Remote Access Virtual Environment (RAVE)

A VPN Knowledge Grid

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1998 Presidential Directive 63

PDD-63 and its implementation raise a number of issues. Among them is the ability and willingness of the private sector to cooperate with the federal government in sharing information. To what extent will the federal government get involved in the monitoring of privately operated infrastructures and what are the privacy implications?

Excerpt: Congressional Research Service Report

Introduction

- CyberRAVE is an Online Business Development company in business since 1996, with an International customer base

- Directly involved with Critical Infrastructure Protection (CIP) Planning since 1998

- Registrar of Industry and Government Virtual Private Network (VPN) Top Level Internet Domain Names

Mission

To provide Communities-of-Interest (COI) ever increasing levels of information security, actionable intelligence, and simplified access to remote resources by establishing Vertical Communities governed by democratic online Advisor Groups (VCAG)

Vision

- Establish a structured network environment, accessible from anywhere, that maximizes free interchange of information while continuously addressing & adapting to the needs of Network Members, and the issues and probable conflicts identified in PPD-6

- In other words; a RAVE

RAVE Objectives

- Strengthen relationships among participating RAVE network users
- Increase the level of data security for RAVE users
- Recognize and support individual privacy and personal freedom to the greatest extent
- Reduce burdens associated with regulatory control
- Provide timely access to community intelligence, and deliver decision support through real-time situation awareness
- Establish a democratic framework for online communities
- Foster data transmission rights and responsibilities

Current Environment

- Open systems lack trust mechanism
  - User privacy / data security is at risk
  - Fear is not an adequate means to 'sell' information security
- Knowledge driven society
  - Knowledge is power
  - Content is king
- Information is the new currency
  - Situation awareness & decision support
- America's economic security is at stake

Unstructured (Raw) Data

Obstacle to Information Efficiency

- Frequently repeated common tasks

- As the structure of data increases, the risk of compromise increases

- Individuals, groups & governments are not equipped to combat internal / external data threats & abuses
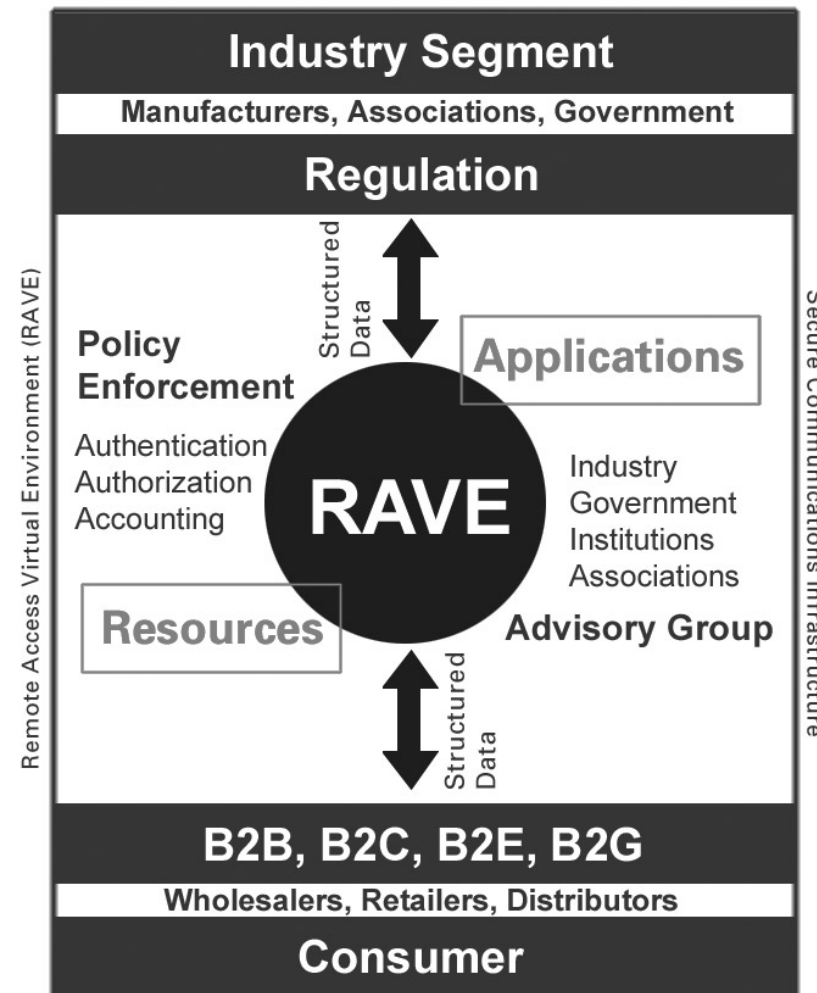
But …

