

Networks of scientific collaboration in competitive intelligence studies.

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Objectives

- › a) What are the patterns of collaboration of scientific community in CI field?
- › b) In which topics does scientific community work and how do they evolve?
- › c) What instruments does scientific community use to collaborate?

Methodology

- › Social Network Analysis and Bibliometric Analysis

Data gathering

- › Papers from *ISI Knowledge Web of Science* (1995 to 2012)
- › Keywords: “Competitive intelligence”, “Marketing intelligence”, “Economic Intelligence”, “Intelligence analysis”, “Territorial intelligence”, and “Environmental scanning”.
- › 679 papers were gathered.

Data analysis

- › Periods: 1995-2000; 2001-2006 and 2007-2012
- › Groups of data: a) Co-authorship networks, b) Co-words networks and c) Journals statistics

Processes for research method are

- › literature retrieval and filtering
- › keyword revision and statistical analysis
- › author revision and statistical analysis
- › journal revision and statistical analysis
- › visualization of keyword network
- › visualization of co-authorship network

Collaboration networks

Micro-level analysis: coauthorship

	1995-2000	2001-2006	2007-2012
Number of authors	175	398	675
% of authors with jointly papers	73,71%	75,62%	73,48%
% redundant collaboration	0,35%	2,85%	6,95%
Average degree of collaboration	3,17	2,81	2,77

Collaboration networks

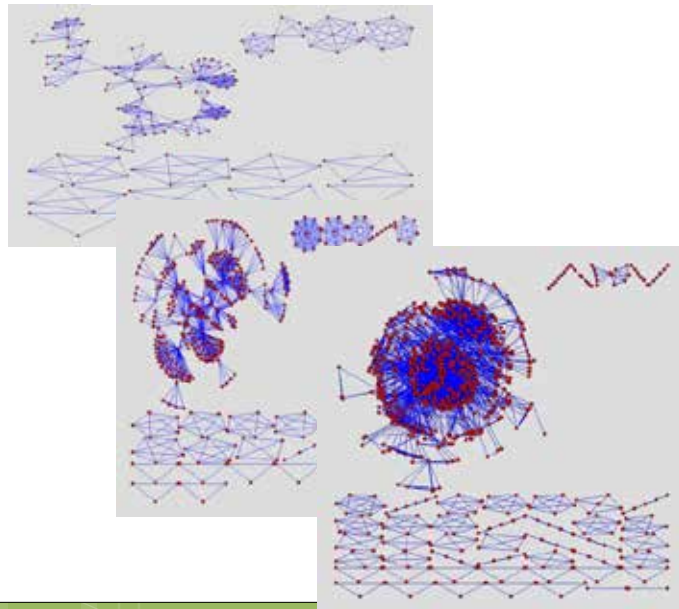
Micro-level analysis: coauthorship

	1995-200	2001-2006	2007-2012
Institutions	45	81	186
% interinstitutional collaboration	51,11%	48,14%	55,78%
Institutions with redudant collaboration	1	12	2
Average degree of collaboration	1,68	1,87	1,96

Topics of research

Descriptors' evolution

YEARS	DESCRIPTORS	CLUSTERS
1995 - 2000	166	15
2001 - 2006	414	21
2006 - 2012	952	46



Difficult analyse topics

Great variety of descriptors
Increasing synonyms to identify the same area of research

