



# A blueprint for market construction? Spatial data infrastructure(s), interoperability, and the EU Digital Single Market<sup>☆</sup>

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## ABSTRACT

Geographers have recently turned increased attention to the spatial dimensions of markets. However, digital information markets, positioned at the leading edges of capitalism, remain under-examined from this perspective. Contrary to the aspatiality suggested by metaphors of information networks such as ‘the cloud’, a salient element of these markets is their close linkage with legal regimes bound to territorial jurisdictions. Addressing this linkage through a Polanyian economic geographic approach, the present article examines the recent initiative by the European Commission to build a territorially unified digital market spanning the entire European Union, and its relationship with a previous pan-European project aimed at developing unified standards for geospatial data: INSPIRE, the EU’s spatial data infrastructure. The analysis focuses on interoperability, or the ability of systems to communicate with each other, and centers on the specific mechanisms of legal and technical interoperability in two EU member states: the UK and Germany. These two types of interoperability are considered key factors in the social and institutional embeddedness of markets – and as a consequence, their spatial constitution. Through this examination, the article shows that, while digital information markets ostensibly ‘flatten space’ and allow market actors to overcome geographical barriers, their very constitution is the result of particular sets of policies, institutional features, and political negotiations that require both technical and political agreements to achieve integration across multiple scales of territorial jurisdictions.

## 1. Introduction

This article draws from extensive interviews with executives at geographic information agencies, participant observation at a trade fair, and institutional and legal documentation across EU member states and the European Commission to examine the influence of the Infrastructure for Spatial Information in the European Community (INSPIRE) in the construction of the EU Digital Single Market (DSM). Through this examination, the article advances the central argument that, while digital information markets ostensibly aim to ‘flatten space’ and overcome geographical barriers to trade and communication, their very constitution is deeply influenced by existing geographical arrangements. Thus, digital information markets are the result of interlocking sets of policies, institutional features, and political negotiations that require both technical and political agreements to achieve integration across multiple scales of territorial jurisdictions. Elucidating how these mechanisms have played out in the construction of INSPIRE, and their potential adoption for the construction of the EU DSM, advances our understanding of market making processes and their

interrelation with territorial jurisdictions; an especially pressing task in the case of digital markets, whose geographic dimensions are still scarcely understood.

Theoretically, the approach at the core of this article brings together insights from political economic and techno-cultural strands of Economic Geography to develop a fuller understanding of the underlying market-making processes at the early stages of the EU DSM. This analysis is conducted through the lens of interoperability – which encompasses, among others, cultural, linguistic, organizational, and political processes (Benson and Grieve, 2016; Onsrud, 2010; Palfrey and Gasser, 2012; Santosuosso and Malerba, 2014). While, undoubtedly, many types of interoperability are required for the implementation of sociotechnical systems across borders, the two mechanisms of legal and technical interoperability have been central to the implementation of INSPIRE. While legal interoperability has enabled coordination between geographic agencies across the EU, its member states, and their subnational administrations, technical interoperability has been crucial in setting standards for spatial data production and distribution. While there is unevenness in the progress made by EU member-states, along

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all of the key criteria of evaluation, the overall implementation of the INSPIRE Spatial Data Infrastructure has made important progress towards its completion by 2021 (Cetl et al., 2017). Through this experience in coordinating and advancing a complex informational project across all member states and subnational administrations, INSPIRE has informed the construction of the EU DSM. Furthermore, as this market initiative has been rolled out, it has offered a powerful economic rationale to catalyze the completion of INSPIRE. However, despite this reciprocal influence, the limits of legal and technical interoperability faced by INSPIRE are instructive of how political and operational factors create a landscape that must be navigated in the construction of digital markets across borders, such as the EU DSM.

These instances of interoperability and their role in the development of INSPIRE are illustrated by the experiences in two member states of the EU: UK and Germany. These cases have been identified due to the particular configuration of their geographic agencies, corresponding to their divergences in market orientation, and their adoption of differential information policies, intellectual property regimes, marketization mechanisms, and technical choices in the geospatial data ecosystem. As such, they serve to show contrasting technical and institutional registers (such as the different approaches to the collection and commercialization of government information), and illustrate the potential challenges and implications of leveraging INSPIRE as a blueprint to construct a general-purpose DSM in the European Union.

The Digital Single Market is a political priority for the European Commission, the European Council, and a highlight of the 2015 European Parliament Annual Growth Survey (European Commission, 2015, p. 3). This initiative aims to unify the different territorial markets from member states in areas related to digital and online goods and services. The European Commission has defined it as:

A Digital Single Market is one in which the free movement of goods, persons, services and capital is ensured and where citizens, individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition, and a high level of consumer and personal data protection, irrespective of their nationality or place of residence.

