

# The politics of spatial data infrastructures: State transformation, urban governance and the instrumentation of electronic territories

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## 1 ABSTRACT

With the proliferating conception and implementation of „spatial data infrastructures” (SDI) around the globe, the interaction of state transformation and technological innovation dynamics has entered a critical stage. Spatial reference provides a common ground on which the vast majority of public and private data can become directly interrelated - across all scales and boundaries. The resulting potentials for creating new services, improving (cost-) efficiency, enhancing rational decision making, as well as increasing transparency and participation have swiftly been embraced (in this order) by almost everyone addressing the topic. Yet, the genuinely political character of SDI’s has largely been ignored. But it is here that SDI raises the more fundamental questions for the future of democratic societies.

This paper starts from a brief outline of the cognitive and normative framework of SDI. Sustained by a global network of actors, this framework has allowed SDI to gradually evolve from a specialist technical issue to a mainstream policy instrument. Against this backdrop the examples of France and Germany are used to illustrate the particular institutional dynamics that the set-up of national, regional and local SDI’s has unfolded. It becomes clear that state actors (national, regional) and the private sector dominate the processes, whereas the requirements of local authorities and civil society occupy a marginal space on the agenda.

These common traits are finally discussed in the light of ongoing state transformation and changing multi-level governance systems. Apparently, SDI’s have become seized as strategic projects, helping to construct new representations of the state and to mobilise resources at the urban level. At the same time, the deeper political and structural implications have been evaded as they would question established authority levels, sectoral divisions and governing practices. Therefore, to escape the logic of depoliticisation identified and to prevent SDI from becoming an “information one-way”, it needs to be placed back in its urban context. If the starting point were local challenges and the needs of stakeholders and citizens, it is argued, SDI may actually offer an interesting opportunity for society to reinvent its democratic culture and urban governance systems.

## 2 BUILDING “INFRASTRUCTURES”: THE DISCURSIVE FRAMING OF SDI

Spatial data can be defined as data with a spatial reference, either direct (coordinates) or indirect (address, postal code, etc.). This comprises not only geographic data describing topography, positions of physical objects (e.g. roads, rivers, buildings) and spatial boundaries (e.g. authorities, cadastre), but also the position of data objects such as socio-economic activities, pollutant concentrations or registration procedures. Today, most data held by public and private agencies has a direct or indirect spatial reference, which makes space a powerful common denominator for interpreting data that describes the dynamics of society in any territory considered.

A framework that aims to enhance the discovery, availability, quality and exchange of spatial data according to certain rules is now widely referred to as a spatial data infrastructure (SDI). The concept first emerged in the early 1990’s from international discussions among spatial data experts i.e. practitioners and researchers. Regarding the plethora of SDI definitions available today, it is remarkable that these have mostly been derived from an attempt of classification so far, aiming to interpret SDI by identifying common “components” (data, standards, networks, policy, etc.), “dimensions” (organisation, production, technology, etc.), or main stakeholder groups (data supplier, technology supplier, user, etc.). This has in fact contributed to a convergence towards a particular understanding both in research and practice (Nebert 2004; Williamson, Rajabifard, and Feeney 2003).

However, such an approach implicitly assumes a given “nature” of SDI that appears to reside within certain technological properties and organisational principles, and which is therefore deemed to become reality - sooner or later. It thus underpins a rather deterministic view that cares mainly for overcoming barriers to implementation instead of better understanding the social and political struggles that occur in practice through and about SDI development. For now, little to no room is left for recognising the meaning of apparent differences in the societal appropriation of spatial data technologies, and therefore the pivotal role

of the driving actors and their particular motives. Hence, there is a need to take a closer look at the social construction of SDI, considering also the notions, concepts and practices that have underpinned its development. Here, discourse analysis can help to obtain further insight (Foucault 1971, 1978).

