Triangular Concepts and Models for Applications in Adaptive Complex Systems

Rafael Rodríguez de Cora
Managing Director: Computer Aided Logistics

COMPUTER AIDED LOGISTICS & SECURITY

"All that is necessary for evil to triumph is for good men to do nothing"

Agenda

1.- New Systems Approach. Interlinked Systems

2.- Adaptive Complex Systems. Organisations as Living Systems

4.- Triangular Models:

- 4.1.- For Living Systems
- 4.2.- For Brain Functions
- 4.3.- For Life Cycles
- 4.4.- For Family Conflicts
- 4,5.- For Society

5.- General Applications / Human Projects

6.- Environment Project / Ecosystems and Methodology – Working Groups

7.- Conclusions

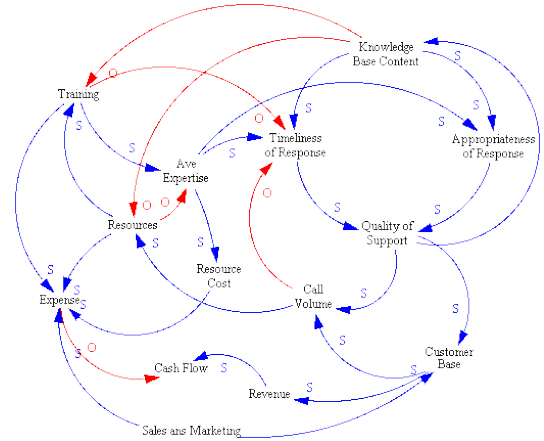
New Systemic Approach – General Systems Theory

Everybody talks now about Ecosystems:

Corporate Ecosystem National Ecosystem

Living and Non-Living Systems

Models

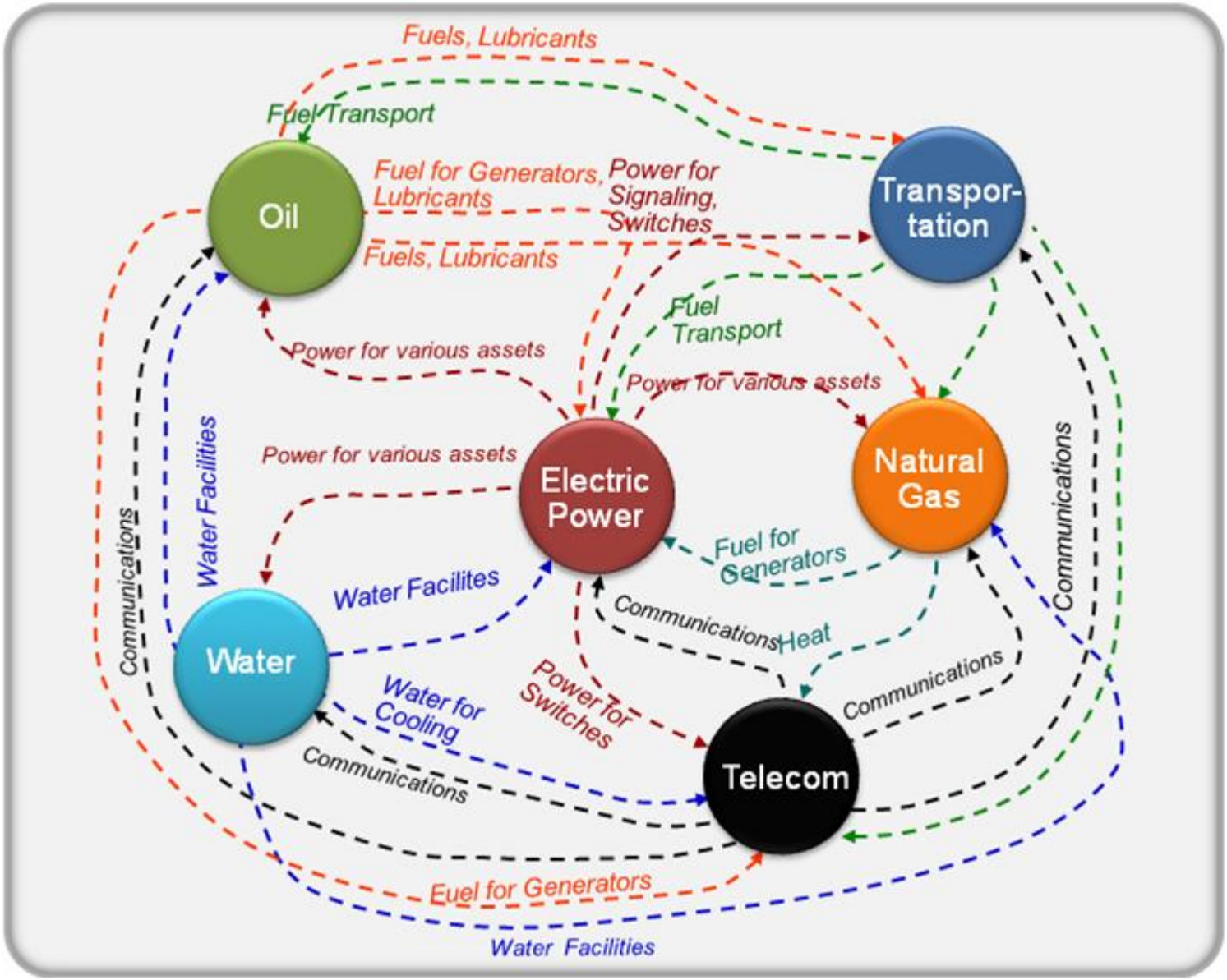


Cyberattacks - American Blackout

Ten days without Electric Energy. Progressive Impacts:

- **Power Energy falls down under a cyberatack**
- **Telecommunication Systems fall down**
- **Transportation System falls down**
- **Basic supplies stop**
- **Water cannot be delivered above 6th floor**
- **Emergency services are overloaded**
- **Public health services cannot cope with the situation**
- **Contamination due to wastes that cannot be recollected**
- **Uncertainty and fear in population (riots, robberies, fights for survival)**
- **Victims, Chaos. Army has to take control**
- **Energy comes back. Takes time to save the pieces, recover and go back to previous situation.**

New Systemic Approach - Complex and Interlinked Systems



Why are we talking about security and risks in Organizations? Example – American Blackout –

