



Citation:

Cardoso-Castro, PP (2020) Teoria de Complejidad y Cibernetica organizacional: Aplicaciones y perspectivas de uso en el campo de seguridad y manejo de riesgo. In: Administración de Riesgos, Seguridad y Salud en el Trabajo, 01 June 2020 - 03 June 2020, Universidad Militar - Bogota, COlombia. (Unpublished)

Link to Leeds Beckett Repository record:

<https://eprints.leedsbeckett.ac.uk/id/eprint/7359/>

Document Version:

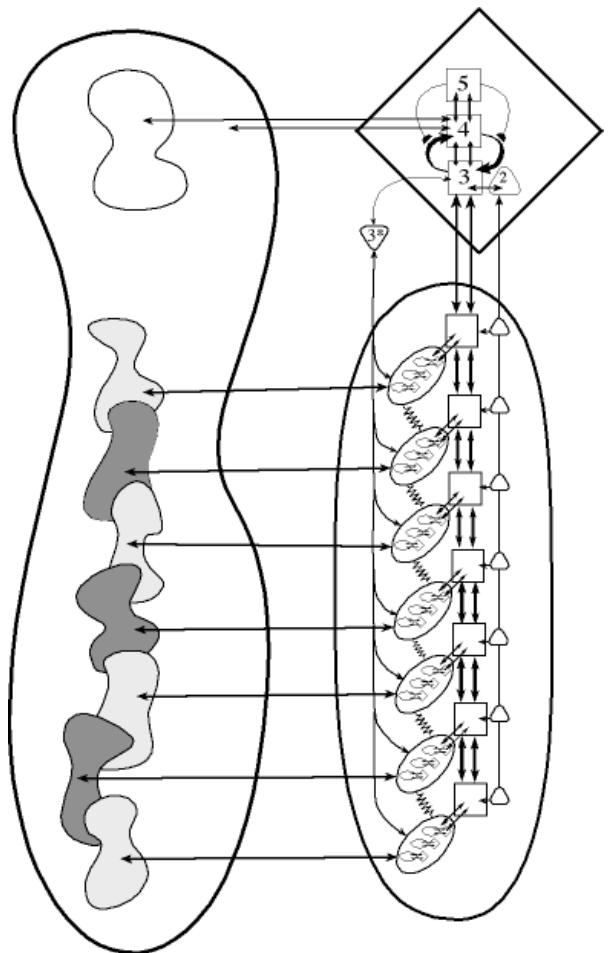
Conference or Workshop Item (Presentation)

The aim of the Leeds Beckett Repository is to provide open access to our research, as required by funder policies and permitted by publishers and copyright law.

The Leeds Beckett repository holds a wide range of publications, each of which has been checked for copyright and the relevant embargo period has been applied by the Research Services team.

We operate on a standard take-down policy. If you are the author or publisher of an output and you would like it removed from the repository, please [contact us](#) and we will investigate on a case-by-case basis.

Each thesis in the repository has been cleared where necessary by the author for third party copyright. If you would like a thesis to be removed from the repository or believe there is an issue with copyright, please contact us on openaccess@leedsbeckett.ac.uk and we will investigate on a case-by-case basis.



"Teoria de Complejidad y Cibernetica organizacional: Aplicaciones y perspectivas de uso en el campo de seguridad y manejo de riesgo

Dr. Pedro Pablo Cardoso

p.p.cardoso-castro@leedsbeckett.ac.uk



CONTENIDO

1- Conceptos generales

- Sistemas y Pensamiento de sistemas
- Complejidad – Problemas complejos
- Caja de herramientas: SD; SNA, Cibernetica Organizacional

2- Ejemplos de aplicacion

- VSM y disenno de sistemas de defensa
- VSM y Sistemas de Defensa Total
- VSM y gestion de riesgo (desastres)
- VSM ofensiva
- DS y seguridad y toma de decisiones (Sensitivity Analysis / Malik)

