

SDI and coordination

*Glenn Vancauwenberghe
K.U.Leuven – Instituut voor de Overheid*

*Seminar “SDI, latest trends and research”
Leuven, 11 November 2011*

Introduction



- “SDI is about facilitation and coordination of the exchange and sharing of spatial data between stakeholders in the spatial data community”
- “Coordination is the most important SDI-component, because without it all the other ones would either not happen or do so in a very fragmented and inconsistent way”
- “SDI as a tool to help coordinate access to spatial data”
- “Coordination among multiple GIS users within one organisation”
- “(Poor) coordination as an important organisational factor in determining the diffusion of GIS”
- “GIS are considered crucial for the coordination of information flows”

Coordination



- Intuitively: simple concept, used daily

- Complexity:
 - used in different contexts
 - used in many different ways
 - no clear definition

- Coordination implies the bringing into relationship of disparate activities or events (Thompson et al., 1991)
 - Motive: fragmentation and (inter)dependence
 - Coordination can occur in diverse kinds of systems
 - Coordination can be achieved in different ways
 - Collaboration, cooperation, coordination bodies = subparts of coordination

Coordination



- Dimensions of coordination
 - Process – result
 - Passive – active
 - Informal – formal
 - Intra-organisational - inter-organisational
 - Horizontal - vertical
 - Voluntary - mandatory

Coordination levels



- Issue of coordination addressed by researchers from different backgrounds:
 - Economics: formation of organizations
 - Organizational studies: forms of organizations
 - Public administration: interorganizational relationships
- Different forms or levels of coordination are addressed using distinct analytical frameworks
- Coordination as an organizational phenomenon cannot fruitfully be analysed without crossing different levels of analysis

Coordination mechanisms

- Three main perspectives on how coordination can be achieved

	HIERARCHY	MARKET	NETWORK
<i>Base of interaction</i>	Authority and dominance	Exchange and competition	Cooperation and solidarity
<i>Focus</i>	Consciously designed and controlled goals	Spontaneously created results	Consciously designed purposes or spontaneously created results
<i>Guidance, control and evaluation</i>	Top down norms and standards, routines, supervision, inspection, intervention	Offer and demand, price mechanism, self-interest, profit and losses as evaluation, courts; invisible hand	Shared values, common problem analyses, consensus, loyalty, reciprocity, trust, informal evaluation - reputation
<i>Role of government</i>	Top-down rule-maker and steering, dependent actors are controlled by rules	Creator and guardian of markets; purchaser of goods; actors are independent	Network enabler, network manager and network participant
<i>Theoretical framework</i>	Weberian bureaucracy	Neo-institutional economics	Network theory

Coordination mechanisms

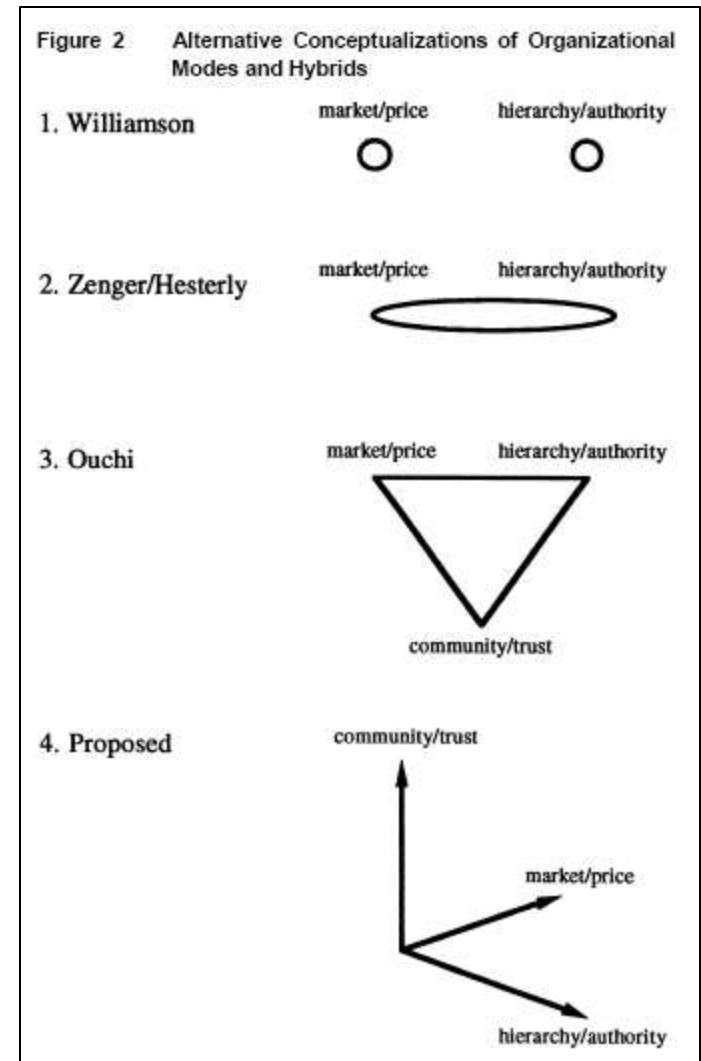
Hybrid forms of coordination

= mixtures of hierarchical, market and network coordination

Three-dimensional representation of coordination

Need for meta-coordination

- the design and management of combinations of hierarchy, market and network
- Coordination of coordination



SDI & coordination



Research question:

What coordination mechanisms can be used to coordinate the exchange of, access to and use of spatial data in the public sector?