Ten days without Electric Energy. Progressive Impacts

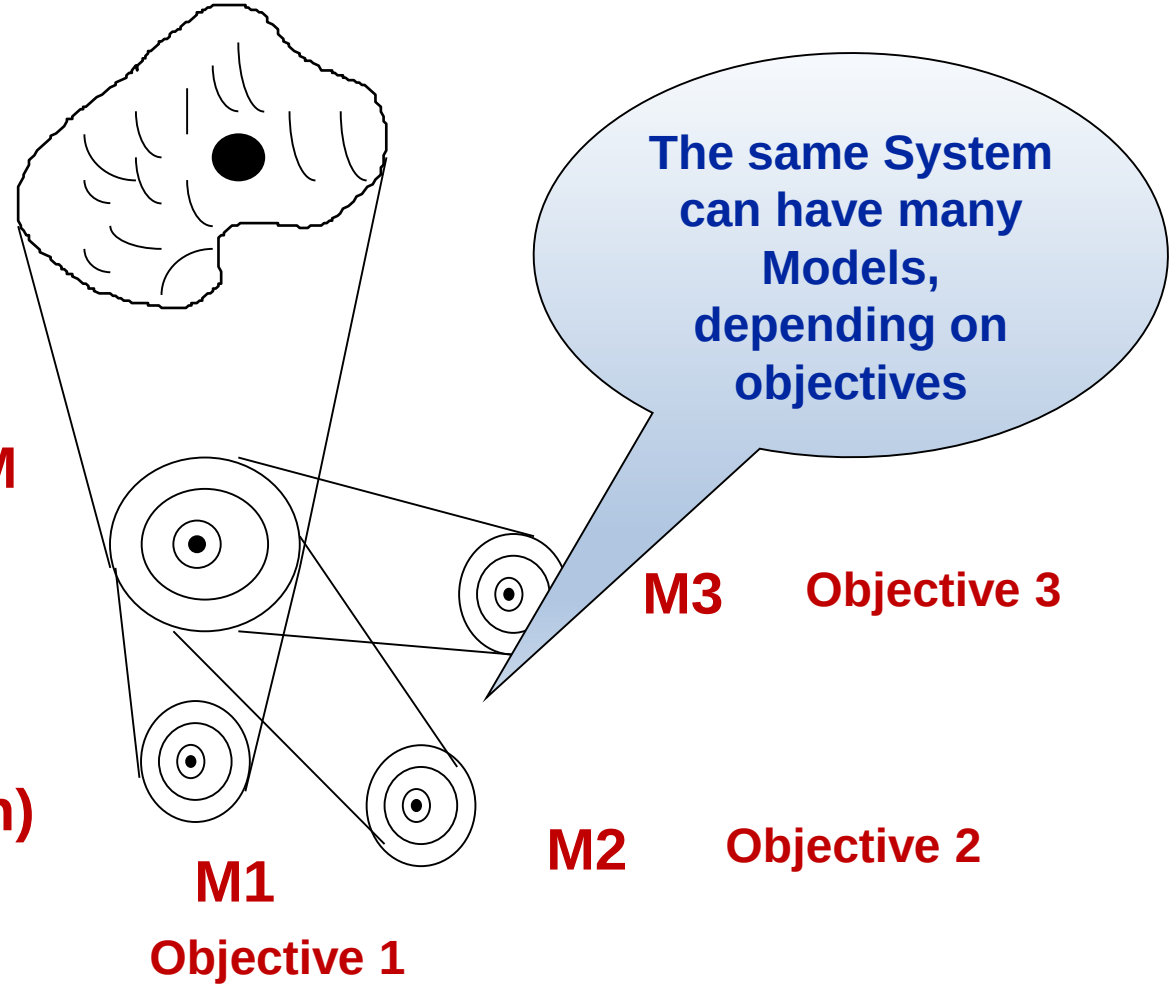
Systems Thinking comes into place because of Cyberattacks

Systems and Models (Model depends on Objectives)

REALITY
(Many Variables)

GENERAL SYSTEM
(Basic Reduction)

MODELS
(Specific Reduction)



Adaptive Complex Systems

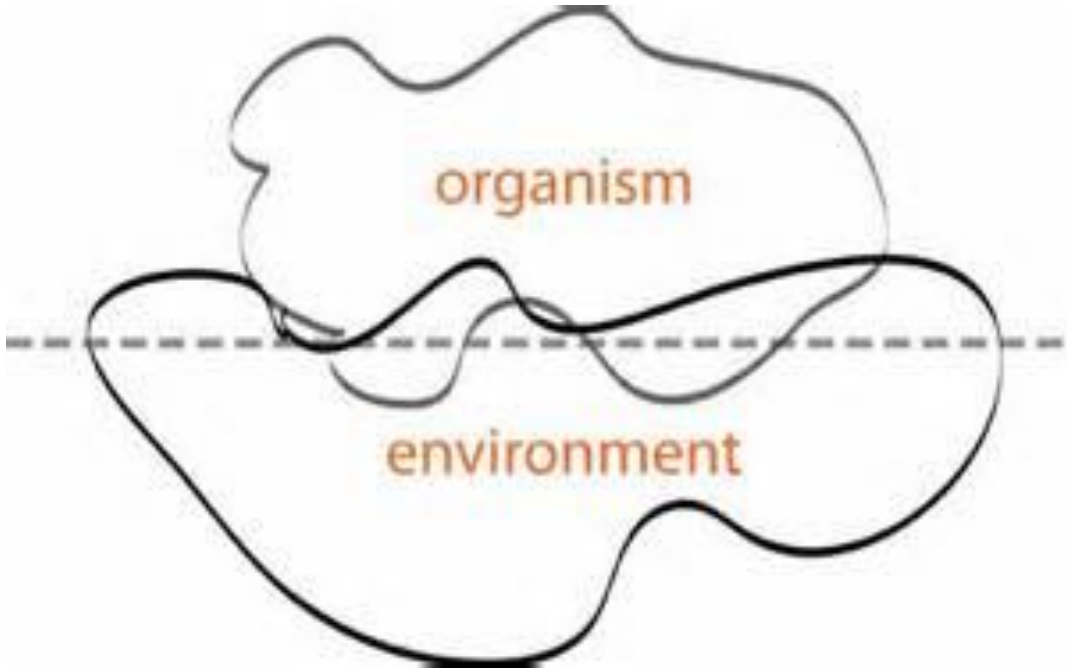
System that:

- **obtains information (from the environment and from itself),**
- **which identifies regularities**
- **and condenses them into an "squema" or model,**
- **and actuates on the real world on the basis of such schema without sufficient information. (Decision making)**

Examples: A Human Being, an organization, a society.

The Quark and the Jaguar: Adventures in the Simple and the Complex - Murray Gell-Mann 1995

Adaptive Complex Systems



Interactions between Organisms and Environment

Genetics
(Deterministic)

