Benefiting the Open Data and Open Government initiatives with ontologies and knowledge representation.

CRICS 9

José Francisco Salm Jr., PhD

My Background

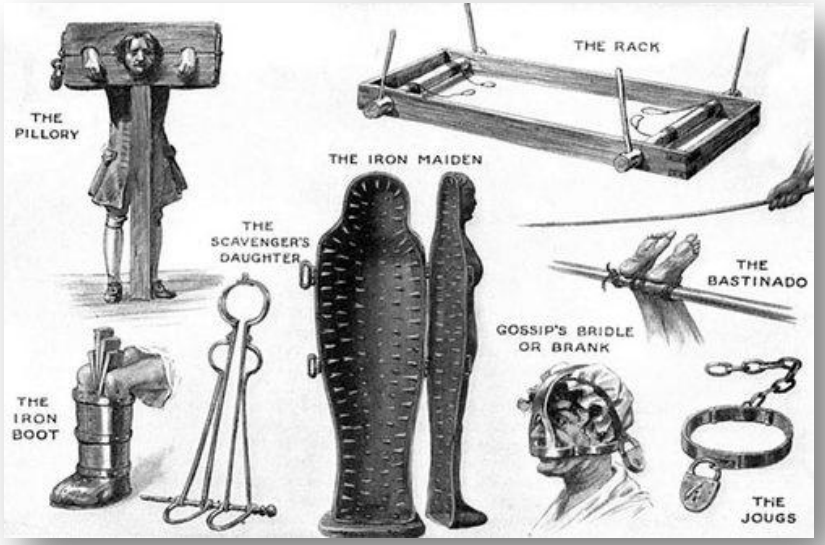
- Professor at the *State University of Santa Catarina*
  - ESAG : Public Administration Department
- Created the Lattes Community of Standardization (1999 - 2001)
- Stela Institute – R&D Institution
- R&D partnership with Synthosys LLC
- Knowledge Engineering Platforms Ontology Engineering

How the Government got information from citizens in medieval times

No API's, no Interoperability……

http://static.ddmcdn.com/gif/10-medieval-torture-devices8.jpg

museum of MEDIEVAL TORTURE instruments



http://filipspagnoli.files.wordpress.com/2009/01/torture-devices.jp

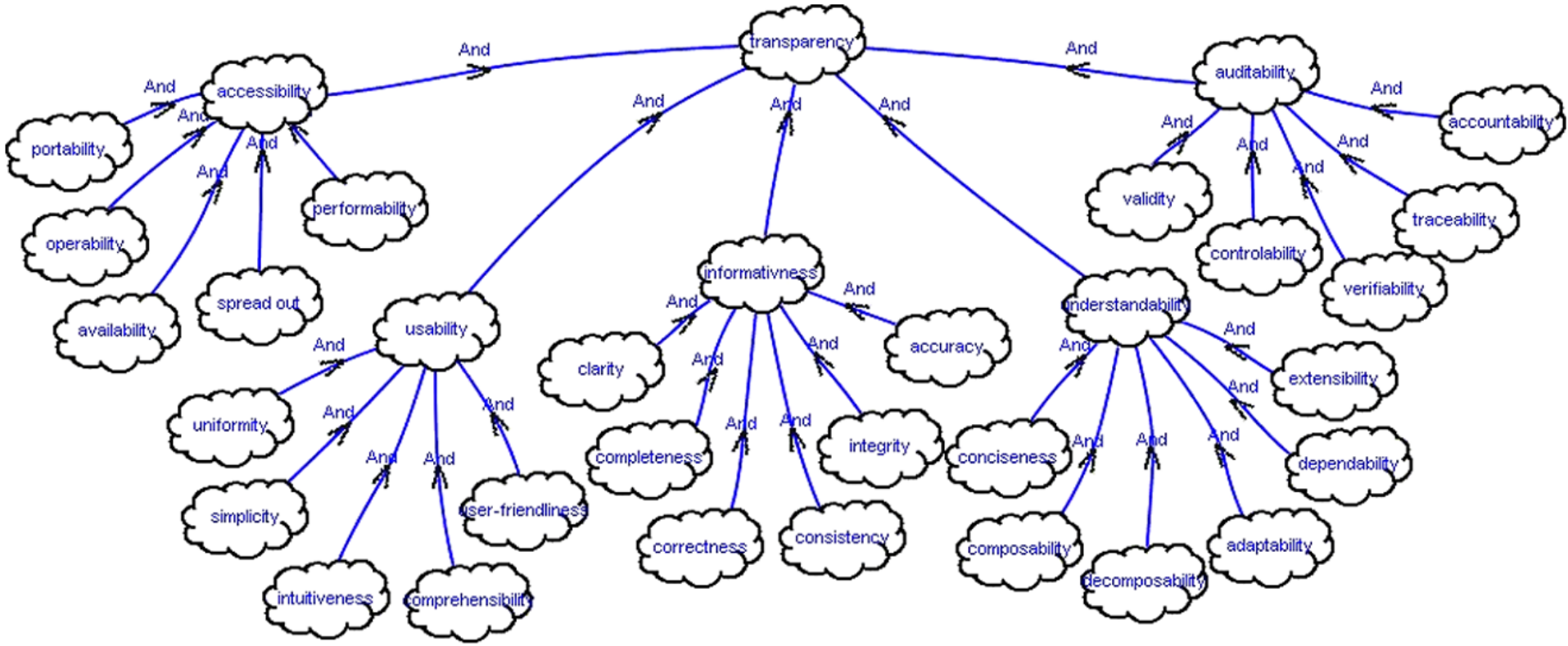
Open and Transparent Government

Transparent Government

WHAT DOES TRANSPARENCY MEAN FOR INFORMATION SYSTEMS?

It means that there should be requirements...

5 groups - accessibility, usability, informativness, understandability and auditability



SIG (Gráfico Interdependência Softgoal) - Fonte: Leite (2010).

Open Data, Open Government and Interoperability

SO WHAT ARE THE CHALLENGES?

What are the Challenges?

- Ambiguity (understandability + informativness)

- Not just data, Interoperability (accessibility + usability)

Is Halloween ambiguous to rule understanding?

http://image.spreadshirt.com/image-server/v1/products/102871204/views/1,width=378,height=378,appearanceId=2/Keep-Calm-and-Give-Me-Candy-Halloween-Kids--Shirts.png

During all year long we say to kids, don't accept candy from strangers…

Then on Halloween we tell them not only to meet strangers but also to trick them if they don't have any candy…

Two simple words from just one language

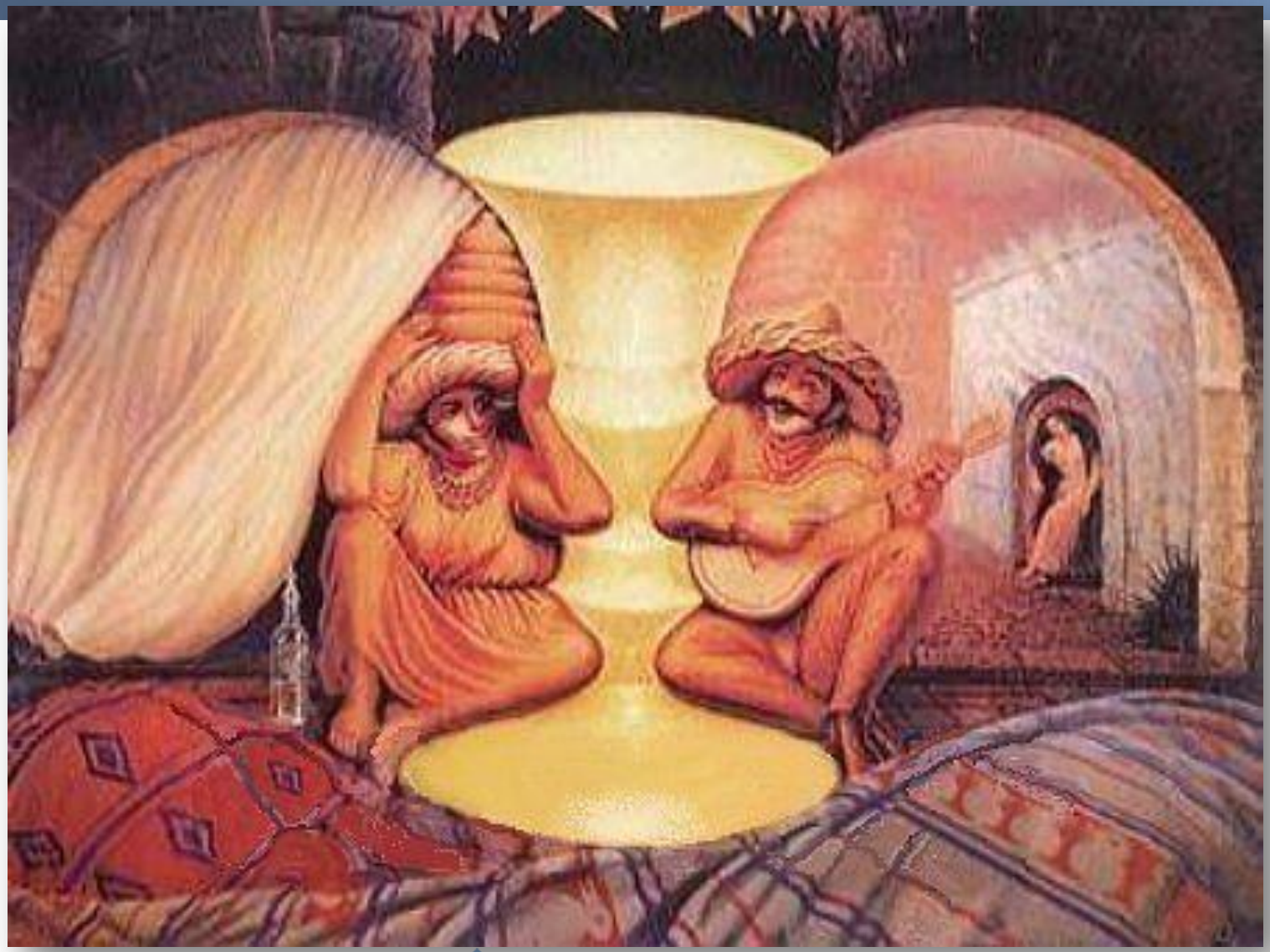
- Man
  - The human species (i.e., man vs. animal)
  - Males of the human species (i.e., man vs. woman)
  - Adult males of the human species (i.e., man vs. boy)