1. Exchange of, access to and use of spatial data can be considered as distinct coordination issues
2. Different coordination mechanisms are used to tackle each of these coordination issues
3. 'Network coordination' will become more important (but in combination with hierarchical and market coordination)
4. Coordination efforts at one level (partly) determined by coordination efforts at other levels

1. Coordination levels

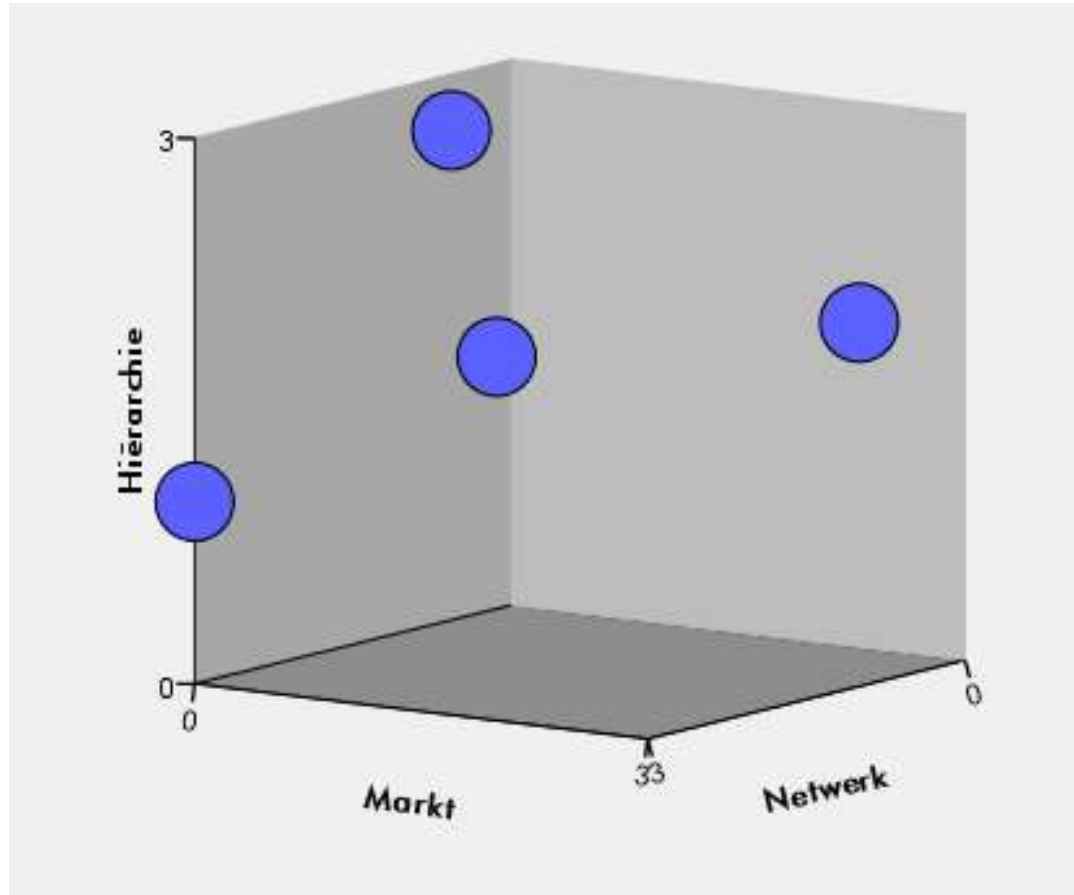
Macro	Exchange	Inter-organisational	
Meso	Access	Organisational	
Micro	Use	Intra-organisational	