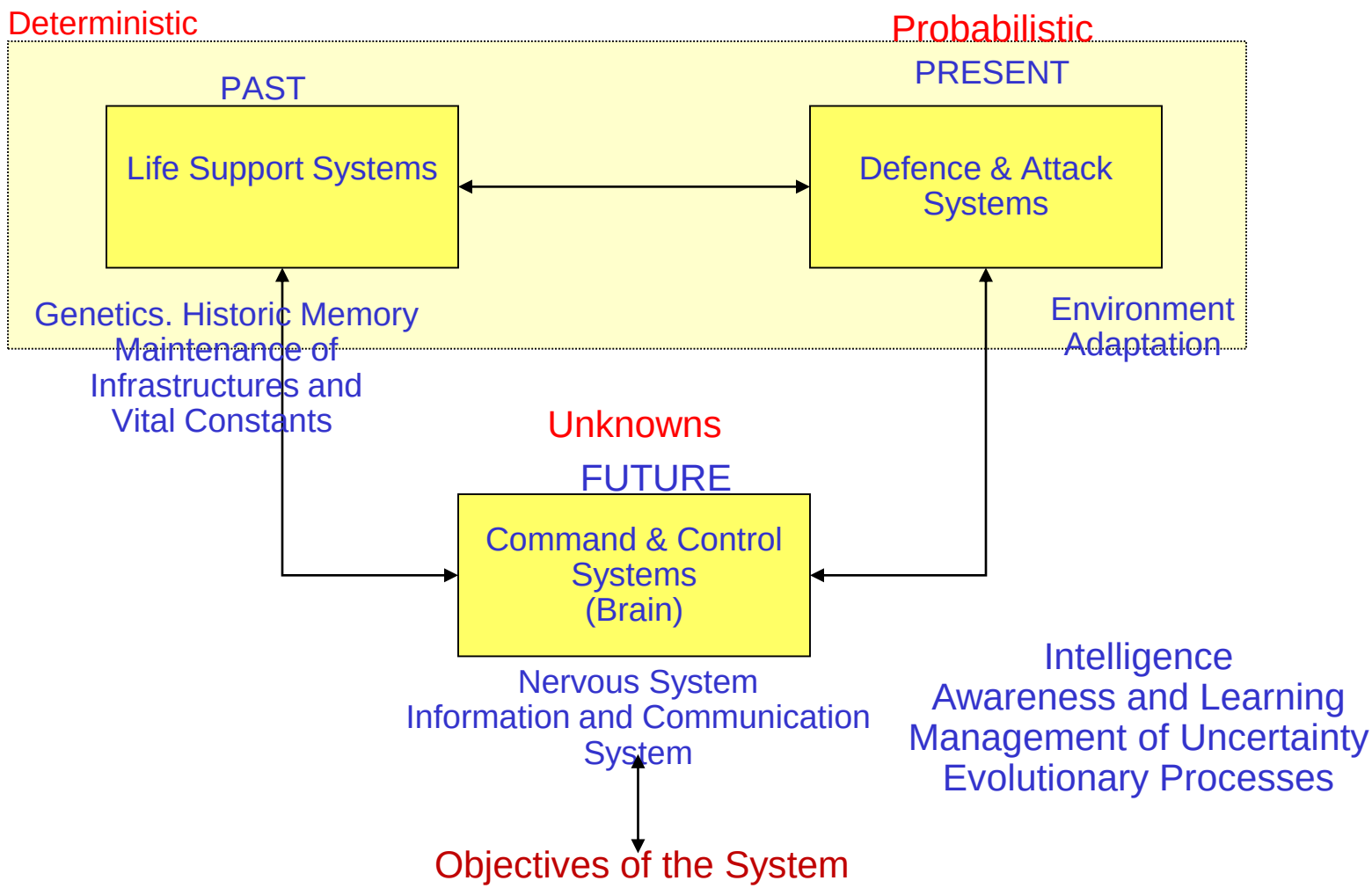
Environment Interaction
(Program)

Future
(Decision Taking)

RESILIENCE: Is also about adapting to the changes of environment.

Resilience is evolution

Triangular Models – Adaptive Complex Systems

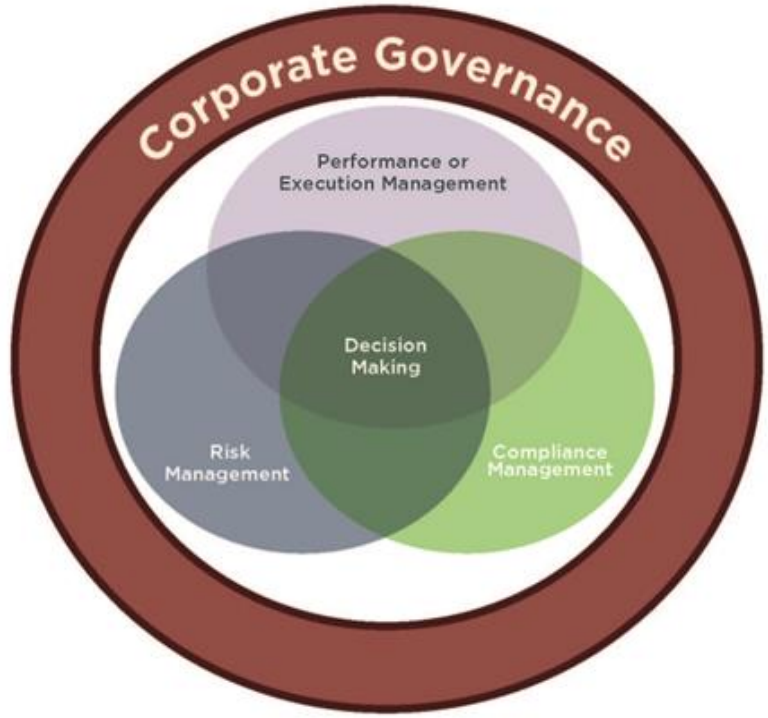


Triangular Models - Organisations as Living Systems

Adaptive Complex System have the following things to take into account.

- **Genetic limitations:** Internal limitations by design. Limited internal subsystems. The organisation has to be conscious of its own limitations.
- **Membrane**: Interfaces with environment. Open and Close mechanisms. Field of action.
- **Environmental limitations:** Factors for or against the system. Access limitations to resources
- **Limitations of Information:** Uncertainty factors
- **Perspective depending on the level:** "Safety" – People; "Security" – Organisation (but we are talking about the same thing)
- **Scope of actions.** Now we are talking about five different environments for defence and attack: (Land, Sea, Air, Space, Cyberspace)
- **Limitations of the models.** Variable reduction should be made carefully and in relation to objectives, to exclude unnecessary complexity and to include valuable and sufficient information so the model is useful.

