

**ALGER : 2^{ème} Assises de l'intelligence
économique. VIP Groupe
10 au 11 Novembre 2008**

**Analyse des Jeux Mondiaux de Contrats dans
l'Industrie Pharmaceutique par Intelligence
Economique
Implications Stratégiques**

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Groupe ESC Business School*

10.02.09

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- L'utilisation d'outils, de méthodologies constitutives de l'intelligence économique permet l'étude des réseaux d'alliances dans une industrie.
- Dans les industries où la High Tech est très développée, l'innovation est soutenue, souvent de rupture, et globale, les cartographies dynamiques de réseaux permettent alors de faire des audits évolutifs des différents segments technologiques constitutifs de ces industries: émergence de technologies nouvelles, croissance et rythme de croissance, obsolescence, répartition géographique.
- La prise ou la perte de pouvoir d'acteurs/firmes au sein de ces réseaux mondiaux, et les contraintes exercées dans le temps par l'ensemble des acteurs sur une entreprise, i.e. l'environnement concurrentiel, peuvent être analysés. Les analyses de structures de réseau permettent ainsi de comprendre la cohérence de la stratégie d'une entreprise et la pertinence de sa position dans un segment donné, ou dans l'ensemble des segments de ou des industries dans lesquels elle est impliquée. L'intelligence économique, dans ce cas, devrait aider les entreprises à assurer la maîtrise de leur position.

The Strategic Innovation Challenge

- **Innovation matters** the game keeps changing – new technologies, new markets, new competitors, even new rules for the game.
- Estimates indicate that, in fields in which technology-exchange agreements between firms are widespread, **information about innovations is disseminated throughout the world *within a year or two* of the introduction of an innovation**

Meeting the Strategic Innovation Challenge

- Open innovation implies that **organizations open up** their innovation processes, searching widely outside their boundaries and working towards managing a rich set of network connections and relationships right across the board.
- Innovation increasingly becomes a corporate wide task and one which extends **beyond the boundaries of the enterprise.**

From a closed to an open corporate innovation system:

Some examples of transformation and increased performance

- *IBM has generated more than \$10 billion in **licensing revenues** from 1996 to 2006*
- *Companies also receive revenues from **royalty payments**. IBM for example received \$1.9 billion in royalty payments in 2001.*

Some examples of transformation and increased performance:

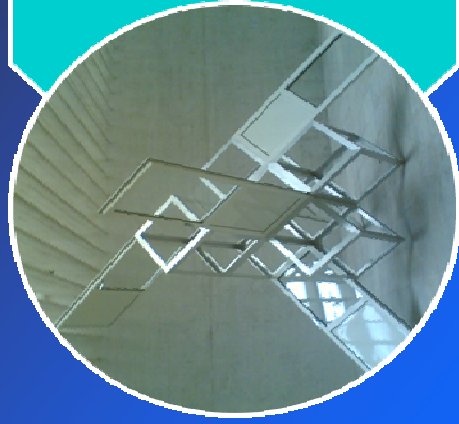
The pharmaceutical industry

- Pfizer reviewed in 2005 over 400 licensing or acquisition opportunities.
- 44 percent of mid-pharma revenues in 2005 were from products discovered outside their own pipelines
- Analyst forecast:
 - Revenues from products discovered by external sources will reach 49 percent by 2010 based only on the deals already in place.
- Data monitor statistics on the **increased dependence on licensing** over the next years:
 - Big pharmaceutical companies should retrieve over US\$100 billion in sales from licensed products by 2010.

INTERFIRM ALLIANCES

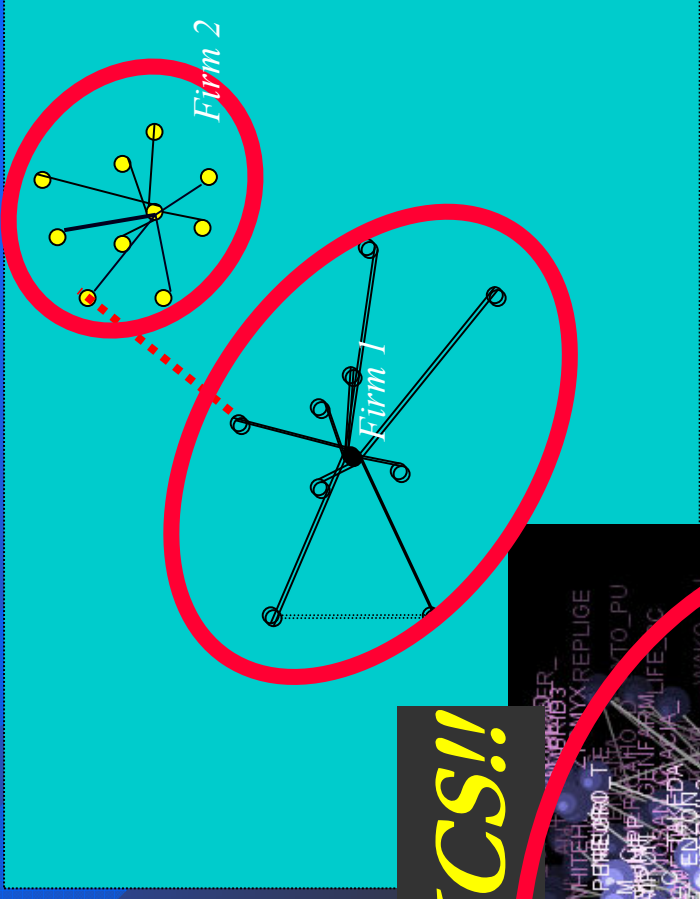
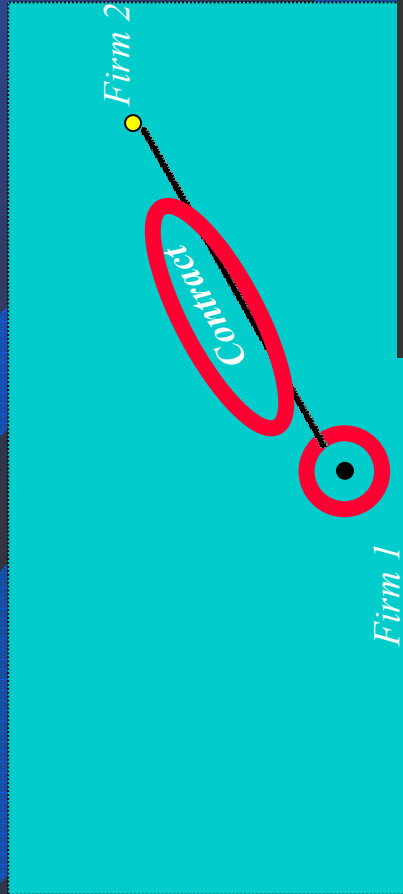


= 6 percent to 15 percent of the market value of the typical company and that alliances are expected to account for 16 percent to 25 percent of median company value within five years and more than 40 percent of market value for almost one-quarter of companies.

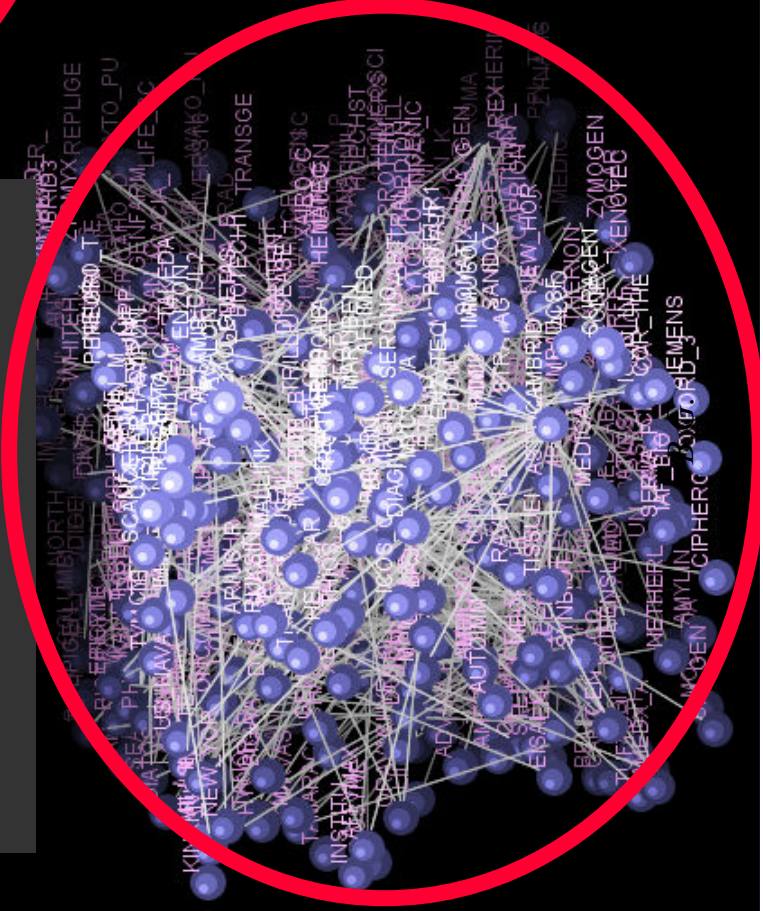


In current dollars, this means that for the advanced economies as a whole, alliances will represent somewhere between \$25 trillion and \$40 trillion in value within five years.

Taking a Network Lens to Alliance Management



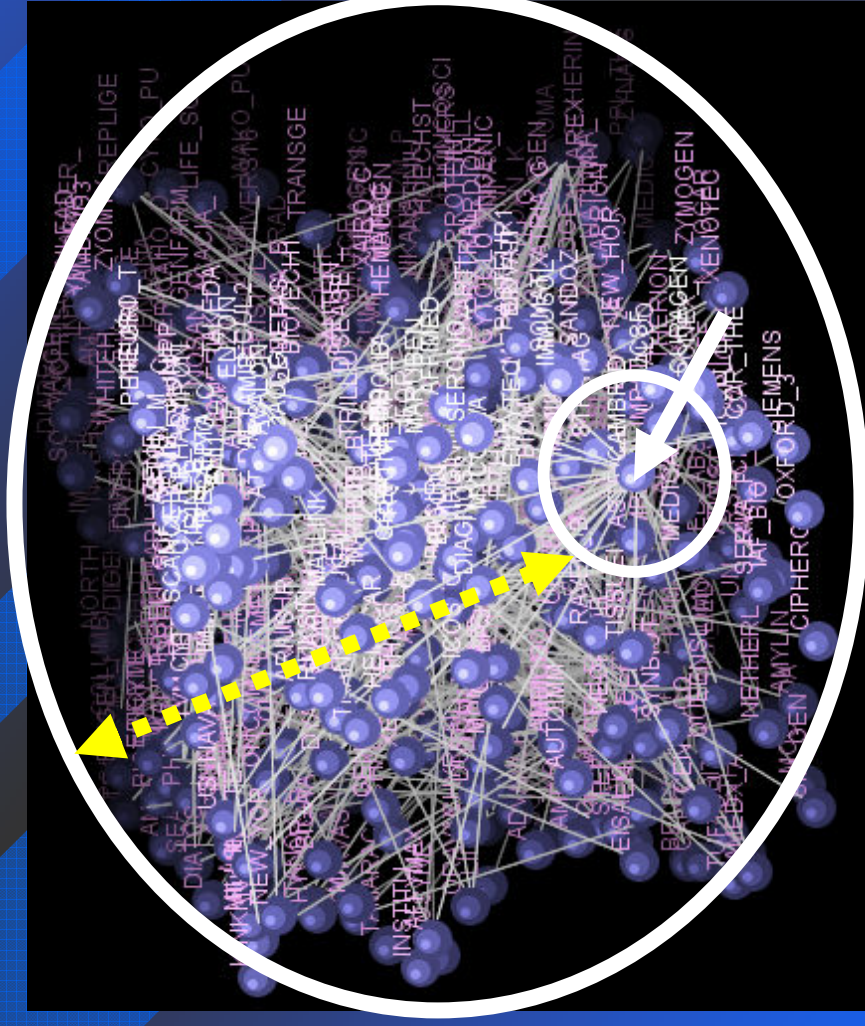
DYNAMICS!!