2. Coordination mechanisms

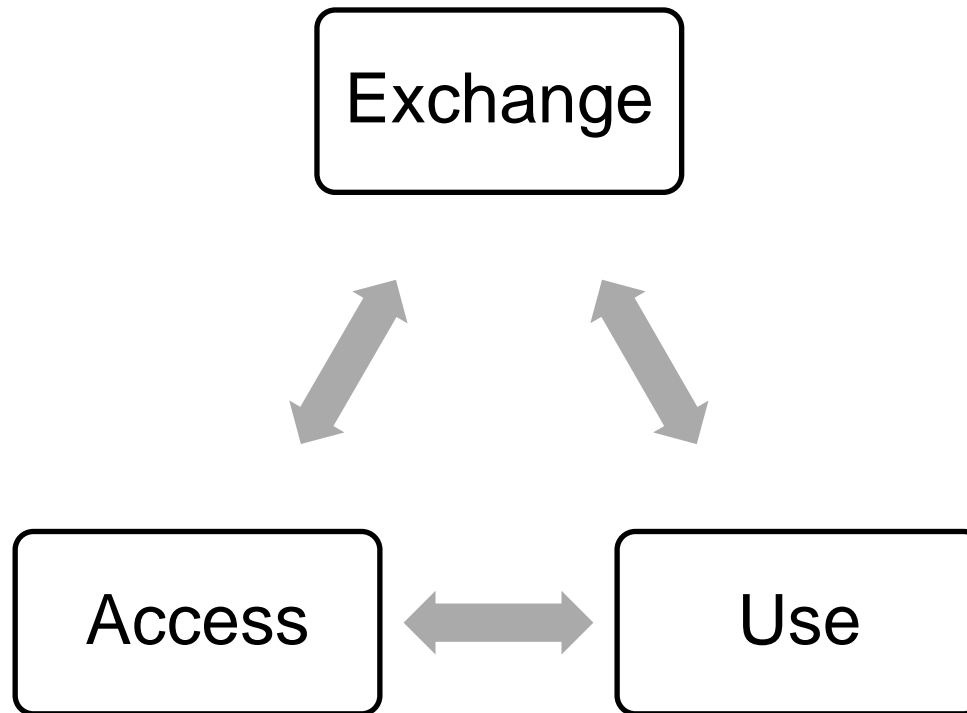


	Hierarchy	Market	Network
Exchange	<i>Centralisation</i> <i>Top-down</i> <i>Rules & regulations</i> <i>Reshuffling of competences</i>	<i>Financial incentives</i> <i>Decentralisation</i> <i>Bilateral data exchange</i> <i>Deregulation</i> <i>Regulated markets</i> ...	<i>Collective decision-making</i> <i>Collaboration</i> <i>Multi-lateral data exchanges</i>
Access	<i>Inhouse production</i> ...	<i>Outsourcing</i> <i>Data purchase</i> ...	<i>Joint data production</i> <i>Data sharing</i> ...
Use	<i>Top-down management</i> <i>Reshuffling of competences</i> <i>Establishment of coordinating function</i> ...	<i>Internal markets</i> <i>Outsourcing</i> <i>Financial incentives</i> <i>Decentralisation</i> ...	<i>Bottom-up management</i> <i>Collective decision-making</i> <i>Consultation</i> <i>Intra-organizational learning</i> ...

3. Coordination mechanisms



4. Coordination levels



***Case study:
Address data in Flanders***

Case background



■ Addresses

- Addresses are simple, well known, detailed and visible
- Critical nature of address information to public sector organizations
- Two perspectives on addresses
 - As an attribute of other entities (persons, businesses, ...)
 - As an entity itself

■ Addresses and GIS

- Address data more valuable when addresses are linked to a position
- Many GIS-applications for address-matched (administrative) data
- GIS to manage, control and correct address data

Case background



■ Situation in Flanders

- Municipalities are authorized to create and assign official addresses: limited number of processes in which an official address can be created or changed
- In reality, addresses are created and changed in many other processes → use of (address) information that is provided by citizens/organizations
- Collection and management of address information often related to other administrative databases
- Address information in national authentic databases: National Registry, Cadastre and National Companies Database → address information as an attribute of other entities

1. Exchange (macro)



■ Coordination need

- Fragmentation: large number of address databases, in different styles and formats
- Duplication: same data collected and managed more than once
- Contradictions: different formats – unofficial addresses
- Gaps: database of all official addresses in Flanders – address coordinates
- Missed opportunities

Exchange (macro)



■ Coordination efforts

- CRAB: Central Reference Address Database (started in 2003)
 - Development of address standard
 - Construction of address database (with address positions)

- 1st phase (started in 2003)
 - other address datasets used as sources
 - AGIV processes these data and builds address database
 - update by loading new version of source data

- Limitations
 - CRAB not actual
 - CRAB not complete

Exchange (macro)



■ Coordination efforts (2)

- 2nd phase
 - Municipalities as ‘initiators’ of address components involved in construction of address database: determine address components (+ location)
 - AGIV as ‘administrator’ of CRAB

- CRAB decree (2009)
 - Distribution of competences between AGIV and municipalities
 - CRAB as authentic registration

- Instruments to coordinate municipalities
 - Pilot projects to involve municipalities (and software providers!)
 - Information and consultation with municipalities
 - Different tools developed for CRAB address management

Exchange (macro)



■ Coordination mechanisms

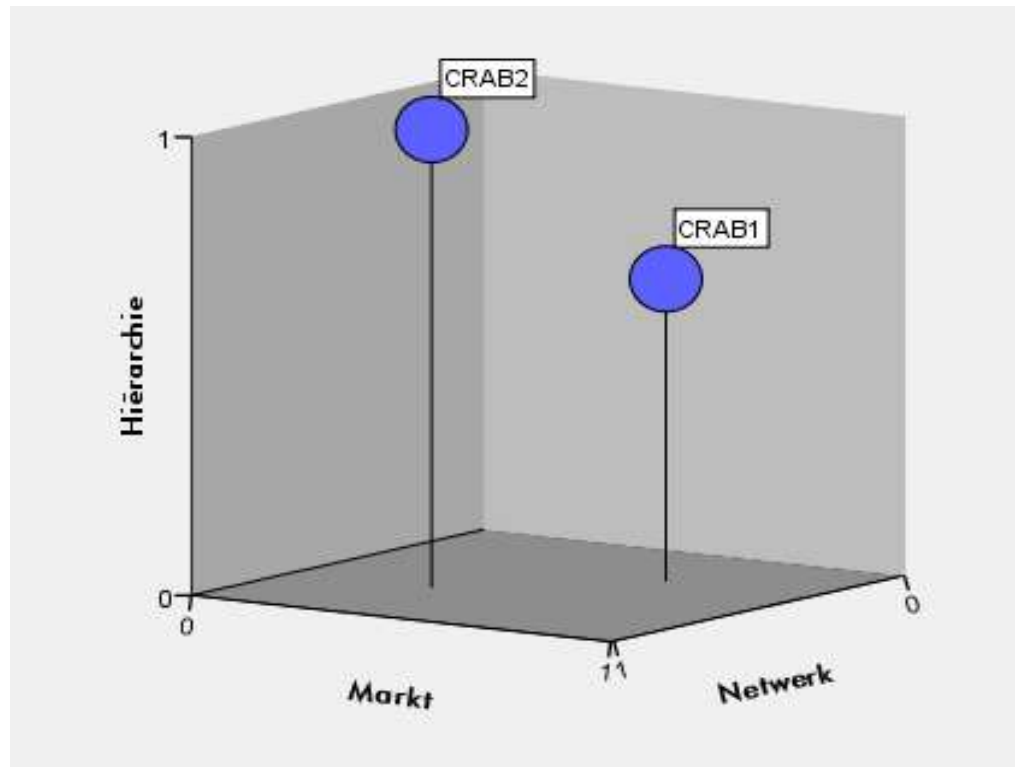
- Hierarchy (high)
 - AGIV as central administrator
 - Legal framework