- Standardized data resources establish an information commodity that Virtual Community users can exchange

- Threat of security breach provides common incentive to establish effective data protection methods
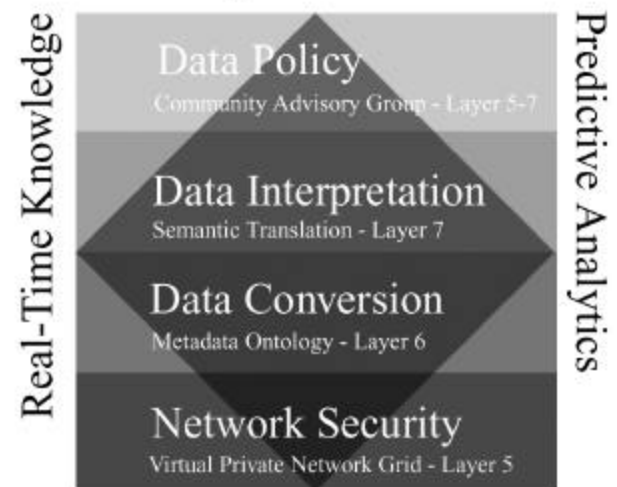
Knowledge Grid: Solutions

Open Security Standards

Data Protection

- Encrypted data channels
- Federated ID management
- Transparent policy oversight
- Ontological schemas