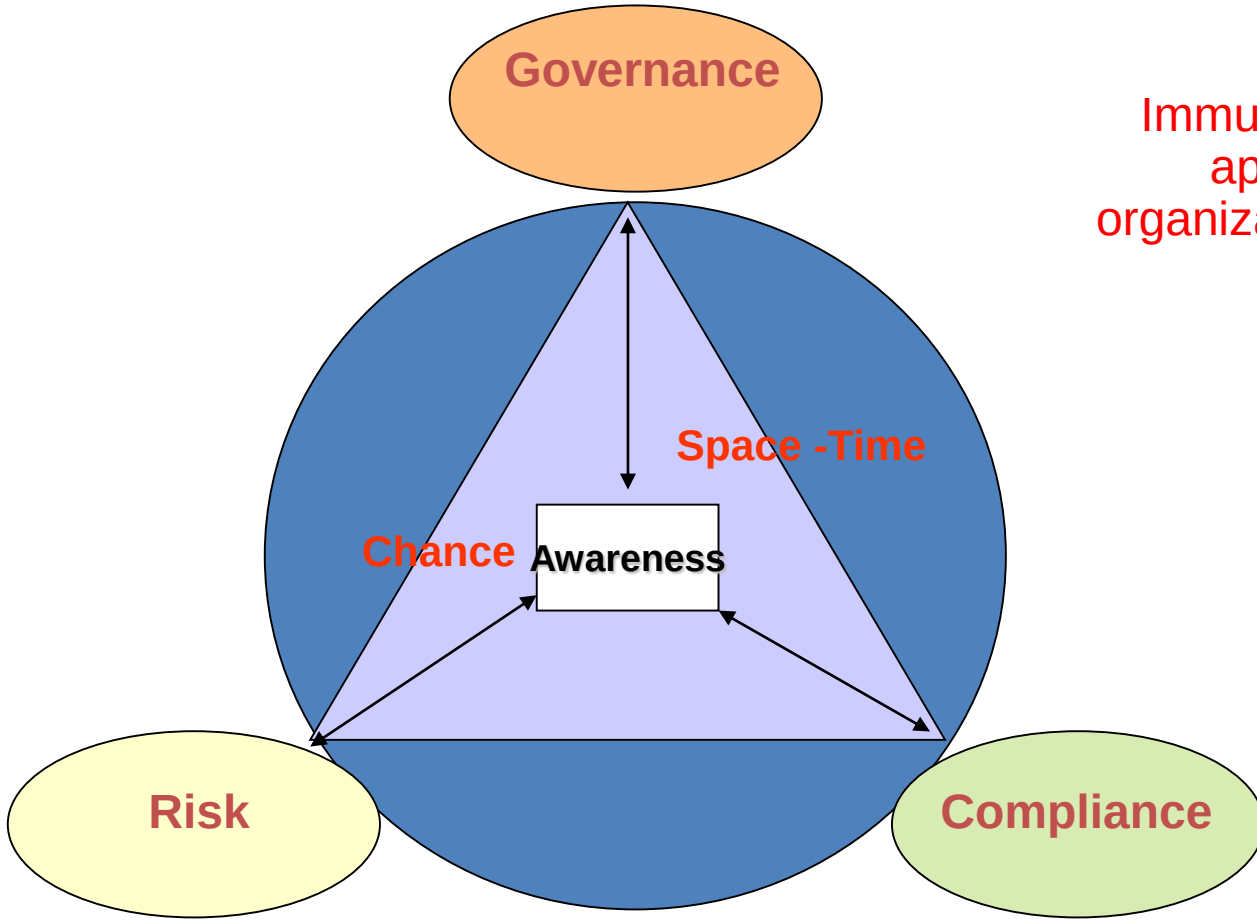
Triangular Models - GRC Concept in Organisations



Systems Thinking comes into place because of Cyberattacks

GRC: A capability to reliably achieve objectives (Governance), while addressing uncertainty (Risk Management), and acting with integrity (Compliance)

Triangular Models – GRC Concept in Organisations

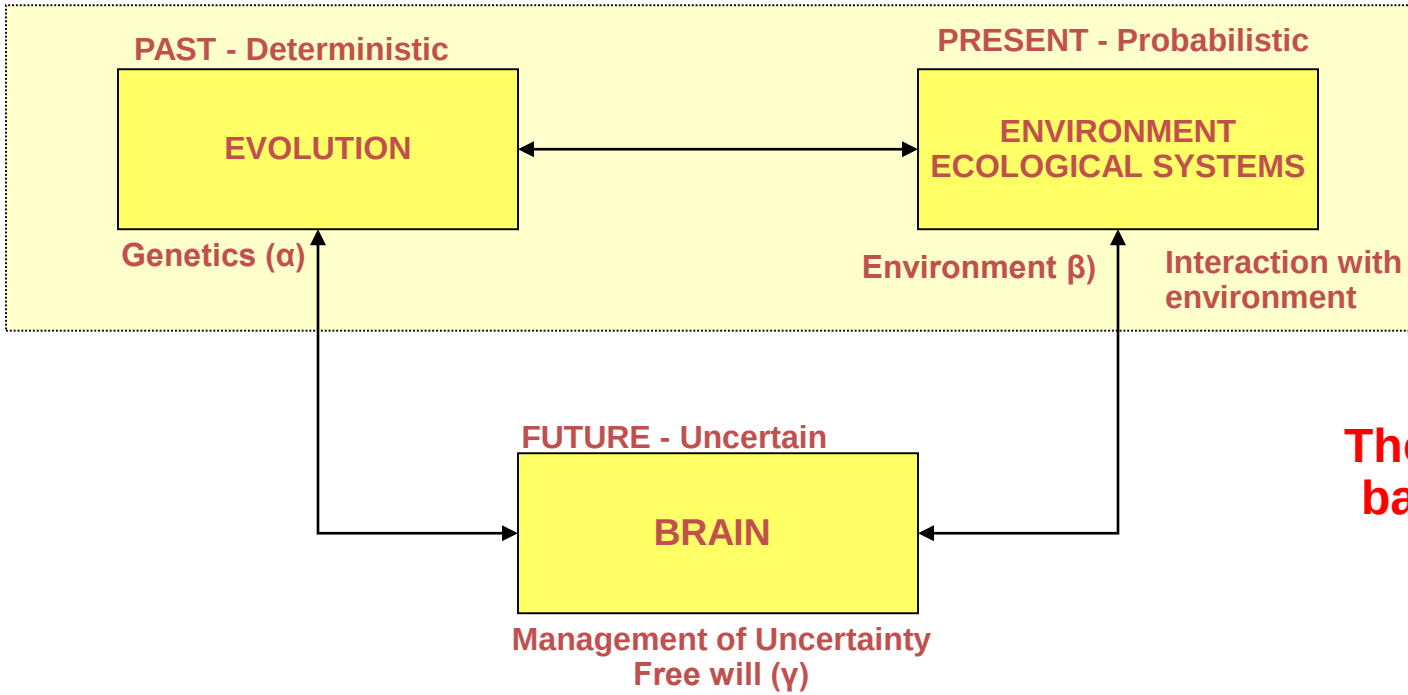


Immune System applied to organizations **(RRC)**

GRC: People Centric Security

Triangular Models for a Living System

Scientific Perspective



The triangle is the basic stable unit

"Universe is everywhere and we watch for it (or we should)"

Triangular Models – Weight Factors

Weights – For research!

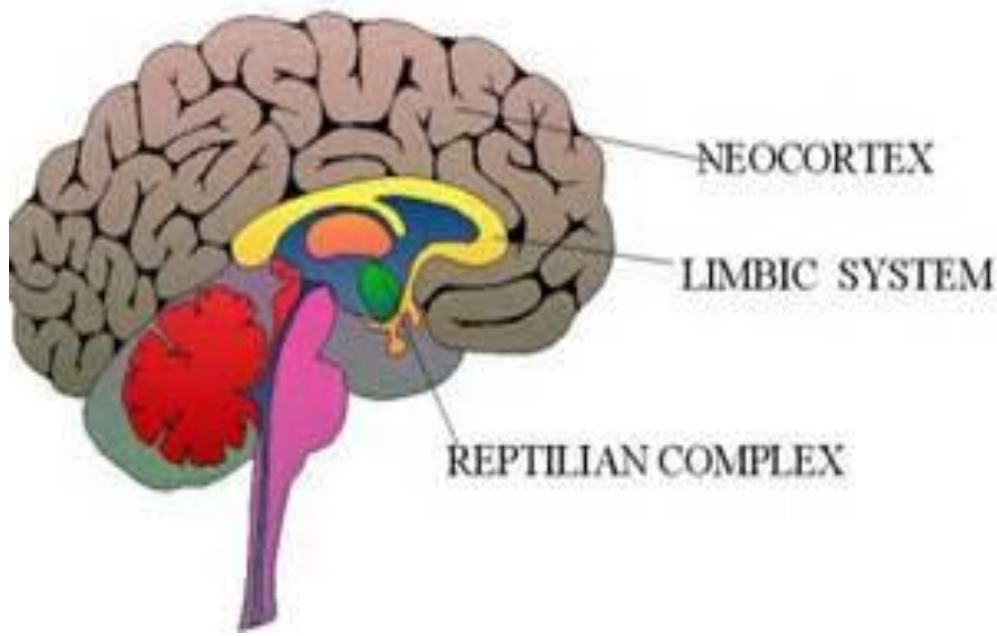
	α	β	γ
Minerals	95%	5%	0%
Vegetables	58%	40%	2%
Animals	50%	45%	5%
Humans	40%	50%	10%
Sup. Beings	30%	40%	30%