- Market (low)
 - Control based on complaints of users
 - Flexibility in address management

- Network (medium)
 - Multilateral coordination
 - Involvement and engagement of municipalities and private actors

Exchange (macro)

- Coordination mechanisms



2. Access (meso)

■ Coordination need

- Two types of address data needed:
 - Administrative data (with address data as attribute)
 - personal addresses
 - business addresses
 - (Reference) address data
 - address as an entity on its own
 - other entities can be linked to an address
 - address can have certain characteristics

Access (meso)



■ Coordination efforts

- Some organizations have their own (reference) address database
- CRAB is used in five different ways
- Municipalities can use their own personal address data, provinces need access to National Registry
- Access to business data provided by National Companies Databases
- Municipalities and provinces not directly involved in registration of businesses
- Access to several private databases

Access (meso)



- Coordination mechanisms
 - Province of Antwerpen (Medium)
 - Hierarchy: contact addresses (low)
 - **Market: personal addresses + business addresses (medium)**
 - **Network: CRAB (medium)**
 - Province of West-Vlaanderen (High)
 - Hierarchy: business addresses + spatial addresses (medium)
 - Market: personal addresses + business addresses (medium)
 - **Network: business addresses + spatial addresses (high)**

Access (meso)



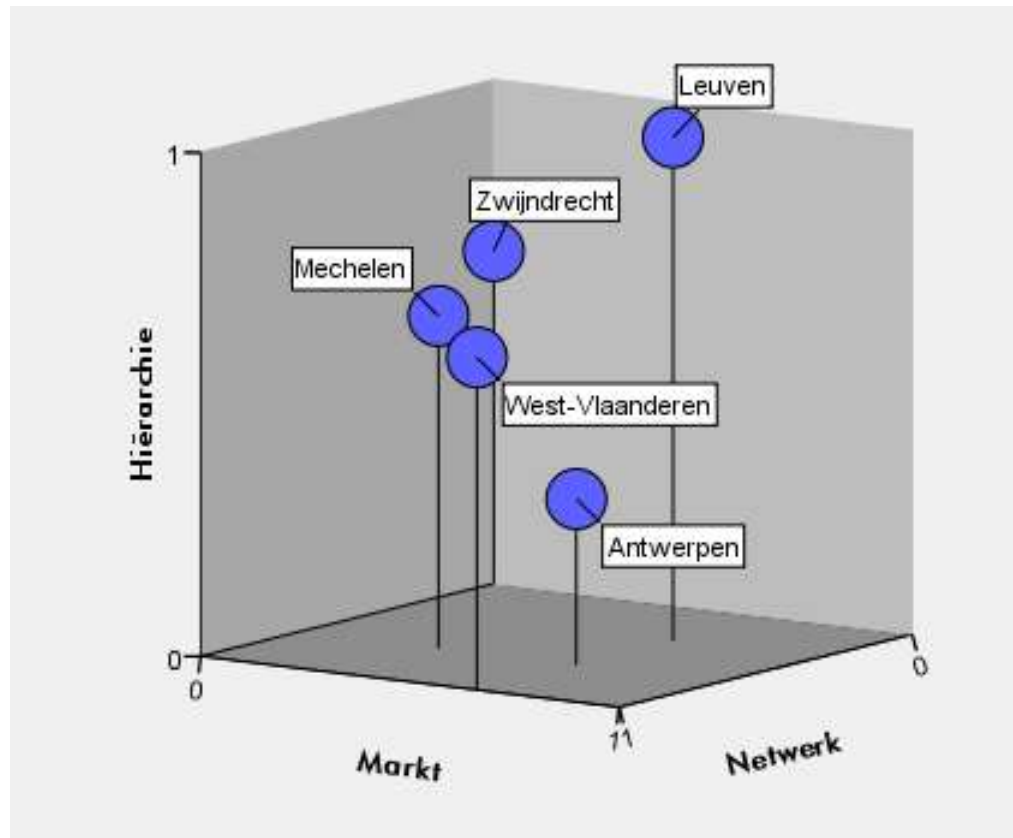
- Leuven (High)
 - **Hierarchy: personal addresses + central address database (high)**
 - Market: business addresses (medium)
 - Network: CRAB (low)

- Mechelen (Medium)
 - **Hierarchy: personal + business + spatial addresses (medium)**
 - Market: business addresses (low)
 - **Network: CRAB (medium)**

- Zwijndrecht (Low)
 - **Hierarchy: personal + business addresses (medium)**
 - Market: /
 - Network: /

Access (meso)