- Book
  - a bound collection of pages
  - to make an action or event a matter of record (e.g. "Unable to book a hotel room, a man sneaked into a nearby private residence where police arrested him and later booked him for unlawful entry.")

Open Data , Open Government, Interoperability and API's

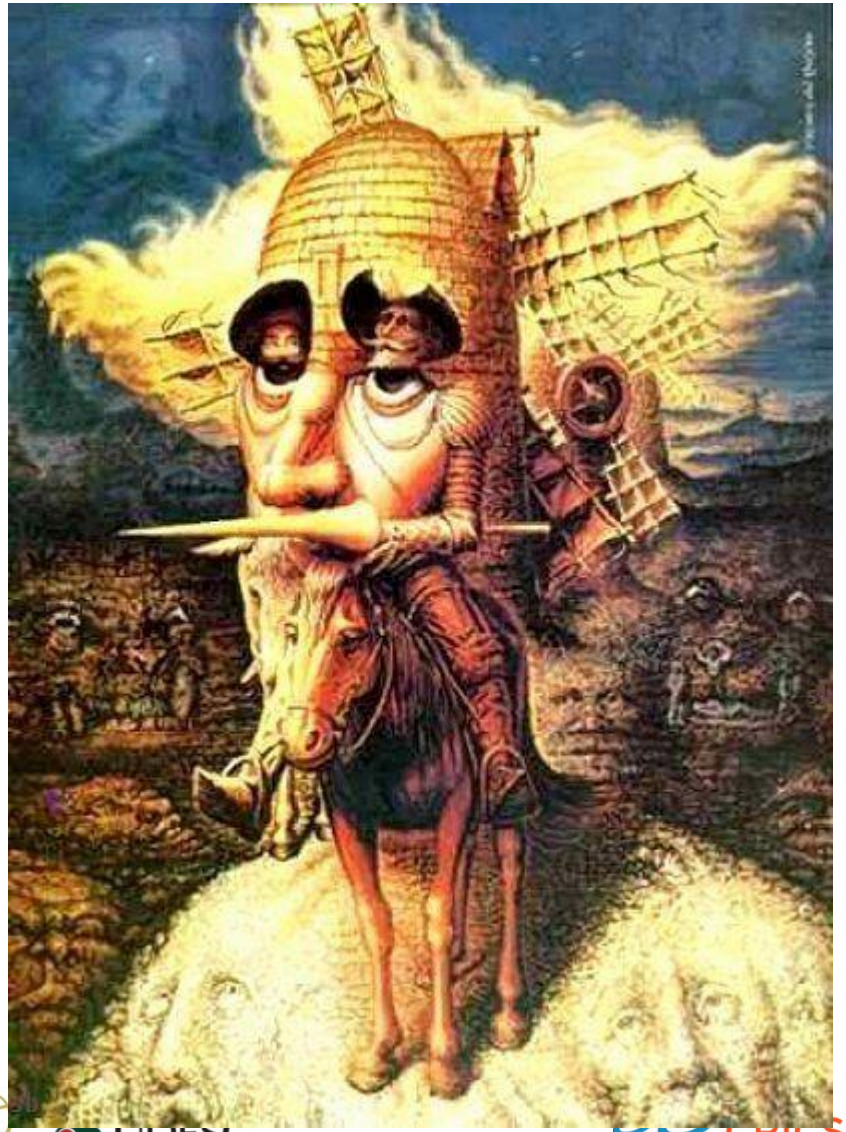
SO WHY USE AN ARCHITECTURE BASED ON SEMANTIC TECHNOLOGY?

Ambiguity



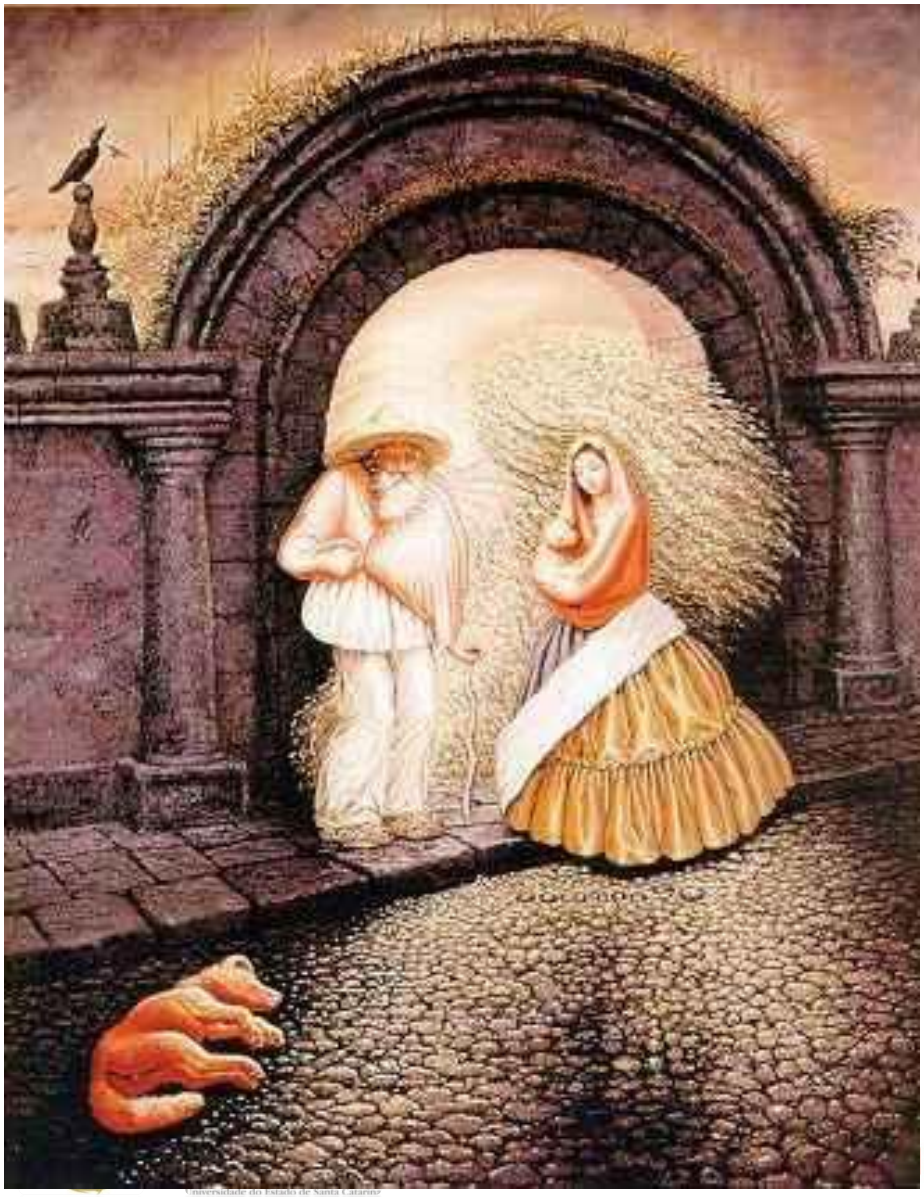
Ambiguity

Ambiguity



Ambiguity

Ambiguity



Ontology mapping: a possible way out of the tower of Babel?