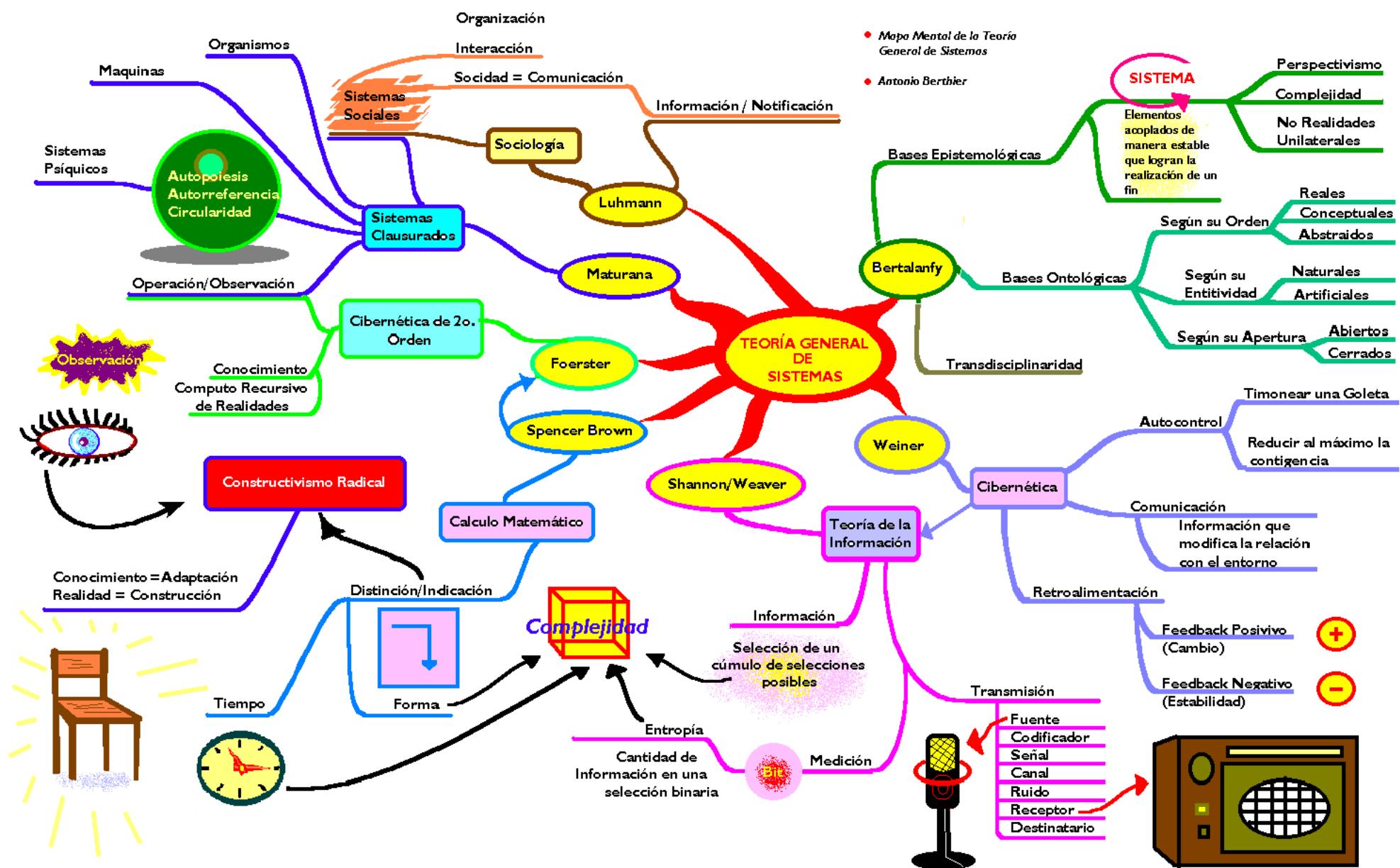
- 3- Nuevos proyectos

- VSM y sistemas dinamicos
- VSM y Analisis Avanzado de Redes Sociales

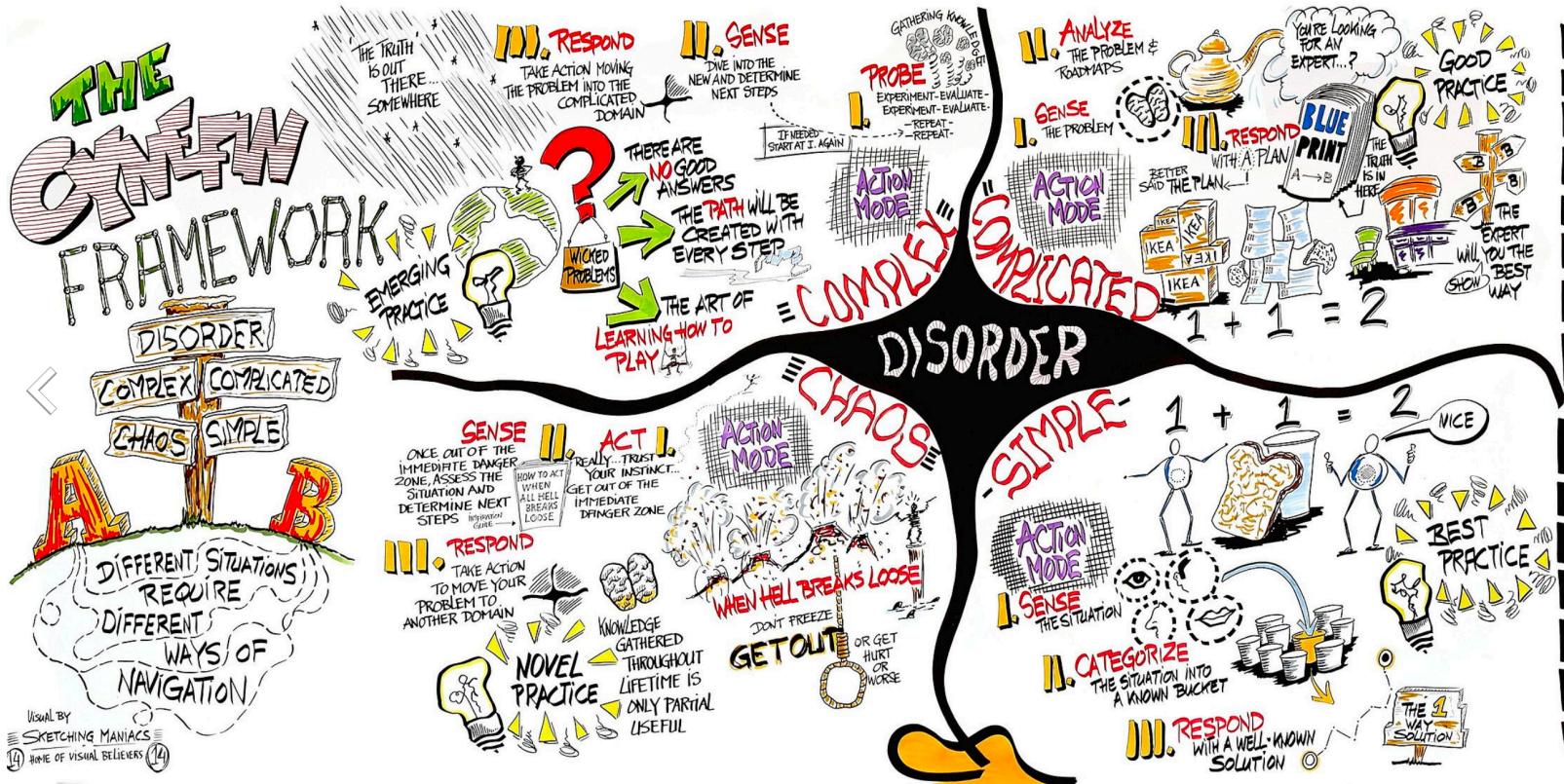
4- Q&A



1- Conceptos Generales: sistemas y pensamiento de sistemas



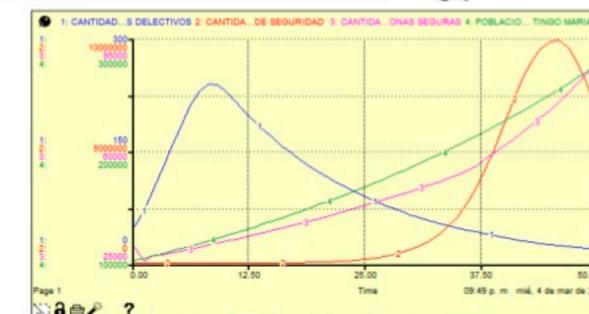
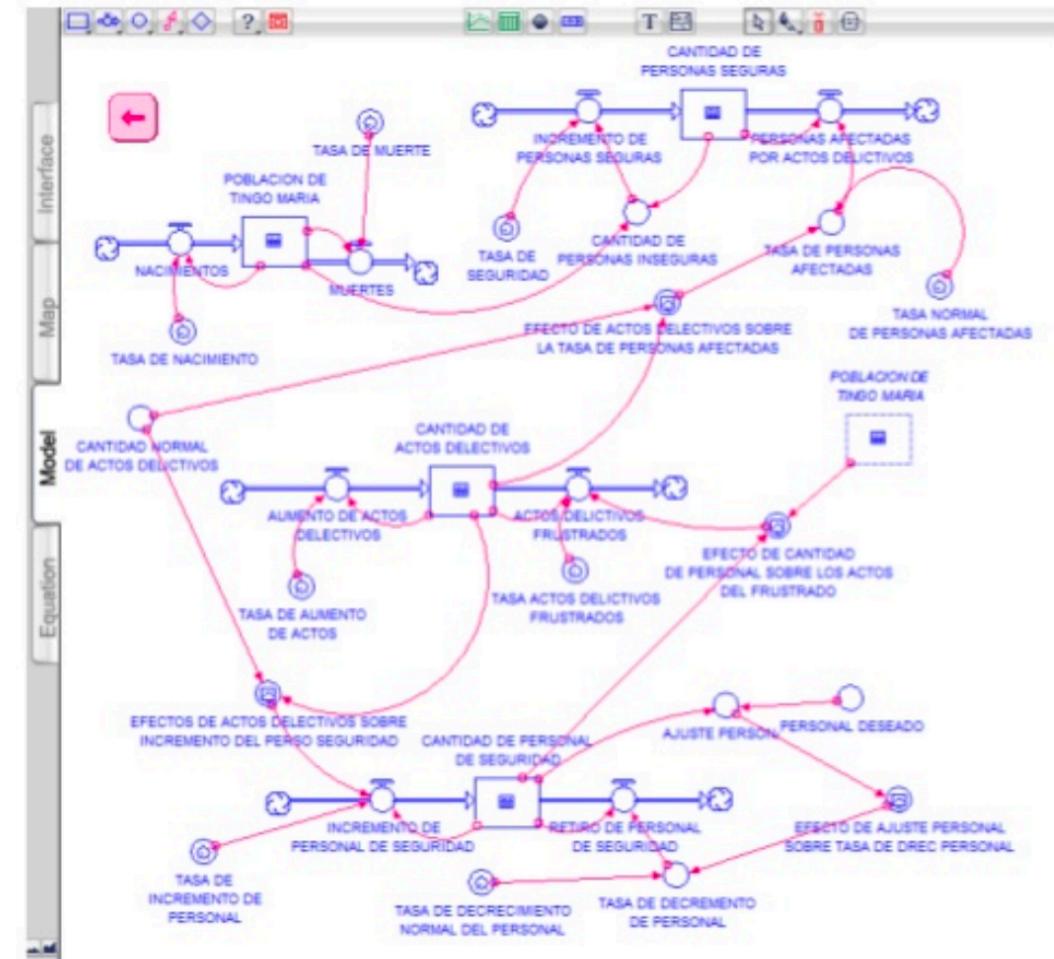
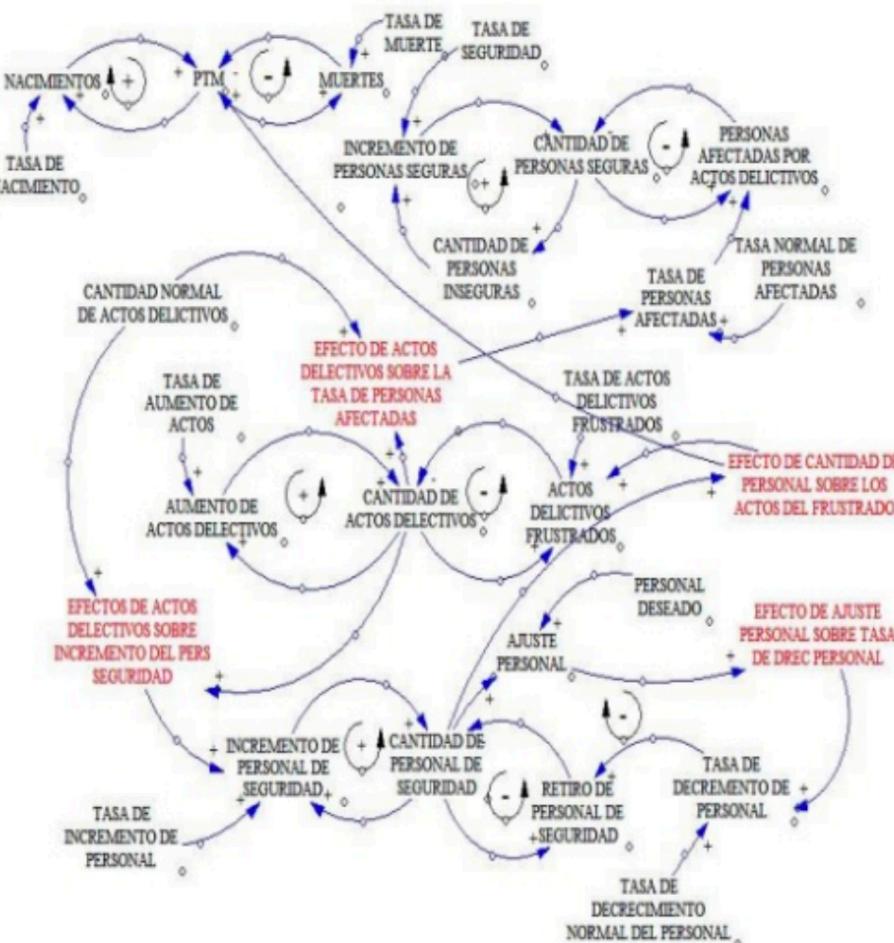
1- Conceptos Generales: Complejidad y problemas complejos



