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Mega-City Regions:

On awareness and value chain approach

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Abstract

Mega-City Regions (MCRs) as a new large-scale urban phenomenon have been gaining attention recently. In research, empirical studies address their functional consistency, and spatial planning policies underline the strategic role of MCRs in territorial competition within a country. But increasingly, tensions are beginning to emerge between the functional logic of knowledge-intensive business activities and the territorial and normative approaches of public bodies. Typical spatial development conflicts in MCRs occur for example when globally motivated investment decisions impact upon local needs. This paper proposes an integrated view that can help to bridge the gap between the growing factual knowledge about MCRs and the ability, as yet still weak, to use this knowledge for local and regional development and spatial planning purposes.

The proposed integration draws on the one hand on the corporate-based value chain approach. The interaction of analysis of spatio-economic development, its adequate visualisation and focussed communication with stakeholders is apt to bring about the initiating momentum for beneficial spatial development. In the context of a diffuse perception of MCRs – whose mere size surpasses our usual concepts of space – analysis, visualisation and communication as methodological components in the spatial planning process add value to the spatial development. The process starts with creating awareness for the often invisible and complex spaces of flows, functions, qualities and identities of the MCR spatial scale. New strategies of visualisation and communication are needed to improve insight and motivation of the actors involved.

On the other hand this value chain approach has to be adapted to the varying vertical levels of public bodies with their numerous policies. The paper will apply the value chain approach to the case study of the announced expansion of the Munich Airport International. This complex process experiments with a consensus-oriented dialogue platform – the so called "Neighbourhood Forum" – bringing together actors with diverse responsibilities and objectives. This case study shows how we can use the value chain approach – analysis, visualisation and communication – to better understand a spatial planning process. The paper concludes with recommendations for using the above described spatial value chain approach for more efficient and effective planning processes.

1   Introduction

1.1   The process of emergence of Mega-City Regions

Mega-City Regions (MCR), a new large-scale urban phenomenon, have been gaining attention recently in two fields. In research there is a growing factual knowledge of MCRs and in spatial planning policies, especially on a national and European scale, the crucial role of MCRs in societal, economic, social and cultural development is increasingly being recognised.

An initial definition of MCR can be found in a mainly static description. Apart from a required critical mass, MCRs can be recognised by a concentration of main functions such as control and regulation functions, gateway functions, innovation and competition functions (Blotevogel 2002). A second approach, however, emphasises that MCRs are not a static and completed state of urbanisation. MCRs are in the process of emergence, they are a multi-scalar urban process that is currently unfolding on two spatial scales. First, at an international / European level there are increasing functional linkages between the core cities of each MCR. Second, at a metropolitan, regional level

there are evident and increasing interdependencies between highly global cores and their surrounding areas. The main driving forces of the emergence of MCRs are knowledge-intensive business sectors leading to a dense network of interaction such as virtual communications and business travel within and between advanced business service firms (Convery et al. 2006). So Hall and Pain find the definition of MCRs as follows:

> MCRs are a series of anything between ten and 50 cities and towns, physically separate but functionally networked, clustered around one or more larger central cities, and drawing enormous economic strength from a new functional division of labour. These places exist both as separate entities, in which residents work locally and most workers are local residents, and as parts of a wider functional urban region (FUR) connected by dense flows of people and information carried along motorways, high-speed rail lines and telecommunication cables. (Hall, Pain 2006a)

The Interreg III B Study Project POLYNET – Sustainable Management of European polycentric Mega-City Regions – is one of the most recent research activities on the emerging phenomenon of MCRs (Hall, Pain 2006b). Eight MCRs in north-west Europe were examined in three steps. Action one included firstly, the analysis of commuting and the definition of the functional urban region and secondly, the quantitative analysis of service business connections. These quantitative findings were deepened by the qualitative analysis of service business connections in action two. Action three finally complemented the analytical findings on the functional constitution of the MCRs with the analysis of policy documents and policy focus groups. This study of the policy implications arising from the analytical findings about the emerging phenomenon of MCRs identified – not without surprise to the whole project team – the crucial importance of awareness of the spatial scale of MCRs (Convery et al. 2006).