This requires to locate SDI development within the broader perspective of state transformation and changing systems of urban governance. Today's talk of SDI in fact appears to be strongly rooted in a number of interrelated discourses that have shaped the development of the modern (nation) state from the beginning to its latest post-fordist transformations. While their respective weight may vary from case to case, these discourses continue to have a major influence on the development and institutionalisation of practices related to spatial data, with national and sub-national levels increasingly conditioning the local sphere. Analysing their interplay thus raises some more general questions concerning the character and purpose of current SDI's than a discussion of its "nature" suggests. The following sections sketch the key story lines (Hajer 1995) identified from case studies in France and Germany, highlighting their cognitive references and implications for SDI development.

## **2.1 Infrastructure - population - welfare**

"Infrastructure" is a powerful concept with a long history, closely linked to that of the modern state. In 18th century Europe, the traditional conception of the subject/sovereign relation started to transform fundamentally through a rising general search for efficiency and rationalisation in public administration. State power exercise became increasingly oriented at safeguarding individual security and prosperity through policing, health care and other public services (Lascombes and Le Galés 2004). In this context the concept of infrastructure first appears, defining a key means to develop the "wealth of nations" (Adam Smith), or more precisely the welfare of the population, conceived of as a totality of resources and needs.

For the first time, transport, water, waste, energy and - later on - also communication facilities are envisaged as crucial support systems for socio-economic activity that should be provided by the state, as they organise the distribution of highly homogeneous resources demanded by everyone. This basic notion of infrastructure has gradually extended beyond the physical facilities to also include the related operating procedures, management practices, and development policies, thus framing a broad range of state activities and increasingly also private sector operations (due to liberalisation). It also maintains a highly positive connotation as it is through infrastructures that tax payers obtain a tangible return from their governments.

The concept of SDI suggests a continuity of this understanding, now also embracing the use of spatial data. However, this is precisely where the infrastructure allegory results in a severe reductionism, since spatial data is of course far from being a homogeneous resource. Rather, characteristics such as data types, availability and quality that determine the actual meaning and utility of the data in different social contexts, vary considerably. Further crucial differences are introduced regarding the schedule of data integration (what comes when?), the rules of access formulated (who gets it and how?), and the capabilities and demands of the actual users. Values and preferences are already implied both in the data and in the process of SDI set up, thus blurring the conceptual difference between infrastructure and application. Hence, what is usually depicted as a generic public good, objectively enhancing socio-economic welfare and efficient decision making across sectors and domains, may in practice turn out to be a rather discriminating configuration of data, users and related practices, selectively favouring power positions and resource allocations, and ultimately influencing perceptions and understandings of the state, governance and territorial development.

## **2.2 Sovereignty – people - territory**

Mapping and surveying are constitutive activities for the modern state. To provide the grounds for the control and administration of a resident population (taxation, jurisprudence), sovereigns drew on their military's expertise of measuring and dividing the territory they dominated (or intended to dominate). The continuous demand of the state for this activity led to the establishment of the surveying profession and specialised agencies, providing services for governments and administrations. This crucial role of mapping and surveying for state formation is well reflected in Max Weber's classic definition of the state as constituted through sovereignty, people and territory (cf. Sharma and Gupta 2006, 22; Scott 1998, 369).

Obviously, SDI represents a great opportunity to perfectly rationalise the system of territorial observation, allowing to "zoom in" where required. Its strongly hierarchical conception clearly connects tasks of data collection and management at national, regional and local levels, thus directly aggregating scales to inform

decision making. Moreover, the identity and legitimacy of some of the key actors in SDI development today is very much based on the above definition of the state, which is reflected in their discursive contributions. State mapping agencies, cadastral agencies and surveying professionals thus tend to portray SDI development as a logical extension of their traditional tasks. They successfully claim a “natural” responsibility, simply derived from the spatial reference of most data and their expertise in dealing with geographic data, thereby constructing a durable justification of their activities.

Inevitably, this particular perspective on SDI implies a strong emphasis on hierarchy and state control, on physical geography (reference, topography, boundaries), but also on serving an external demand for information. It equally reinforces existing authority perimeters (nation state, region state, county, municipality) and their representations as these become transferred into electronic space through labelling and access gates (portals). Therefore, although severely contested through the borderless information spaces created, the Weberian state continues to matter when SDI's are built up.