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AT STAKE IN STRATEGY:

- FIRM POSITION WITHIN UNBALANCED COMPLEX NETWORKS OF ALLIANCES
- THE CONCEPTION OF EGONET STRUCTURES WELL ADAPTED TO THE MACRO STRUCTURES INTO WHICH FIRMS ARE EMBEDDED



CONSTRAINT



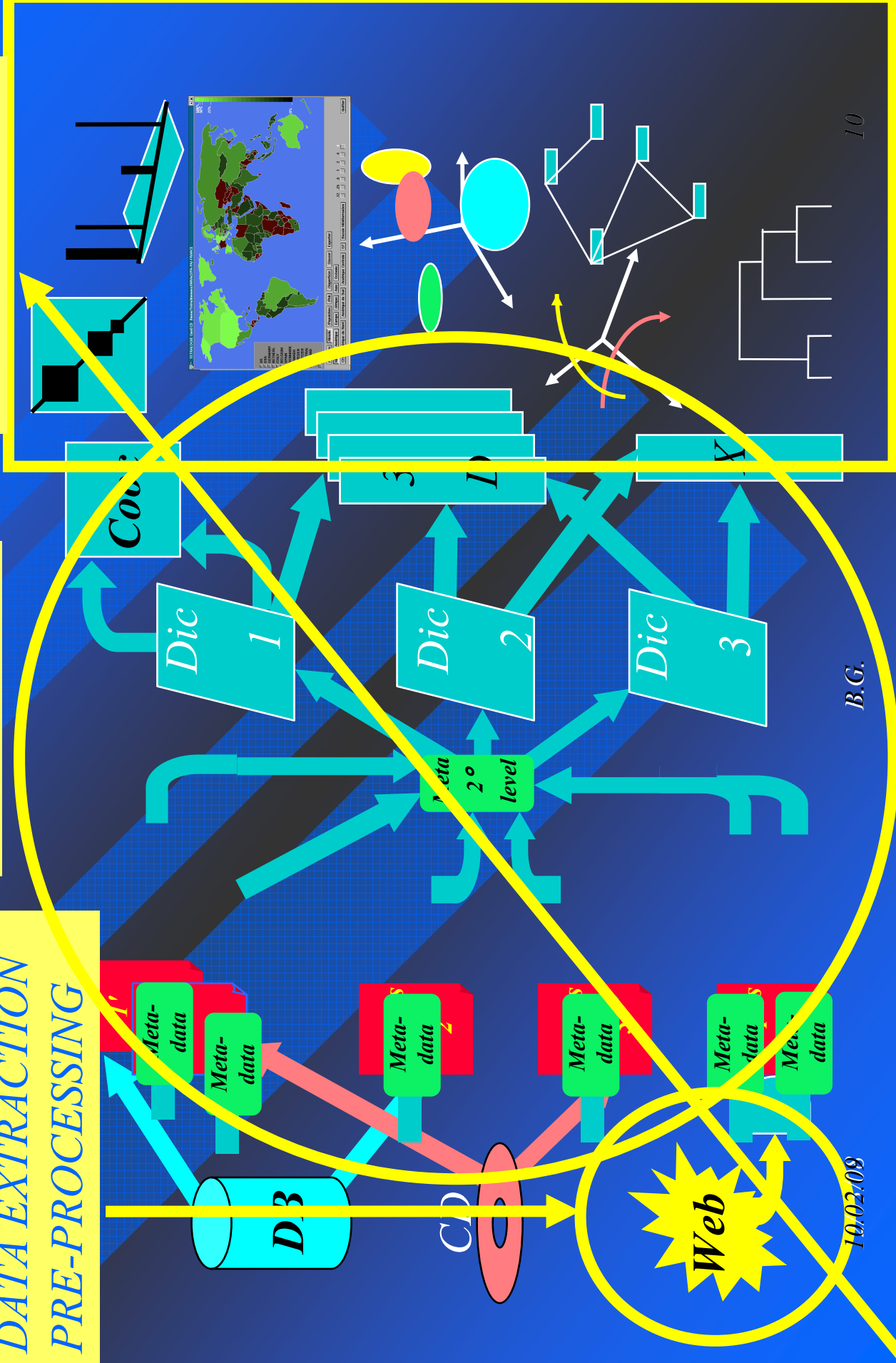
POWER
CONTROL

Architecture

DATA EXTRACTION
PRE-PROCESSING

DATA MINING

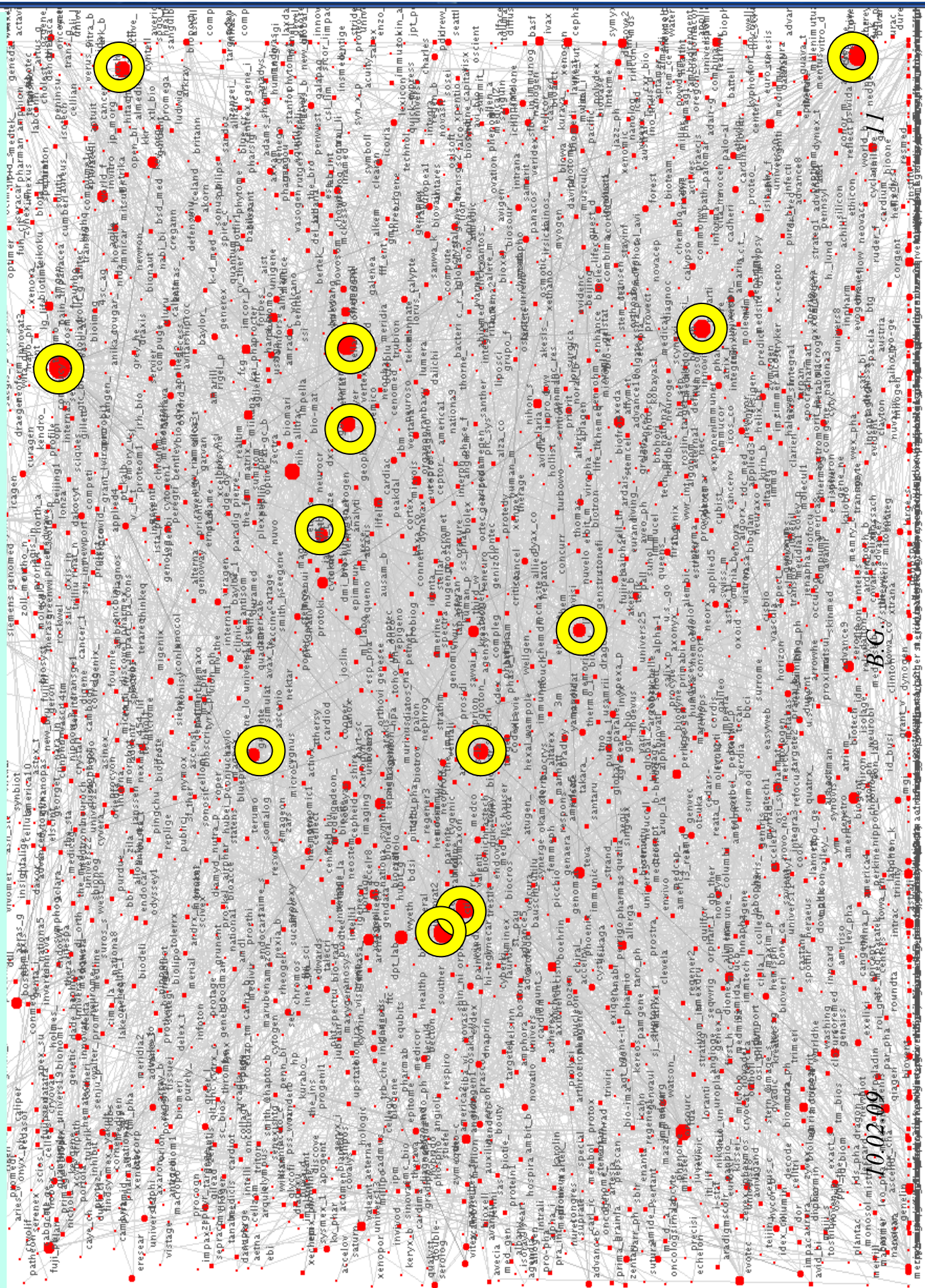
VISUALISATION
STATS



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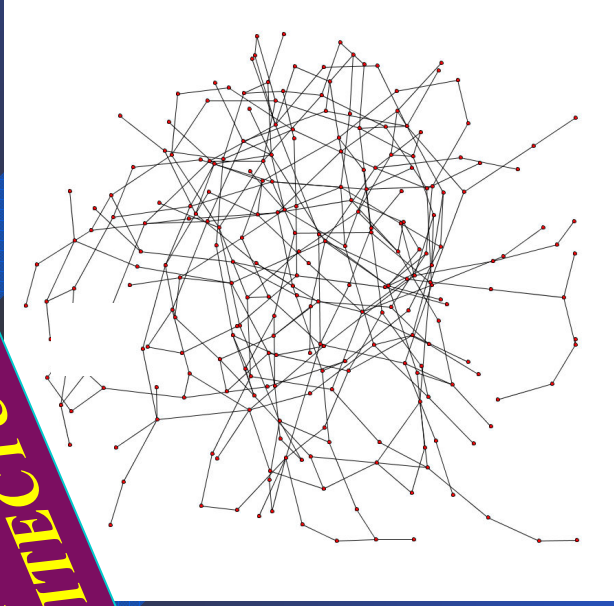
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TEXT MINING (open-source, press releases) : 5600 alliances in the PHARMA Industry in 2004 and 2005 (simplified image)

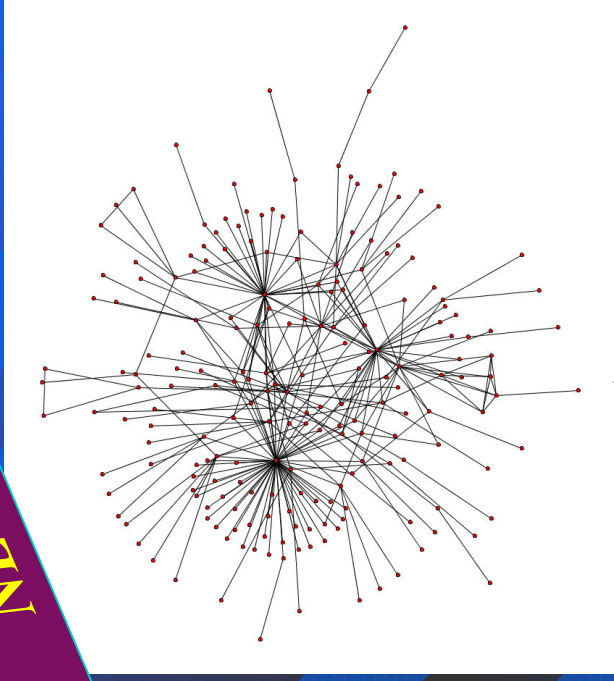


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**RANDOM
ARCHITECTURE**



**ALLIANCE
NETWORK**



This world is not RANDOM!