With regard to policy-making – especially on a regional, national and supra-national level – a gap in perception still seems to exist between the documented and normative policy approaches on polycentric development of MCRs – as in the ESDP – and knowledge and recognition of the factual polycentricity and the spatial scale of MCRs (Convery et al. 2006).

1.2   The awareness issue

The results of POLYNET stress the essential and pressing awareness issue in all eight MCRs. The lack of attention and awareness leads to a gap between the growing knowledge about MCRs provided by research on the one hand and spatial policy in MCRs on the other hand. Governance processes on a metropolitan scale have hardly started yet, and awareness of the importance and the particular functionality of MCRs is not apparent in EU policy in the years 1999-2000, nor in policy at regional and national level in the year 2005. As there is little concern for the crucial connection between the changing requirements of knowledge-intensive firms and urban change, the ability to use this knowledge for local and regional development and spatial planning purposes is still weak (Hall, Pain 2006b).

Double complexity of the perception of MCRs

The perception and recognition of the new spatial scale of MCRs from a local, regional and metropolitan perspective underlies a double complexity. The first difficulty can be attached to the spatial characteristics of MCRs themselves. The second one is tied to the fragmentation of political responsibilities that result in a concurrence of views,

backgrounds and interests of different actors that have to be integrated in a metropolitan governance process.

What are the spatial characteristics of MCRs found in POLYNET that make the perception so difficult and demanding for the different actors?

Firstly, the mere size of MCRs – they are bigger than a city and its agglomeration – breaks down our common notions of spatial categories. As shown in the example of the Zurich-Basel metropolitan region in Switzerland, the new scale of this emerging MCR impacts upon the traditional perception of the country as rural or semi-rural with little urban character (Gabi et al. 2006). Additionally, when extending beyond administrative borders and other familiar boundaries, MCRs also impact upon every historically founded comprehension of the territory.

Moreover, it is difficult to define precisely this new unfamiliar perimeter of MCRs.

> Everywhere it proved impossible to identify precise MCR boundaries. The dynamic nature of emergence of MCRs prevents their fixed delimitation, (…). (Halbert et al. 2006)

The definition of Mega-City Regions mainly by means of their functions and networks means that its constituent elements are not directly perceptible. 'Hidden spatial development' refers to the – at first glance invisible – influence of physical and virtual connections and relationships between enterprises as part of the current economic and social processes on spatial development (Thierstein et al. 2006).

> Visible changes by no means tell the whole story of the underlying development tendencies. Beneath the surface of expansion of the built environment there exists an intensive network of virtual exchange of knowledge, data and information. Recent research has shown that the activities of the knowledge-intensive business firms and their location strategies are major driving forces of spatial development (Gabi et al. 2006).

This functional analysis of MCRs reveals simultaneities of different and overlapping spatial scales. In order to really understand the ongoing MCR formation processes it is necessary to permanently change the perspectives – again an unusual and ambitious procedure – between different spatial scales such as global, national, metropolitan, regional and local. And when doing so, simultaneities appear of opposing processes in MCRs, such as concentration and dispersion, centralisation and decentralisation.

Once the functional correlations within MCRs are revealed, one observes that the invisible functional shape thus far discovered does, in the majority of cases, differ from the initially visible morphological shape of the territory. The interrelations between the functional and morphological spaces are not evident and are difficult to understand. Finally, the functional spatial approach to MCRs brings about a perimeter that includes manifold and morphologically heterogeneous parts that partly invalidate common spatial categories such as the distinction between urban and rural spaces (Thierstein et al. 2006).

The second complexity in the recognition of the emerging new urban phenomenon is induced by the institutional fragmentation of MCRs that brings about also a fragmentation of perception.

In most cases there exists no political institution at the scale of MCRs. Instead a multitude of political bodies from different spatial scales, regional as well as municipal, have to be integrated in a process of multi-level governance. As functional forces are crucial driving forces to spatial development in MCRs, other important actors for spatial devel-

opment that have to be considered come from outside the administration (Davoudi 2006). The resulting inconsistency of the perception of the MCR includes differences in the spatial scale, the focal distance of the actors, differences in the relevant topics and problems, the contents that they focus on, and different notions of space such as a morphological or a functional spatial approach.