### **2.3 Knowledge-based economy - market development - liberalisation**

Another argumentative cornerstone in the debate over SDI is its assumed contribution to the establishment of an informational or knowledge-based economy. Although widely interpretable, this concept primarily suggests the growing importance of knowledge for economic activity and competitiveness and has therefore become a strategic policy objective (e.g. Lisbon strategy). Correspondingly, the first prospective analyses of the emerging spatial data sector in the 1990's were market studies, aiming to assess and quantify the market volume that a broad uptake of spatial data technologies and the free trade with data could create. The resulting figures were echoed by a cry for liberalising what was labelled a spatial data market from the outset. This emphasis fits well with EU and government efforts for lifting public sector control over activities that could be subject to competition, while the genuine public utility of SDI is not further explored.

With this focus on conditions of (private sector) access to (public sector) data, an important priority is set regarding the development of SDI, which leaves a lasting imprint on its design and functions. The responsible civil servants are discursively reduced to “service providers”, working to facilitate business development and supply information to citizens. This orientation is reflected by resources becoming geared towards getting “everything online” (defining standards, interfaces, pricing policies, etc.) instead of rethinking government and administrative practices related to spatial data.

### **2.4 State modernization - new public management - e-government**

SDI development has of course not remained unaffected by the widespread turn to new public management since the 1980's, seeking to extend market orientation in the public sector. The key objective of this management philosophy has been to increase the (cost) efficiency of governments and administrations. Most public sector ICT investments have thus been motivated in the first place by accelerating public service delivery. Hence, we find a first generation of largely independent e-government applications realising a digitalisation of analogue services without modifying procedures (Hill 2004; Lenk 2004). In the following also notions of data sharing, virtual cooperation and participation have started to modify regulation and practices, while the dominant orientation remains to be policy implementation and service provision.

This is where the use of spatial data technologies comes in since it is presented as an opportunity to advance efficiency even further. It is gratefully promoted to modernise the image of the state and its leaders, underlining possibilities for clever management and better public services, casually creating new visual representations of the state (images, internet portals). Apparently, this emphasis is rather following the spirit of early e-government initiatives, prematurely subsuming the vast potential of SDI under the narrow categories of management and service provision, without much consideration of its wider implications for policy design or evaluation (cf. Snellen 2002).

### **2.5 Technological innovation - technology impact - information society**

A key source that nourishes the thinking and talking about SDI is also technological utopianism, a position that has been of major importance for the societal adoption of new technologies. Its starting point is an ideal status of development in the future that is usually based on an extrapolation of technological innovation, while largely ignoring the societal conditions of implementation (Webster 2002). In practice this is often a position put forward by technology specialists, trying to devise a better future to the best of their knowledge.

Society is then seen to transform under the impact of technologies, so that policies should facilitate the emergence of the anticipated information society.

The problem with technological utopianism is of course that, while being fairly influential in current SDI developments, it is not reflecting societal requirements and tends to remain entirely apolitical. With SDI, the utopian vision is the global level playing field for data exchange that would allow a largely unrestricted usage of spatial data by all stakeholders. While the causes may be noble or naïve, the consequence is a massive concentration of SDI on standards and networks, thus neglecting the applications and practices that will actually build upon it. Yet, these will not be determined by a “perfect SDI”, but by the users and the multiple (local) restrictions under which they operate. Unfortunately, technology does not offer any guidance here.

### 3 SDI CONCEPTIONS IN FRANCE AND GERMANY

The story lines sketched above provide the principal cognitive grounds on which current SDI’s are being built up. It is through this discursive framework that SDI has gradually evolved from a specialist technical topic to a mainstream policy initiative, constructing “SDI” as a policy issue, reducing complexities, conveying normative connotations, supplying actor legitimacy, preparing coalitions and driving institutional change. Most importantly, this framework has allowed to focus the debate over SDI on a particular set of arguments, while hardly considering others. It forms a rather dominant thrust that has become difficult if not impossible for actors to question or challenge.