- Coordination mechanisms



3. Use (micro)



■ Coordination need

- Fragmented use of address data: by many departments and units within one organization (and even within one department/unit)
- Fragmented access to address data:
 - Personal addresses: population department
 - Business addresses: economy department
 - ‘Spatial’ addresses: GIS unit
- Need to exchange and integrate these data, to avoid typical coordination problems (*duplications, gaps, contradictions, missed opportunities*)

Use (micro)



■ Coordination efforts

- Degree of coordination generally low
- Exchange of personal data is regulated by privacy legislation, exchange of business data is rather limited
- GIS-unit coordinates use of georeferenced address data
 - spatial analysis applications
 - neighborhood-oriented policy
- Use of georeferenced business data coordinated by economy department
 - in collaboration with GIS-unit
 - purchase of georeferenced business database

Use (micro)

- Coordination mechanisms
 - Province of Antwerpen (Low)
 - Hierarchy: GIS-unit (low)
 - Market: external data provider (low)
 - Network: /

 - Province of West-Vlaanderen (High)
 - Hierarchy: GIS-unit (medium)
 - Market: external service provider (low)
 - Network: collaboration with departments (high)

Use (micro)

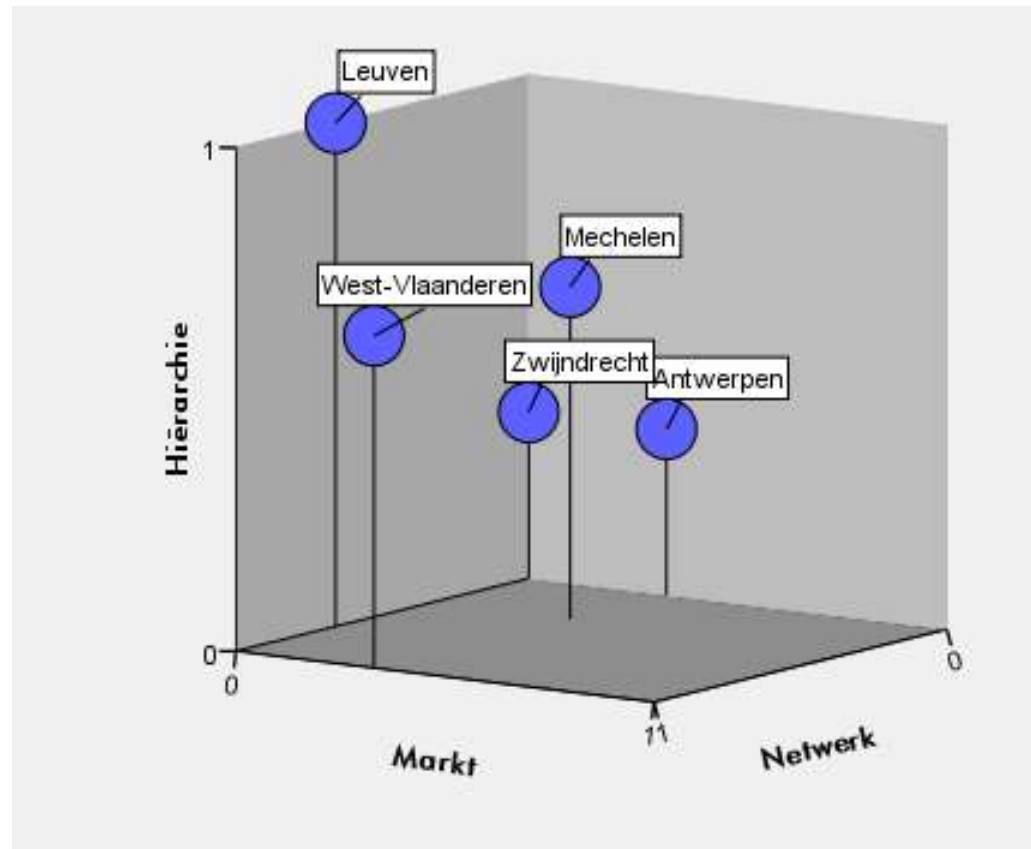
- Leuven (High)
 - Hierarchy: GIS-unit + procedures (high)
 - Market: /
 - Network: involvement of departments + consultation (medium)

- Mechelen (Medium)
 - Hierarchy: GIS-unit + procedures (medium)
 - Market: external data provider (low)
 - Network: collaboration with departments (low)

- Zwijndrecht (Low)
 - Hierarchy: procedures (low)
 - Market: /
 - Network: /

Use (micro)