Privacy Protection

Real-Time Knowledge
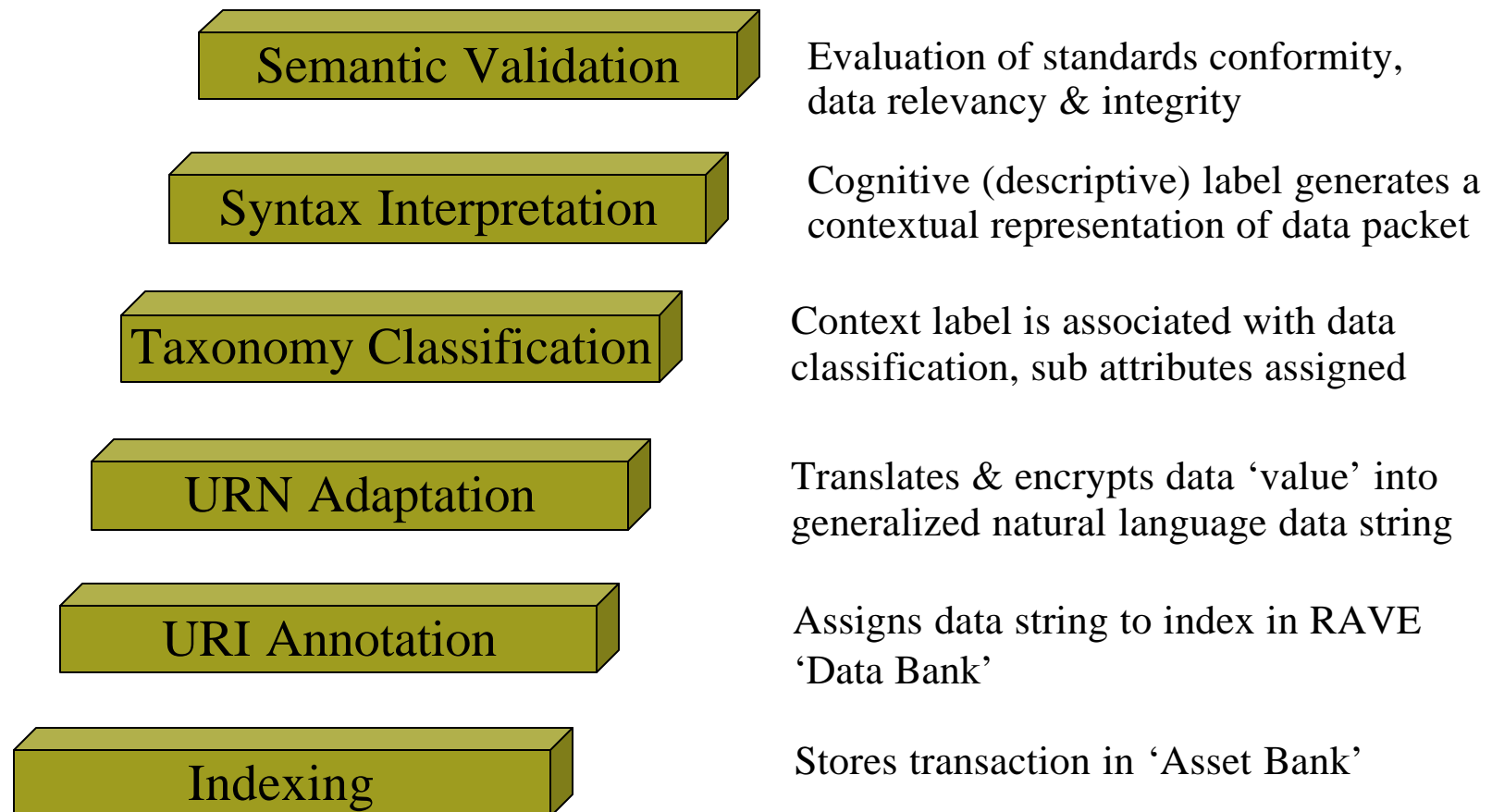
Predictive Analytics
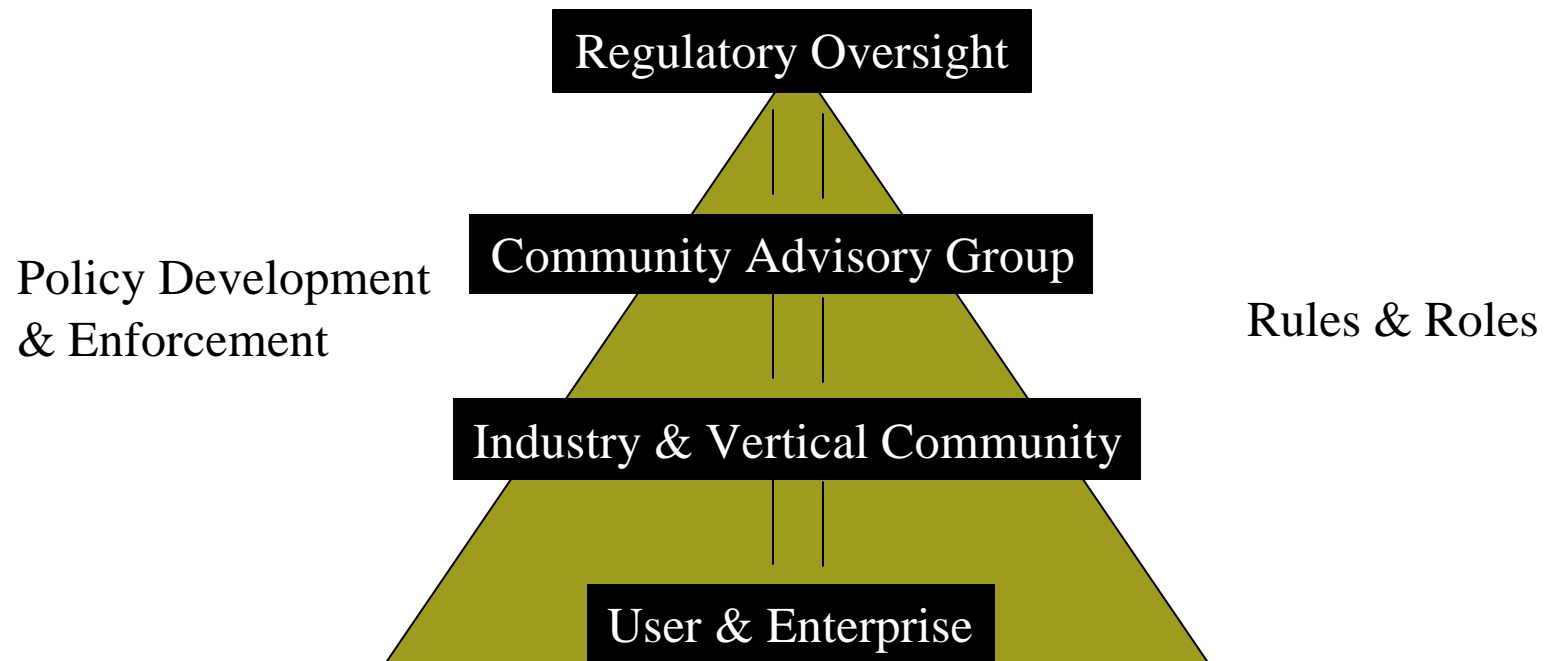
Data Policy
Community Advisory Group - Layer 5-7