This section examines, how such discursive material emanates from actors in practice and how it is being deployed. In Europe, most national SDI’s are currently set up with a high-level political mandate for one of the major geographic data producers (e.g. mapping agencies, surveying agencies, cadastral service), while the rest is usually being coordinated by councils of ministries, administrations or GI associations (Janssen et al. 2005). Referring to SDI developments in France and Germany, similarities exist in this respect with initiatives at the sub-national level, whereas at the local level the diversity of approaches is considerable. To illustrate the institutional dynamics that have been unsettled through SDI in these two countries, the key milestones are highlighted in the following, identifying who took the initiative and what forms of interaction were involved. Furthermore, also the principal objectives formulated and issues addressed by the actors are reported to portray the conceptual orientation of these processes.

#### 3.1 The French approach: IFDG

The development of SDI in France is essentially marked by a confrontation between the traditional modes of public geographic data production and services, represented by major national agencies, and the demand for liberalisation advocated by the private sector and its associations. The government has thus been oscillating between these positions, trying to defend the interests of its agencies through the responsible ministries and at the same time to mediate towards the private sector and favour market development. Only in recent years, some emphasis has also been put on the role of geographic information systems in e-government and state modernisation. Local authorities, although the principal users and producers of spatial data, have played a fairly secondary role so far.

Geographic information became an issue in French national politics as early as in 1983, when the central national mapping agency (IGN) decided to quit the preparation of their 1:25.000 scale maps. The special status of the IGN, a large independent public body under the auspices of the ministry of public works, required to recover half of its costs from its customers i.e. mainly local authorities and to a minor extent also the private sector and civil society. The decision of the IGN was therefore based on cost efficiency and demand considerations, but the implicitly growing commercial orientation was critically observed by the private sector, denouncing a distortion of competition. Also coordination of IGN data production with the national cadastral agency DGI (controlled by the same ministry) became tenacious as the IGN tended to diminish its consideration for other authority requirements.

Consequently, the minister of state created a commission led by the minister of maritime affairs with the brief to reflect together with private sector actors on a “general policy of French cartography and geographic information”. Based on an analysis of the historic evolution of geographic techniques and the economic situation of “the geographic information sector”, the commission underlined the need to pursue and reinforce

“traditional activities” (mapping, cadastre), to modernise and decentralise data production, and to support the development of the sector identified.

Most importantly, the work of this commission was continued through the subsequent creation of a “national council for geographic information” (CNIG) by law in 1985. This council is mainly composed of representatives from national ministries (17) and the national data producers (11 including surveyors), while also counting local authority representatives (one region, one agglomeration, two mayors) and two independent experts (scientists). The CNIG lacks a formal decision making competence but acts as a consultative body for the government in geographic information issues. Beyond coordinating public sector data production, it is also in charge of other aspects of geographic information such as RTD, user needs, international cooperation or exportation. The CNIG therefore forms a central relay for the main interests involved in SDI development. Also at the county level (département) similar committees have been established by the government with a focus on coordinating local activities related to spatial data (CDIG). They equally form consultative bodies and are presided by the Préfet. However, any substantial influences of the CDIG’s cannot yet be discerned.

Responding to the urge to better articulate its interests in the emerging circles of national level decision making, the private sector founded in 1986 a national “association of geographic information” (Association Française de l’Information Géographique - AFIGÉO). With its slogan of “Modelling the world to better understand it – such is the Leitmotiv of this developing technological domain”, AFIGÉO launched studies on “the demand and functioning of the market, evaluating obstacles for its development” (CNIG 1998). It organised multiple events to facilitate exchange between key actors, also in cooperation with the CNIG.

The IGN, however, was very much aware of its own prospects in this emerging market and effectively evaded the efforts of AFIGÉO and CNIG in fear of losing its private financing pillar in exchange of a potentially shrinking and unstable public one. As a result, for almost a decade the struggle revolving around the future organisation of geographic information production and usage became an internal issue of state agencies and ministries, with only minor developments to be observed.

The process was revived after the 1997 general elections and AFIGÉO published its influential “white book” titled “French geographic information in the information society – status and proposals for action” (AFIGÉO 1998). The white book proposed five axes for policy orientation: 1) achieve a quick coverage of national territory (reference data and metadata), 2) develop private GI and IT businesses, 3) clarify market rules, 4) launch export activities and 5) develop research and education. Its central message was therefore to review the status of the IGN in order to improve cost efficiency and enhance economic activity and employment.