- Coordination mechanisms



Multi-level analysis

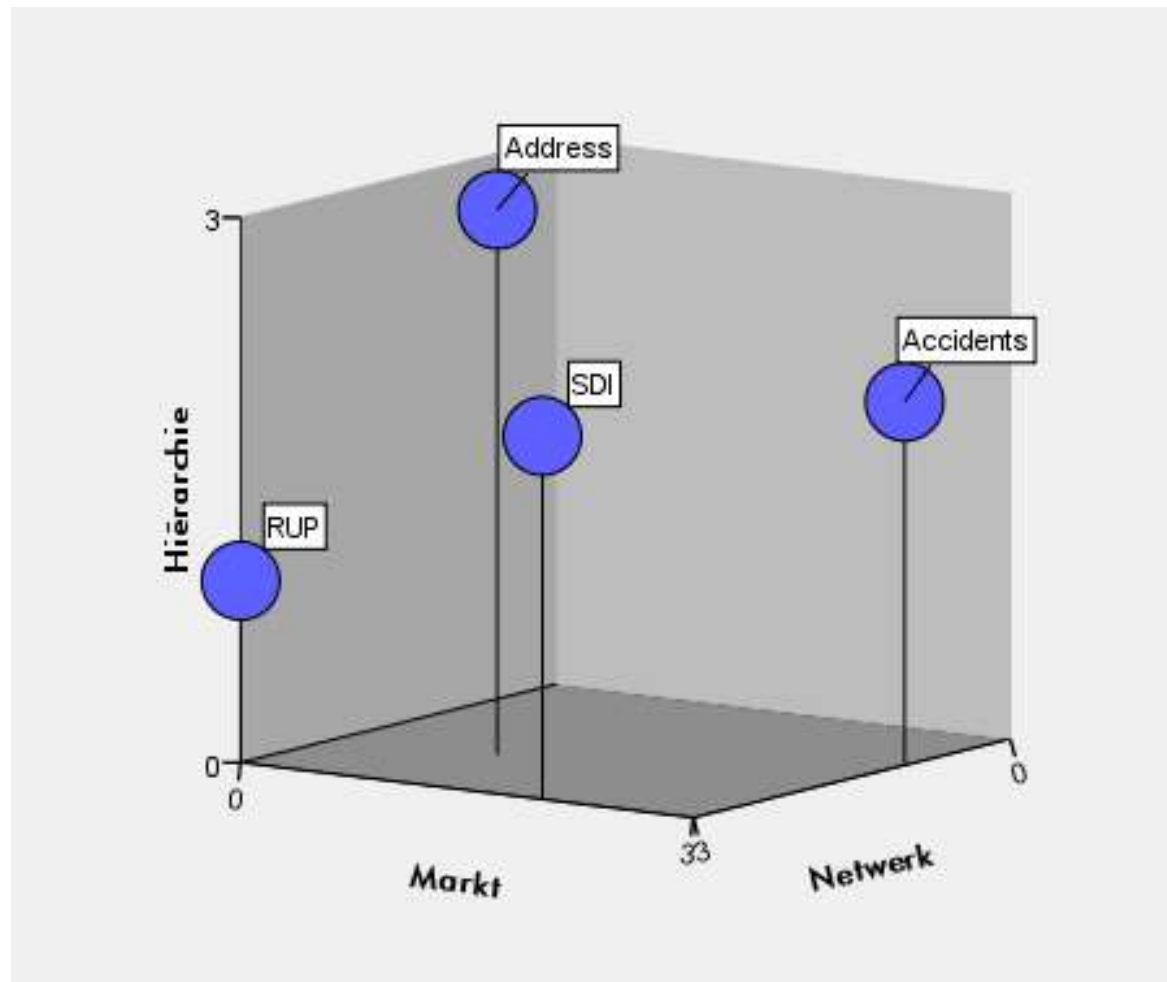


- Exchange & access
 - Access to address data provided by CRAB, but...
 - Integration of other address data in CRAB

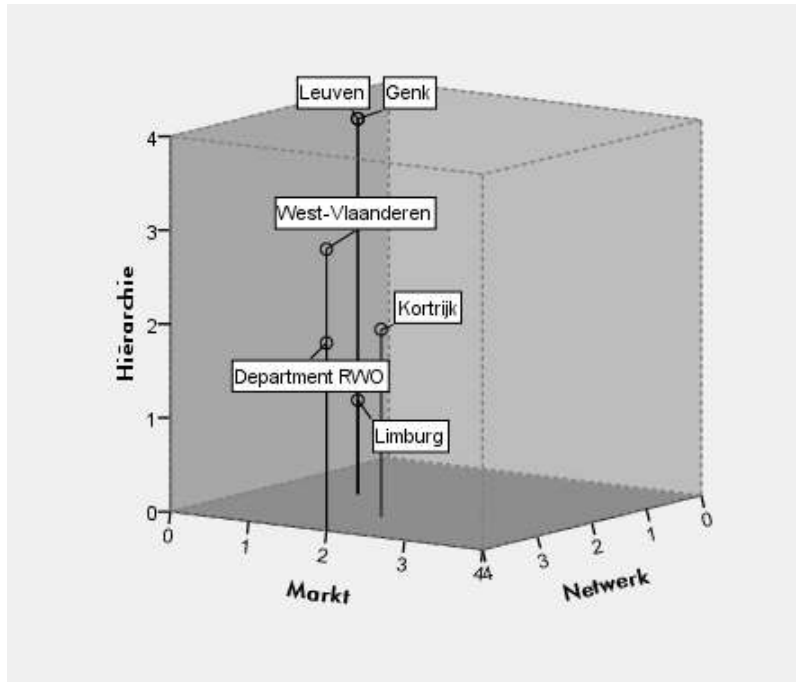
- Exchange & use
 - CRAB facilitates and regulates the use of address data
 - Analysis of use and management of address data during the implementation of CRAB

- Access & use
 - Access to address data determines the use of address data
 - Use of address data determines the access to address data