Cada tipo de Sistema requiere en consecuencia, una caja de herramientas específica.
 Inspirados en modelos lineales; no-lineales; mecánica de probabilidad, o modelos cuánticos



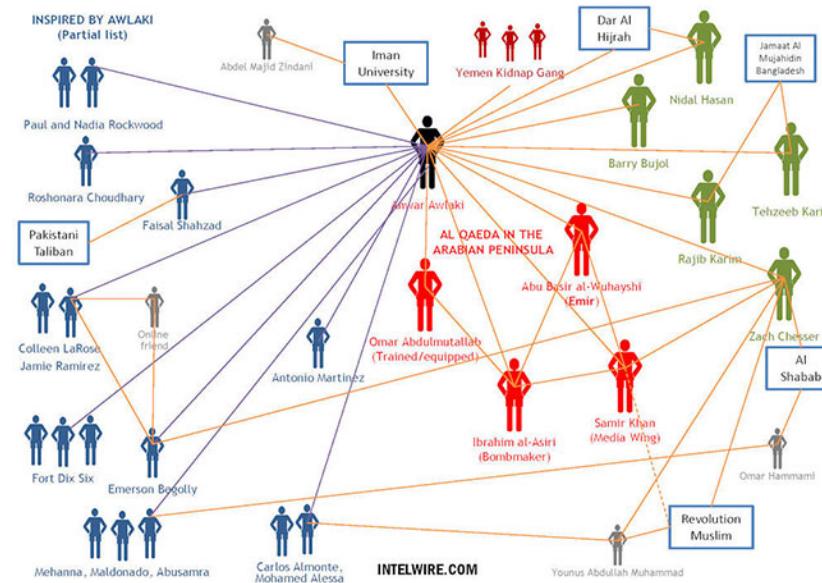
1- Conceptos Generales: caja de herramientas - dinamica de sistemas



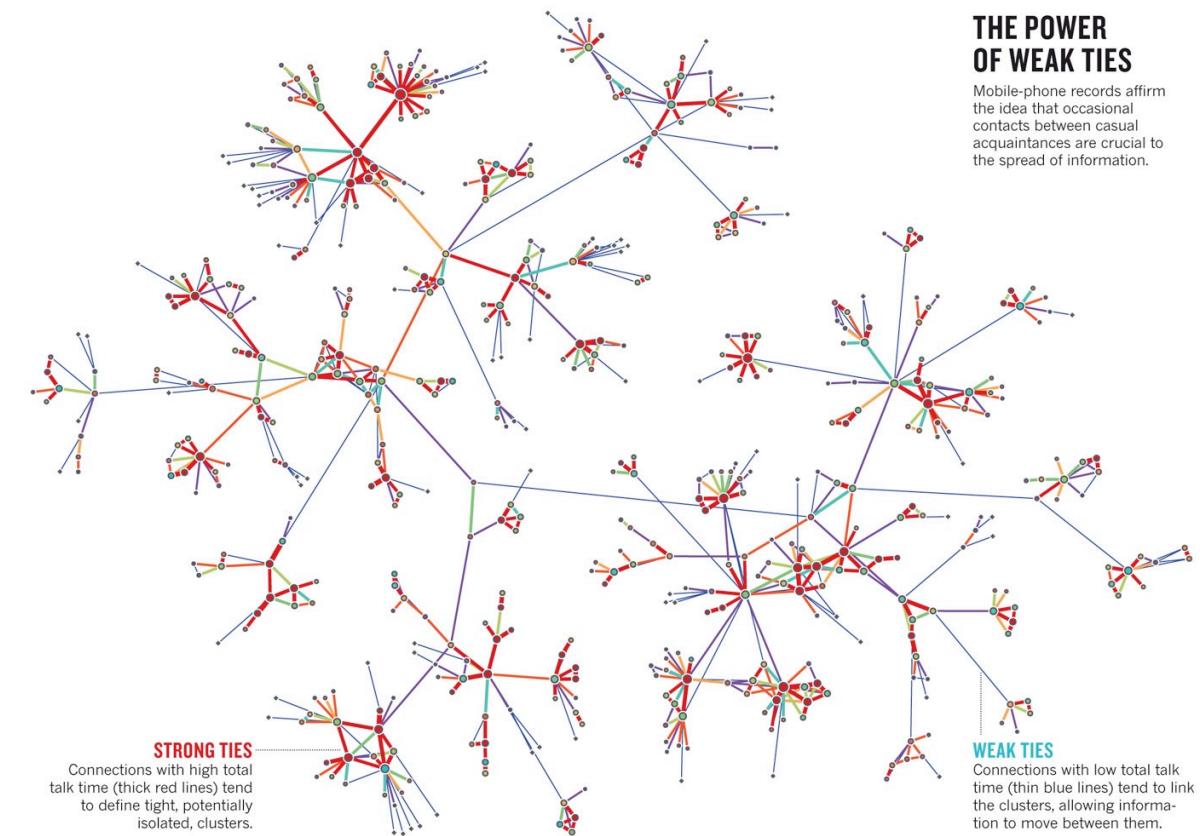
Ej: Jaen, S. & Dyner, I. (ns). POLÍTICAS SOSTENIBLES PARA LA PREVENCIÓN Y LA DISMINUCIÓN DE LA CRIMINALIDAD EN COLOMBIA. II Encuentro Colombiano de Dinámica de Sistemas. UNAL - Medellín