Two government reports commissioned by the prime minister in 1999 and 2000 then picked up these recommendations and preconceived a new policy framework. The first report (“Lengagne”) suggested the creation of a coherent public reference database for the national territory (référentiel à grand échelle - RGE) and a fundamental modification of the IGN status, making it responsible for the integration and maintenance of the RGE and requiring public data delivery at moderate prices. The second report (“Mandelkern”) on “the state and new technologies” concluded that, in general, public digital data publishing should become a legal obligation, being free of charge for data “essential for the exercise of citizen rights.”

In consequence, the government decided in February 2001 to fund the creation of the RGE (72%), entrusting this task to the IGN as principal responsible for production, integration, management, maintenance and dissemination. It defined the RGE contents (reference, topography, perimeters, orthophoto, cadastre, addresses) and fixed 2007 as the horizon for its realisation. Moreover, the government gave geographic priority for realisation to “zones of strong economic challenges”, where data availability was considered of particular importance. The status of the IGN was then officially reformed by a decree in 2004, safeguarding especially competition and introducing local authority representation in its management board. In parallel, the main objective of the CNIG was reformulated as to “achieve the adoption of a national policy of implementation for a national SDI (Infrastructure Française de Données Géographiques - IFDG), comprising metadata, reference data, common specifications, standards and norms, as well as legal and economic data access modalities” (CNIG 2001). Activities of the CNIG now also started to show results in other domains. When in 2004 a new national e-government strategie (PSAE 2004-07) was adopted, it contained a first explicit reference to geographic information use, framed within the general topic of enhancing service provision (“more”, “user-friendly”, “trustworthy”) and making public administration more efficient

(Ministère de la Fonction publique 2004). Thus, in this respect the related strategic action plan mainly envisages to promote the use of GIS to improve administrative decision making and service delivery.

The narrowness of the orientations that govern the debate at the national level becomes visible when regarding local initiatives related to spatial data. Here, the variety of approaches and applications is broad also since many of them were quite ahead of the national level, thus developing rather independently from the emerging conceptual framework. Most notably, in addition to issues of technology and data exchange, cost reduction, service improvement or economic development (CNIG 2000), here also concerns for changing procedures and stakeholder relations play an important role.

For instance in the Lyon agglomeration, where activities for integrating and treating geoinformation date back to the early 1980's. The main interest of the agglomeration authority (Grand Lyon) at the time was to use a common geographical reference and to establish a frame for data exchange between all municipalities in order to enhance planning procedures, regardless of the existence of a national reference. In parallel also the development of metadata and public data delivery (paper, electronic) have been fostered, as well as the definition of a tariff system for data selling, making this entire system operational by 1999.

In 2004 the central city's planning agency (AUL) started to develop a spatial information system at a scale without any institutional representation (urban region). Here, the key issues are rather the centralisation or decentralisation of tasks and responsibilities, defining degrees of public data access that account for the particular sensitivities of the different administrations and political representatives, or achieving consensus about territorial representations produced by the new system.

On the contrary, in the adjacent département Loire the agency for public works (DDE) decided in 2000 to initiate a public information platform by first making all its digital data available for free, thus turning the common SDI philosophy upside down. Here the process is expected to advance as stakeholders identify requirements and options for harmonisation, data sharing or participation that can gradually be translated into a technical framework drawing on open standards (OGC).

Thus, at the local level it is the very culture of cooperation and participation that is put to the test, questioning the established regulative, cognitive and behavioural frames. When civil society can do what in policy making or evaluation, and how public agencies from different levels and domains can work together in a specific territory appear to be questions that derive directly from the development of new spatial data practices.

### **3.2 The German approach: GDI.DE®**

In Germany, the development of SDI is largely driven by the regional surveying agencies in conjunction with the private sector and their respective associations. Due to the federal structure, it were initiatives in some of the Länder that led the way, while the federal government has taken up the issue with a certain delay. It now essentially follows the emphasis of the principal actors on developing the "geoinformation market", while also placing the debate in the context of the federal e-government initiative. The government has provided an organisational framework that coordinates between the different federal ministries and agencies, the regional surveying agencies and the private sector. Similar to the French situation, local authorities have not had any significant influence on the general process so far but often established their own priorities.