- *Alliance networks are dominated by hubs in all industries*

This world is not RANDOM And it is SMALL

Small-World Features of the Biotechnology Network

**the clustering coefficient of a regular lattice tends to 0,75.*

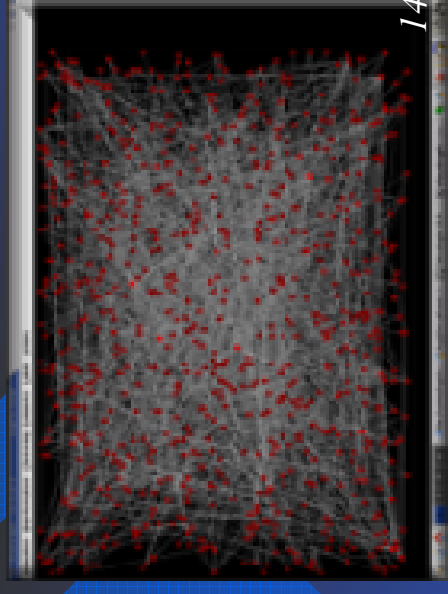
	Connectivity: clustering coefficient	Shortest Path
Biotechnology network	0,27*	3,5**
Random graph	0,005	6,1

INFORMATION DIFFUSES FAST

Whether we examine a high-tech sector or a whole industry

*Industries rapid moves translate into complex
alliance networks submitted to sustained innovation
and fast diffusion*

**ENTREPRENEURS NEED TO UNDERSTAND THE
MACRO ENVIRONMENT IN WHICH THEIR FIRM IS
SITUATED**



SECTOR 2

NIH

Merck

GlaxoSmithKline

Crucell

Chiron

Aventis

Medimmune

Id Biomedical

Dow

Genvec

SECTOR 1

Genentech

Medarex

Morphosys Ag

Biogen Idec

Medimmune

Xoma

Protein Design Labs

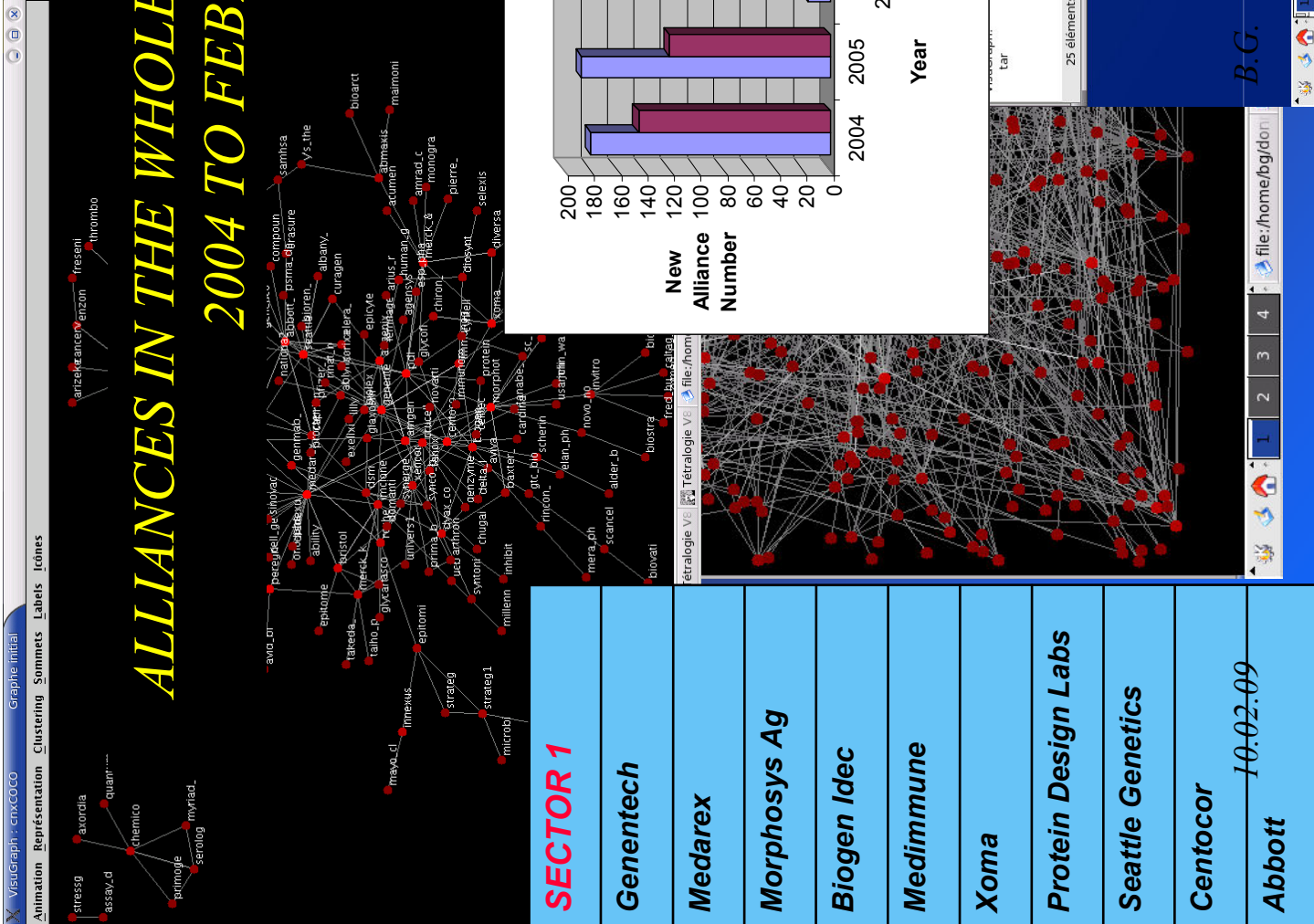
Seattle Genetics

Centocor

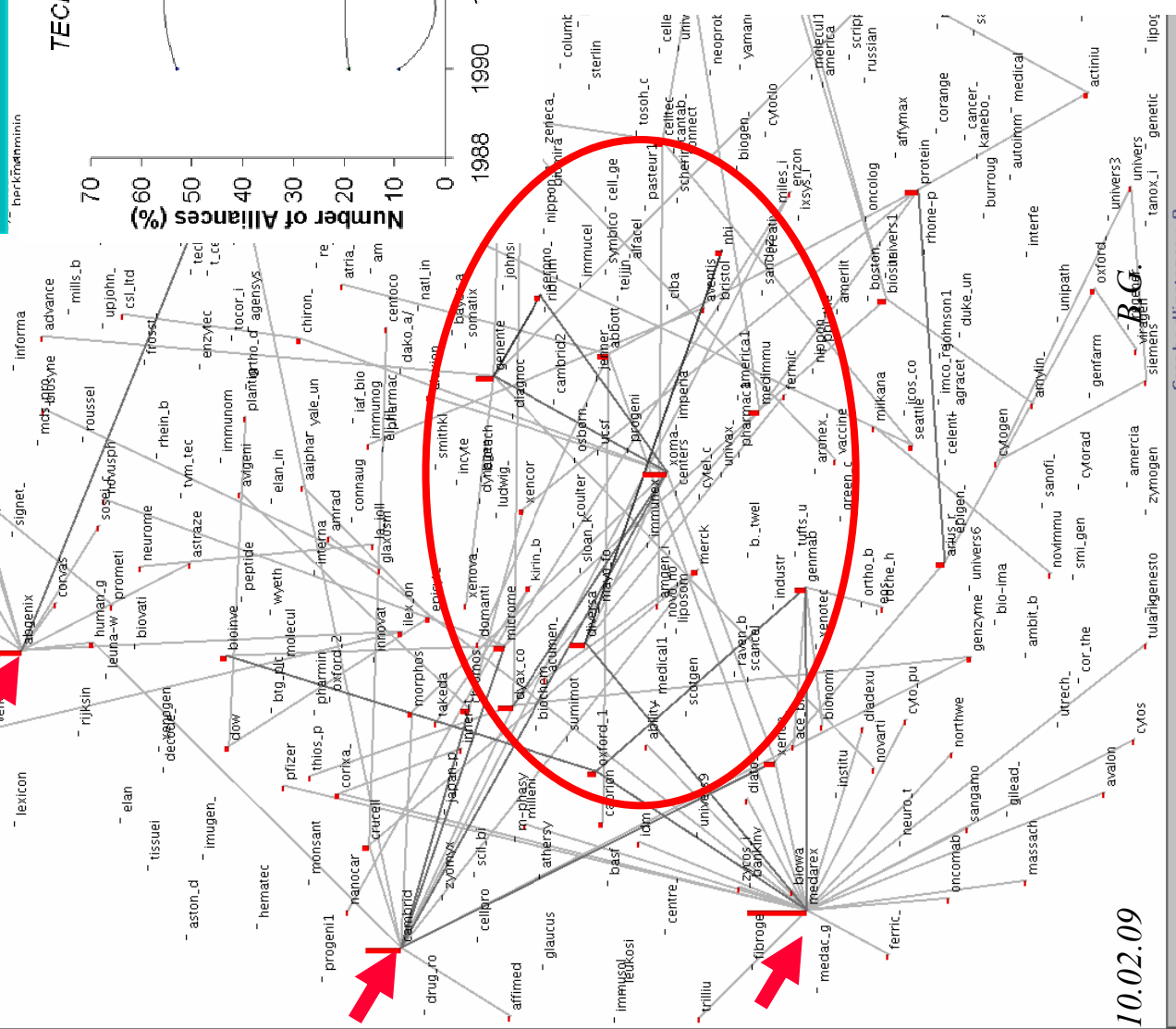
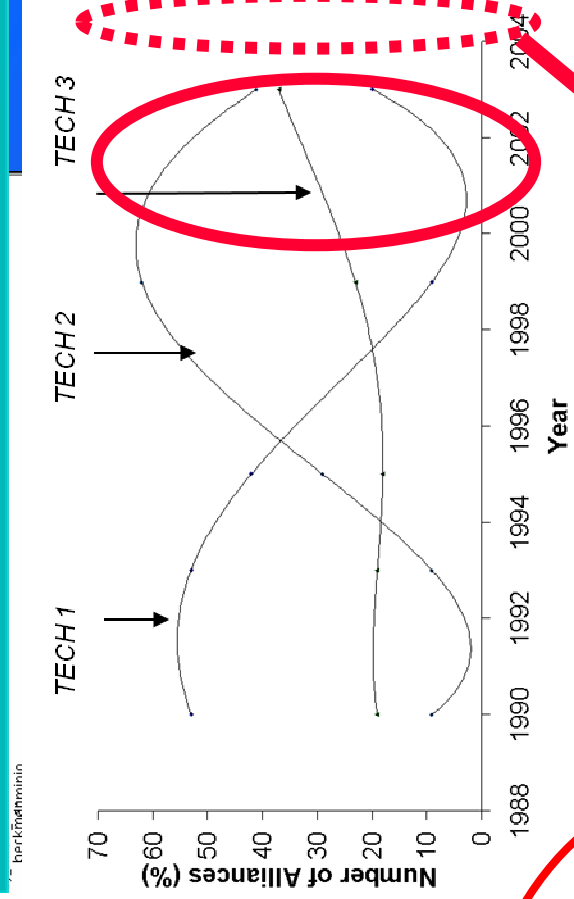
Abbott