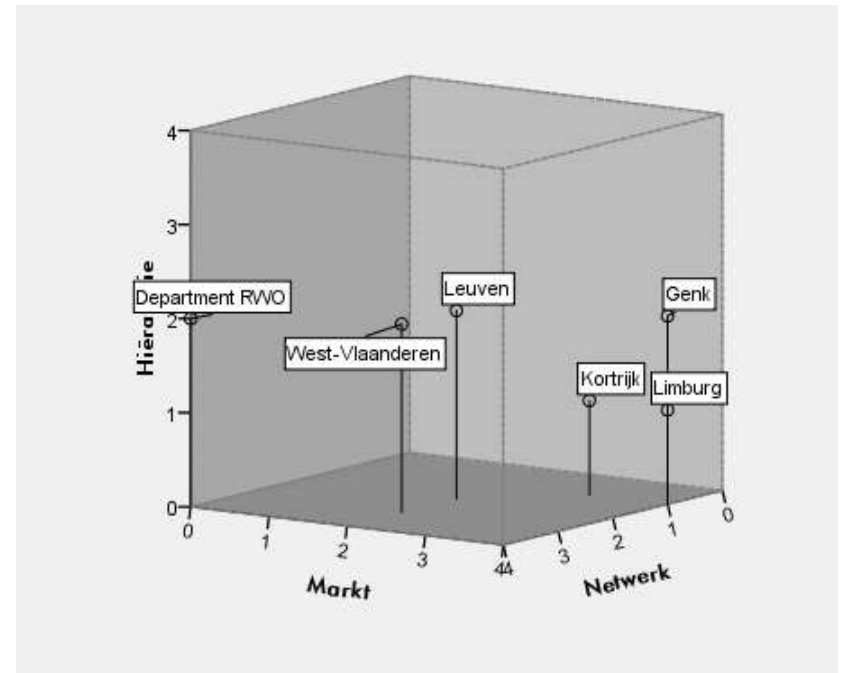
Exchange



Case 'RUP'



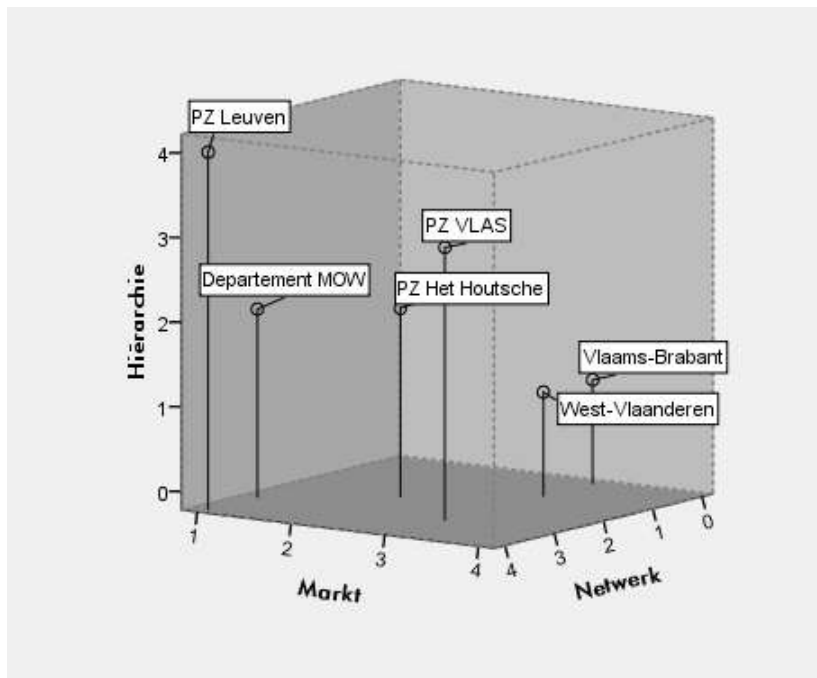
Access



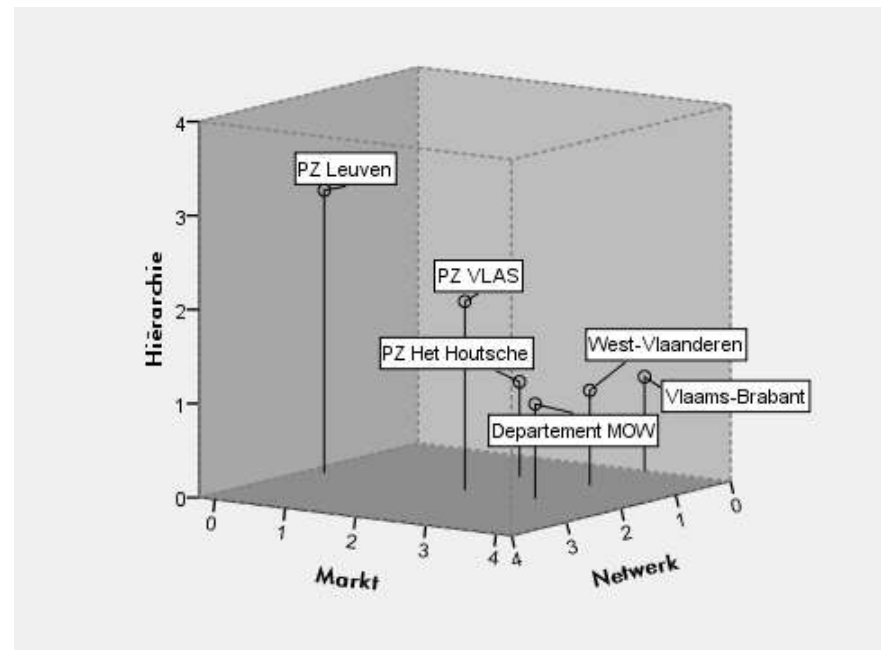
Use

Case 'Traffic accidents'