In the German system the responsibility for mapping and cadastral activities is with 16 specialised agencies of the the Länder (Landesvermessungsamt - LVermA), mostly under the authority of the respective ministries of the interior. At federal level these agencies cooperate within a common association (AdV), while a national agency for geodesy and cartography (BKG) produces complementary data sets at larger scales. During the 1990's the LVermA's have been subject to a general restructuring of public administration, following the philosophy of new public management. This resulted in a change of their status from public administration to public corporation (Landesbetrieb) i.e. legally dependant units that operate on a commercial basis. In parallel, the AdV has been working on a national data model for topography (ATKIS), which after 1996 has become extended towards integrating references (AFIS) and the cataster (ALKIS), now commonly referred to as the "AAA model" (corresponding to the French RGE). All three components have been registered by the AdV as trademarks, apparently with a view to their commercial exploitation.

In 1994 a „German association for geoinformation“ (DDGI) was founded by the key private sector actors, but also involving some particularly active public agencies such as the LVerMA of North-Rhine Westfalia (now represented in the DDGI board), Lower Saxonia and Hesse or the BKG. The objectives of the DDGI have been formulated as to „underline the importance of geoinformation; represent the interests of the geoinformation economy; enhance offer, access and standardisation; carry out political lobbying; optimise economic utility [...]“. Furthermore, the activities of the DDGI are underpinned by working groups established for the topics of education, geodata market, geodata economy, SDI for infrastructure providers, resources and environmental protection, communication and public relations. It is with the establishment of the DDGI that the notion of SDI started to spread among spatial data practitioners in Germany, considering e.g. the fact that the first global SDI conference (GSDI) took place in 1996 in Bonn, hosted by the DDGI.

It is therefore not surprising that various SDI developments at the sub-national level preceded those at the federal level, especially regarding the case of North-Rhine Westfalia. Here, the government and the LVerMA of the Land launched in 1999 the SDI initiative “GDI-NRW”, building on a previous campaign for media and IT business development (mediaNRW). First activities were focused on organisation, standards and specifications, followed by a competitive selection and promotion of pilot projects for the definition of SDI components. In 2001 a public-private partnership was created for the operative management of the SDI initiative (CeGi GmbH), defining an organisational structure that regulates decision making and coordination among the participating actors. The main objective of the GDI-NRW is to „[...] activate the geoinformation market. To this end, different technical, legislative, socio-economic and logistic obstacles have to be identified and overcome, as well as support measures and infrastructure projects developed“ (CeGi 2003). Hence, between 2001 and 2004 broadly disseminated annual market studies have been commissioned to quantify potentials and specify barriers.

At federal level, a first visible reaction to the developing German „geoinformation“ discourse was the creation of an „interministerial committee for geoinformation“ (IMAGI) through a cabinet decision in 1998. This body, chaired by the ministry of the interior and physically hosted by the BKG, is composed of representatives from 10 ministries dealing with spatial data and the AdV as an observer. Its brief was summarised as achieving “a concept for efficient data management by federal state agencies, harmonisation between federal and regional authorities regarding interoperability and questions of data pricing, implementation of norms and standards, and awareness raising regarding the significance and utility of geoinformation, considering marketing approaches for public data selling”(IMAGI 2004).

In 2001 the federal parliament responded to a request strongly driven through the DDGI (e.g. organising business lunches with MP’s) in a first decision on the “use of geoinformation in Germany”. In this decision the parliament requires the government to take action in order to enhance the set up of a national SDI, following the example of the USA. It thus calls for a closer cooperation between levels and sectors (public/private) in order to “modernise economy, science, administration and policy” (Deutscher Bundestag 2001). This was followed in 2003 by a second parliamentary decision equally initiated through the DDGI, requiring improved coordination between federal and regional levels, and underlining especially the conclusions of a study commissioned by the federal ministry of economic affairs. This study highlighted that the “commercial use of geoinformation has a high economic potential and can develop into a market segment with considerable added value, qualified employment and highly innovative products”.