1- Conceptos Generales: caja de herramientas - Análisis de Redes Sociales

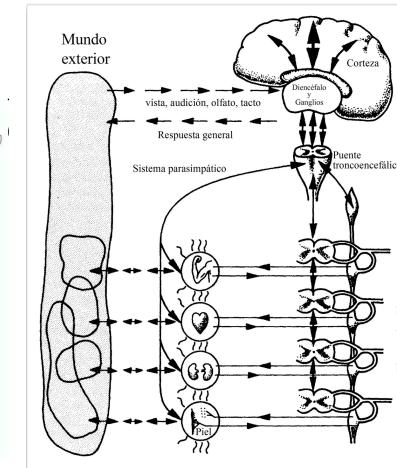
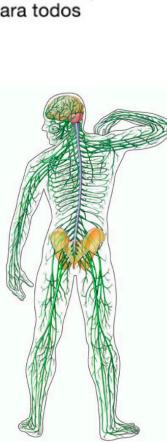


En general se analiza el tipo de enlace
y la posición de los nodos en la red

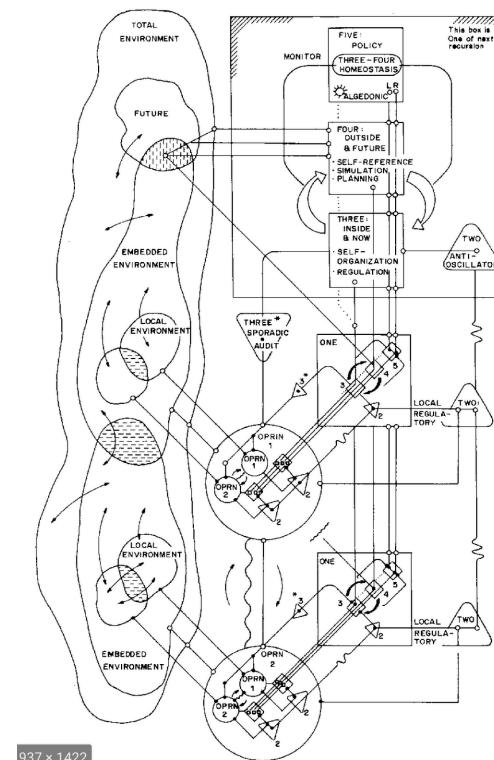
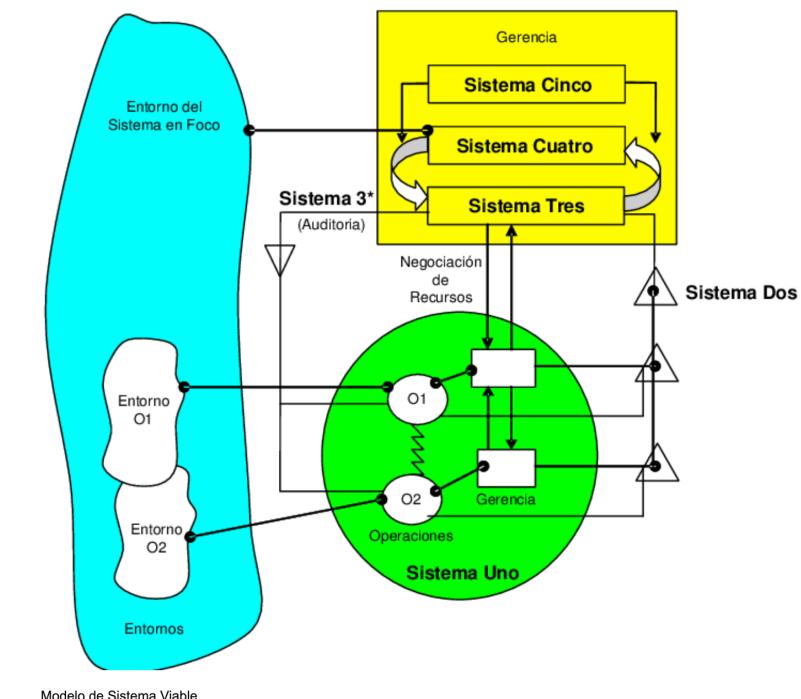




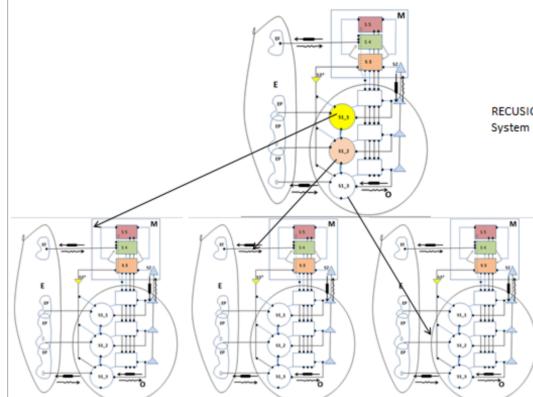
UNIVERSIDAD MILITAR
NUEVA GRANADA
La U para todos



1- Conceptos Generales: caja de herramientas - Modelo de Sistema Viable



937 x 1422



- Todo Sistema viable contiene/contenido en un Sistema viable
- Solo la complejidad puede asimilar complejidad

OppsRoom
Cybersin – Chile (70's)
<https://99percentinvisible.org/episode/project-cybersyn/>



2- Ejemplos de aplicacion – VSM y disenno de sistemas de defensa (Patent: US 7,181,302 B2)