Variable α = "weight" of genetics

Variable β = "weight" of environment

Variable γ = "weight" of "free will"

Triangular Models - Brain Functions

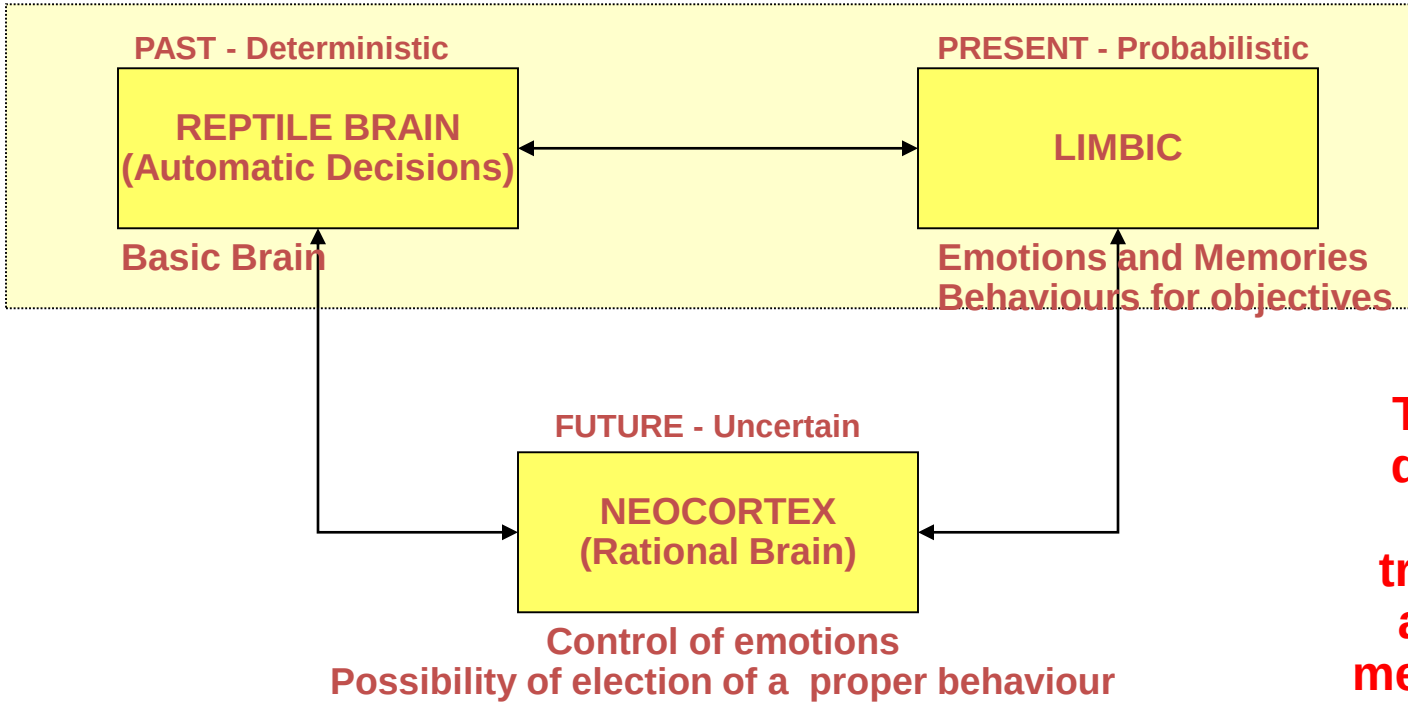


Central Communications and Coordination System.

Command and Control

Information Network

Triangular Models - Brain Functions



The Brain is a quantic organ which can transcend time and space by means of dreams and imagination

Evolution phases of the human brain

Triangular Models – Weight Factors applied to Humans

Weights – For research!

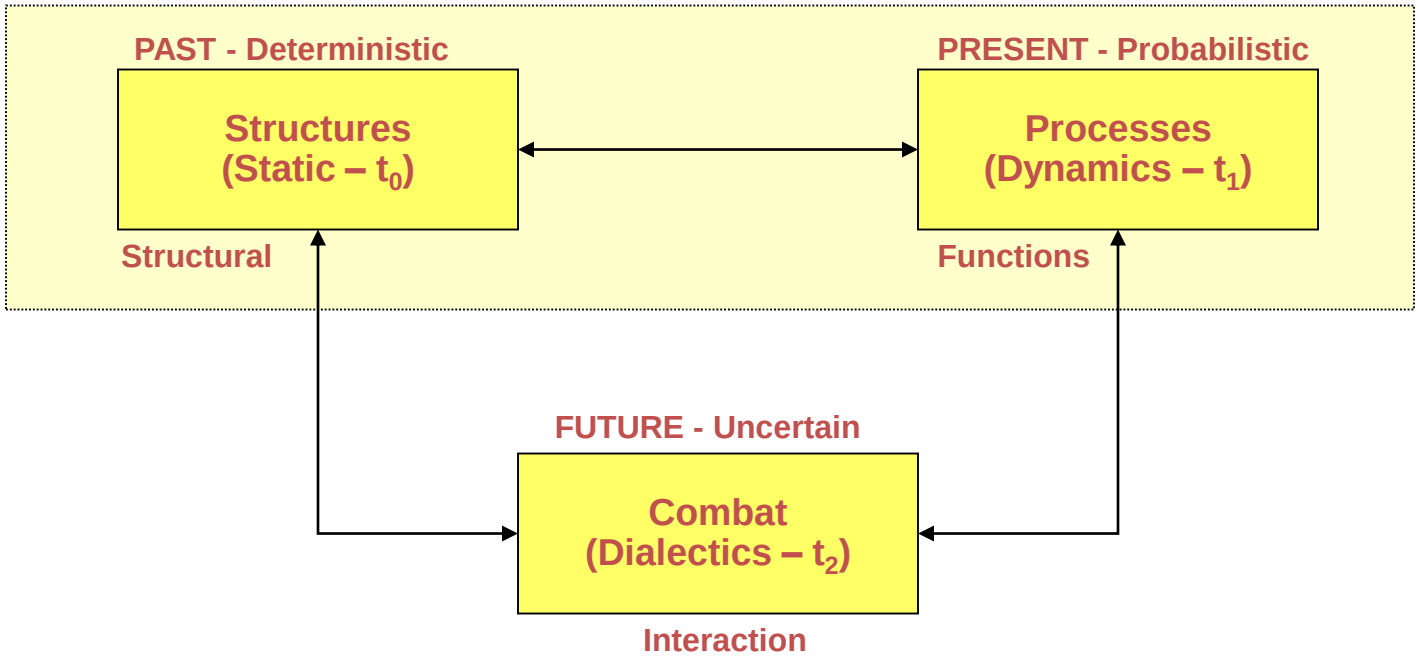
	α	β	γ
Animals	90%	5%	5%
Humans -1	60%	30%	10%
Humans -2	40%	40%	20%
Humans -3	20%	50%	30%