Data Interpretation
Semantic Translation - Layer 7

Data Conversion
Metadata Ontology - Layer 6

Network Security
Virtual Private Network Grid - Layer 5

Risk Management

Semantic Mediation

Data Transformation

Semantic Validation — Evaluation of standards conformity, data relevancy & integrity

Syntax Interpretation — Cognitive (descriptive) label generates a contextual representation of data packet

Taxonomy Classification — Context label is associated with data classification, sub attributes assigned

URN Adaptation — Translates & encrypts data 'value' into generalized natural language data string

URI Annotation — Assigns data string to index in RAVE 'Data Bank'

Indexing — Stores transaction in 'Asset Bank'

RAVE Community
Organic Model

Vertical Market Segment (Community)

Regulatory Oversight

Community Advisory Group

Industry & Vertical Community

User & Enterprise
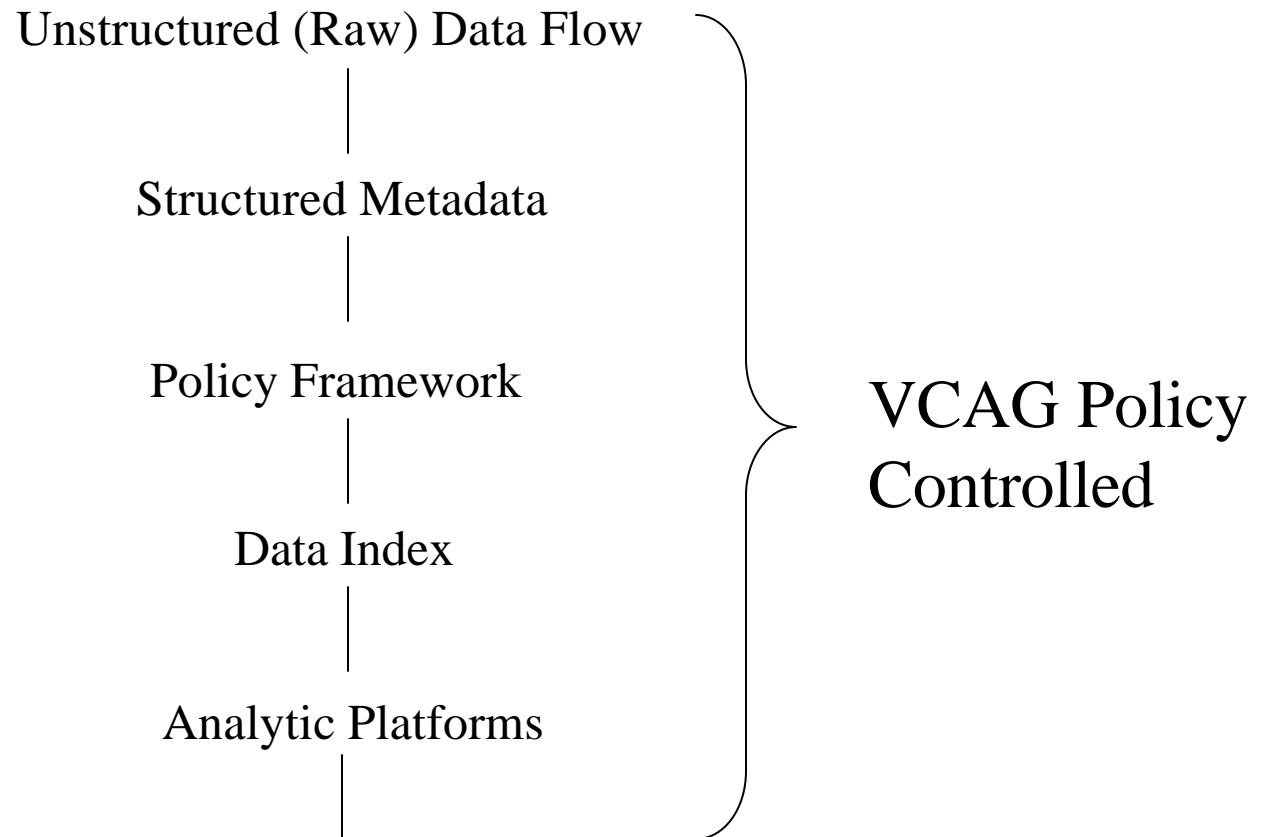
Policy Development & Enforcement