ALLIANCES IN THE WHOLE INDUSTRY FROM 2004 TO FEB 2006

Contribution

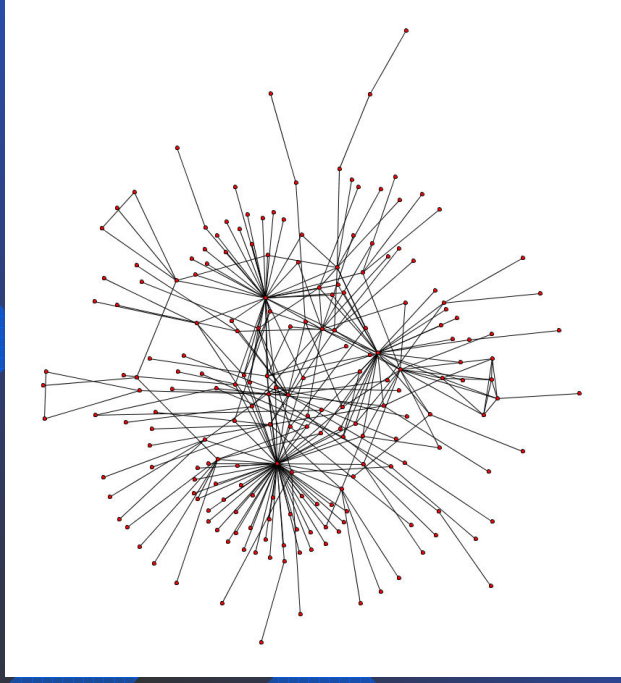
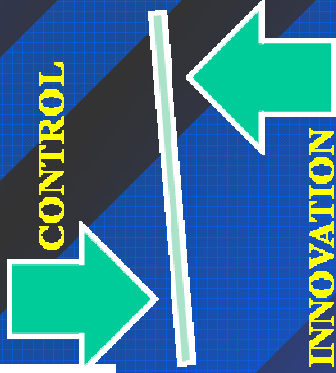
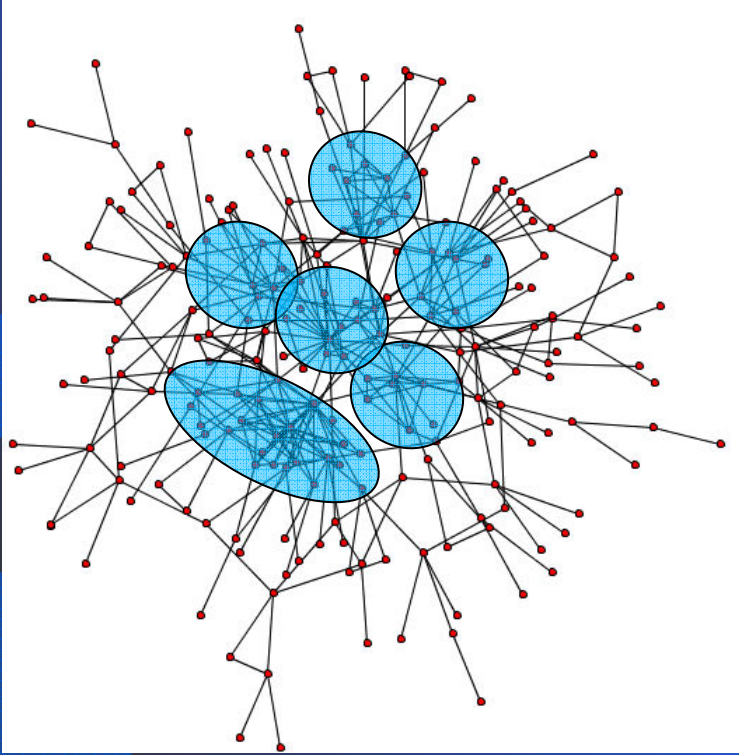


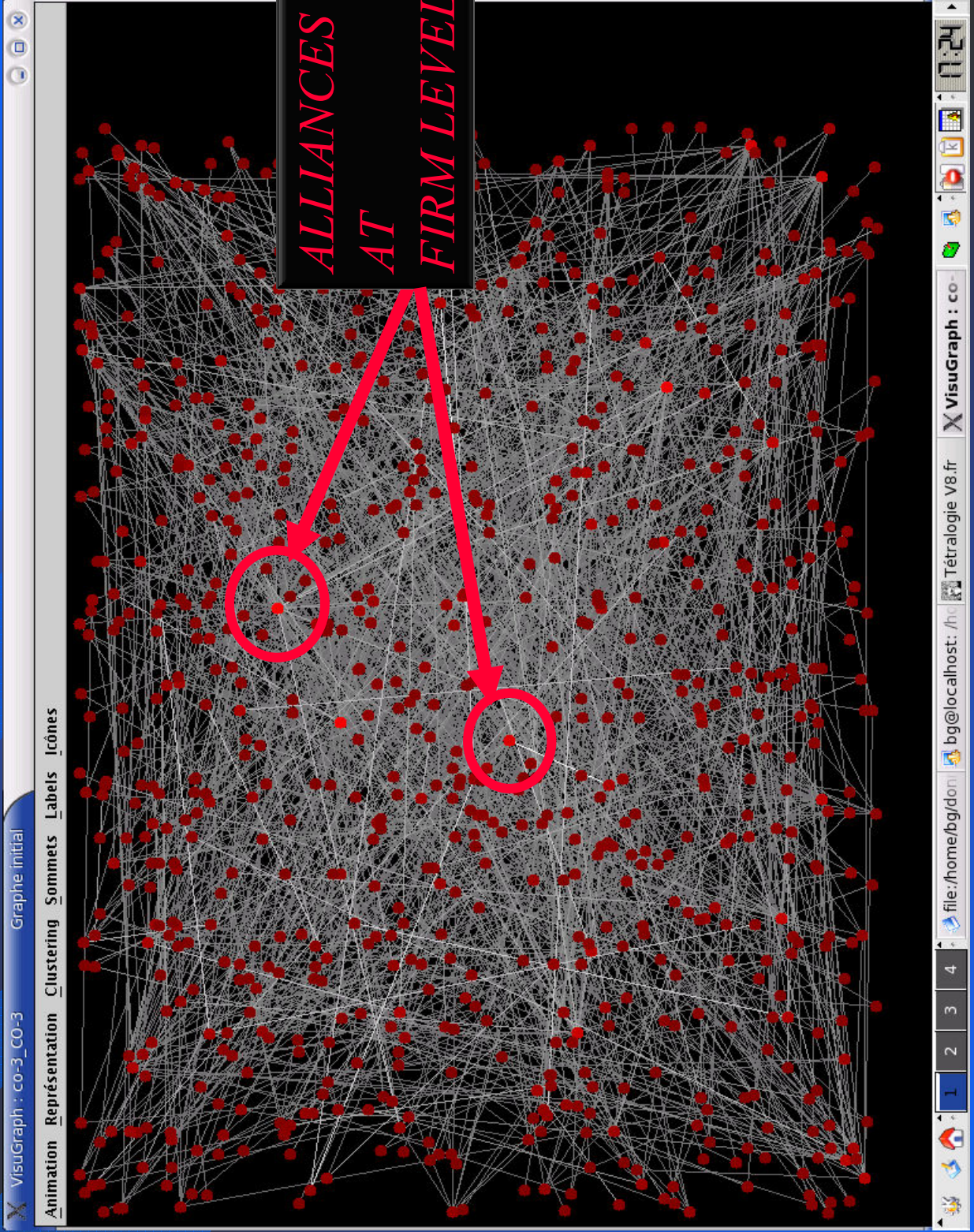
• TECH AUDIT OF SEGMENTS
 • DYNAMICS OF TECH FLOWS



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ALLIANCES
AT
FIRM LEVEL ?

GSK WHOLE INDUSTRY

Force de répulsion

Filtrage

Intensité des liens

Valeurs des liens

Masquage

Proches voisins

Densité de clustering

ATTENTION: CC
9 mai 2006 17
Attention: CC
9 mai 2006 17
Attention: CC
9 mai 2006 17
Attention: CC
9 mai 2006 17

GSK SEGMENT 1

Force de répulsion

Filtrage

Intensité des liens

Valeurs des liens

Masquage

Proches voisins

Densité de clustering

COld Syn
Phase3
SEG2.Syn
Target vaccine-not

MERCK WHOLE INDUSTRY

Force de répulsion

Filtrage

Intensité des liens

Valeurs des liens

Masquage

Proches voisins

Densité de clustering

ATTENTION: CC
9 mai 2006 17
Attention: CC
9 mai 2006 17
Attention: CC
9 mai 2006 17
Attention: CC
9 mai 2006 17

MERCK SEGMENT 1

Force de répulsion

Filtrage

Intensité des liens

Valeurs des liens

Masquage

Proches voisins

Densité de clustering

Choix d'instances

ATTENTION: CC
9 mai 2006 17
Attention: CC
9 mai 2006 17
Attention: CC
9 mai 2006 17
Attention: CC
9 mai 2006 17

Roche

Growth outlook secured by combined tech/pipeline portfolio

Paramètres

Force de répulsion

filtrage

Intensité des liens

Valeurs des liens

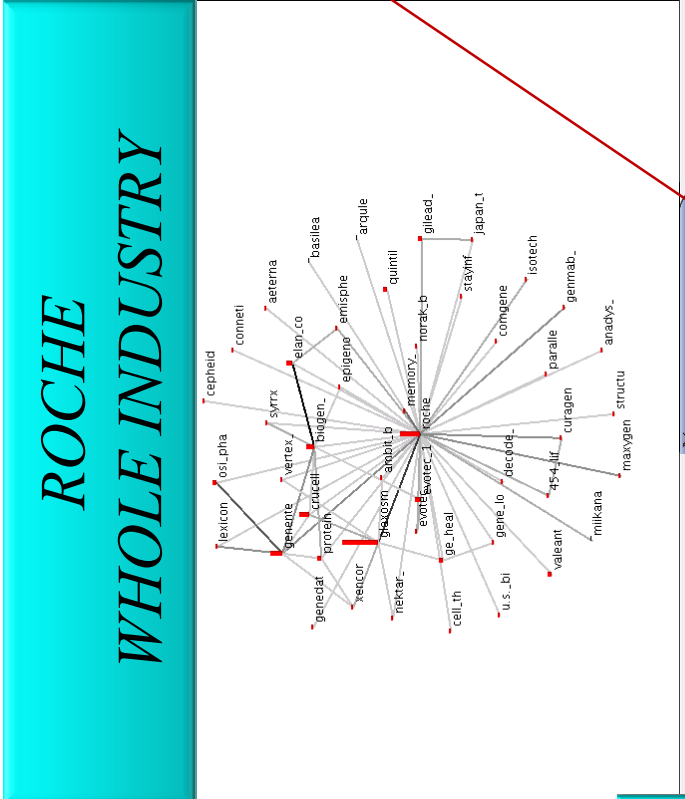
Masquage

Proches voisins

Densité de clustering

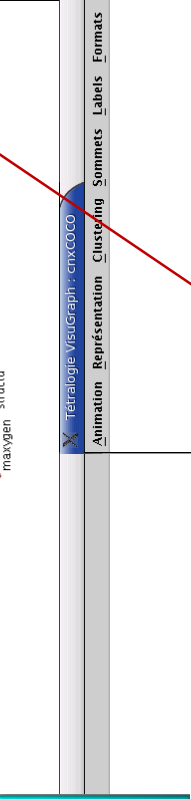
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ATTENTION: Cc
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9 mai 2006 17:44
ATTENTION: Cc
culdn't get f
25 élt
    