Variable α = "weight" of Reptile

Variable β = "weight" of Limbic

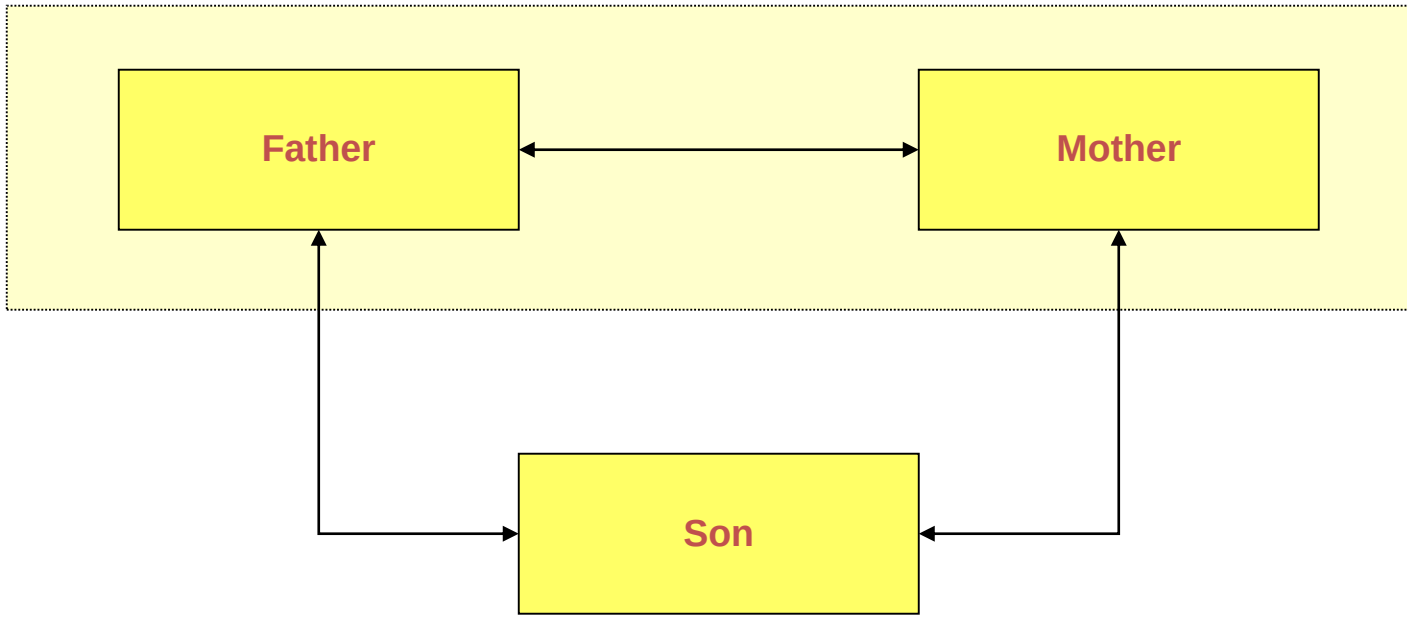
Variable γ = "weight" of Neocortex

Triangular Models – Life Cycles



Model which objective is the system's interaction with the environment

Triangular Models – Bowen Theory – Family Conflicts



Emotional triangles:

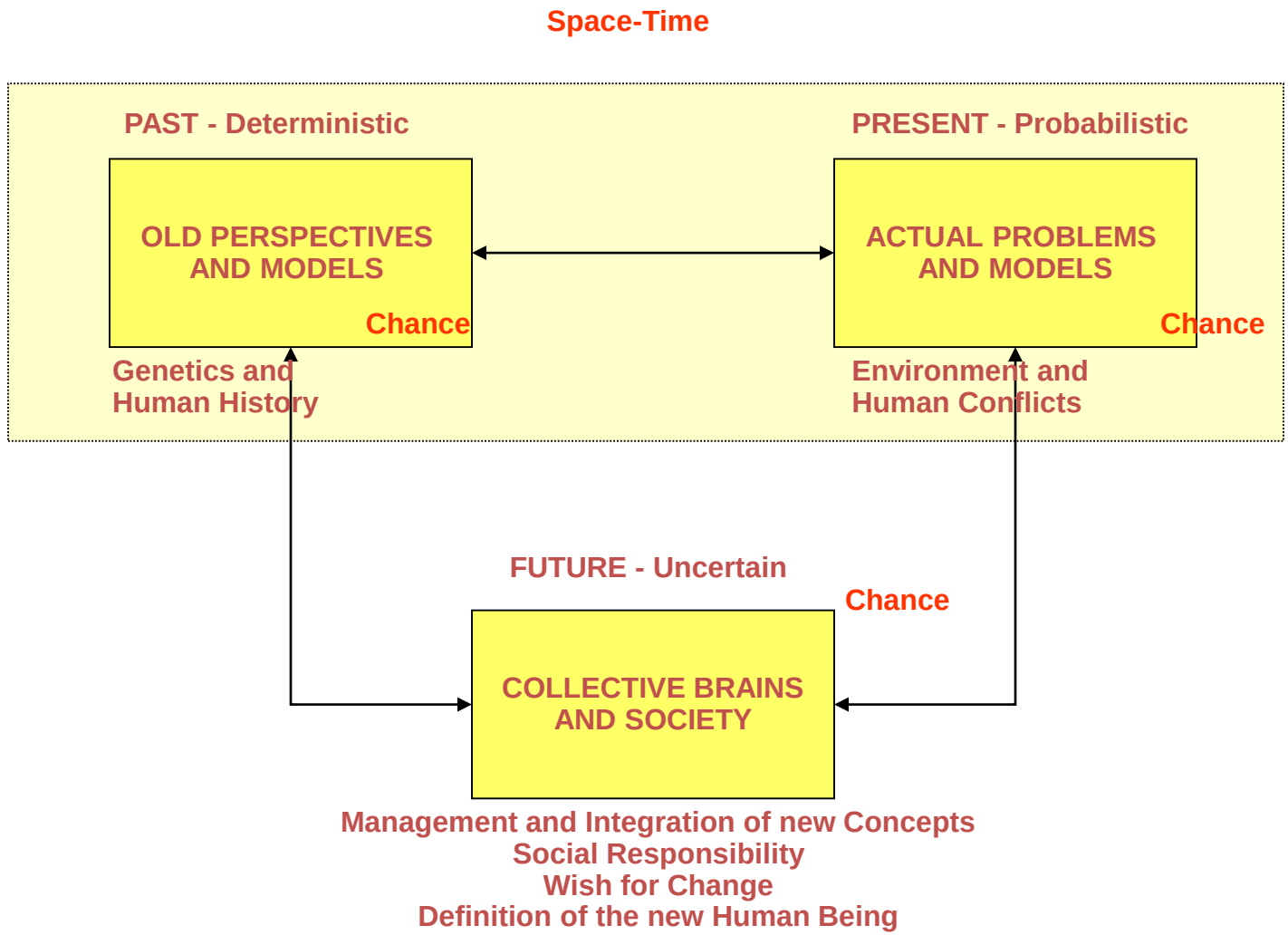
"The pattern of all emotional Systems are the same whether they be family systems, work systems or social systems"

An emotional system is composed of a series o interlocking triangles

An emotional triangle is made up of three living people. It is a living, biological system (a pet, being a living being, may qualify as a potential third member of an emotional triangle.) All three are emotional participants and are able to act and react to the other two members of the triangle.