Access



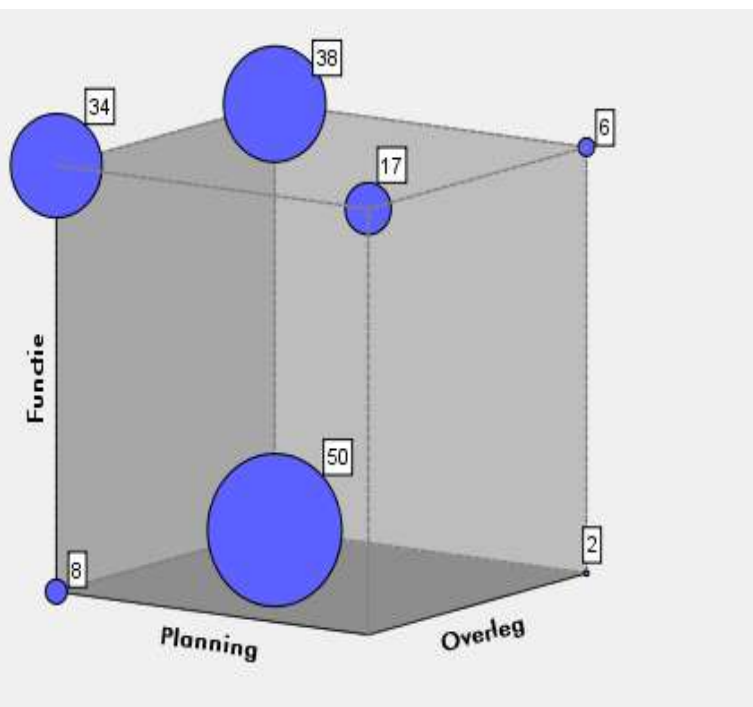
Use



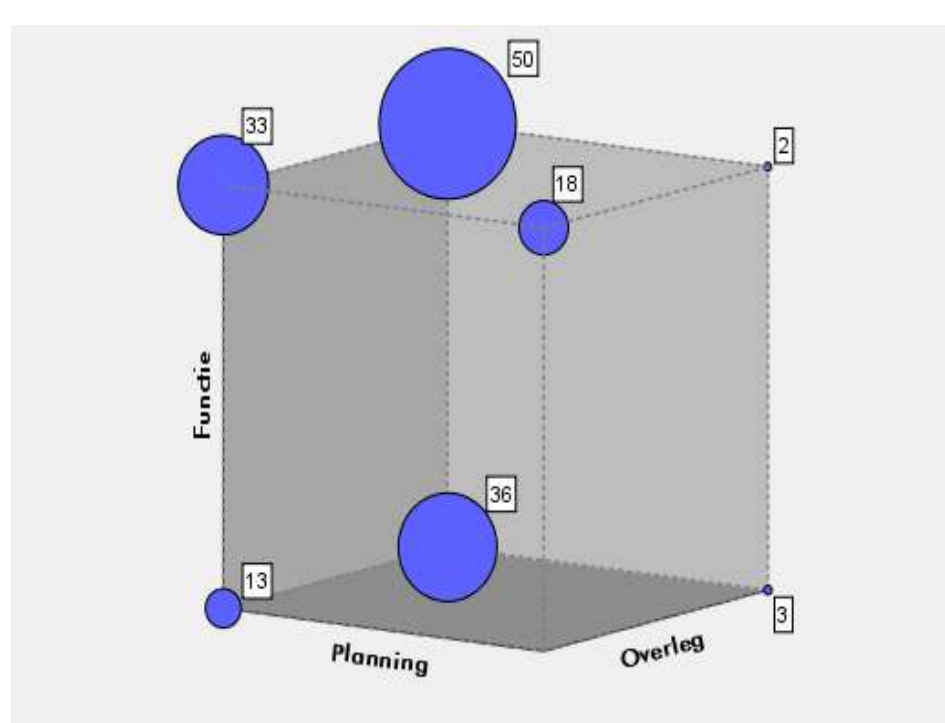
Use (survey)

Use of different coordination instruments in Flemish municipalities

2008



2010



Conclusions



- Exchange, access and use as coordination issues: coordination need – coordination efforts – coordination mechanisms
- Hierarchy, market and network as analytical framework to address coordination efforts
- Different combinations of coordination mechanisms:
 - Network not always present/dominant/active
 - Different ‘types’ of combinations
- ‘Exchange → Access → Use’ and ‘Use → Access → Exchange’

Recommendations



- Coordination = design and management of a suitable combination of hierarchy, market and network

- Coordination = explore how existing initiatives and practices can be supplemented and improved with new forms of coordination

- Flexible coordination: ability to adapt the combination of coordination forms
 - different environments
 - changed conditions

Discussion



- What my country/state/organization needs, is:
 - more hierarchy?
 - more market?
 - more network?
 - more hierarchy, market and network?
 - a better combination of hierarchy, market and network?

- The main objective of an SDI should be:
 - to facilitate the exchange of data?
 - to facilitate the access to data?
 - to facilitate the use of data?
 - ...

More information



Glenn Vancauwenberghe

Parkstraat 45 bus 3609

B-3000 Leuven

0032 16 32 34 58

glenn.vancauwenberghe@soc.kuleuven.be

www.spatialist.be