Source: Frank van Harmelen

Six Clusters - Using Open Data

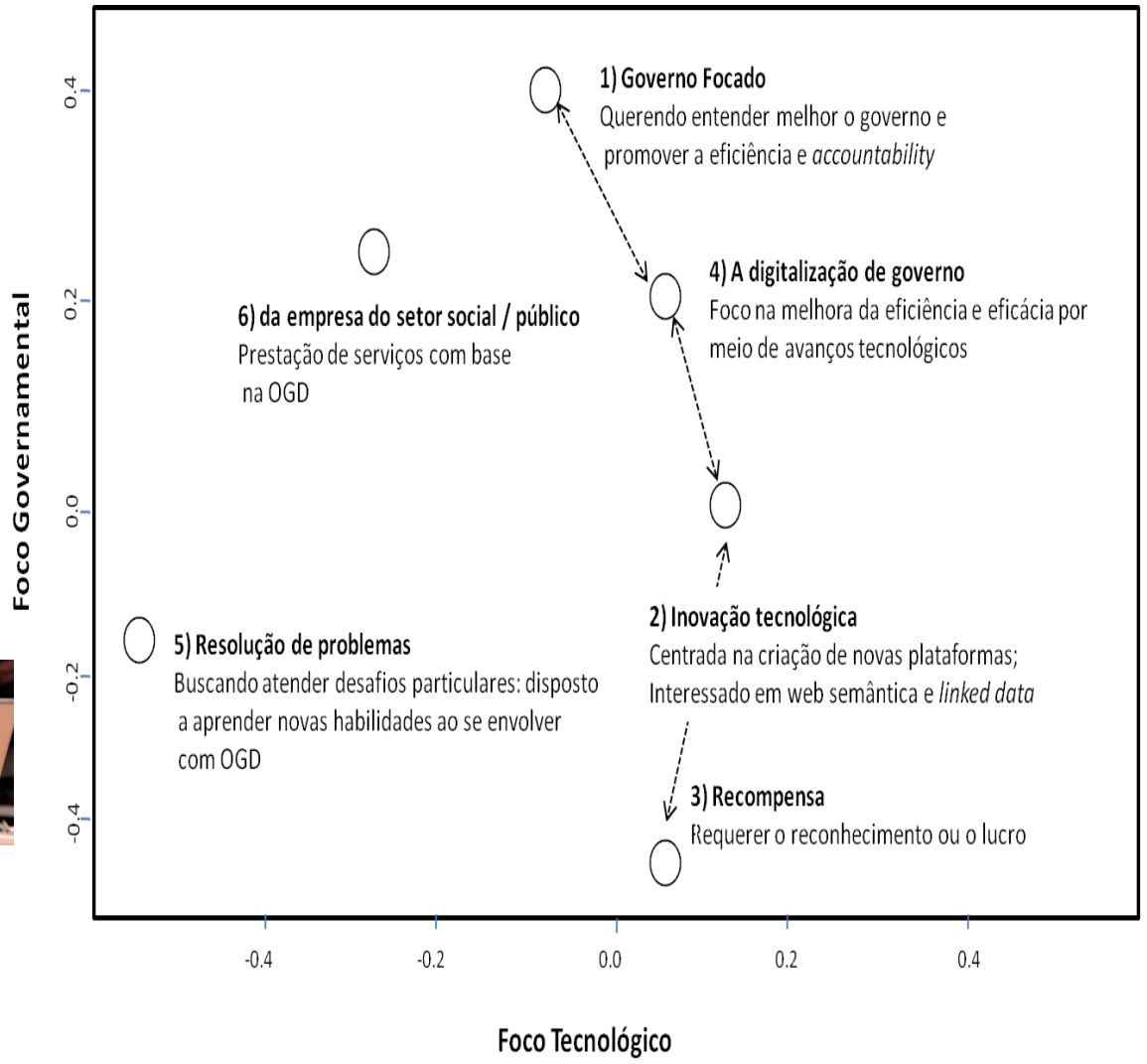
Citizens

Scientists and Analysts

Public managers

Journalists

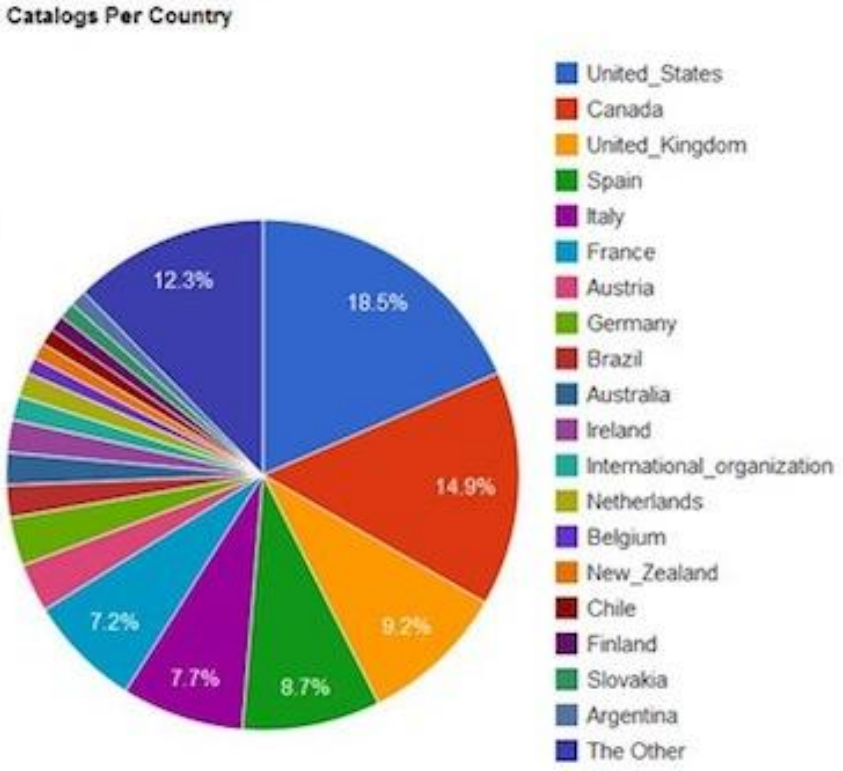
Open Data Developers



Cluster da motivação para uso de *Open Data*.
Fonte: Traduzido de Davies (2010)

1,022,787 datasets from 192 catalogs
in 24 languages representing 43 countries and international organizations

http://logd.tw.rpi.edu/page/international_dataset_catalog_search



For transparency,

IS OPEN DATA ENOUGH?

Dr **Alice Mary Stewart**

1950's Dr Alice Mary Stewart was a nonconventional researcher. Epidemiology

She did research with cancer in children

Small funding, she made a questionnaire and soon she discovered one patterns was clear on the data.

Findings: All mothers had done X-rays during pregnancy. Published the results – very accessible data.

A child died per week and nothing was being done.

It took 25 years for the British to stop examining with X-ray machines pregnant women.

Margaret Heffernan

Dr **Alice Mary Stewart**

Open data is not enough

We need to think on developing API's and other means of interoperability.

So, we should not think that Open Data is the end, it is just the begging.

Ecosystem for Open Government and Transparency

New view for Open Gov

Memo from the White House

The need to use API's as means to access Government Open Data (May 23rd 2012)