On the operational side, the IMAGI had proposed in 2001 a three-step concept for developing the national SDI (Geodateninfrastruktur - GDI.DE). It envisaged to 1) establish a metainformation system (GeoMIS.Bund), 2) harmonise data stocks, and to 3) gradually start implementing a national portal for data provision (GeoPortal.Bund). In 2003 the heads of regional cabinets adopted an organisational framework for the set up of the GDI.DE - meanwhile also registered as a trademark. It distinguishes a political orientation through the existing e-government working group (16 secretaries of state), and a conceptual coordination by a steering group and the “commission for the geoinformation economy” (GIW Kommission), led by the ministry of economic affairs. The steering group is co-chaired by the ministries of the interior and economic affairs and comprises representatives from the regional ministries (16) and the main associations of local authorities (3). Similarly, for the technical management two offices have been created, one for the “geoinformation economy” and one for the GDI.DE. This structure reflects very well the definition of SDI provided by the AdV in 2002 as the “[...] technological, political and institutional measures to ensure, that methods, data, technologies, standards, financial and personal resources for the production and application of

geoinformation are made available according to the requirements of the economy” . Support in this direction is provided in particular by the GIW Kommission that formulated in 2005 a memorandum titled “digital ‘raw material’ geoinformation – a contribution to safeguarding Germany as a business location” (GIW Kommission 2005; AdV 2002).

Regarding SDI activities at the local level, it is first of all remarkable that the associations of local authorities have mainly acted as observers, thus accepting the place they have been assigned. Only the association of German cities (Deutscher Städtetag) in North-Rhine Westfalia has picked up the issue of SDI, trying to provide some guidance for its members. However, since this initiative was driven by its working group for municipal mapping and cadastres (composed of local spatial data practitioners), the results have been manuals on “geodata management” and “marketing municipal geodata”, mainly following the approach of the AdV and the IMAGI. Consequently, the Städtetag most of all suggests to focus on an efficient central geodata management and data delivery for commercial reuse by transforming the local cadastral departments into “content providers”(Städtetag Nordrhein-Westfalen 2003).

The example of the Bonn region illustrates, though, how local actors have also discovered new challenges and options related to spatial data. Here, the city and its region were confronted with a particular challenge after the 1991 decision to move the German capital functions from Bonn to Berlin. A new inter-municipal cooperation was therefore created (Regionaler Arbeitskreis Entwicklung, Planung, Verkehr - :rak) to manage structural change. While it first focused on the less conflictive issue of housing, more difficult topics such as leisure or retailing/centers have been addressed over time. This work of the :rak has been supported increasingly by the creation of a “regional online planning system” (ROPS), developed in cooperation with universities and private companies. As the system draws on data from the different municipalities, key issues have been to agree over data types to be incorporated, different access levels (public, restricted), as well as the representations to be created. Spatial data sharing, it appeared, is essentially a question of establishing mutual trust and a framework of social practices that can make it meaningful.

#### 4 SPATIAL DATA AND URBAN GOVERNANCE

The sketched cases of France and Germany illustrate how much SDI development is intrinsically linked to ongoing transformations of the state, its institutions and governing practices. In this, it exemplifies a new type of strategic state intervention that characterise this process at present. While theoretical discussions in the 1990’s still predominantly invoked the inevitable “state in retreat” or its “losing control” (Sassen), today a broad consensus exists in recognising the continued central role of the state, as well as a qualitative shift in the forms and orientations of state power exercise that does not contradict the main trends of destatisation, denationalisation and internationalisation (Macleod and Goodwin 1999; Brenner 2004).

Having acknowledged the increasing involvement of the private sector and civil society actors in policy making since the 1980’s and therefore a growing pluralism of sites, themes and techniques of policy (Le Galès 1995; Benz 2005), it is the expanding normative use of the concept of governance in policy itself that is significant here. Governing has thus become the art of designing interaction processes between stakeholders that ultimately should produce the desired results, drawing on a wide range of tools to take influence. The capacity and skills that this requires have therefore become a decisive production factor for the competitiveness of the territory concerned (Jouve and Lefèvre 2003).