In the case of the Rhine-Main MCR, Polynet has found a concurrence of various regionalisations, a multiplicity of regional views compiled by different coalitions of actors (Freytag et al. 2006). According to the authors, the region remains internally fragmented despite the high international visibility of Frankfurt. In the RhineRuhr case the research team even speaks of an 'unborn' giant because of fragmented institutional landscape, fuzzy strategic concepts and uncoordinated policies (Danielzyk et al. 2006).

1.3 Mismatch between functional and territorial logic

The difficulties of perception described above are one fundamental reason for the lack of awareness of the new spatial scale of MCRs, resulting in the inability to establish stable and successful multi-level governance. Consequently, contemporary spatial planning policies are characterised by a gap between the functional logic of spatial development and the territorial normative approaches. This mismatch becomes apparent on different spatial scales as in the example of the MCR of Paris. The lack of functional polycentricity in the Paris region, with its still relatively concentrated functional patterns and locations of knowledge-intensive firms can partly be explained by an inappropriate normative polycentric planning policy at two other competing spatial scales: the national scale and the agglomeration scale – two territorial approaches that fail the MCR's functional logic (Halbert 2006).

This mismatch affects the ability to pursue sustainable spatial development in MCRs. The political bodies and institutions that have impact on MCRs indeed have planning objectives of sustainability, but their strong territorial logic doesn't consider the driving functional forces of spatial development. As a consequence, the concept of sustainability is not reflected in the context of the complex system of interaction of MCRs on a global / European as well as regional / local spatial scale. MCRs are more or less open economic and ecological systems, which means that policy measures taken in one MCR may have effects in other regions (Convery et al. 2006).

The main questions still to be asked, which are crucial for future policy in MCRs aimed at sustainable spatial development, touch on four distinct themes: economic development, social inequities, environmental sustainability and territorial cohesion (Convery et al. 2006). The interrelation of these themes with the new spatial scale of MCRs is far from being simple and obvious, and much more attention must be given to this question, in policy-making as well as in research.

1.4 Hypothesis

Overcoming the mismatch between the functional and territorial logic of spatial development is crucial for any policy aimed at sustainable spatial development. Solving the awareness problem is a prerequisite to establishing the urgently-needed multi-level governance in MCRs. This paper proposes an integrated view that helps to get to grips with the awareness issue of MCRs, and hence supports the initiation of multi-level governance processes. In the context of the diffuse and fragmented perception of MCRs, we introduce a value chain approach of analysis, visualisation and communication (AVC) as an instrument for better structuring of the governance problems.

This paper will first introduce the hypothesis of the value chain approach by outlining the conceptual framework of AVC. In a first sketch, analysis, visualisation and communication will be set out, showing their potential, their possible functions and applications in the spatial planning process. In the second part of the paper, this value chain approach will be applied and tested in the case study of the expansion of Munich Airport International – a complex multi-level governance issue. The aim is to better understand the opportunities and obstacles of the recently started planning process concerning the important international gateway infrastructure of the MCR of Munich.

2   Conceptual Framework

2.1   The concept of a value chain approach to spatial planning

AVC as instrument to structuring governance problems

The corporate-based value chain approach seeks for an integrative, strategic use of three different complementary competences in the spatial planning process: analysis, visualisation and communication (AVC). This instrument is thought to be a guide to posing the right questions to the right dimensions of the issue at stake. It aims at securing a comprehensive approach to spatial development processes. Applied to concrete problems of multi-level governance, it helps, according to our hypothesis, to show the ways out of situations which so far have appeared stagnant. So the instrument of analysis, visualisation and communication might encourage a learning process towards better multi-level governance by giving orientation to the players and stakeholders within these governance processes.