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release May 23, 2012

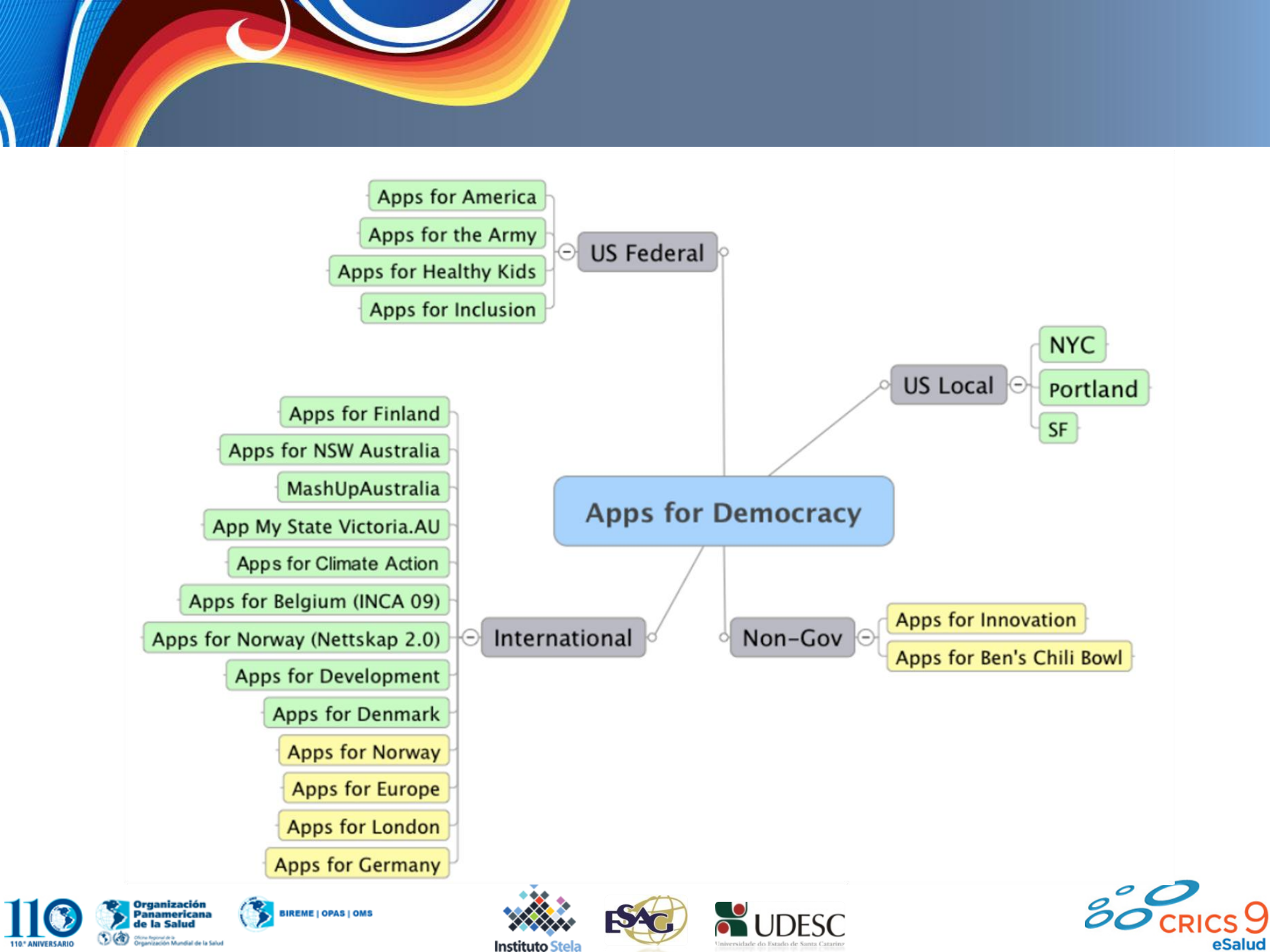
May 23, 2012

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

SUBJECT: Building a 21st Century Digital Government

The innovative use of technology is fundamentally transforming how the American people do business and live their daily lives. Exponential increases in computing power, the rise of high-speed networks, and the growing mobile revolution have put the Internet at our fingertips, encouraging innovations that are giving rise to new industries and reshaping existing ones.

Innovators in the private sector and the Federal Government have used these technological advances to fundamentally change how they serve their customers. However, it is time for the Federal Government to do more. For far too long, the American people have been forced to navigate a labyrinth of information across different Government programs in order to find the services they need. In addition, at a time when Americans increasingly pay bills and buy tickets on mobile devices, Government services often are not optimized for smartphones or tablets, assuming the services are even available online.


Apps for America
Apps for the Army
Apps for Healthy Kids
Apps for Inclusion
US Federal
NYC
Portland
SF
US Local
Apps for Democracy
Apps for Finland
Apps for NSW Australia
MashUpAustralia
App My State Victoria.AU
Apps for Climate Action
Apps for Belgium (INCA 09)
Apps for Norway (Nettskap 2.0)
Apps for Development
Apps for Denmark
Apps for Norway
Apps for Europe
Apps for London
Apps for Germany
International
Apps for Innovation
Apps for Ben's Chili Bowl
Non-Gov

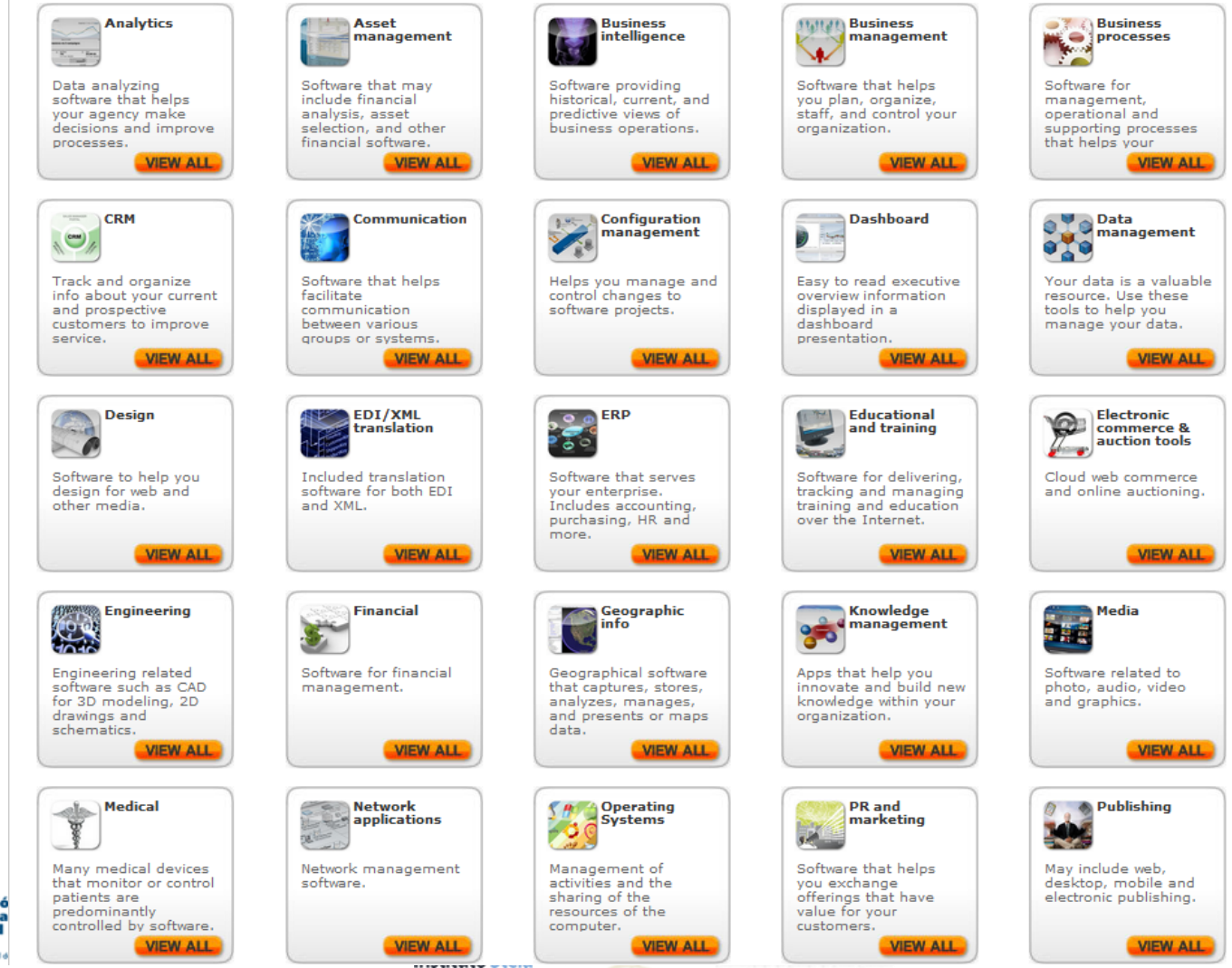
Examples

GSA
Apps.Gov
A Service Provided by GSA
Welcome Register | Log In
0 Items in Cart $0.00
Contact Us | Cloud FAQs | Vendor FAQs
Home Business Apps Productivity Apps Cloud IT Services Social Media Apps Info.Apps.Gov
Thursday, March 29, 2012
SEARCH FOR
IN All Categories
GO
Welcome to Apps.gov
Apps.gov is your source for cloud computing applications designed to help your agency harness the power of today's technology. Whether it's Business or Productivity Applications, Cloud IT Services or Social Media solutions, Apps.gov is the place to get your government agency in the cloud.
What is Cloud Computing?
Want to learn more?
Watch this brief video for an overview of Cloud Computing to gain a better understanding of what it is and its benefits.
Watch the video now »
Video transcript »
What type of solution do you need?
Business Apps
Your agency or service is complex and requires state-of-the-art software to get business done.
GSA Cloud Business Apps has a solution!
Cloud IT Services
Need a better solution to reduce cost and implement projects faster?
GSA Cloud IT Services has the answer!
Productivity Apps
You need to get things done and GSA is there to help you do just that.
GSA Cloud Productivity Apps has the tools!
Free Social Media Apps
Social media tools make it easier for government and the public to work together.
Social Media Apps help us innovate together!
Before using/purchasing the products and services on apps.gov, please do so in accordance with your agency's policies and procedures pertaining to Procurement, Information Technology, Cyber Security, Privacy, Accessibility, Social Media, and any other applicable Federal mandates. If you have any questions about your agency's policies and procedures, please contact your agency's Office of the Chief Information Officer or Terms of Service point of contact.
Home | Register | Order History/Status | Cloud FAQs | Vendor FAQs | Contact Us
*** WARNING ***
This is a U.S. General Services Administration computer system that is "FOR OFFICIAL USE ONLY." This system is subject to monitoring. Therefore, no expectation of privacy is to be assumed. Individuals found performing unauthorized activities are subject to disciplinary action including criminal prosecution.
Privacy and Security