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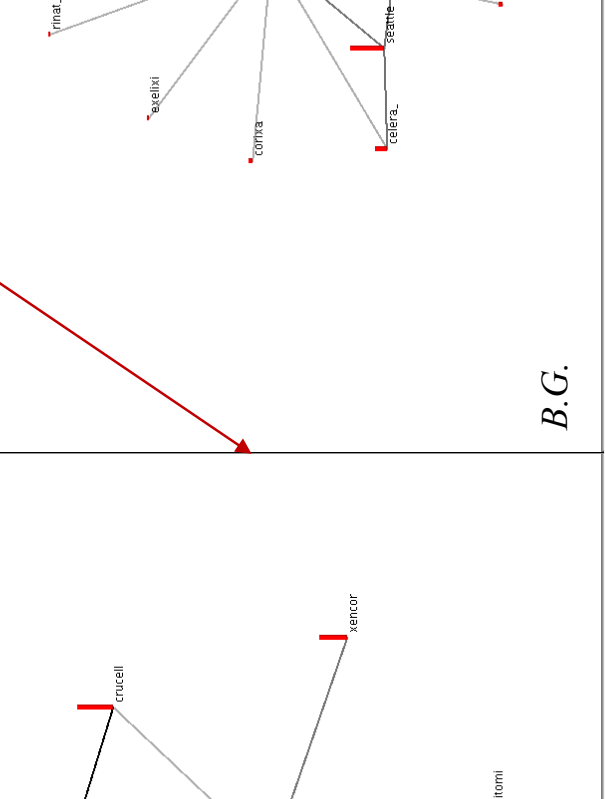
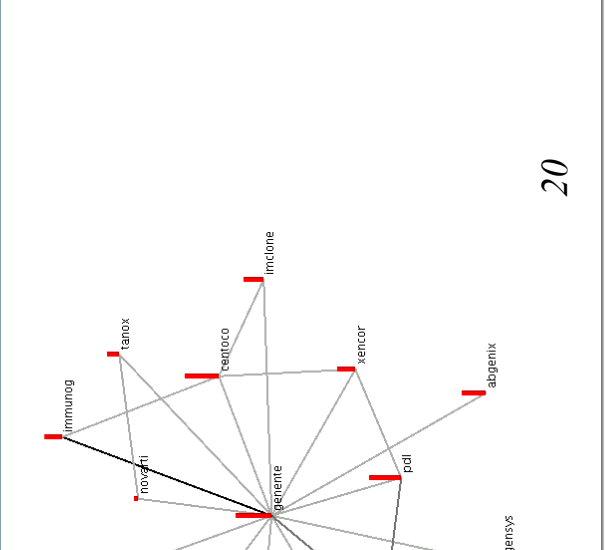


...and 51% interest in Chugai

GENENTECH SEGMENT ONE



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UNDERSTANDING THE DYNAMICS

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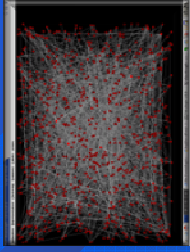
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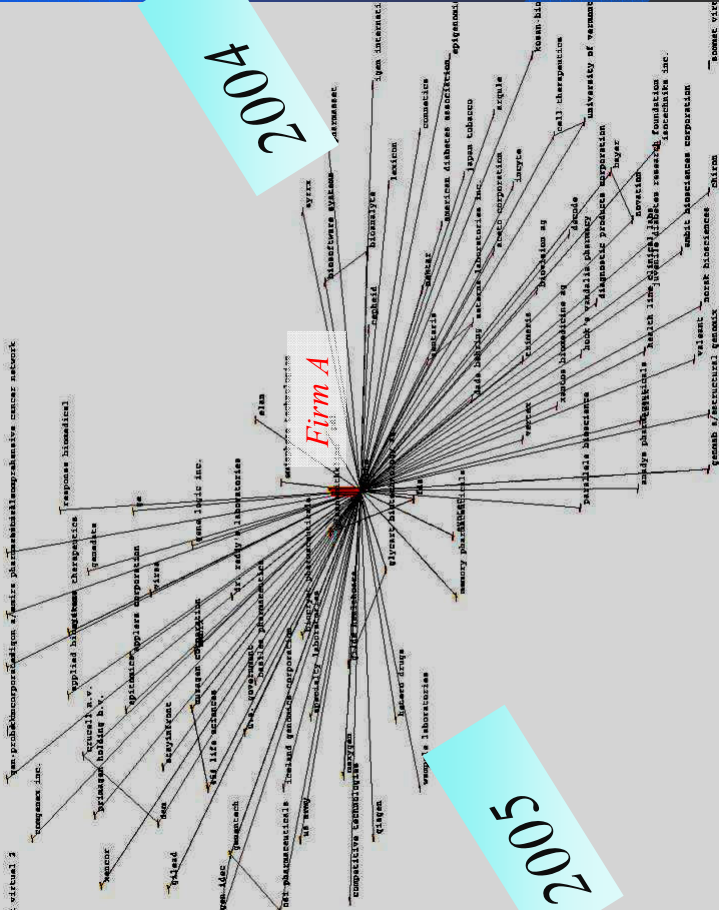
BIG PHARMAS:

Very Fast Turn over of links !!!

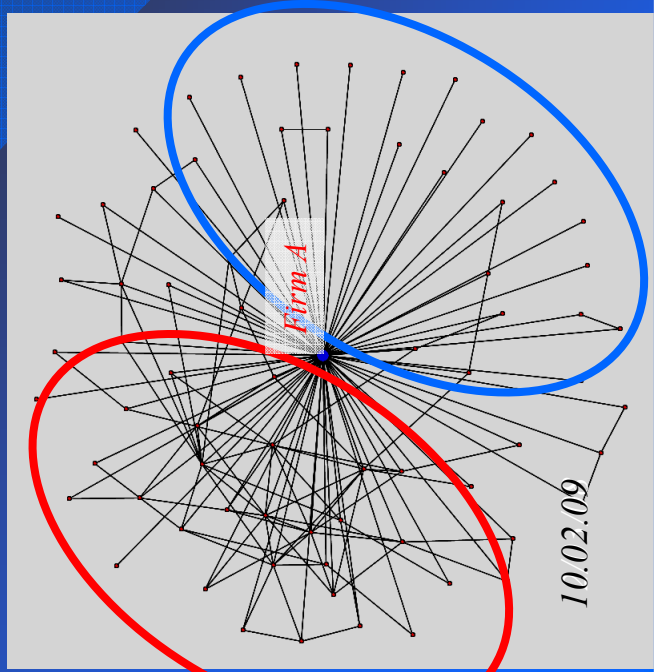
Obligatory to escape competition



2002

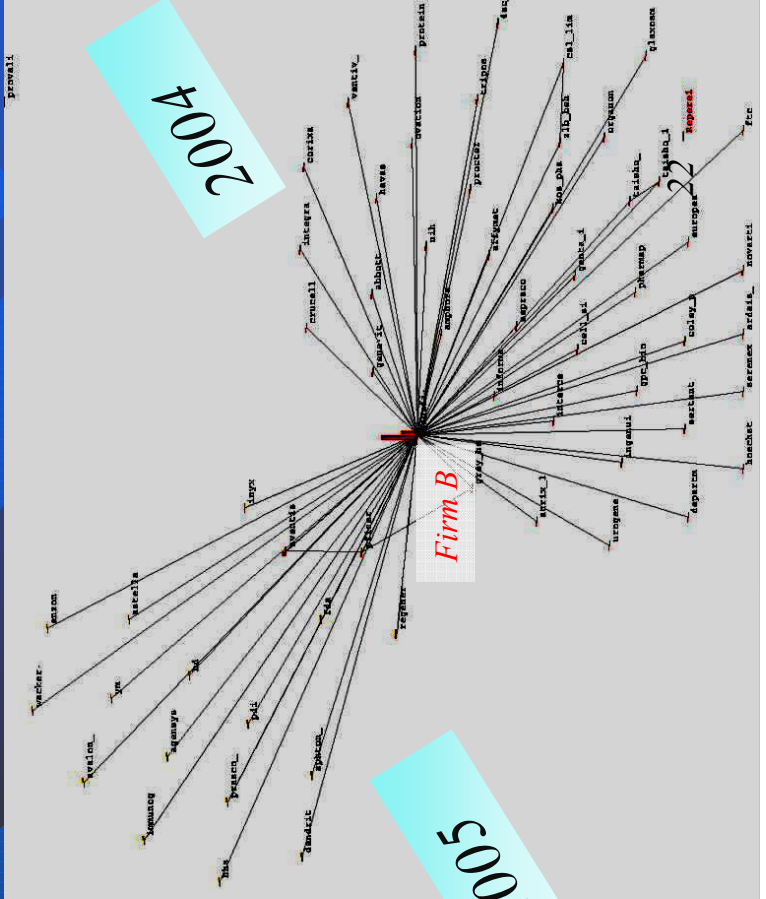


2005



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2004



2005

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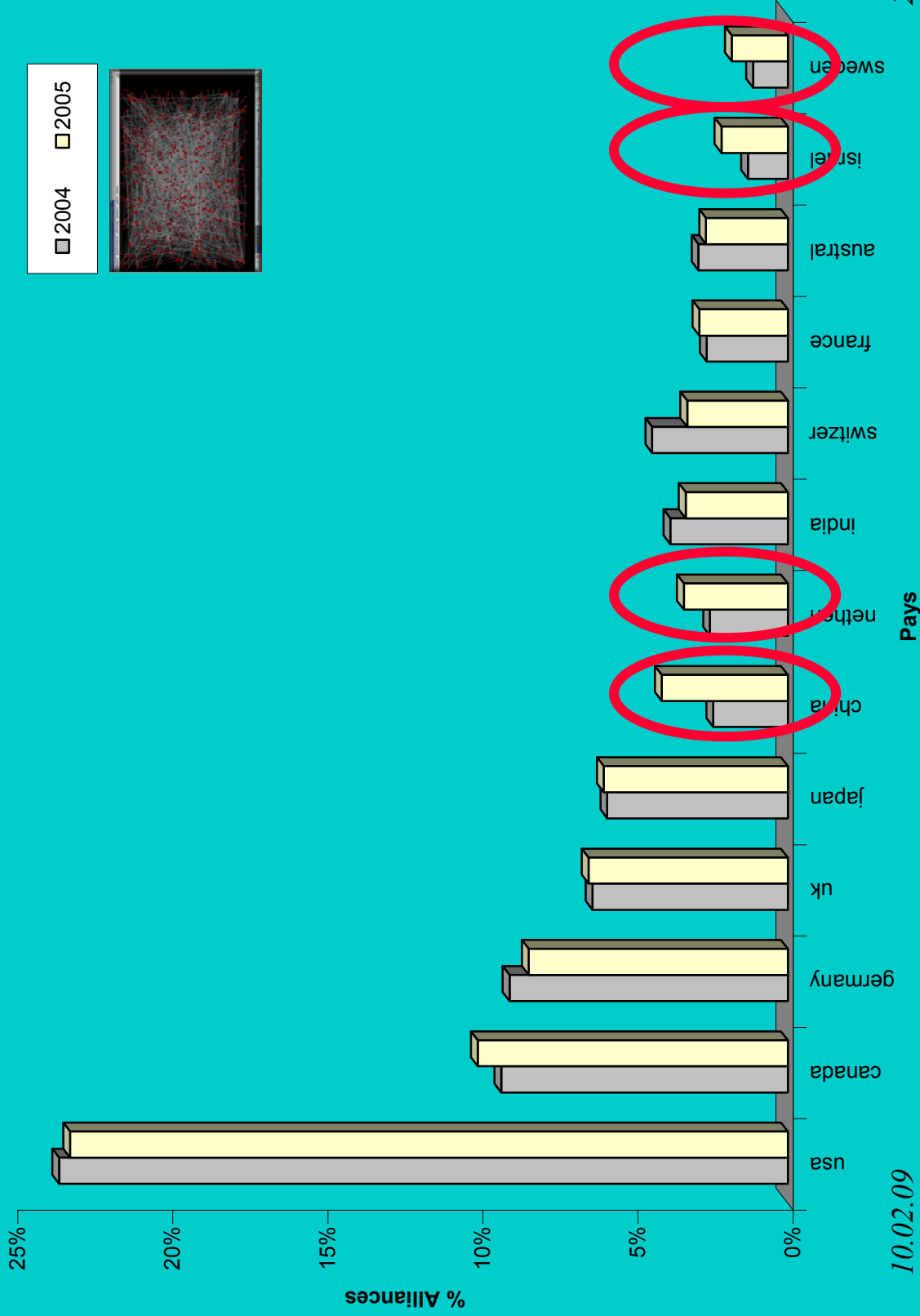
SPATIAL ANALYSIS WORLDWIDE INTERACTIONS