Conceiving sustainable spatial development as a value chain approach

The value chain approach also refers to a specific understanding of sustainable spatial development that includes a variety of competences from different disciplines working together. The long route of spatial development, from the initial creation of awareness, ultimately to the implementation of products in single sectoral fields in governance processes, can be stimulated by the strategic use of analysis, visualisation and communication. Hence AVC can be conceived as methodological components in the spatial planning process that facilitate and encourage the advancement of awareness, products and processes.

Why do we need these three competences?

The complex awareness issue of MCRs can be divided into problems according to the three dimensions of analysis, visualisation and communication:

- the inability of different stakeholders to properly understand the new dimension of MCRs,
- the lack of a visual depiction of these new spatial characteristics and hence the predominance of obsolete spatial images, and finally
- the inability of the players to realise their interests, positions and responsibilities in the metropolitan governance process.

These main obstacles will be further explored in the subsequent paragraphs and assessed in the case study.

How does a process of added value come about?

The key benefits of the value chain are better understanding and insight on the one hand, and better motivation and coordination of the players on the other hand. In a first approach, value is added to the spatial development and planning process in three stages: the analysis of spatio-economic development provides the basis for visualisation. Visualisations enrich the analysis by providing a big picture and details, making structures and patterns visible and illustrating relationships of space, time and cause and effect. In a third stage, visualisation supports the communication of the analytical findings to the relevant stakeholders by conveying contents more easily.

This understanding of the value chain approach was provoked amongst others during the research work on Polynet by the need to make the detailed analytical findings about the functional constitution of the MCR visible and therefore communicable. The research team was confronted with the task of transferring the results to the relevant stakeholders and addressing a certain kind of public, such as senior public administrators. So they started to experiment with various maps, photography and interactive visualisations as a first step to supporting the pressing awareness process for the new spatial scale of MCRs (Thierstein et al. 2006).

Establishing multi-level governance in MCRs is based on a social learning process, a process in which the capacity to coordinate various sectoral policies on different spatial scales has to be constantly developed and renewed. This capacity building process requires four kinds of capital (Davoudi 2006): intellectual capital, social capital, material capital and political capital. Intellectual capital – socially constructed knowledge resources – needs comprehension, understanding, orientation and also creativity, social capital – the creation and maintenance of cooperation – requires coordination, motivation and commitment. As will be shown later, the potentials and possible functions of AVC are linked with and support these increasingly important resources.

Detecting current functions and tasks of well-known planning tools

When taken separately, analysis, visualisation and communication are well-known and long-standing tools of spatial planning that are gaining new importance in the context of multi-level governance in MCRs. Therefore these tools have to be adjusted and adapted to the current challenges they are expected to support – the pressing awareness issue of MCRs caused by their complex and unfamiliar qualities on the one hand and the preconditions of governance processes on the other hand.

As shown before, AVC helps to structure and gives orientation in the awareness problem in MCRs. As a consequence, the specific functions and tasks of analysis, visualisation and communication can be defined in relation to these challenges:

- the recognition of the functional spatial scope of MCRs,
- the adequate illustration and visualisation of its spatial characteristics facilitating comprehension and motivation,
- the identification and integration of the relevant actors in the governance process.

There is a mutual correspondence between these issues, therefore functions and tasks of analysis, visualisation and communication are also interdependent. So the hypothesis of the value chain approach implies the application of analysis, visualisation and communication in a strategic and coordinated way, so that these revived tools are able to reveal their full potential and to support the process of multi-level governance as a soft planning instrument.

The following paragraphs will explore the main challenges, functions and potential applications of AVC and their interaction on the basis of the awareness issue in MCRs. These will be applied and assessed later in the case study.

2.2 Analysis – Recognising the spatial scope of MCRs

The main precondition for the creation of awareness of the new spatial scale of MCRs is the choice of the adequate analytical approach. Three analytical approaches can be distinguished in the research on MCRs:

- normative-political approach
- morphological-spatial approach
- functional approach
    - physical (commuter patterns)
    - non-physical (intra-firm and inter-firm connectivity)

These different analytical approaches bring to light different spatial scales. The non-physical functional reach of MCRs is much more far-reaching in scope than the physical functional reach observed by analysing commuting patterns. Looking at morphological spatial structures – for example of built-up areas – the spatial scope is even smaller. So depending on the analytical view, the size and nature of the phenomena are very different.