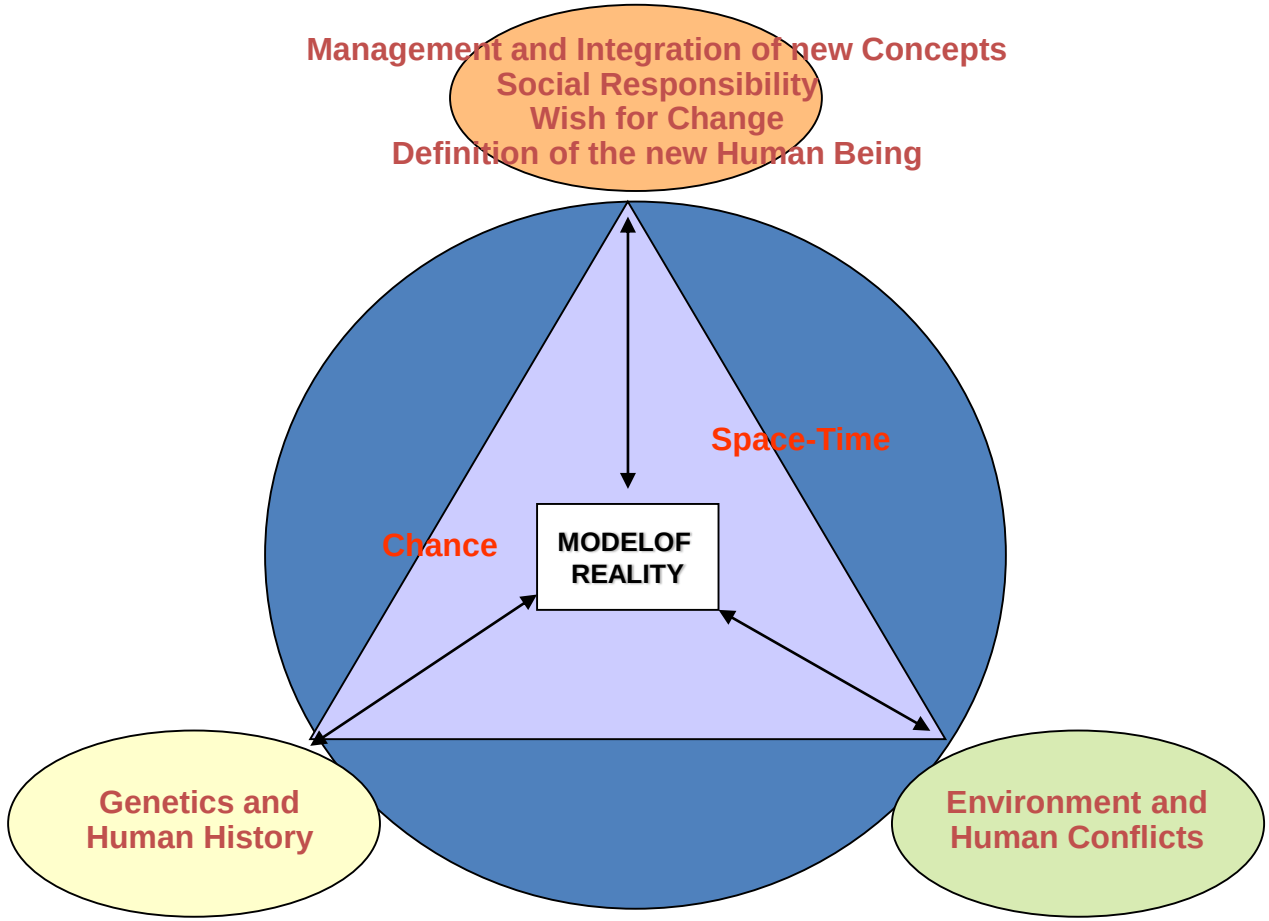
Bowen's movement from a psychoanalytic to systems theory: from the individual to the dyad of the triangle. (Triangles: Bowen family systems theory perspectives /Peter Titelman, editor. The Haworth Press, Taylor & Francis Group. Ney York. 2008)