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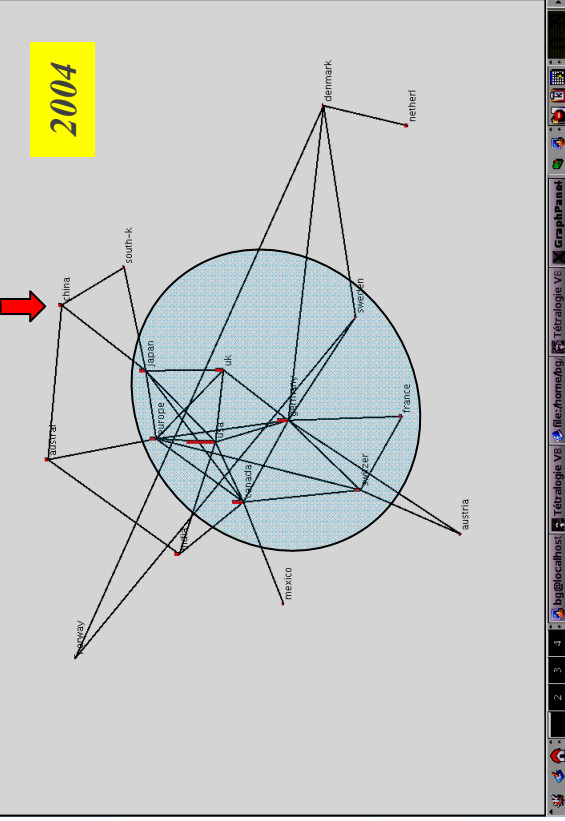
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WorldWide Situation- Histogram