When examining the functional relations that contribute to the process of emergence of MCRs (see the different definitions of MCRs in chapter one of this paper), traditional analytical methods are not sufficient. These relations can only be discovered when combining the physical functional with the non-physical functional approach that investigates functional connectivities, resulting from knowledge-intensive firm interaction such as virtual communications and business travel within and between advanced business service firms at two spatial scales: firstly, functional linkages between MCRs at an international and European level, and secondly, interdependences at a metropolitan and regional level between the different parts of MCRs, for example between core cities and the surrounding areas (Convery et al. 2006).

The recognition of the new spatial scope of the functionally defined perimeter of MCRs is a prerequisite both for the choice of the topics, themes, problems to be negotiated at the metropolitan scale, and the integration of the relevant actors in this governance process.

The understanding of MCRs as a dynamic phenomenon with the interaction of different spatial scales requires not only increased analytical effort, but also the visual representation of the analytical findings and the visualisation of this immaterial spatial structure.

2.3 Visualisation – Depicting the spatial characteristics of MCRs

Besides the analytical problem, awareness of the new spatial characteristics of MCRs is distorted because they impact upon our familiar spatial images. Spatial planners as well as policymakers are very much used to static maps with clear, predominant administrative borders, clear-cut relations that strongly stress aspects of morphology or land use. This corresponds to the importance of and fascination for satellite photography or thematic cartography. But these predominant images can also be interpreted as an expression of certain spatial concepts in the planners' and players' minds. Maps are not neutral, they always reflect a certain interpretation and concept of space (Corboz

1983). It is the supposed relationship between an image or a certain kind of map, and the way we think about spatial issues, that gives visual representations a special importance for spatial development.

The potential of a differentiated and accurate use of visualisations

As explained in the preceding section, two main functions are attached to visualisations in the value chain approach: supporting and facilitating both the understanding and illustration of the analytical findings, and their communication to the relevant actors from different backgrounds.

But what are the parameters and criteria that can help to define the qualities and capacities of visualisations? Burkhard proposes four perspectives that should be considered when transferring knowledge through visualisations (Burkhard et al. 2005):

- The function type includes functions such as attention, transfer, exploration, recall and activation. These different functions can be interpreted as referring to questions of communication strategy in multi-level governance processes.

- The knowledge type distinguishes know-what, know-how, know-why, know-where, know-who. In the context of MCRs, these categories might be extended to the spatial categories, space as distance, function or process, as well as the spatial scales of the analytical findings.

- The recipient type such as individual, group or organisation introduces a communication perspective. In processes of multi-level governance in MCRs it implies the consideration of the different stakeholders and players with their different backgrounds and interests. And finally,

- The visualisation type, which includes a variety of techniques and approaches, from sketches to maps, diagrams, models, images, interactive visualisations and storytelling.

This complex matrix of relationship and correspondence anticipates a differentiated use of visualisations according to the different framework conditions. In the context of the value chain approach it shows a variety of different links between analysis and communication.

Advantages of visualisations: Cognitive, social, emotional benefits

Visualisations add cognitive, social and emotional benefits (Eppler, Burkhard 2005). In the first stage, visualisations add cognitive benefit by supporting better and deeper understanding and insight of the complex spatial characteristics of MCRs among the relevant stakeholders and helping to gain and keep attention and to raise awareness of the contents and themes that are visualised. They can also provide new perspectives and insights. In a second stage they help in a coordination process of different players involved, as a social benefit, and increase their motivation, as an emotional benefit.