Progressive connexion among clustered topics

Topics of research

Great variety of descriptors

Information / intelligence sources▶

Visualization▶

DESCRIPTORS	1995-2000	2001-2006	2007-2012
competitive intelligence	17,47	20,82	38,28
environmental scanning	7,23	13,08	9,78
information retrieval	7,23	3,63	0,74
strategic planning	7,23	0	0
intelligence analysis	6,63	18,89	16,09
terrorism	6,02	3,15	0
information systems	6,02	1,69	0,74
evaluation criteria	5,42	0	0
strategy	4,82	0	2,21
Knowledge management	4,22	8,23	5,36
marketing intelligence	3,61	5,57	7,89
security	3,61	0,73	0
criminal behavior	3,61	0	0
security incidents	3,61	0	0
security vulnerability	3,61	0	0
scanning	1,81	2,91	0
intelligence agents	1,81	1,94	0,00
strategic management	1,81	0	3,05
.....▶ information sources	1,81	0	2,1
monitoring	1,2	0	0
criminal intelligence analysis	1,2	0	0
evaluation	0	6,05	1,16
economic intelligence	0	4,84	1,68
data mining	0	4,36	3,89
.....▶ visual analytics	0	3,39	4,31
business intelligence	0	3,15	6,1
.....▶ information visualization	0	3,15	4
crime	0	3,15	0
scenarios	0	2,91	0,42
data analysis	0	2,66	1,05
national security	0	2,42	0,84
text mining	0	2,42	0
strategy formulation	0	1,45	0
strategy implementation	0	1,45	0
.....▶ visual knowledge discovery	0	1,45	0
.....▶ data visualization	0	0,97	0
regional development	0	0,97	0
visualization	0	0,73	2,1
.....▶ open sources	0	0,48	0,42
social networks analysis	0	0	2,42
counterterrorism	0	0	1,16
.....▶ knowledge visualization	0	0	1,05
.....▶ information sourcing	0	0	1,05
Information search and retrieval	0	0	0,95
.....▶ HUMINT	0	0	0,74
.....▶ OSINT	0	0	0,74
.....▶ human information sources	0	0	0,63
Criminal network analysis	0	0	0,53
intelligence sources	0	0	0,53
information retrieval effectiveness	0	0	0,42
information retrieval models	0	0	0,42
.....▶ human competitive intelligence	0	0	0,32
.....▶ human intelligence network	0	0	0,32
.....▶ open information source	0	0	0,32