European Commission, 2015, p. 3

The European Digital Single Market is a broad ranging project, which aims to incorporate goods and services as diverse as online retail, digital media, social networks, and mobile communications. Within this expanding constellation of digital information, geospatial data is a category that has grown exponentially in its economic potential, as well as volume and availability to governments, firms, and individuals – however, restrictive property regimes, uneven access to knowledge and technology, coupled with obscure and invasive collection practices continue to entrench data asymmetries – which encompass differential access to, rights over, and capacity for agency through data. While the collection and distribution of geospatial data has been traditionally under the domain of the state, neoliberalization and technological changes have paved the way for its rapid diversification and incorporation into a wide range of economic activities (Leszczynski, 2012), leading to broad ranging applications across industries that generate between \$150 and 270 billion in global revenues annually (Oxera, 2013, p. iv).

In this context, Spatial Data Infrastructures (or SDIs), which are sociotechnical and institutional projects developed to manage the production, standardization and distribution of large volumes of geospatial data (Masser, 2007; Van Loenen and Kok, 2004), have taken on an important role in the use and incorporation of geospatial data, first within the state, and, increasingly, by a growing diversity of other actors such as firms and user communities. Due to its multinational and multiscale construction, the Infrastructure for Spatial Information in the European Community, or INSPIRE, is one of the most ambitious projects of this kind.

While INSPIRE was initially developed to standardize the

production and distribution of environmental data for policymaking in the EU, its potential impact has grown with the salience of geospatial data in the digital economy (European Commission et al., 2017). In particular, there has been increased recognition that geospatial data is essential to the development of location-aware digital products and services in the digital economy, and thus is a key component of the EU DSM (European Commission et al., 2017; Lovell and Crompvoets, 2012). However, location-aware services require shared standards in geospatial information to become fully integrated into a market that transcends national boundaries. Due to both the centrality of geospatial data for the digital economy, and the progress made by INSPIRE, this project has been interpreted as instructive in the creation of the European Digital Single Market (Eurogeographics, 2015; Geospatial World Forum, 2015; Konrad, 2017; Nunes de Lima, 2017).

The present article examines the experience of INSPIRE in the context of the proposed creation of the EU DSM, particularly focusing on the specific mechanisms of legal and technical interoperability, which have played an important role in the standardization of the geospatial data ecosystem in Europe. Analyzing the deployment of these two mechanisms of interoperability in the case of INSPIRE improves our understanding of the processes by which markets are created and consolidated within and across territorial jurisdictions. This is a pressing task in the digital economy, since more work is needed to develop our understanding of markets in this realm, specifically in the complexity of their (often overlooked) geographic dimensions.

### 1.1. Economic geography and geospatial data markets

Markets have become increasingly dominant features of social organization in the wake of neoliberalization. Consequently, the range of activities conducted through market logic has continued to increase. In Michael Sandel's assessment, "[t]he reach of markets, and market-oriented thinking, into aspects of life traditionally governed by non-market norms is one of the most significant developments of our time. [...] These uses of markets to allocate health, education, public safety, national security, criminal justice, environmental protection, recreation, procreation, and other social goods were for the most part unheard of thirty years ago. Today, we take them largely for granted". (Sandel, 2012, pp. 6–8).

While it has recognized these trends, the discipline of Economic Geography has long been primarily focused on processes of production (Christophers, 2014, 2015), and only recently take up an explicit focus on the formation and dynamics of markets, and their attendant geographies (Berndt and Boeckler, 2009, 2012, Christophers, 2012, 2014, Hall, 2015, 2017; Kear, 2014; Muellerleile, 2013; Muellerleile and Akers, 2015). These recent efforts in excavating the geographies of marketization are part of a larger project of denaturalizing and critically interrogating markets, which are often assumed as unproblematic by the dominant discourse of neoliberalization.

As Birch and Siemiatycki (2016) correctly point out, marketization should not be seen as a singular process, but rather as a multiplicity of market rationalities (such as those of distributive and allocative efficiency –in contrast to the inefficiency of the state–, value for money, and responsibility), which are underpinned by particular legitimating discourses, and whose concrete outcomes are shaped in accordance to local institutions and political economic configurations. This multiplicity is reflected in the various approaches taken by geographers and other social scientists to the study markets and marketization.

Christophers has identified two main types of approaches in Geography through the useful heuristics of political economic and techno-cultural. These two strands are premised on different epistemological commitments and analytical foci. While political economic approaches seek theoretical generalization, privilege a systemic understanding of capitalism, and critique the role of markets, their analytical focus is largely on the realm of production, often ignoring markets as objects of study. On the other hand, techno-cultural

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