App's for Government

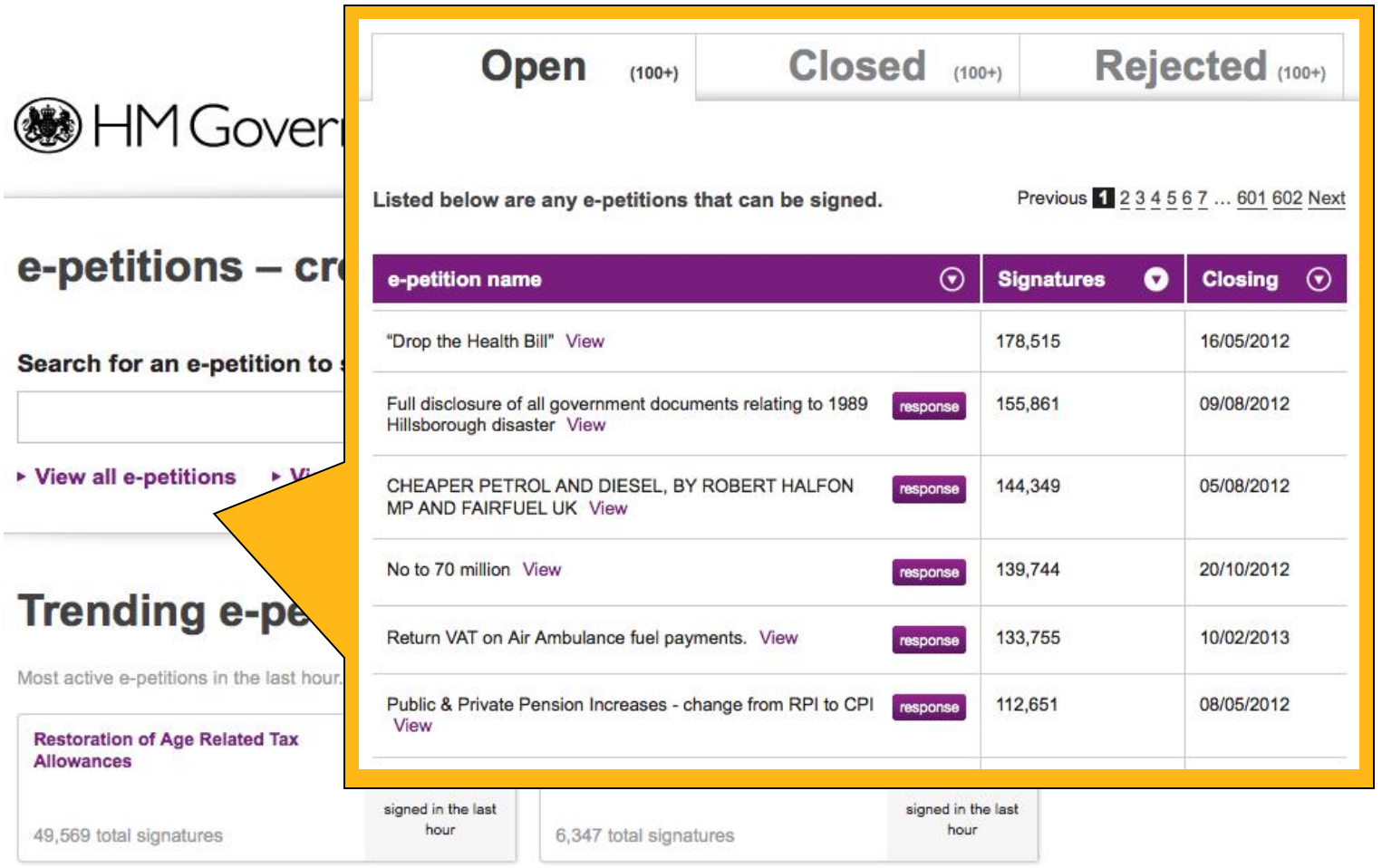
Business Apps

Your agency or service is complex and requires state-of-the-art software to get business done. GSA's Cloud Business Apps provide the solution. Business Apps is geared towards the enterprise with cloud software solutions such as analytical, business processes, CRM, tracking and monitoring tools,<!--#echo var="GATEWAY_INTERFACE"-->



IT'S A GLOBAL MOVEMENT

Participation(ePetitions)



UK -- and many others -- offer an online platform for public petitions.

Participation (Anti Corruption)

Pera ng Bayan website enables citizens to report companies and people suspected of tax evasion or report a corrupt official. Also has Facebook page for submitting reports.

Transparency

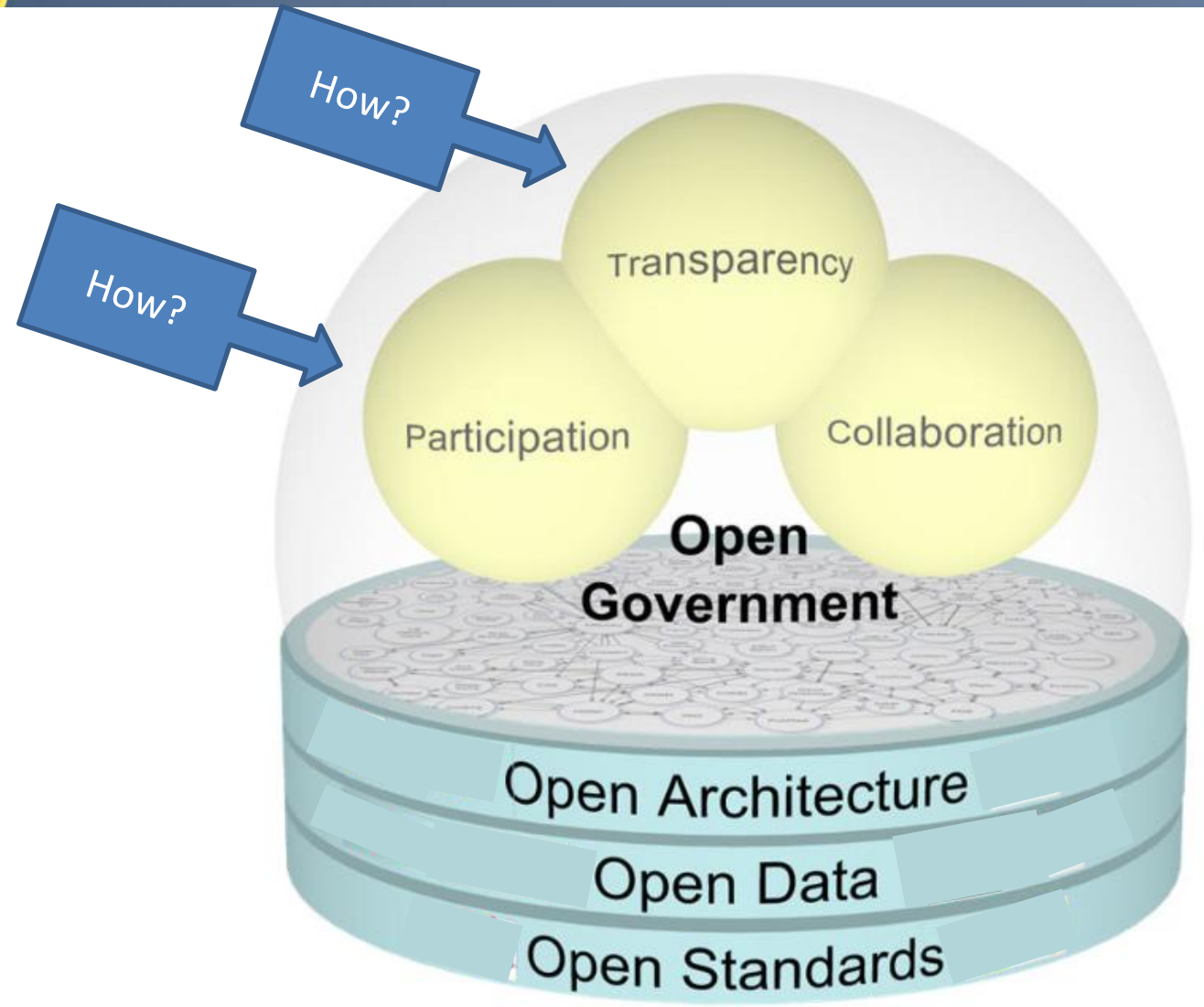
- Created by an NGO to show the public how UK government spends money.
- Won contest by UK Government and grant supported launch 1st version in 2009
- Code is open source so anyone can create their own version with it.