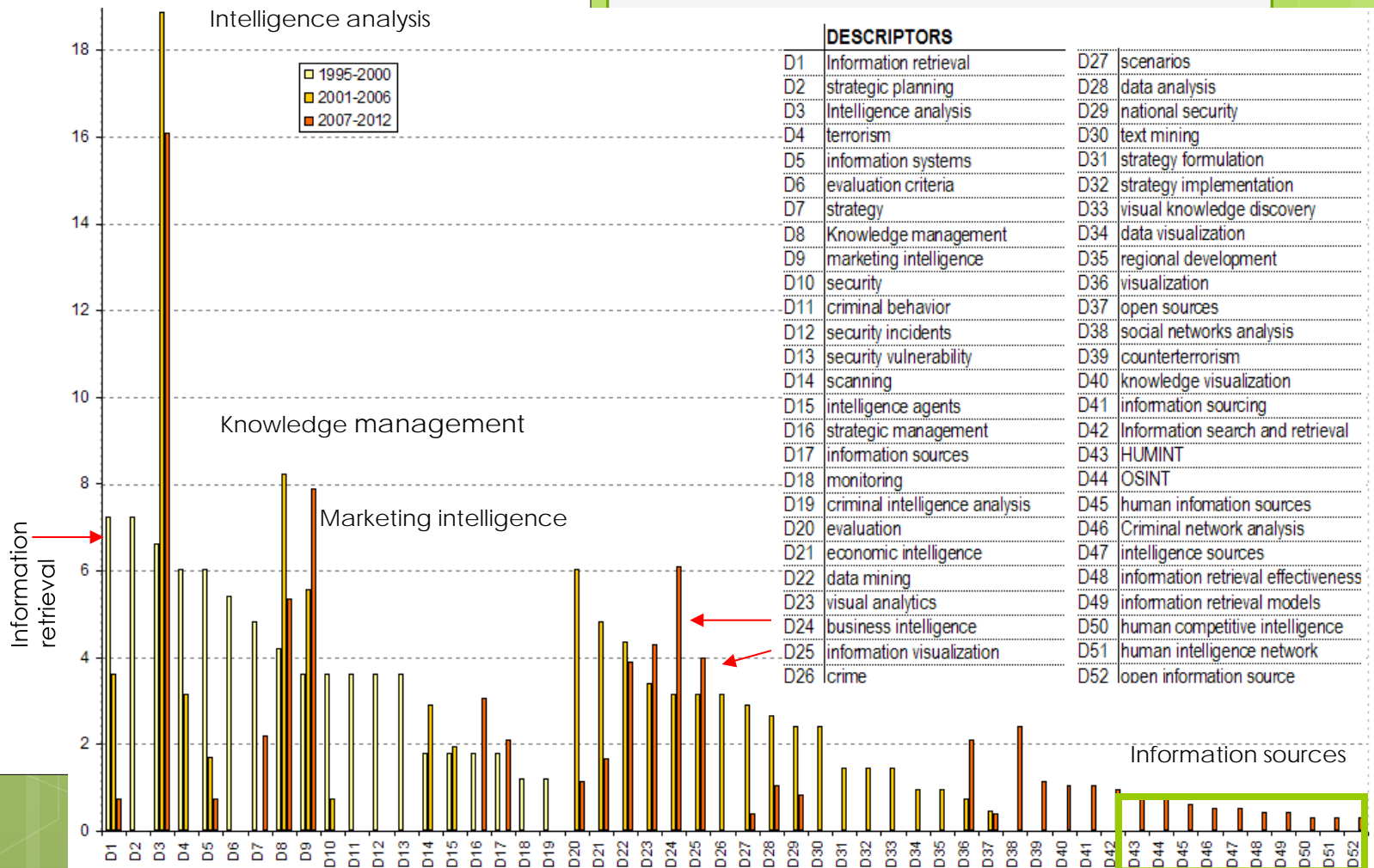
Topics of research

Intelligence analysis on the top but decreasing

Information retrieval high decrease

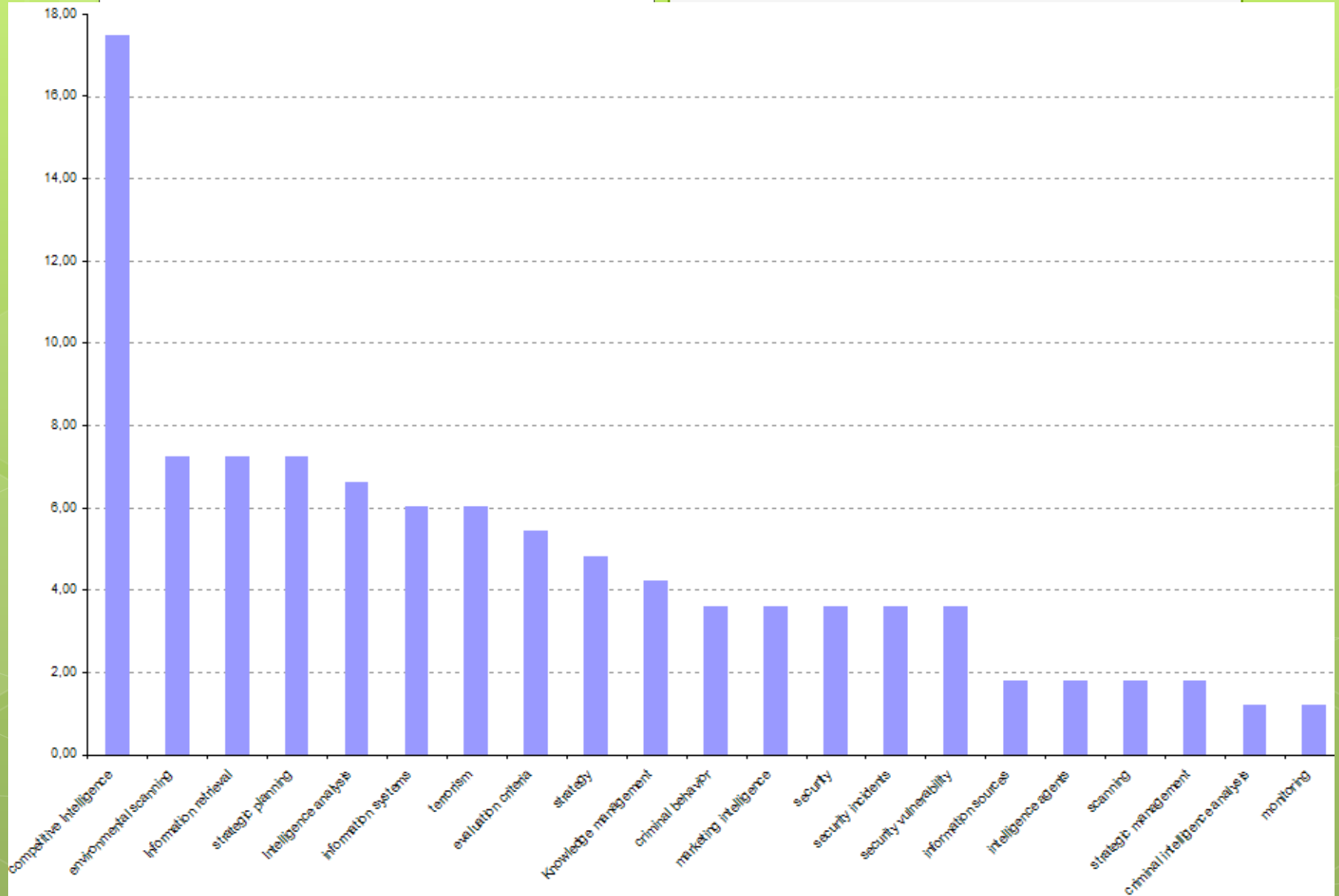
Now, marketing on the top

Data visualization is increasing



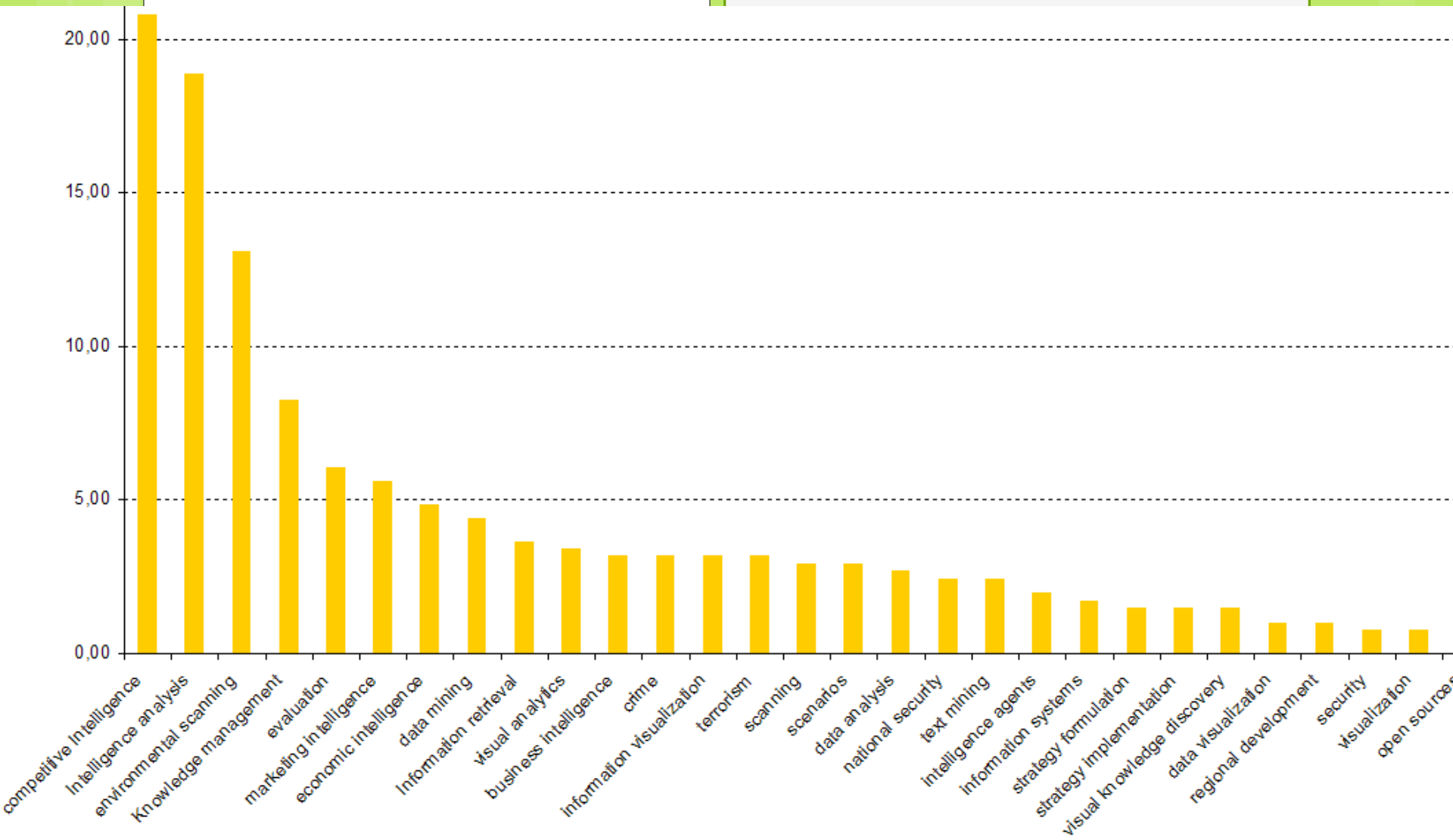
Topics of research

1995-2000



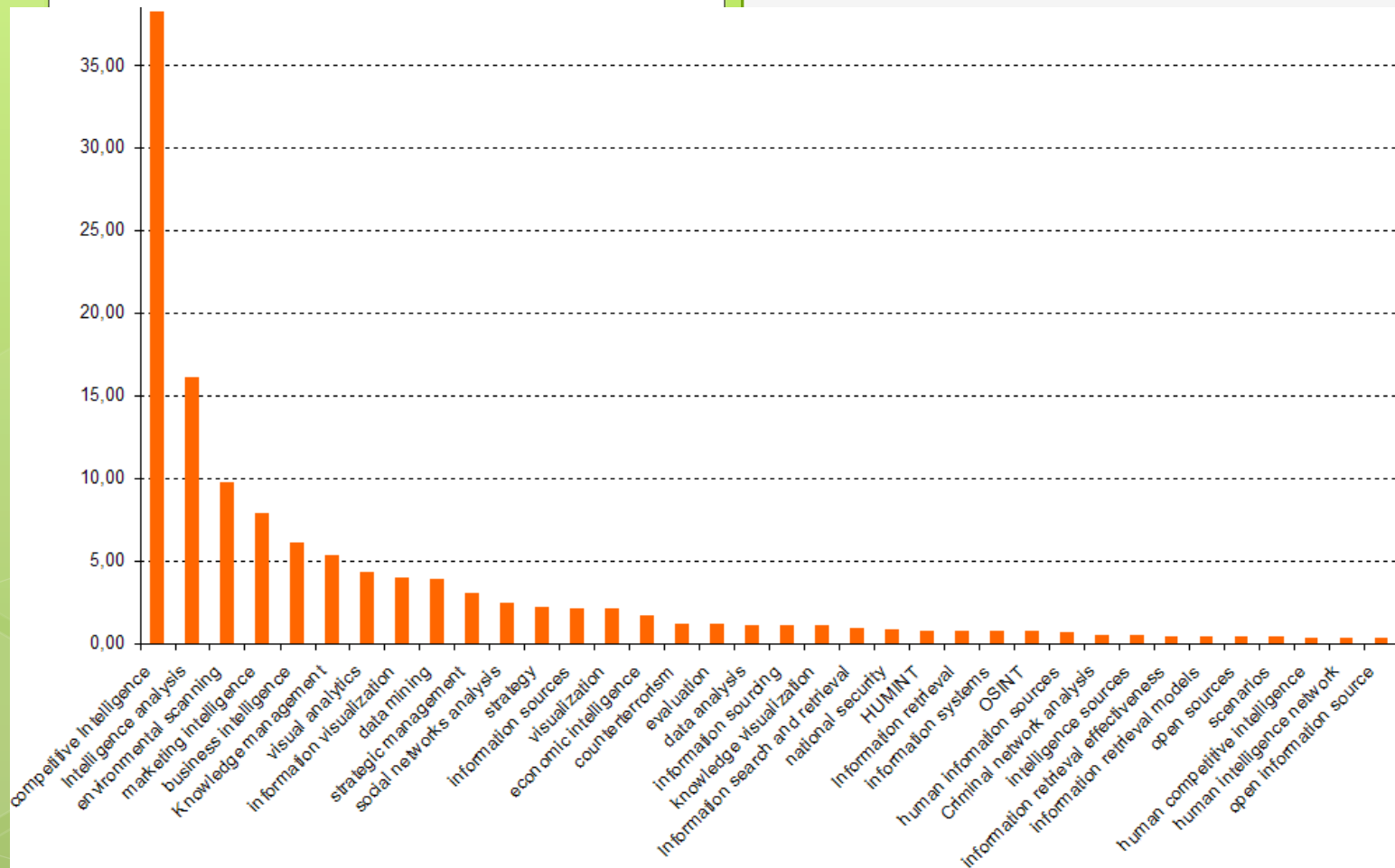
Topics of research

2001-2006



Topics of research

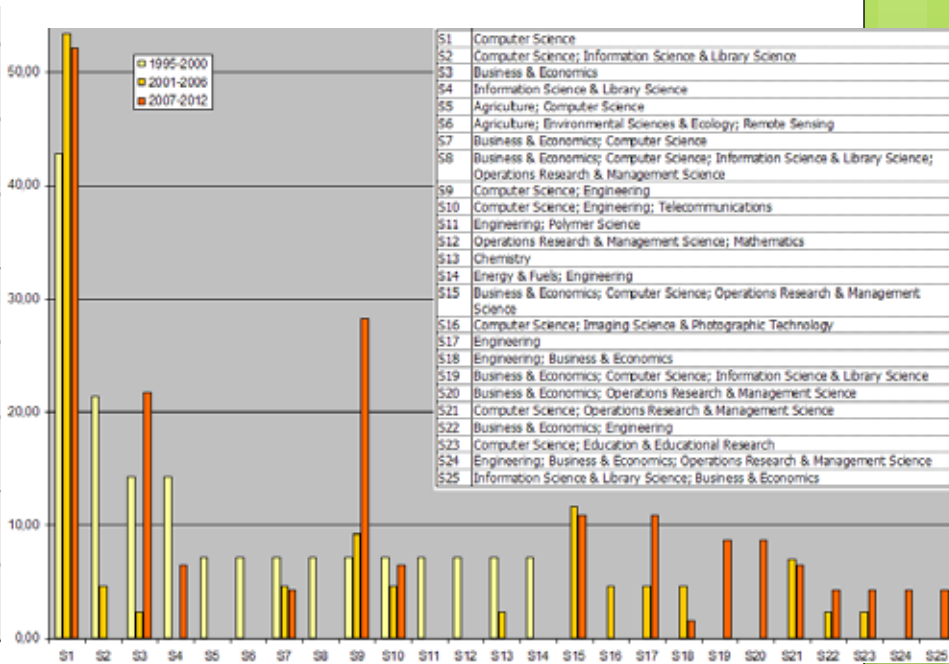
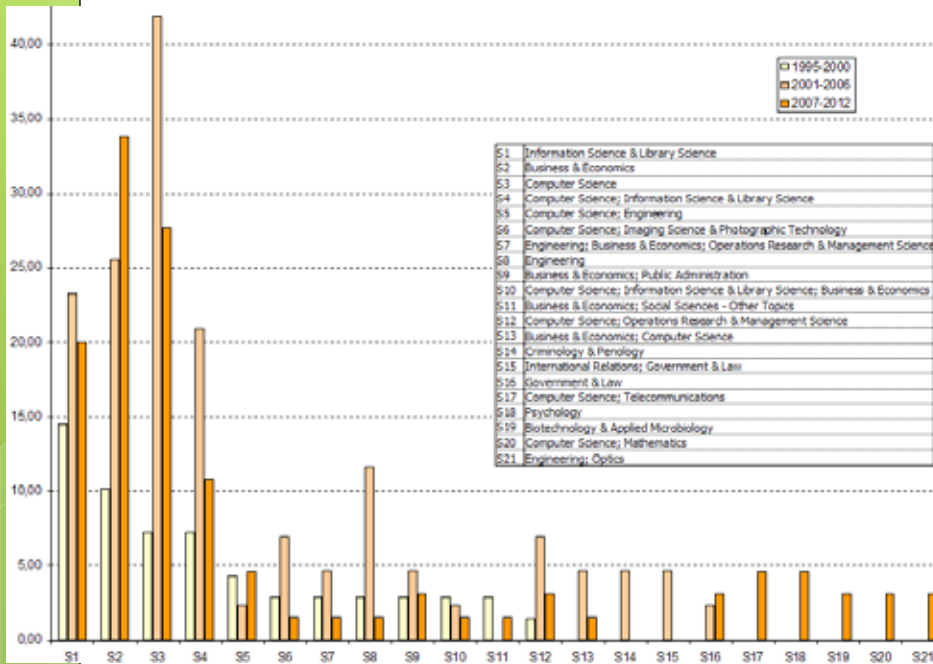
2007-2012



Publications

Journals

Congress



Increasing predominance of:
 Computer science,
 Business & Economics
 Information % library science (except in congress)

Discussion and conclusions

Patterns of collaboration

- › Authors and groups with low productivity and weak links among them
- › Authors with very few relations among them
- › Isolated teams with low interaction among them
- › Slight interdisciplinary collaboration
- › Weak bridges among institutions
- › Slight increase of interinstitutional collaboration

Discussion and Conclusions

Knowledge topics and evolution

- › First period: technological issues and management
- › Second period: technological issues maintain their presence, and there is an increase in subtopics about Open Sources, Economic Intelligence, visualization, data and text mining
- › Third period: Open Sources and Visualization issues continue, Information Analysis is increasing

Discussion and Conclusions

Channels to communicate

- › Few academic journals
- › Few congresses specific to CI (only 2)
- › Lack of descriptors homogenization
- › The interdisciplinary nature of the field makes the consolidation of channels for knowledge interaction difficult

Conclusions

- › Weak interconnected scientific community
- › Dispersion of topics
- › Lack of common language
- › Weak channels of communication

Limitations and future research

- › *ISI Web of Knowledge data base*
- › Hub and authorities will be part of our future approach
- › Shared methodological approaches will be part of our future analysis