Triangular Models – Conceptual Meta-Model for Society

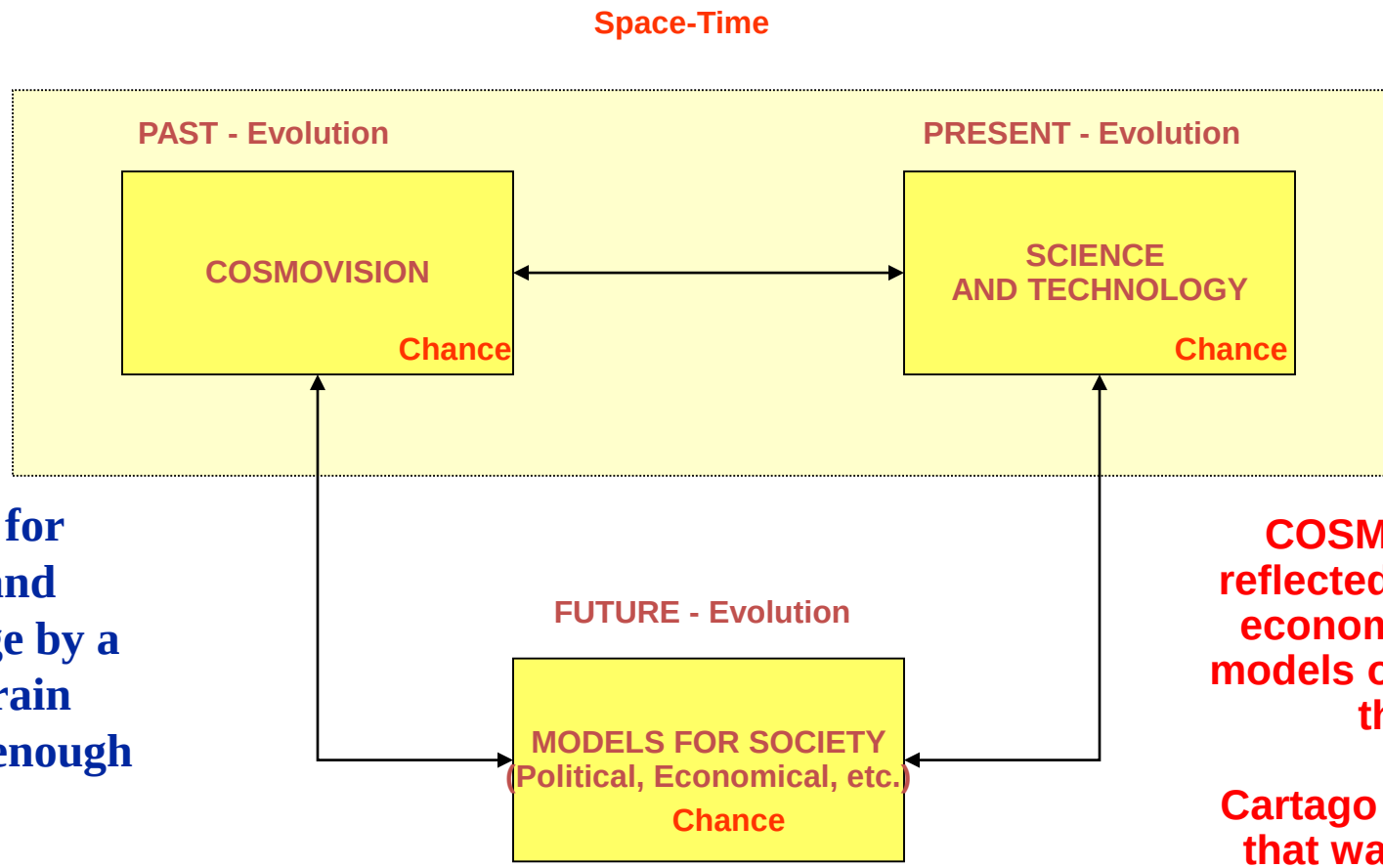


Triangular Models – Conceptual Meta-Model for Society

OR …..



Triangular Models – Conceptual Meta-Model for Society



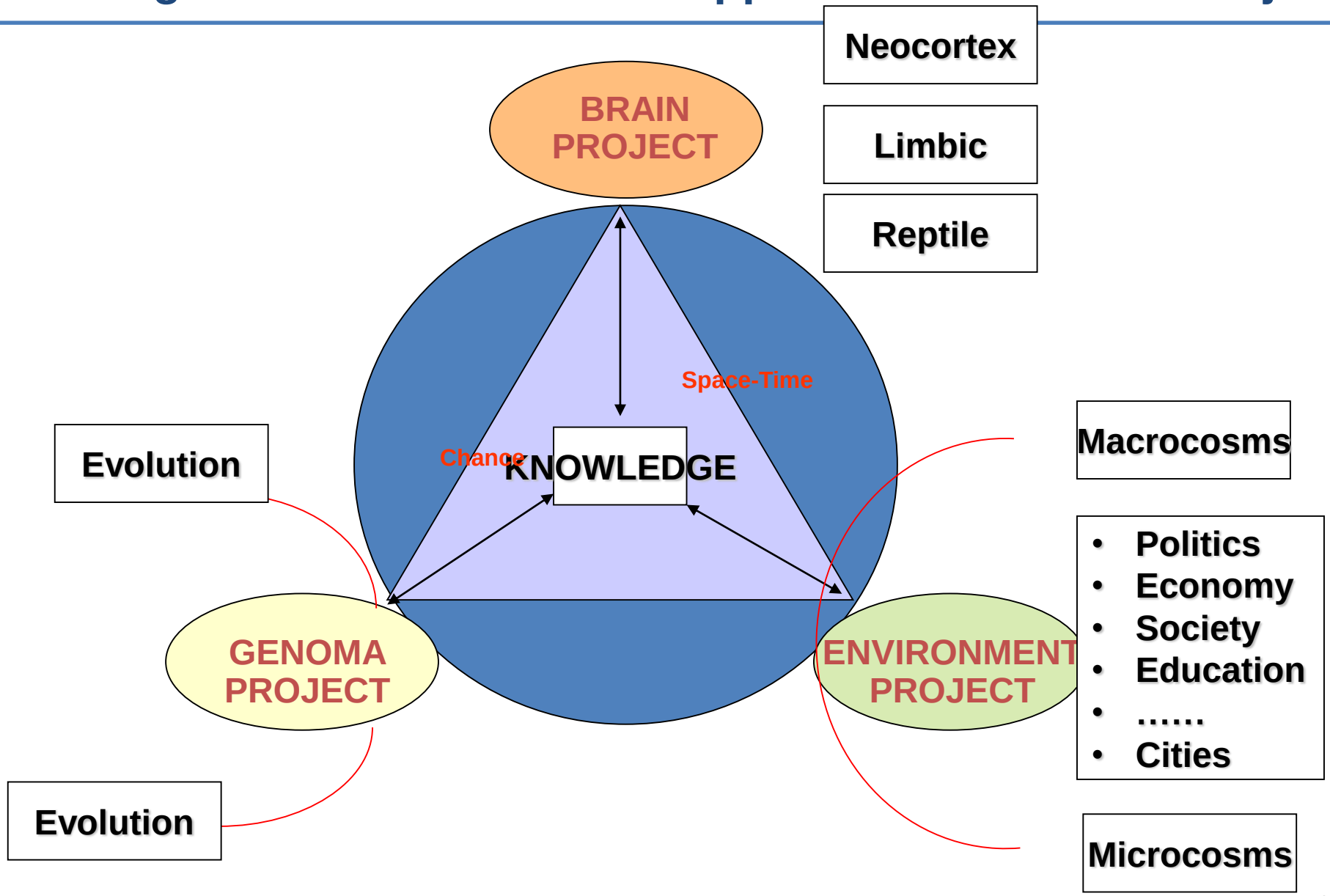
The need for security and knowledge by a limited brain with not enough neurons.

COSMOVISION is reflected in the social, economic and other models of society from the past

Cartago Nova is a city that was planned to reflect the Cosmos

See Archaeological Museums all over the world.

Triangular Models – General Applications – Human Projects



Triangular Models – Environment Project - Ecosystems

Suggestions for New Models for the XXI Century. Working groups for SESGE and other Systems Societies:

These new models are based and should be coordinated with the following back-ground:

- Chapter 5 of book RRD – Modelos para el siglo XXI
- Agenda 2030 ONU – Guidelines for Integrated Development
- Risks 2017 – World Economic Forum
- Universal Declaration of Human Rights - ONU
- Reference Pattern Values (Francisco Parra)

Other aspects, such as Science and Technology, etc. should be considered transversal to help and support each of these projects.

Triangular Models – Environment Project - Methodology

New Models	Book RRD	Agenda 2030 UN	Risks 2017 - WEF	Human Rights UN	RPVs
Political					
Social					
Educational					
…….					
Ideologies					
Military					
Economic					

Conclusions

We think that General Systems Theory and Societies, such as SESGE and other General Systems Societies around the world should help in designing practical solutions for complex systems, human conflicts, etc. and be an asset to Society, acting as Think-Tanks for industry, government and other institutions.

Questions?

CONTACT

Rafael Rodríguez de Cora
Tel: +34 91 432 14 15
Móvil: +34 607 995 117
Fax: +34 91 578 27 97

E-mail: rrcora@calogistics.com