METACOMAND SYSTEMS - Sistema de Informacion del Departamento de Defensa USA

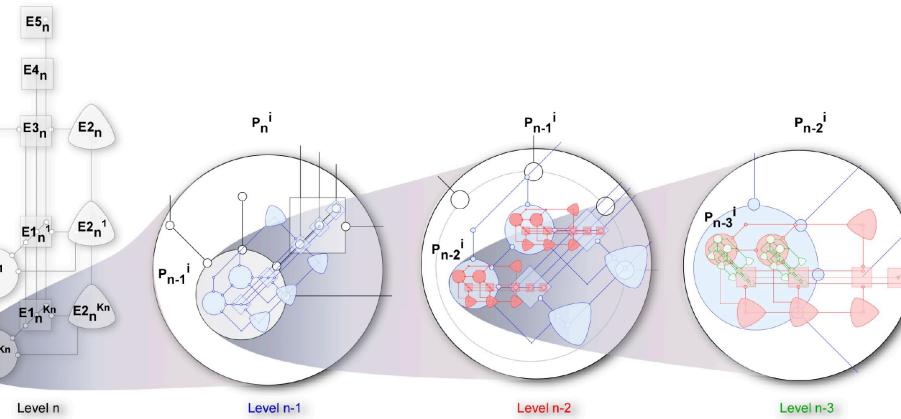
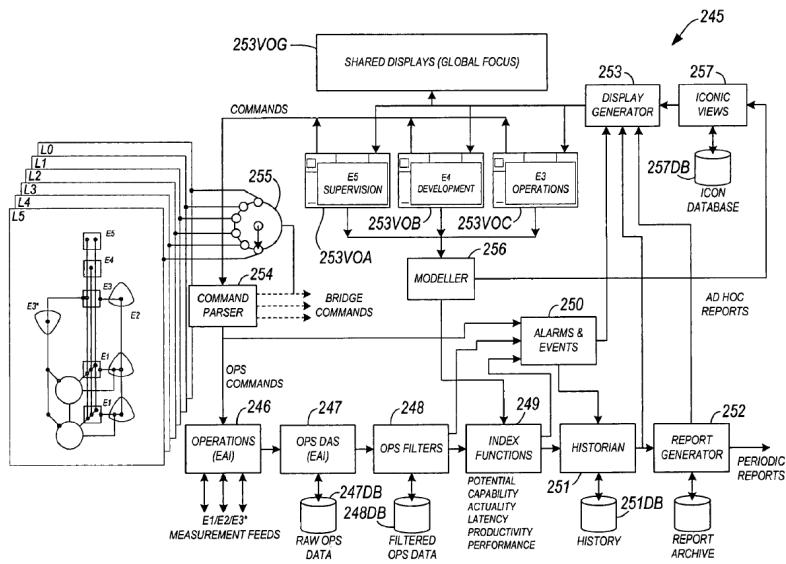
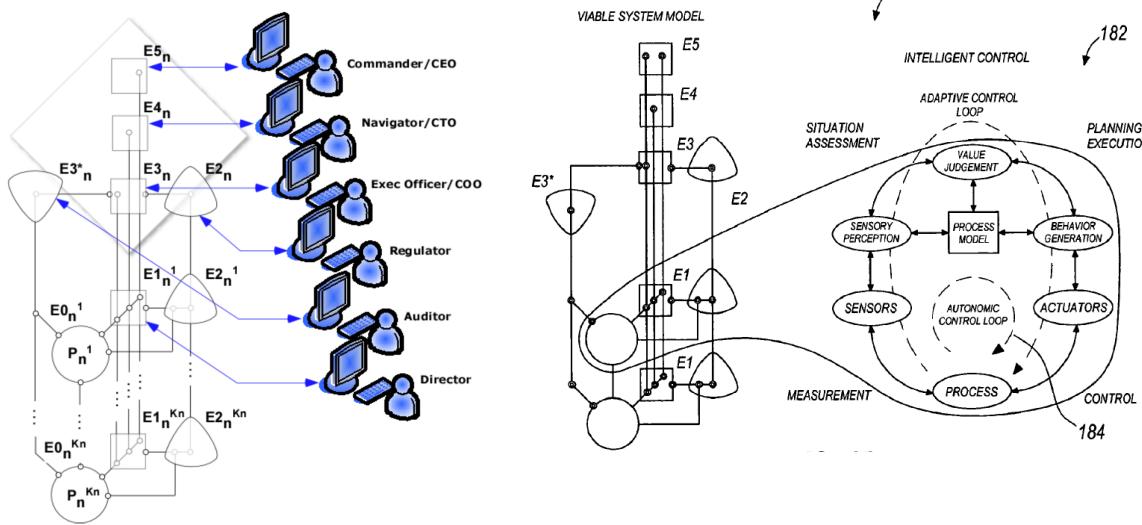


Fig. 6 – Command Axis Recursion (nested accountability hierarchy)

Label	Services	Roles & Responsibilities
E5	Command	Mission Goals & Objectives, Policy & Command Authority
E4	Analysis/Planning	Modeling, Situation Assessment & Plan Generation
E3	Operations	Plan Execution & Capability Management
E3*	Audit	Program & Process Performance Assessment
E2	Regulation	Plan (Task) & Resource Synchronization
E1	Direction	Plan (Task) Execution Management
E0/P	Process	Embedded [Value] Production Process

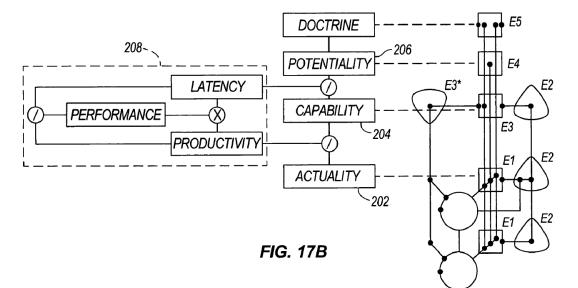
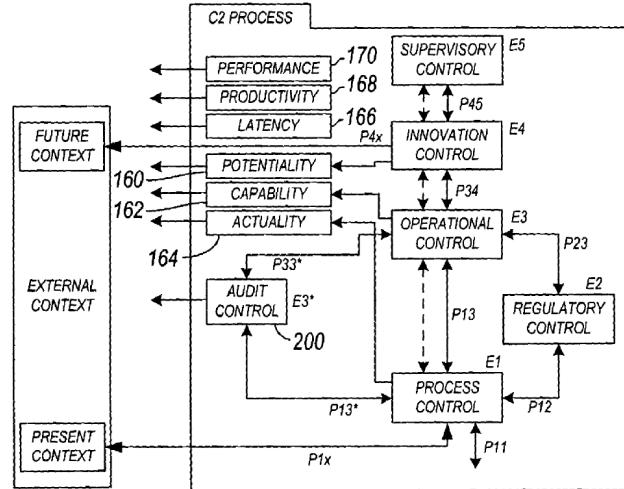


FIG. 17B



2- Ejemplos de aplicacion – VSM y Sistemas de Defensa Total

(En desarrollo/ revision)

Uso de VSM para evaluar la viabilidad y resiliencia de Los Sistemas de Defensa Total de UK Y Noruega.