This is precisely where also the orientation of state action has been subject to change. While the Keynesian welfare state focused on the national scale for regulative intervention to secure its accumulation regime, the past twenty years have seen a growing concern of the state for developing its major urban regions or metropolises. This is reflected in the conception of strategic projects to directly enhance urban competitiveness and exploit endogeneous local resources, ranging from the transfer of competencies or targeted incentivitation to large-scale transport infrastructure construction. It is thus the recognition of cities as “motors of growth” for the national economy that has fostered an alignment between national agendas of deregulation and systems of urban governance (Brenner 2003).

These changing forms of intervention and orientation can well be traced in the development of SDI in France and Germany. It is a particularity of SDI that the initiative originates from the private sector and spatial data technocrats, strongly focused on technological innovation and business development. The proximity between both positions, however, has been favoured by the advancing deregulation of the mapping and surveying

agencies through state policies, which is most emblematic in Germany regarding the registration of their products as trademarks.

The decisive state response of making SDI a national policy initiative of high priority was then based upon the growing recognition of the strategic importance of spatial data for linking two core policy strands, namely enhancing economic development and competitiveness and improving the efficiency of public administration (e-government). It is equally motivated by the opportunity provided through SDI for reaffirming territorial coherence and identities, as the vanishing boundaries in real space are replaced by virtual boundaries and access gates (Mitchell 2003). The emerging interest coalition between state and private sector actors is well reflected in the concepts and arguments exchanged. SDI is thus regarded a splendid opportunity for mobilising local resources, unlocking the “treasure” (Greve and Naujokat 2003) of spatial data by building this new infrastructure.

To this end, a range of policy instruments have been deployed. New forms of interaction have been created, including associations, committees, steering groups, councils or commissions across levels and domains, all following specific regulations of participation and decision making. These new structures raise questions of representativeness and legitimacy, in particular regarding the weak role of local authorities, which is reflected in the lack of corresponding concerns in the national debate. Their conceptual absence contradicts the relevance of local authorities as the principal producers and users of spatial data, as they have been estimated to make up for 60% of all spatial data applications (AFIGÉO 1998). Nevertheless, with SDI the urban level rather appears to be instrumentalised as a mere “content provider” and to support a rationalisation of public administration.

## 5 CONCLUSIONS

As it is conceived today, SDI suggests a separation between a data providing infrastructure and applications that build upon it, selectively using the data required. This utopian perspective neglects that in (local) practice the starting point is often the application, setting up infrastructural fragments that can support it. By giving priority to the “infrastructure”, however, governments and private sector actors have provided a strong conceptual frame that is far from being neutral regarding its outcomes. Its consequence is that resources become shifted towards creating an ideal platform for data delivery, that existing institutional settings and representations are being reinforced, whereas the difficult task of rethinking duties and practices in the light of spatial data usage remains undone. SDI thus largely evades any discussions of its possible implications in terms of actor relations and collective decision making processes, simply depicting data as if it were a “raw material” devoid of meaning. Therefore, a definition of SDI as a governance system modifying public and private decision making for particular purposes seems more pertinent than one distinguishing different “components”.

To develop alternative concepts of what SDI could (also) be, it might be useful to take a closer look at local level initiatives. The examples given above may have illustrated the kind of political challenges posed as spatial data sharing implies creating new transparencies. Starting from extreme fragmentation and enclosure (of data, archives, systems, etc.), the gradually increasing availability of and access to spatial data and the choice to support selected applications by priority appear to be of strategic importance: When, what kind of data should become available for whom, and for which purpose – these are the questions that need to be asked. The new shapability of spatial data usage thus concerns the relation between government levels, between policy domains, between authority perimeters, and between citizens, public administration, politicians and private business (Reinermann and von Lucke 2002). Apparently, these are essential parameters of urban governance systems. It is here that spatial data applications could help reinvent local democratic culture and decision making by developing new forms of knowledge production, exchange and presentation for policy processes..

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