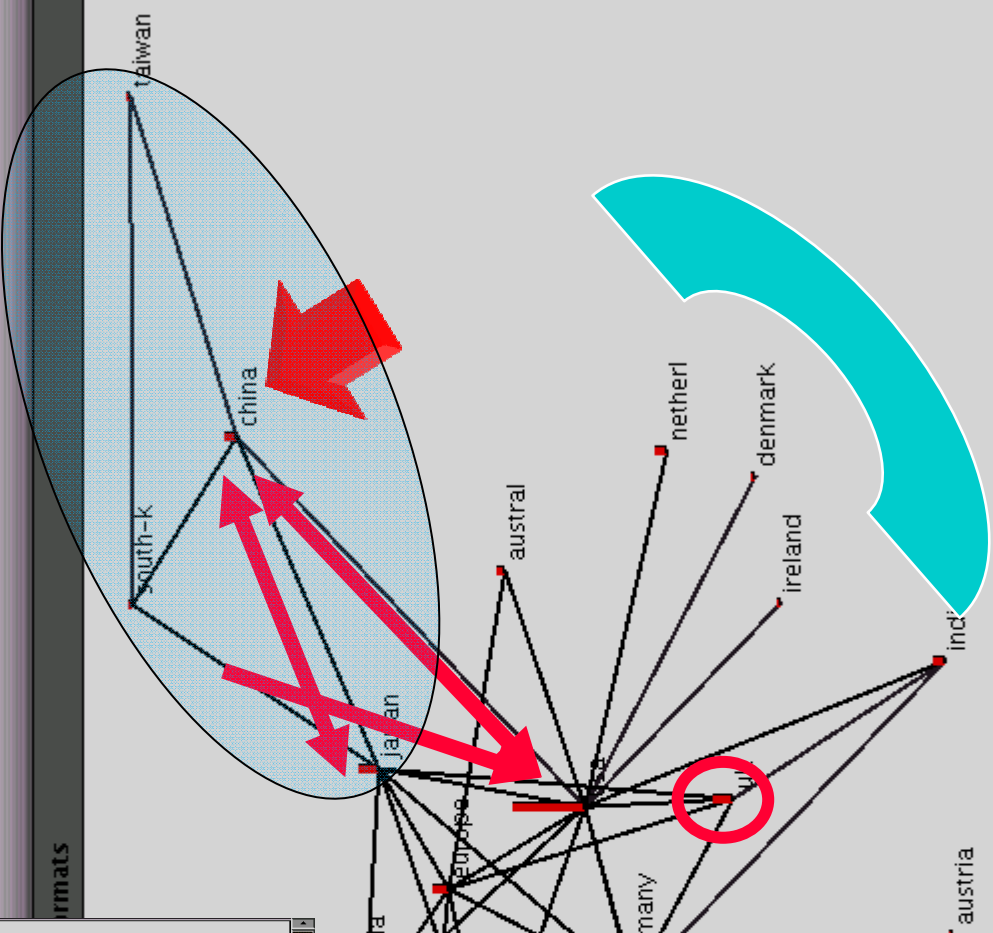


2004

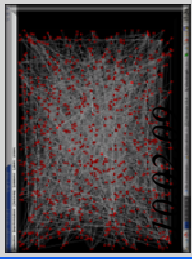


Analysis- Network Structure

formats

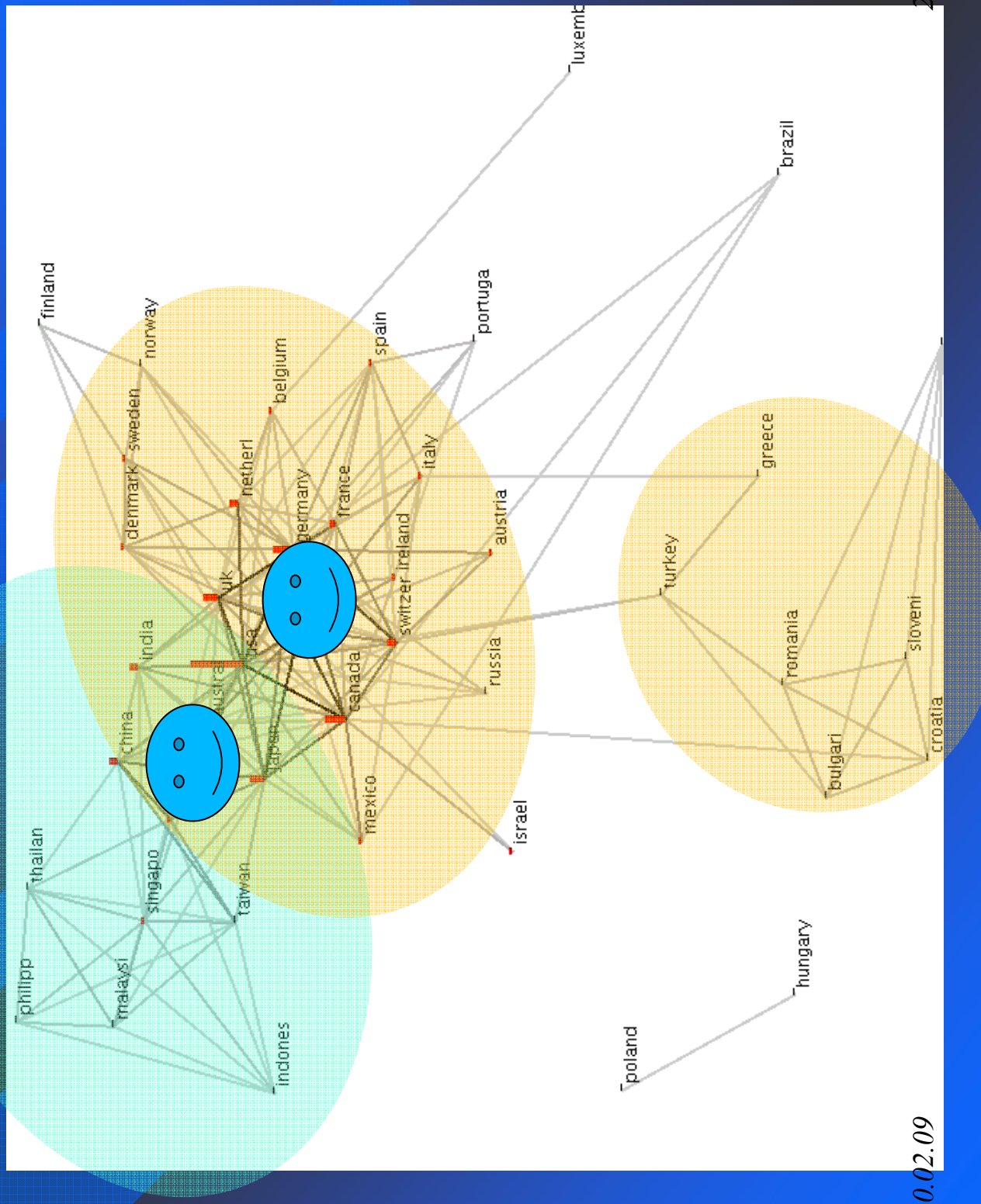


2005

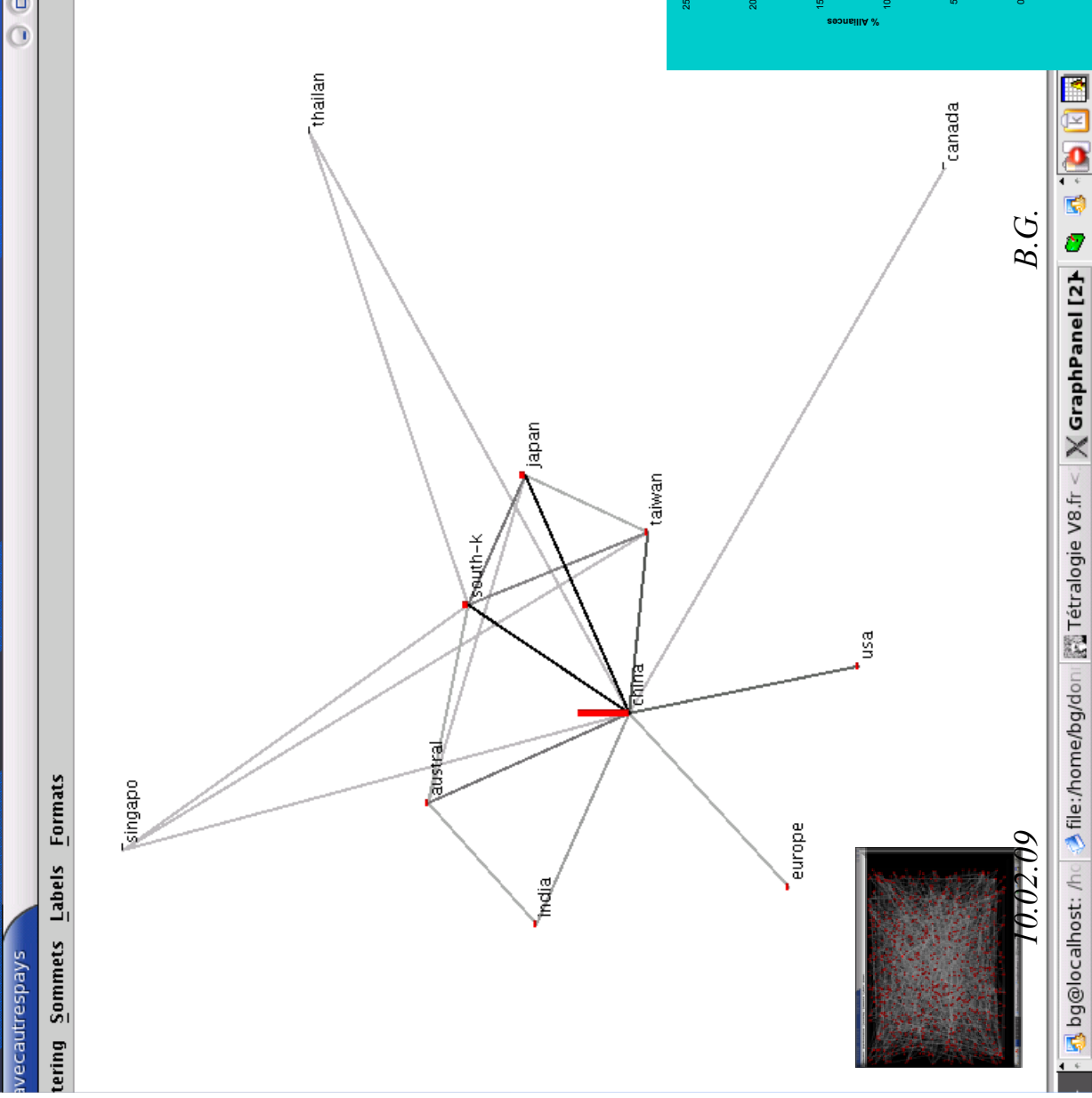


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Increasing the signal A shift in control and power



WorldWide Analysis– Network Structure: CHINA



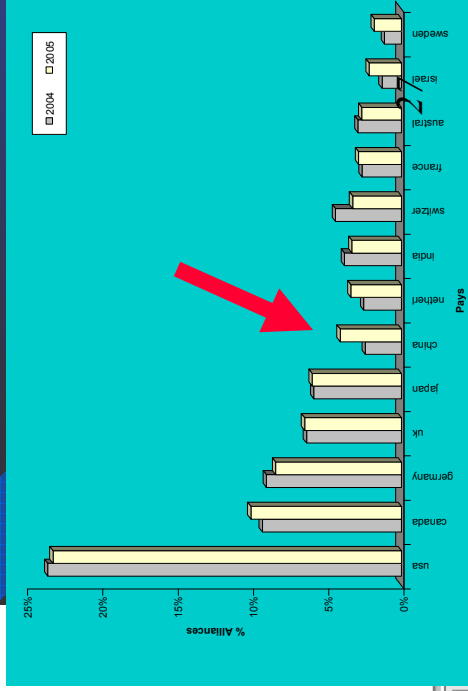
avecautrespays

tering Sommet Labels Formats

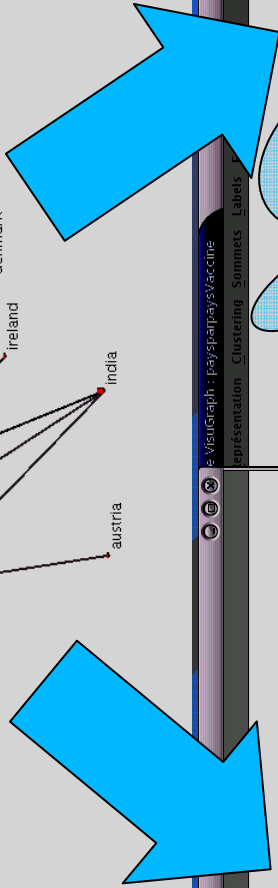
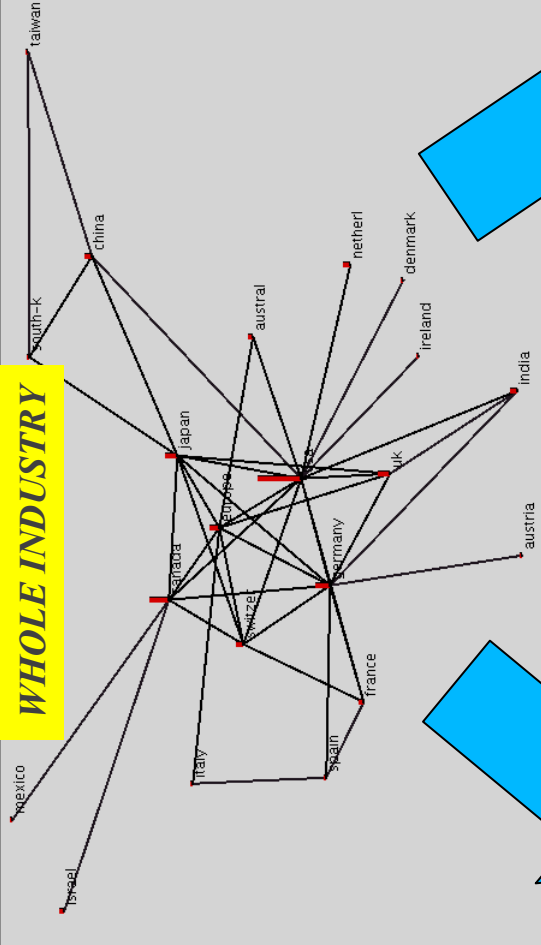
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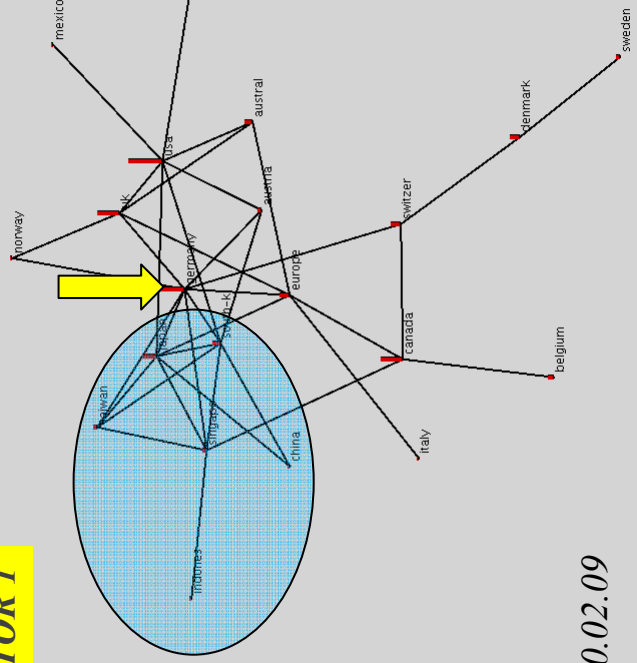
Développement fort sur l'Asie
Attention à la structuration sur cette zone = signal fort/nombre d'alliances



