit losses to date*

# CASE STUDY:
# ONIQUA'S INVENTORY OPTIMISATION



Veriluma's software calculates the likelihood and probability of failure of all critical inventory items for Oniqua MRO's global client base

Uses multiple data sources and qualitative input to calculate and assign parts criticality

Readily customisable for scenario and "what if" analysis

Veriluma's benefit to Oniqua's clients:

Determines spare parts criticality thus leading to material reduction in working capital needs

Reduces risk of production shutdown due to lack of critical inventory

Improves project planning and management

Enhances strategic planning and competitive positioning

**Result**: *Reduced working capital and lost production days, improved project management*

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