Open Source for Open Government

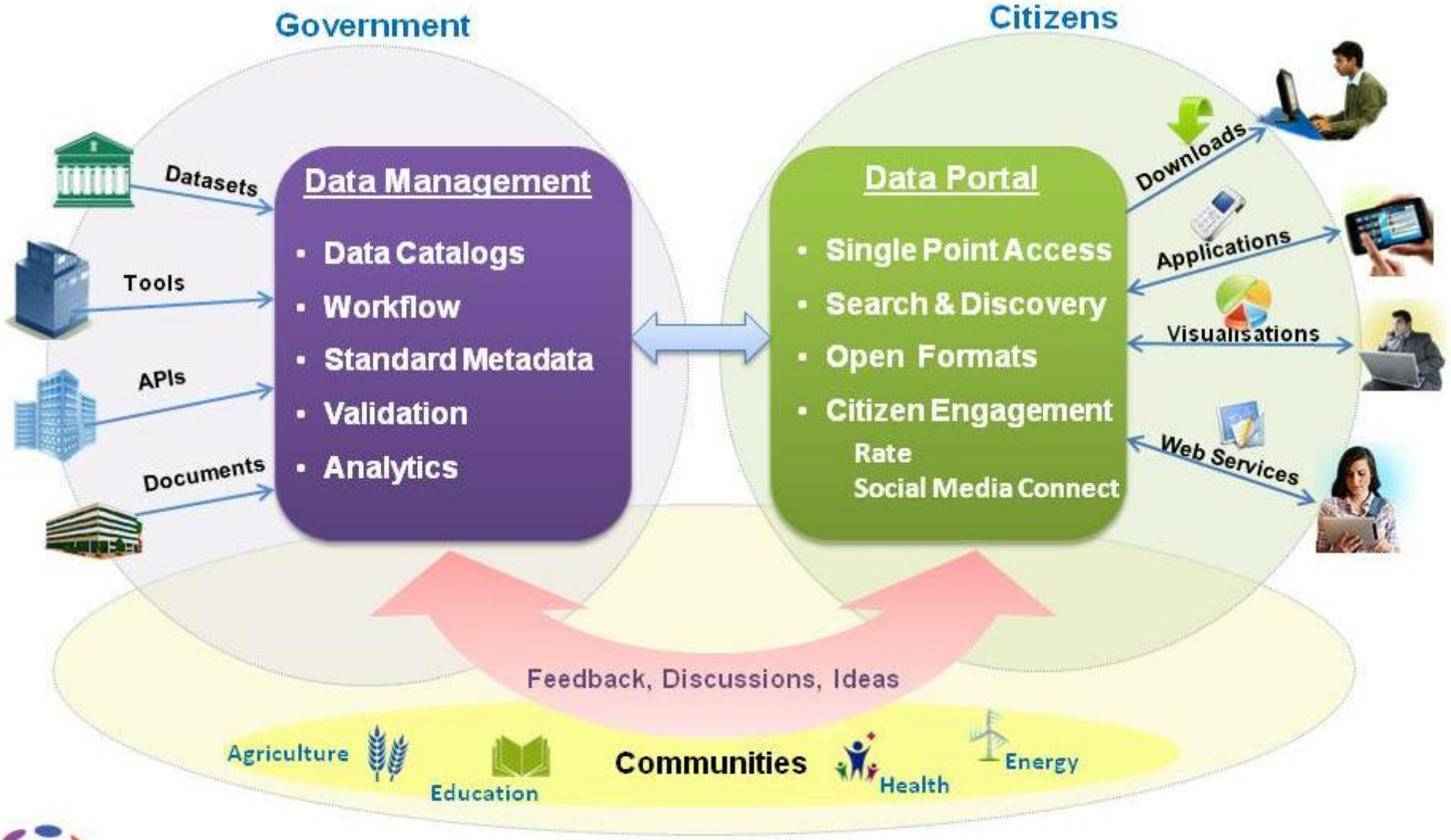
OPEN GOVERNMENT PLATFORM (OGPL)

110° ANIVERSARIO
Organización Panamericana de la Salud
Oficina Regional de la Organización Mundial de la Salud
BIREME | OPAS | OMS
Instituto Stela
ESAG
UDESC
Universidade do Estado de Santa Catarina
CRICS 9
eSalud

Open Government



Open Government Platform (OGPL)



DISCOVER POSSIBILITIES opengov

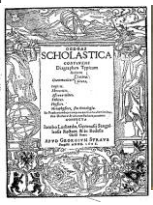
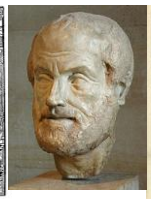
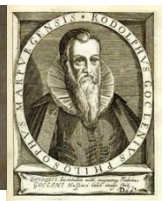
Open Government

HOW TO DEALING WITH THESE CHALLENGES AND THUS PROMOTE INTEROPERABILITY ?

Timeline of Ontologies
Timeline for Ontological Engineering

Source:
Salm, Jr. 2012

1606 – Jacob Lorhard (*Lorhardus*)
Segundo filósofo a citar a ontologia

1606 – Lorhard e o uso de árvores diagramáticas Ogdoas Scholastica,(1606).

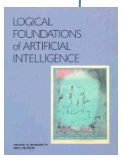
1613 – ***Lexicon philosophicum***

1730 – **Ontologia Popularizada**

1770 – **Framework de KANT (padrão triádico)**

1894 – **Formal Ontology and Transcendental Logic**

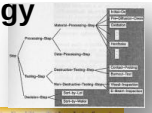
1987 – **Edmund Husserl Ontologia Formalizada**



A primeira noção do que é "conceitualização", depois usado por Gruber (1993) *Nonmonotonic reasoning de Genesereth e Nilsson*

1991 – Primeira Ontologias na IA

1992 – **Ontologia na Inteligência Artificial MKF Ontology**



Publicação na AI MAGAZINE

1993 – Primeiras definições de ontologias na Ciência da Computação

1995 – International Journal of Man-Machine Studies

1996 – **KACTUS**

Diferentes formas de caracterizar ontologias de Guarino e Giaretta

1997 – **METHONTOLOGY**

2000 – **Knowledge Patterns Peter Clark**

Primeiro **workshop on Ontological Engineering** em conjunto com o 12th European Conference on Artificial Intelligence

2001 – **On-To-Knowledge**

2002 – **Project protégé**

2003 – **OWL** recomendação de padrão.

2004 – **OntoGov**

ONTOGOV Ontologia aplicada a Governo Eletrônico.

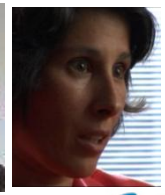
2006 – **NeOn**

Metodologia para engenharia de ontologias em rede

2009 – **ODP's**

2012 – **W3C OWL 2**

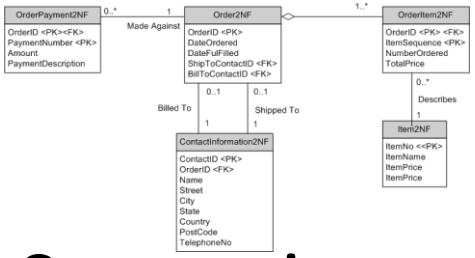
eParticipation Ontology

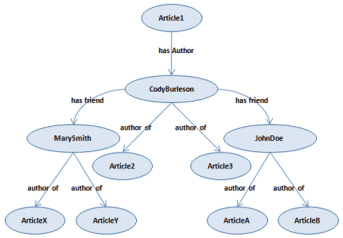


Origin | Theory | Philosophy | Artificial intelligence | Ontology Engineering

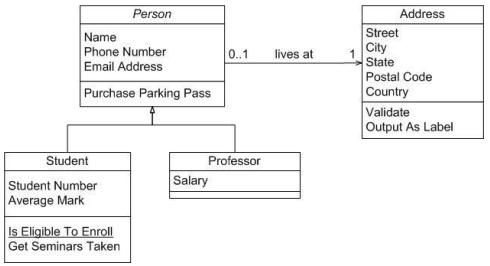
Rethinking Development

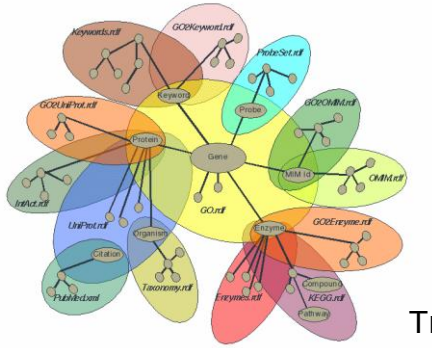
- Think in graphs (concepts) not on the Normal Forms in relation databases (not and easy thing)





- Think on Semantic not on Object Oriented Paradigm (event if semantic technology uses classes and relationships)