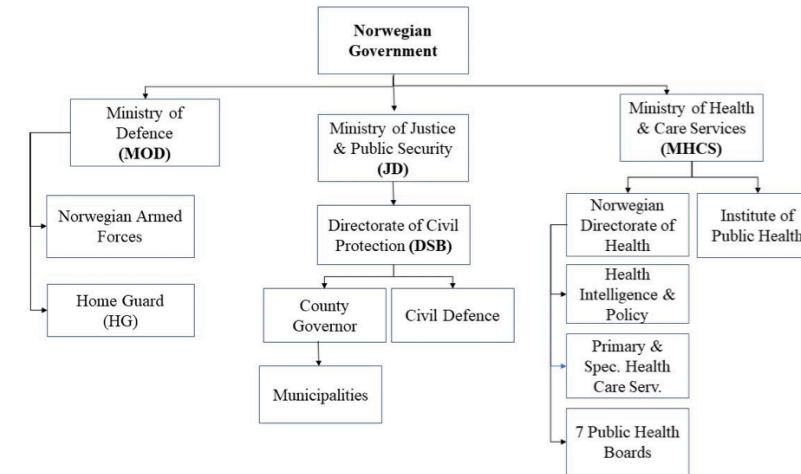


Figure 3 Norway Crisis Response Structure for COVID-19

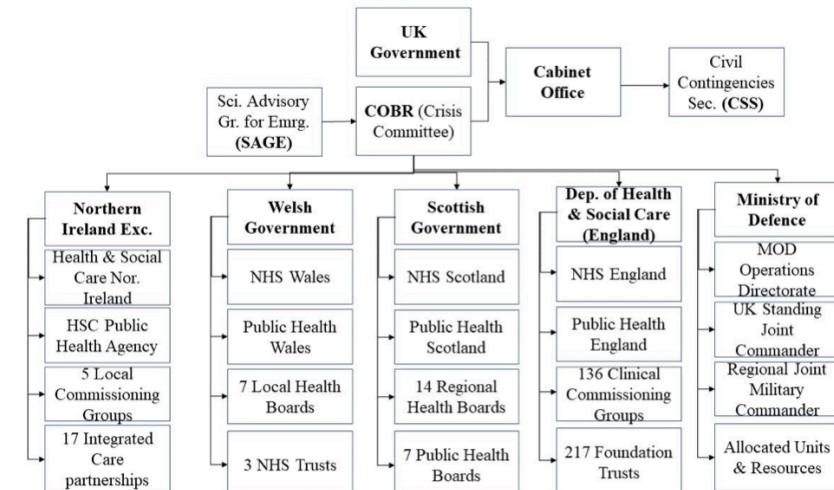
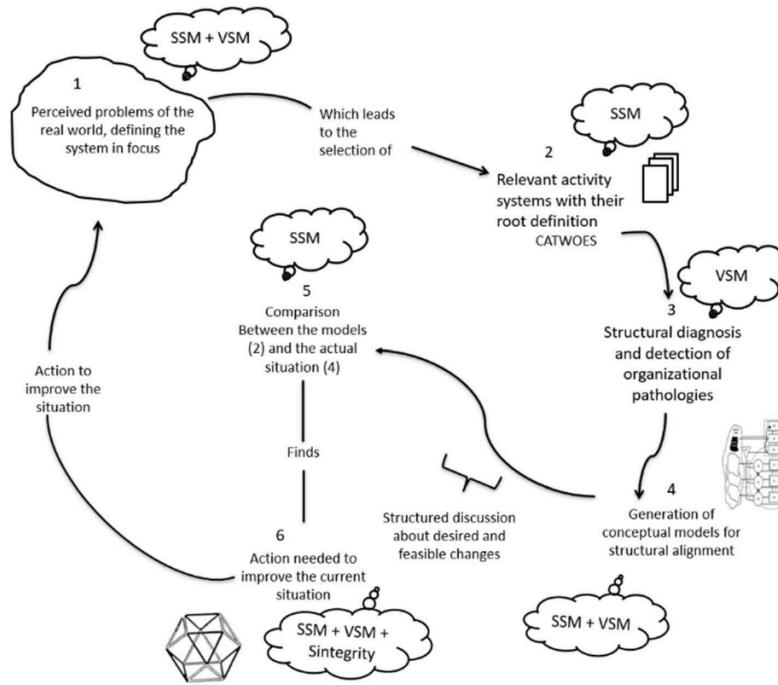


Figure 4 The UK Crisis Response Structure for COVID-19



2- Ejemplos de aplicacion – VSM y gestion de riesgo (desastres)

Pexton, M. (Ongoing). COVID 19 Response - Leeds City Council. DBA project



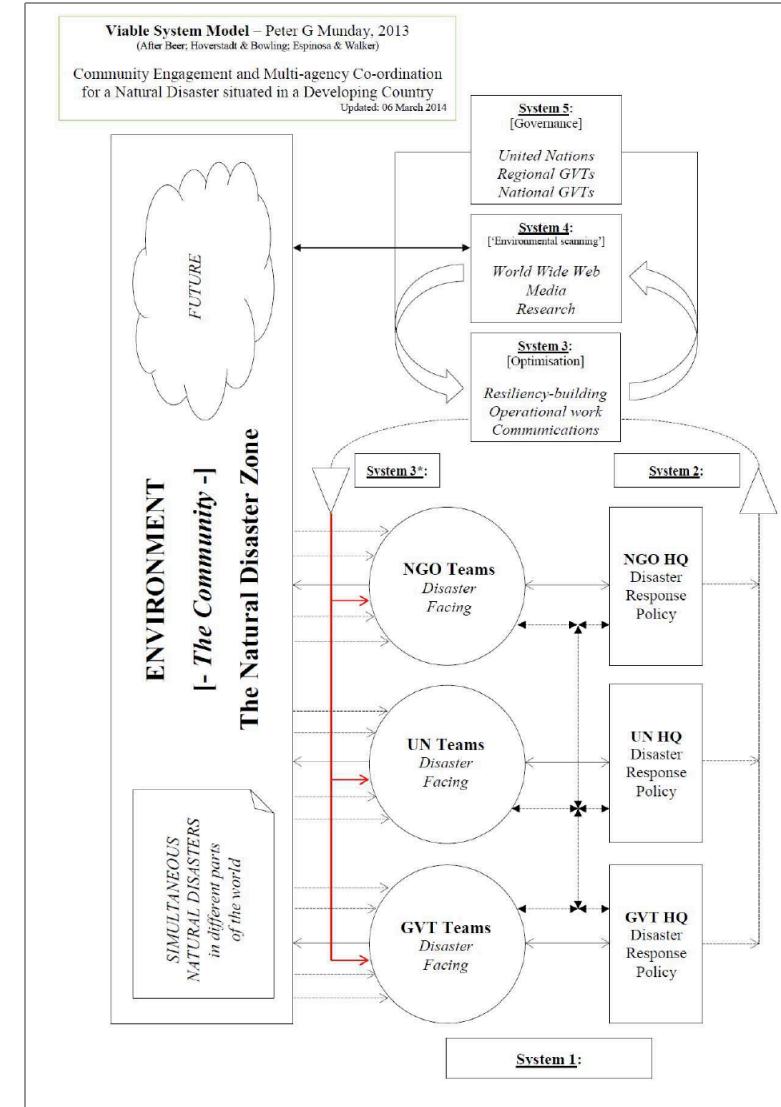
Shawn et al. (2020). Peer Review – Disaster Risk Reduction - Viable System Review

Inspirada en metodologías diagnosticas del VSM - ayuda a definir:

- Como
- Donde Investigar, para evaluar sistemas de atención de desastres
- Que

(VSM – Sistema foco, arquitectura de viabilidad, Comunicaciones)

Graham, P. (2015). Developing a Systems Approach for Multi-Agency Co-ordination and Community Engagement in Disaster Recovery. University of Hull.

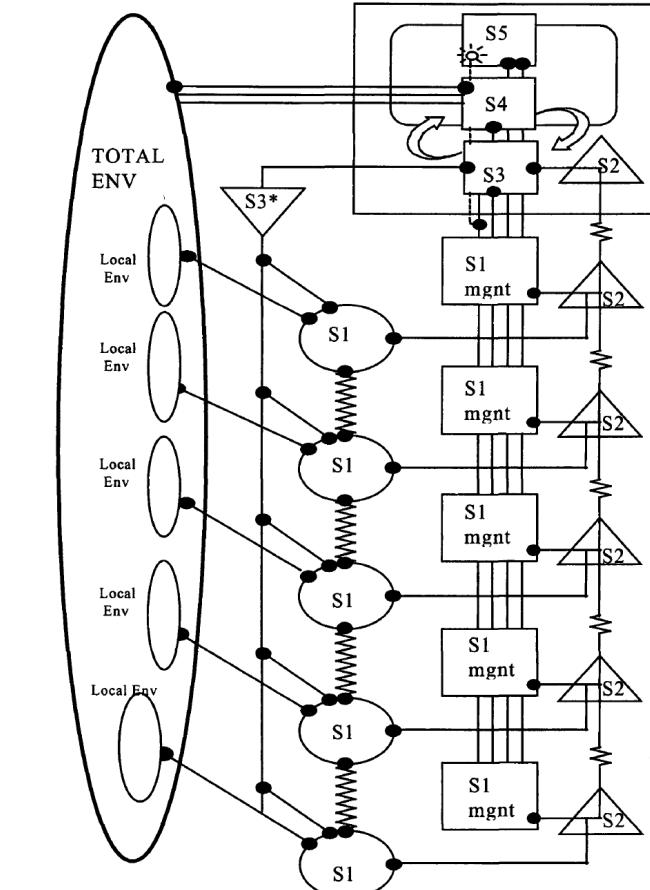


2- Ejemplos de aplicacion – VSM Ofensiva

Hutchinson et al (2002). Information warfare. VSM as a framework to attack organizations.