WHOLE INDUSTRY

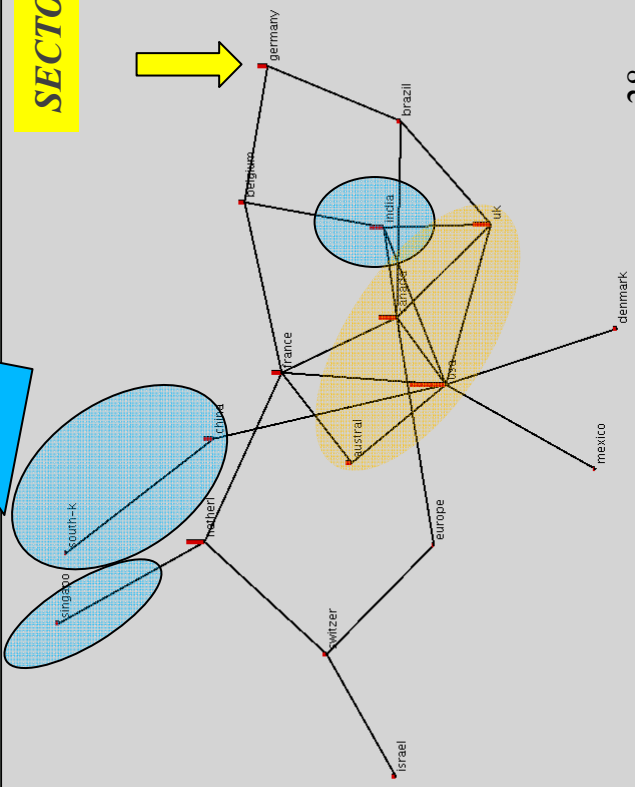


SECTOR 1

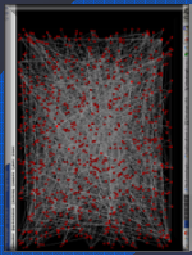


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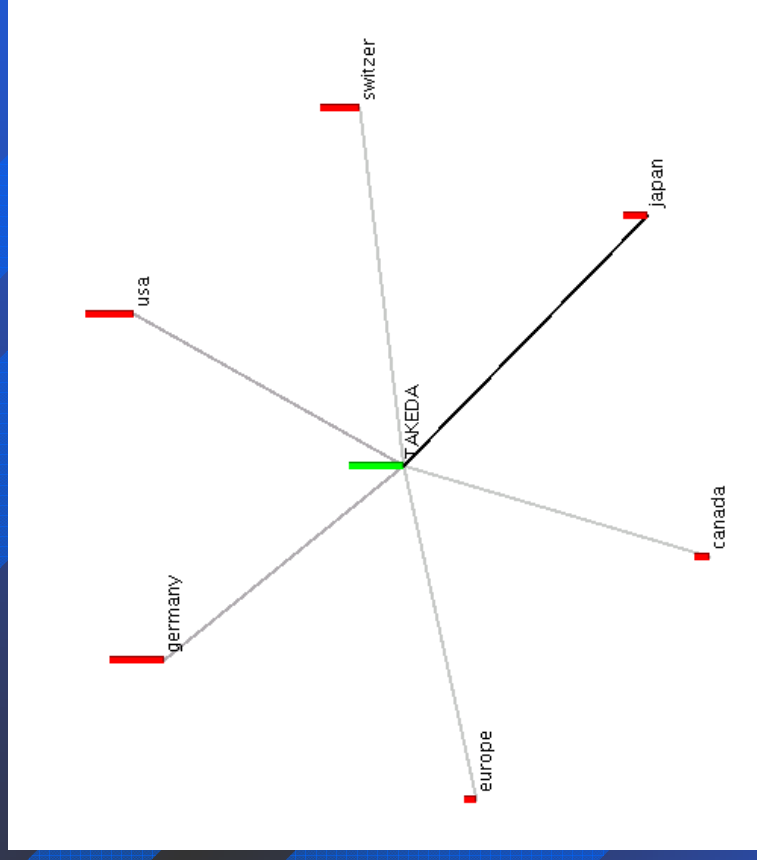
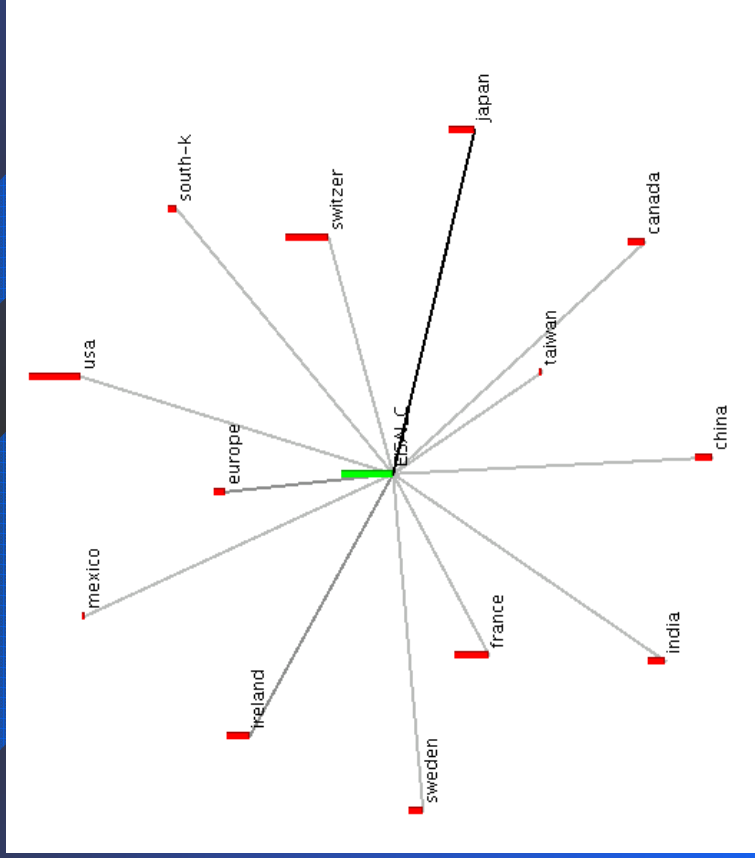
SECTOR 2



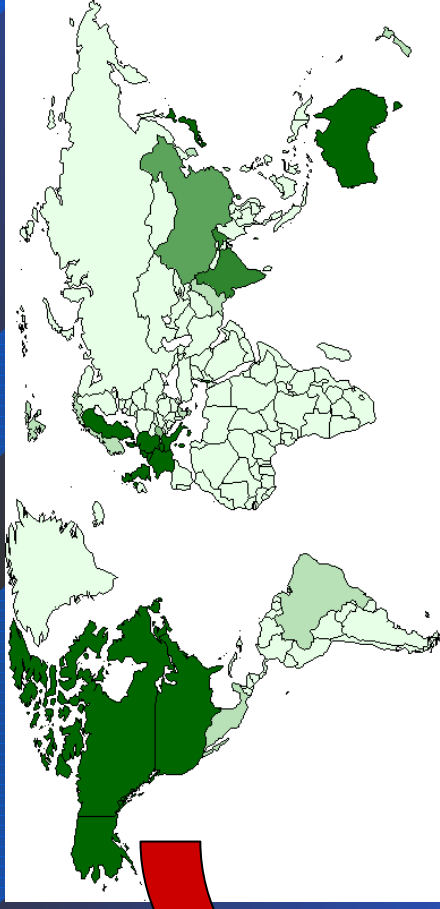
28



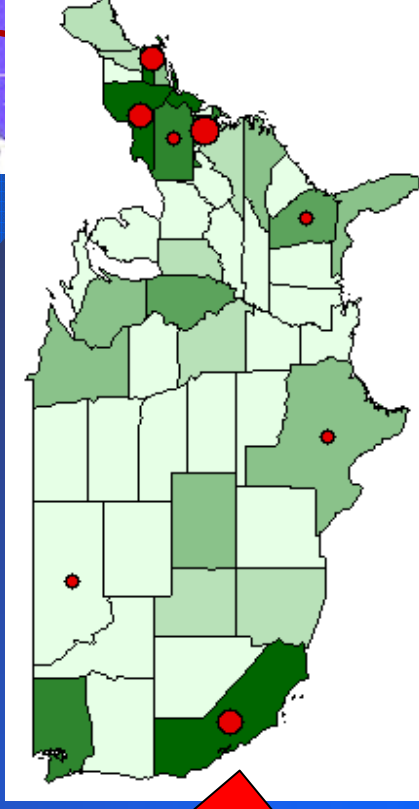
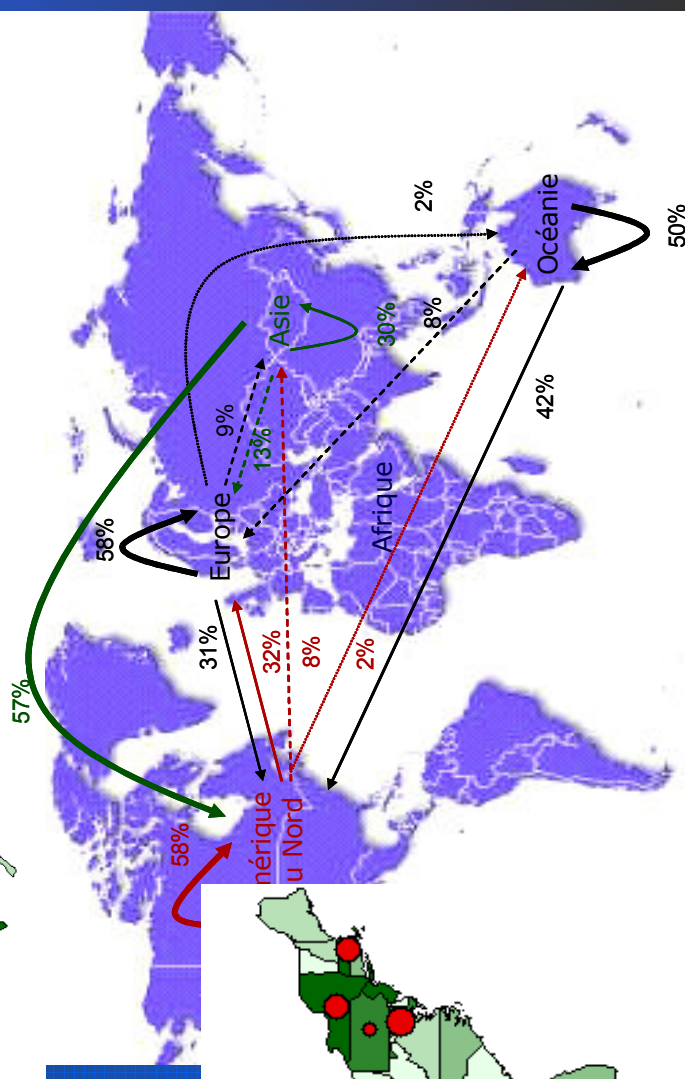
WorldWide Analysis– Network Structure: has a firm a global reach ?



INNOVATION - SMALL WORLD - POWER + Dynamics !



*EXAMPLE:
MAJOR SECTOR OF THE
PHARMA INDUSTRY 2006-
2007*



Conclusion 1

**I'VE MADE IT SIMPLE TODAY
AND SHOWN BASIC THINGS**

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Mapping of evolving networks starting from open sources found on the World Wide Web can bring important information

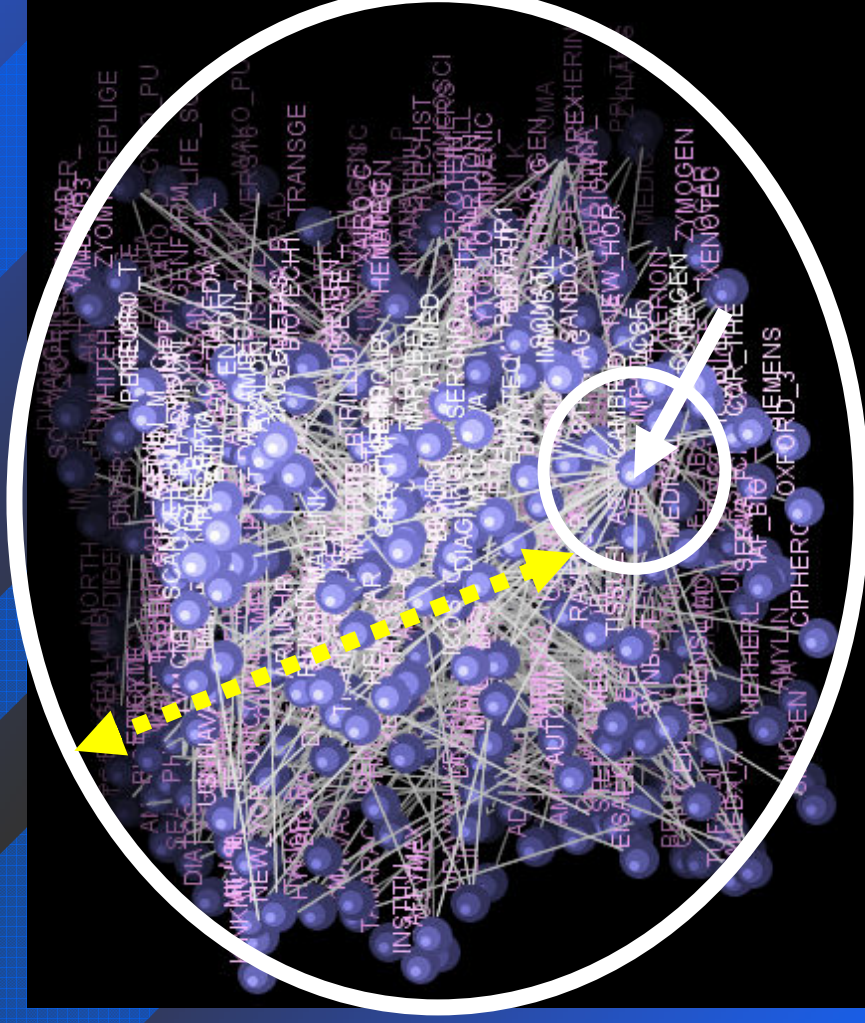
What are the different technical or product flows that occur through alliances, at which step in the value chain?

In which sector have firms invested? How does that investment compare with that of competitors?

With which countries does a firm interact? Are countries heavily involved in key sectors, how are they connected to other countries? Etc

AT STAKE IN STRATEGY:

- FIRM POSITION WITHIN UNBALANCED COMPLEX NETWORKS OF ALLIANCES
- THE CONCEPTION OF EGONET STRUCTURES WELL ADAPTED TO THE MACRO STRUCTURES INTO WHICH FIRMS ARE EMBEDDED



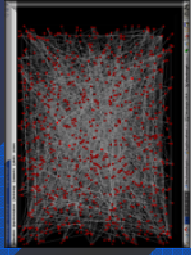
CONSTRAINT



POWER
CONTROL

■ *THANK YOU VERY MUCH FOR YOUR
ATTENTION*

■ *QUESTIONS ?*



Groupe ESC Business School

10/02/09

*A path forward from **alliance** management to **network** management.*