Rules & Roles

Vertical Community Advisory Group (VCAG)
Policy Framework: Principals & Constitution

- Representative Virtual Democracy
  - Network Users
  - Associations
  - Industries
  - Academia
  - Governments
- Community defined Roles, Guidelines (best practices), and Laws
  - Authentication, Authorization, Accounting (AAA)
  - Metadata schema definition (ontology + taxonomy)
  - Metadata management, data storage & use

Data Transformation

Commoditization Process

Unstructured (Raw) Data Flow

Structured Metadata

Policy Framework

VCAG Policy
Controlled

Data Index

Analytic Platforms

Core Technologies

Open System Interconnection (OSI) Layer 6 — Presentation

- **Extensible Markup Language (XML)**
  - Cleanings of 'Raw' data

- **Simple Object Access Protocol (SOAP)**
  - Encode Web service information

- **Extensible Access Control Markup Language (XACML)**
  - Attaching access privileges to semi-structured data

- **Universal Description, Discovery and Integration (UDDI)**
  - Distributed online business directory

- **Web Service Description Language (WSDL)**
  - Describes Web service capabilities

- **Security Agent Markup Language (SAML)**
  - Single sign-on framework ensures secure communication with authentication, authorization, and non-repudiation

- **Lightweight Directory Access Protocol (LDAP)**
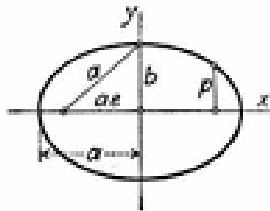 - Set of directory protocols

Digital Vault
Applied Research Tools Platform

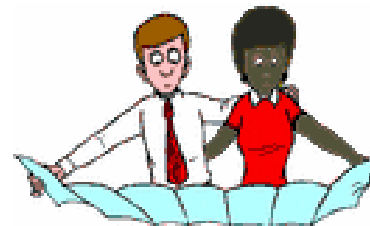Intelligent Agents

Activity Monitoring

Business Analytics

Relationship Management

Data Modeling

Resource Planning

Change Management

- Social

- Economic

- Political

- Legal

- Technical

- Administrative

Heuristically
Prescriptive / Proscriptive

Boundaryless Organization Architecture (BOA)

- Threats & opportunities detection system
  - Unified view
  - Situation awareness
- Works with existing technologies / methodologies
  - Network & vendor agnostic
  - Common-of-the-shelf (COTS) technologies
  - Vendor neutral delivery and maintenance
- Intelligence
  - Cataloging achieved through Dublin Core Metadata, PICS, or similar agreed schema
  - Data assets must be cataloged as Metadata before they can be commoditized
  - Repeatable use of metadata
  - Determination of metadata exceptions
  - Generalized maintenance of taxonomic catalogs
  - Increased probability of predictable results
  - Predictability determined through automated data monitor (heuristic)
- Aggregated cost structure
- Benefits all who participate

Benefits
Governed by VCAG

- Behavior analysis
- Resource Discovery
- Pattern recognition
  - Traffic profiling
  - Data modeling
  - Predictive Analytics (PA)
  - Usage monitoring
- Notification
  - Threats
  - Opportunities

Challenges

- Public & private 'Buy-In'
- Regulatory / policy controls
  - Roles & Rules
  - Compliance & Enforcement
- Linking Disparate Systems: Interoperability
- ID Management
- AAA between application and security service layers
- Security, web services, privacy & metadata taxonomy standardization
- Network QOS
- Application SLA

On the Horizon

- Bundled services
- Simplified application security management
- User-friendly network access & navigation services
- Federated architecture
  - Distributed file system(s)
  - Distributed applications
  - Automated Security Services
  - Centralized authorization support
  - Collaboration
  - Unified / consolidated billing
  - SSO ID Management

Thank you

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