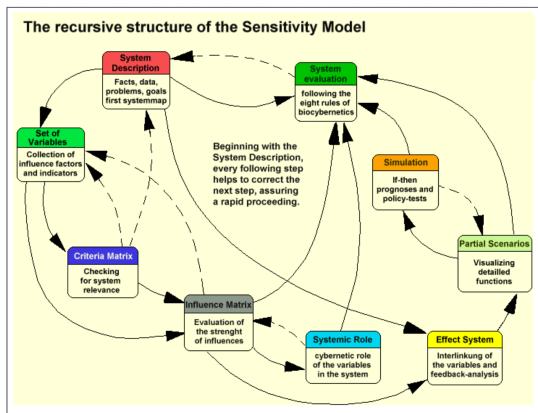
ATTACK TACTIC	COMMENTS
Compromised trusted user	Most software attacks and computer crimes are carried out by trusted users.
Acquisition of user's password	Can be achieved by packet sniffers, and password crackers.
Trojan Horses	Installed after penetration. Mimic actions of system utilities. Useful for sabotage, extortion, and blackmail.
Software Bombs	Similar to Trojan Horses. Planted with some mission critical software, and triggered by date/time.
Viruses	Many variations. Almost all computer systems have been infected at some time.
Worms	Replicate themselves and consume system and network resources.

Identifica formas de ataque para cada rol/funcion dentro de la Arquitectura de Comunicaciones de un VSM



2- Ejemplos de aplicacion – VSM y gestion de riesgo (desastres)

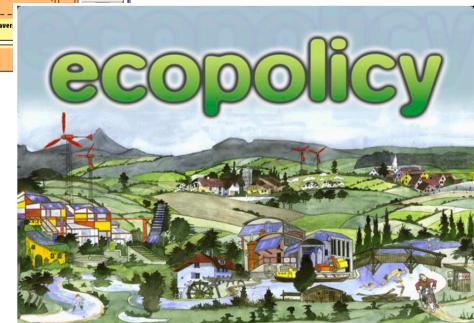
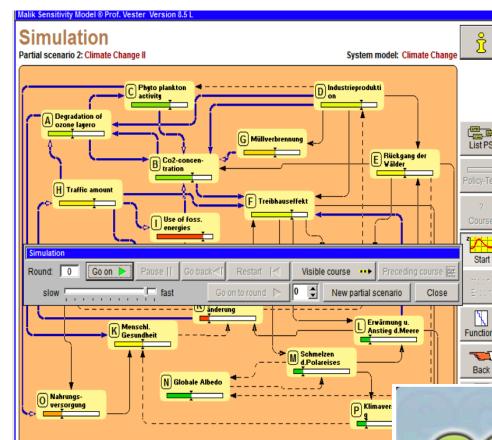
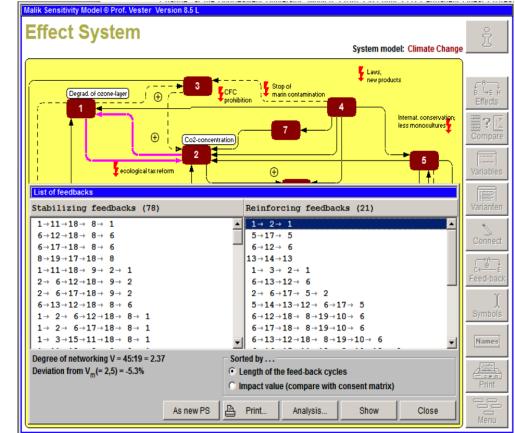
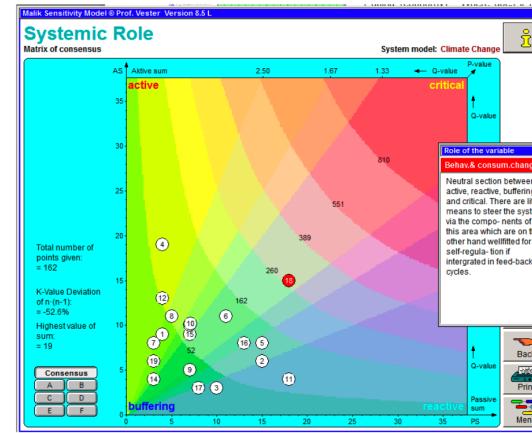
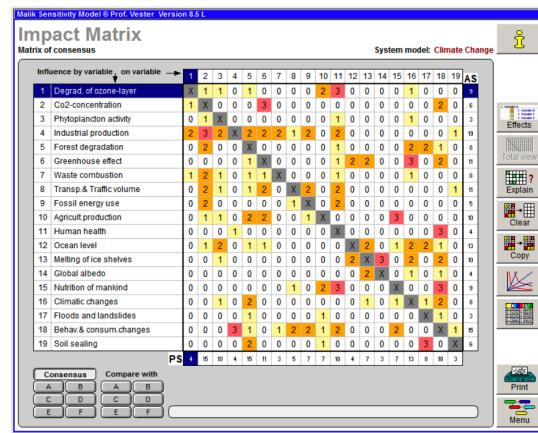
DS y seguridad y toma de decisiones (Sensitivity Analysis / Malik)



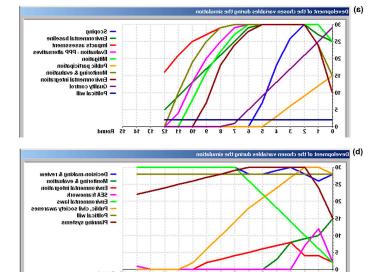
This screenshot shows the 'System Description' step of the Malik Sensitivity Model. It includes a red box with instructions for manual discussion and brainstorming to establish the variable set. Below are icons for defining system boundaries, influence factors, interdependences, sketching a system picture, and constructing a preliminary effect system.

This screenshot shows the 'Variable Set' step. It displays a list of 19 variables related to climate change, such as 'Degrad. of ozone-layer', 'Co2-concentration', and 'Greenhouse effect'. To the right, a detailed description of 'Degrad. of ozone-layer' is provided, mentioning its spread from the south to the north due to chemicals and air traffic, causing skin cancer and crop damage.