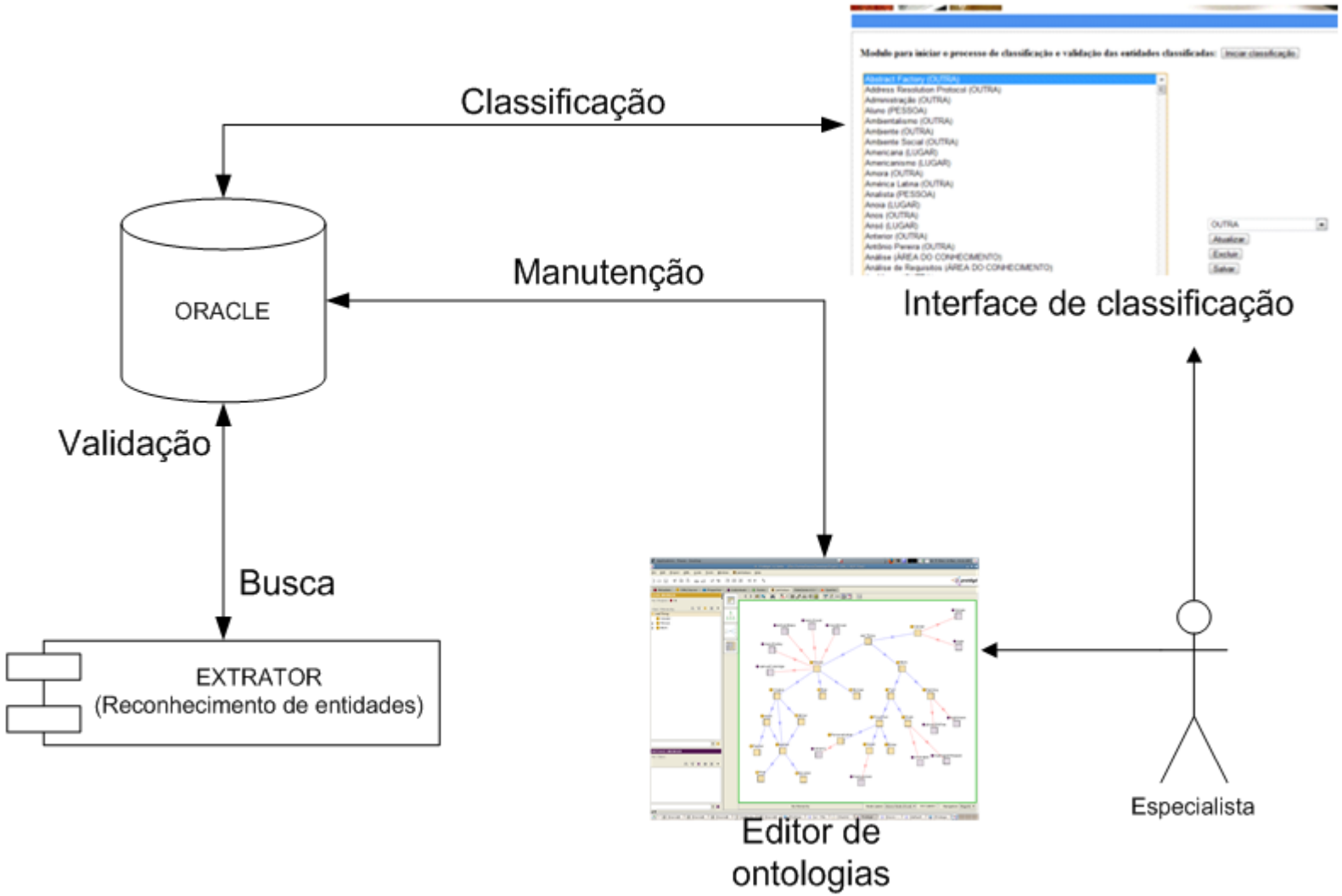




Tm Berners-Lee

HOW TO BUILD A SEMANTIC SEARCH?

Entendendo o funcionamento da **busca semântica**

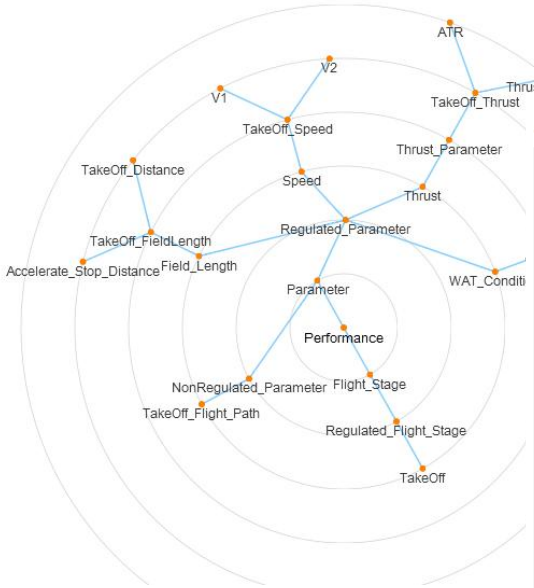


Semantic Search

www.stela.org.br/semanticsearch/#result&q=%7B%22query%22:%22takeoff%22%7D

isdc-x
Busca Semântica Integrada

takeoff BUSCAR



82 DOCUMENTOS RECUPERADOS

Tecnical Reports

AC 135-42 Extended Operations (ETOPS) and Operations in the North Polar Routes.pdf
Link não disponível
airplane equipment and systems are installed and functioning before **takeoff**, more thorough **flight** (...) crewmember to cope with an adverse **operating** condition. **System** failures or malfunctions occurring

AC 150-5220-22A Engineered Materials Arresting Systems for Aircraft Overruns.pdf
Link não disponível
takeoff or while **landing**. Data on aircraft overruns over a 12- year period (1975 to 1987) indicate (...) , but **landing** gear configuration and tire pressure. In general, use the **maximum** take-off weight

AC 23-8B Flight Test Guide Certification Part 23 Airplanes.pdf
Link não disponível
Navigation **System** AC 23-7 Substantiation for an Increase in **Maximum** Weight, **Maximum Landing** Weight (...) 23.61 **TAKEOFF FLIGHT** PATH..... 41 25. SECTION

AC 23-8C_Flight Test Guide for Certification of Part 23 Aircraft_DRAFT.pdf
Link não disponível
23.61 **TAKEOFF FLIGHT** PATH (...) .....73 23.149 MINIMUM **CONTROL SPEED**

AC 25-15_Approval of Flight Management Systems in Transport Category Airplanes.pdf
Link não disponível
speed. 5 25.904 Automatic **takeoff** thrust **control system** (ATTCS). 5 25.1301 Function and installation (...) - engine-inoperative. 5 25.123 En route **flight** paths. 5 25.125 **Landing**. 5 25.149 Minimum **control**

AC 25-25 Performance and Handling Characteristics in the Icing Conditions Specified in Part 25 Appendiex C.pdf
Link não disponível
. Operative Ice Protection **System** A1-1 a. All **Flight** Phases Except **Takeoff** A1-1 b. **Takeoff** Phase A1 (...) stall and maneuverability evaluations with the airplane under **flight** guidance **system control**

AC 25-7 Chapter 2 Section 2.pdf
Link não disponível

Ontologia

- Performance
  - Aircraft
    - Aircraft_Component
      - Flight_Controls (7)
      - Wing (1)
  - Development_Stages
    - Common_Definition (4)
    - First_Definition (3)
    - Phase_Out (1)
  - Flight_Data (9)
  - Flight_Manual (13)
    - Performance_Manual (20)
  - Flight_Planning (2)
  - Flight_Stage
    - NonRegulated_Flight_Stage
      - Climb (2)
    - Regulated_Flight_Stage (6)
      - Landing (10)
      - TakeOff (11)
  - Overall_Procedure
    - Operational_Performance (27)
  - Parameter
    - Regulated_Parameter
      - Speed (13)