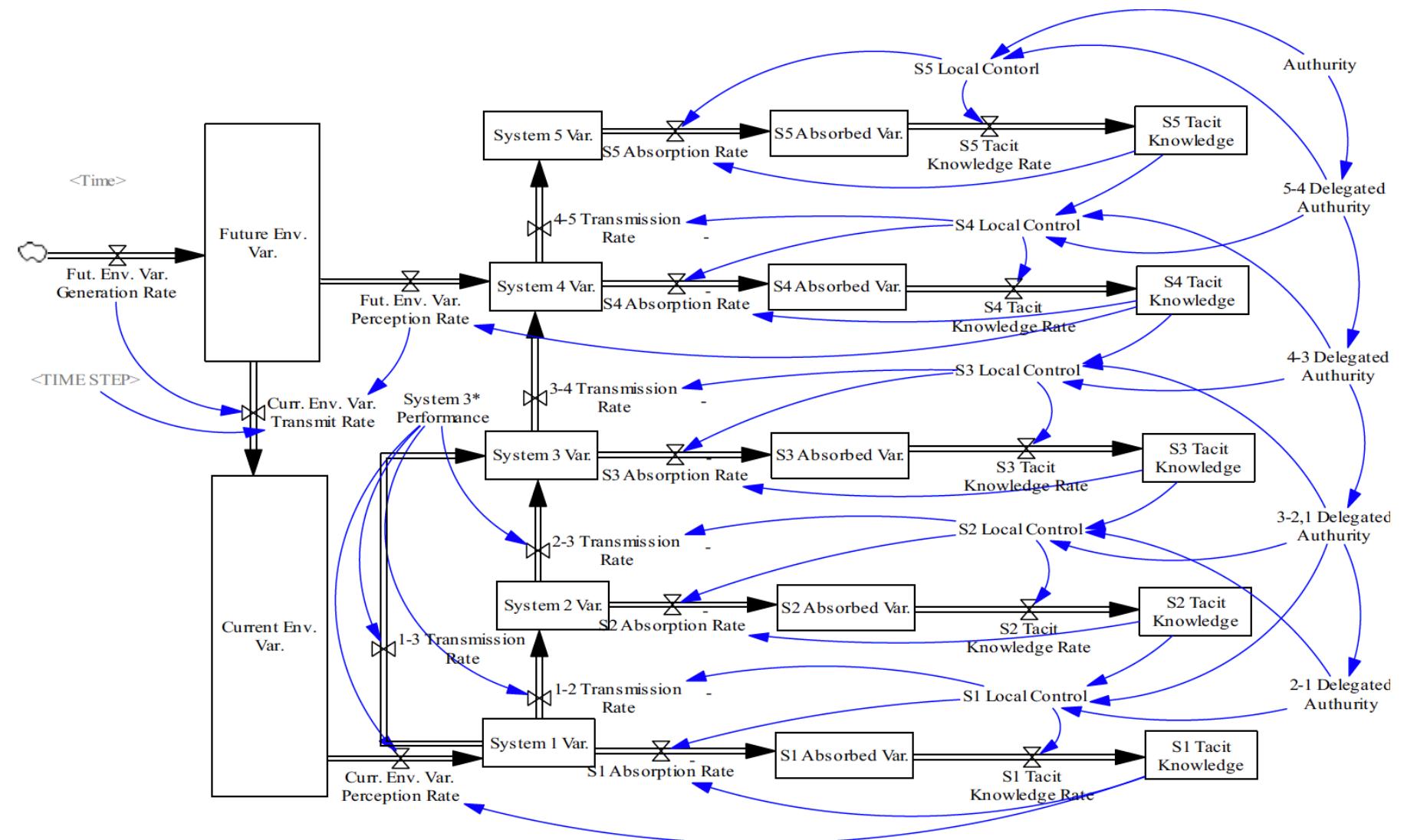
This screenshot shows the 'Criteria Matrix' step. It is a grid where rows represent criteria and columns represent spheres of life (Physiology, Space utilization, Human health, Resource balance, Information, Value and love, Matter, Energy, Environment, Reversibility, Object quantity, Spatial dynamics, Impact factors, Object through input, Object through output, Influenced outside). A legend indicates 'FULLY applicable' (solid dot) and 'PARTIALLY applicable' (open circle).



Alemania – Irak II
Canada – 2010
UK/USA – 2012 – ongoing (?)



3- Nuevos Proyectos – VSM y sistemas dinamicos



Inicialmente para recrear la idea original de Cybersin - luego explorar aplicaciones en diferentes areas.
 SOLO 2 ARTICULOS PUBLICADOS EN LA LITERATURA DE VSM!!!



3- Nuevos Proyectos – VSM y Análisis Avanzado de Redes Sociales

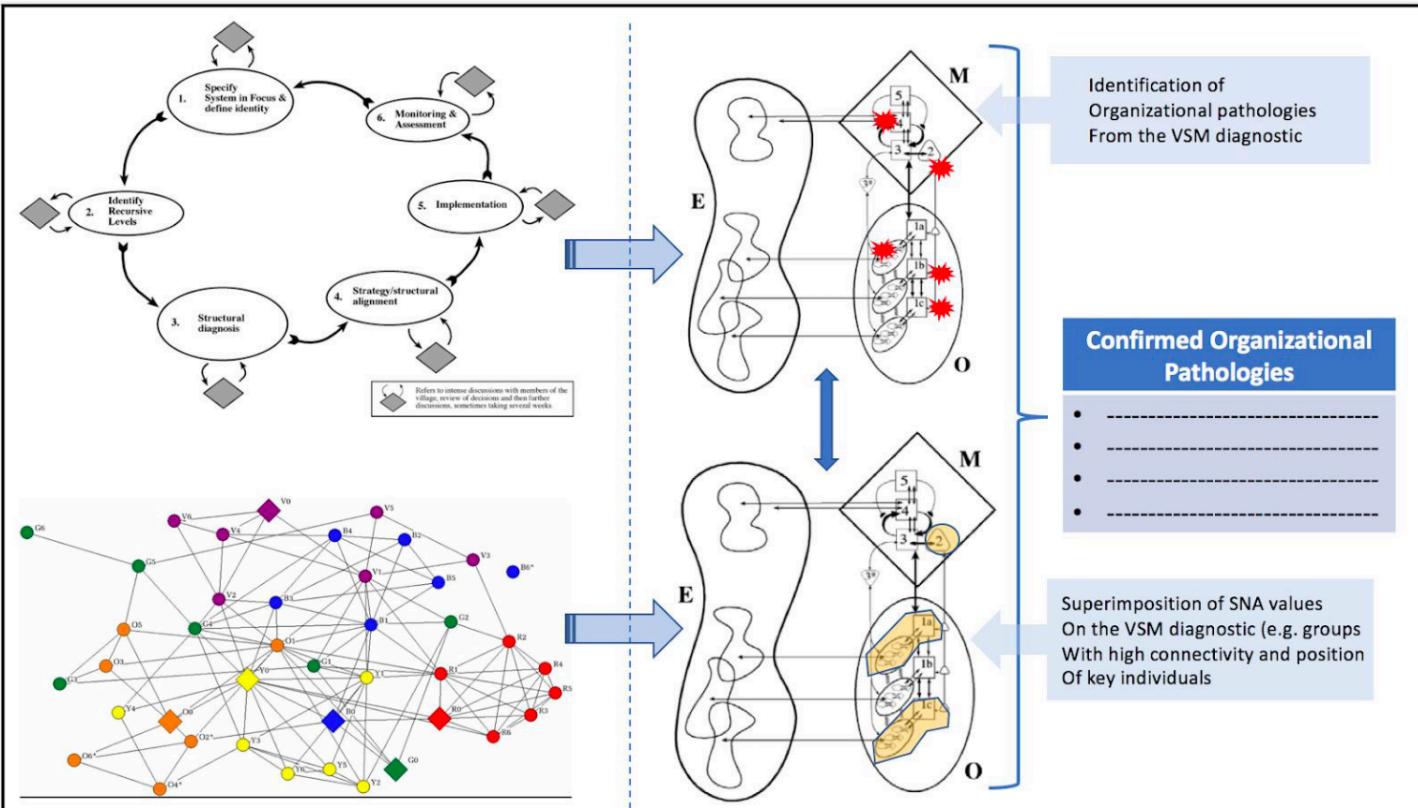
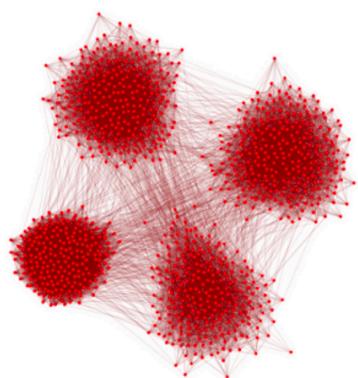


Figure 3. VSM & SNA integration. From left to right the stages of integration can be observed. Note in the top the VSM process running simultaneously with the SNA (Bottom). Also the SNA capacity to identify key actors and groups - represented by color and shape of nodes.

Integración VSM con SNA meta-matrizes de datos ORA



	People	Knowledge	Tasks
People	Social Network Who knows who	Knowledge Network Who knows what	Assignment Network Who does what
Knowledge		Information Network What informs what	Needs Network What knowledge is needed to do the task
Tasks			Precedence Network Which task must be done before which



LEEDS
BECKETT
UNIVERSITY

Q&A