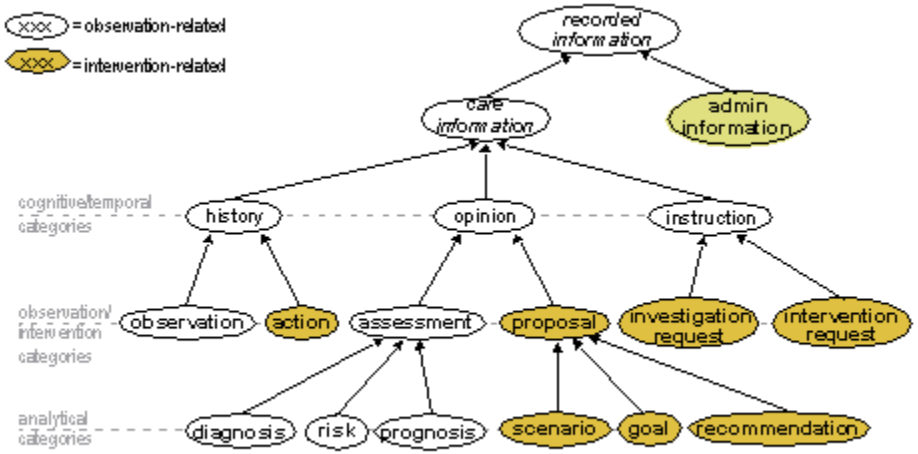
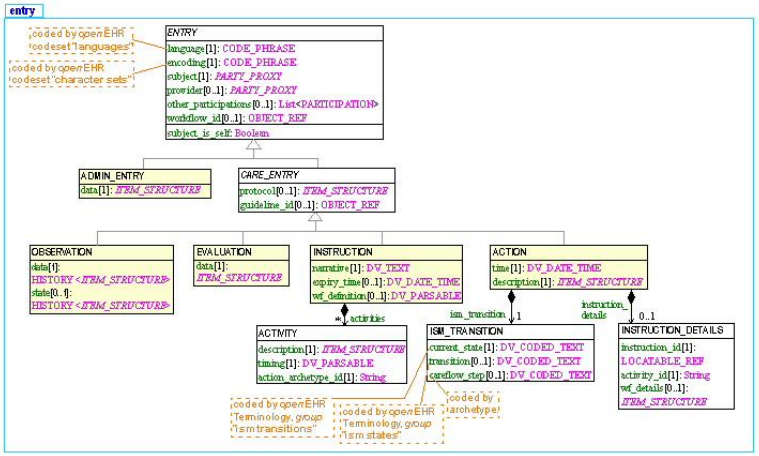
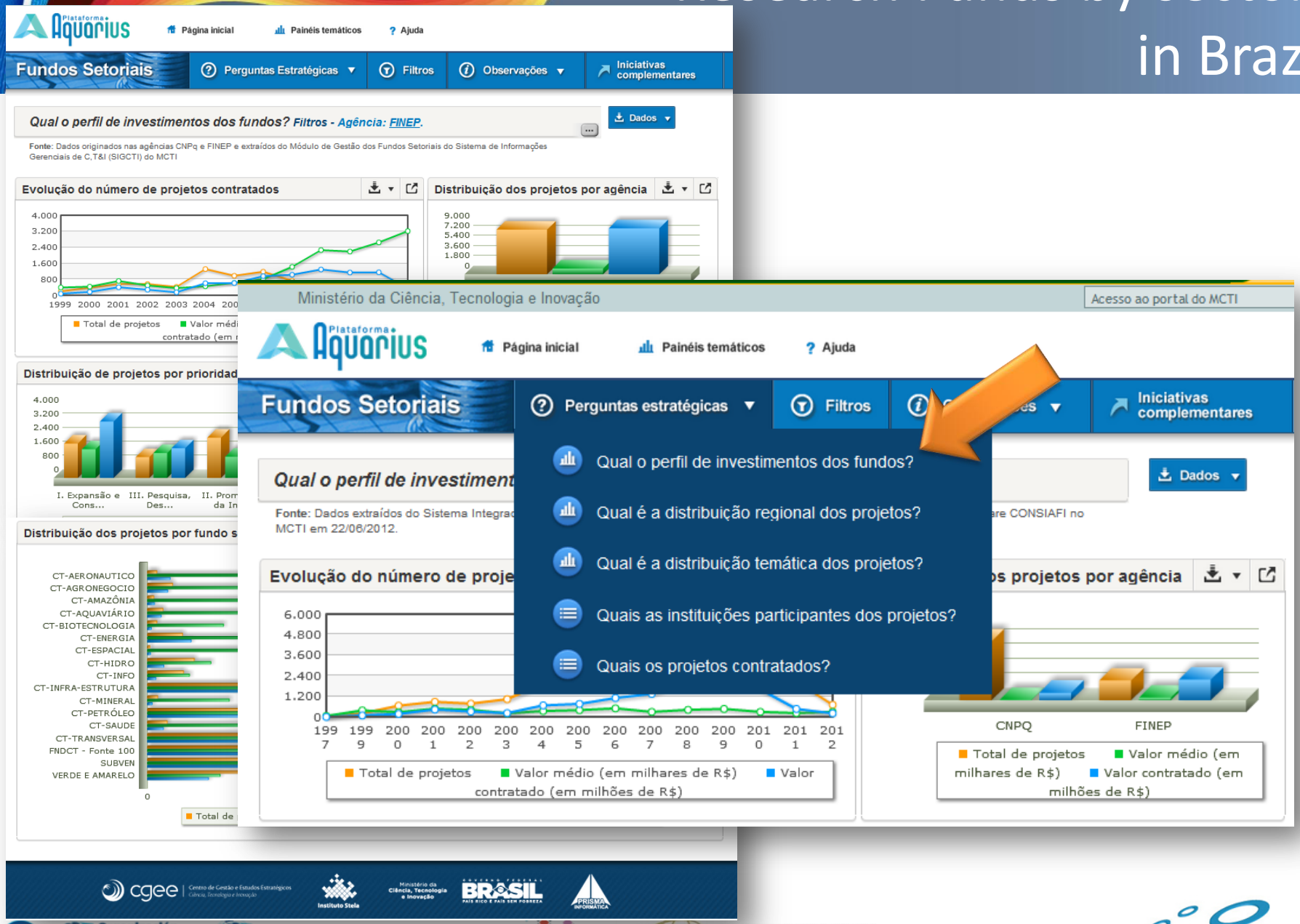


Figure 1 The Clinical Investigator Record (CIR) Ontology



ONTOLOGY BASED INTEROPERABILITY (APPLICATION VIEW)

Research Funds by sectors in Brazil



Topic maps using Ontologies and concepts related to eHealth

Ministério da Ciência, Tecnologia e Inovação

Acesso ao po

Plataforma Aquarius

Página inicial | Painéis temáticos | Ajuda

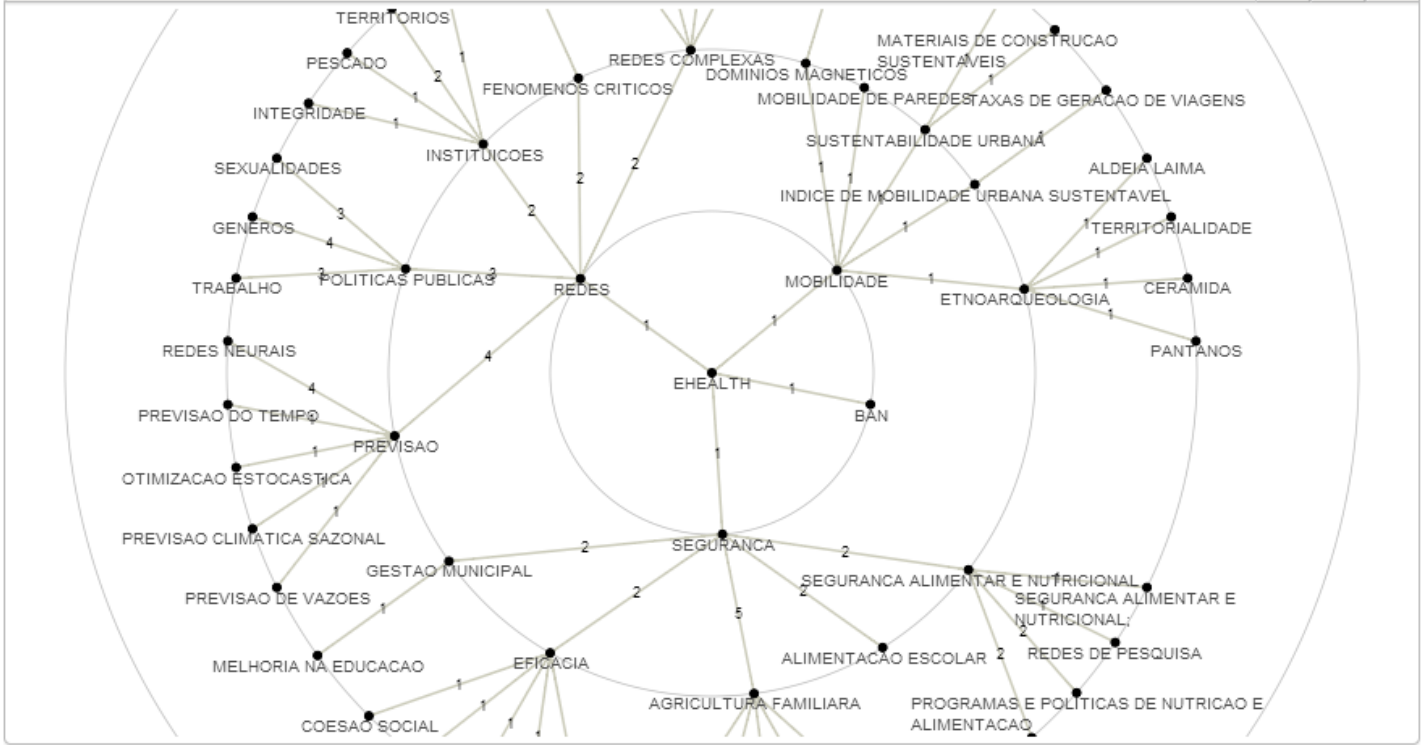
Fundos Setoriais | Perguntas estratégicas | Filtros | Observações | Iniciativas complementares

Qual é a distribuição temática dos projetos? **Filtros** - *Termo: EHEALTH; Período: 2010 - 2012.*

Dados

Fonte: Dados originados nas agências CNPq e FINEP e consolidados no SIGCTI-FS no MCTI em 07/08/2012.

Relação entre as temáticas dos projetos



Questions?

Recommendation:

Sematic Web Services

Semantic Integration

SWRL: A Semantic Web Rule Language Combining OWL and RuleML

RDFa 1.1:

Rich Structured Data Markup for Web Documents

Thank you.

José Francisco Salm Jr., PhD
salm@stela.org.br
www.stela.org.br