Two dimensions of making Mega-City Regions visible

Increasing awareness of MCRs by visual means can be applied to two dimensions which are basically different, but which can also be mutually interrelated. A medial perspective (i) deals with an intangible, medial work of visualisations that unfolds its effects in the minds of the people involved in the planning process. It is about the representation of the spatial characteristics of MCRs, from scientific to artistic approaches in maps, images, interactive visualisations and so on, presented in books, newspapers, magazines, websites or even exhibitions. A concrete, tangible spatial perspective (ii) works with material, visible spatial phenomena in MCRs that might support the awareness process. It aims to create relationships between the intangible functional analyti-

cal findings and the material functional and morphological space that can be read as clues or hints to the MCR spatial scale in everyday space. It can include artistic interventions in space that modify and experiment with the perception, as well as the identification and design of morphological elements with relevance and significance to the spatial scale of MCRs. The latter can be selective strategies (i), landmarks, city centres, symbols; network strategies (ii) such as public transport networks on a metropolitan scale; or open spaces of regional or metropolitan importance (iii), for instance, regional landscape parks (Primas 2006).

The task of making MCRs comprehensible to different actors

Comprehension of spatial planning: **Different degrees of complexity**	
strategic, conceptual	concrete, tangible
metropolitan scale	local scale
functional phenomena	morphological phenomena
comprehensive planning	sectoral policy issues

The likelihood of comprehension of spatial development issues by the different actors depends on the different degrees of complexity in spatial planning. This complexity oscillates between different poles (see diagram). The relations between these different poles are not always obvious to the different actors because their perspective might be concentrated on certain topics, scales, approaches. But the understanding of these interrelationships is essential for the awareness issue in MCRs. Visualisations could help to connect and communicate these different degrees of complexity and understanding. On the one hand, the functional analytical findings on a metropolitan scale have to be linked to and illustrated with concrete local issues of spatial development. On the other hand, seemingly local questions have to be given a metropolitan perspective and viewpoint.

2.4 Communication – Bringing together different worlds

From the communication point of view the pressing awareness issue of MCRs largely depends on the understanding and reconciliation of the different backgrounds and logics of the relevant actors.

Mega-City Regions are described as hubs of different spatial scales, from local to global economic activities (Thierstein et al. 2006). One expression of this function is the crucial importance of international gateway infrastructures, such as airports, to MCRs. But as a consequence, MCRs are also an intersection of people, actors, players with different ranges to their spatial activities, different areas of reference that also imply a different kind of logic and motivation for their action. Differing logic behind actions and different interests imply a variation in spatial reach of respective actions. These different worlds mix and confront one another in MCRs more than on any other spatial scale. This is where they undertake direct or indirect mutual exchange by sharing the same space.

The sociological concept of "économies de la grandeur" is helpful in interpreting the simultaneous and overlapping worlds of various interests and actors (Boltanski, Thévenot 1991). It helps the understanding of the articulation between traditional institutional boundaries and new spaces of areas such as a MCR. Therefore, we are interested in the way the numerous actors within the MCR justify the different dimensions of the emergent new spatial scale, the MCR. The concept of the "économies de la grandeur" distinguished six different "worlds", or justifications that actors use to legitimise their activities. Although originally developed in a corporate context, the sociological concept seems apt to be applied in regional contexts as well. The six "worlds" each have a distinct spatial realm of activity, an individual logic of action, and a few overarching guiding principles. They are:

- Competitiveness (representing the merchant world)
- Territorial cohesion (the domestic world)
- Efficiency (the industrial world)
- Image (the world of opinions)
- Solidarity (the civil society)
- Creativity (the world of inspiration)

In a large-scale space containing different flows, such as MCRs, these six worlds are naturally closely inter-related. The confrontation of such different "worlds" in one place can be understood in analogy to the description of the simultaneity and superposition of different "scapes", different concepts of space belonging to different social groups (Hauser 2003). In one and the same place the coexistence is possible of different claims of interpretation, conventions and land use that compete and come into conflict. At first glance these different concepts of space are quite invisible and even the different actors are not always conscious of them.

In the multi-level governance processes, these different "worlds" and perspectives have to come together, they have to be coordinated and involved in a process of reconciliation and negotiation.

So communication in MCRs faces two main challenges:

- First, there is a divergence between the spatial scale of MCRs, brought to light by analysis, and the associated issues of spatial development, on the one hand, and the sphere of reference of the actors with the corresponding perspectives and interests on the other hand. These players generally do not act on a metropolitan scale but on smaller or bigger spatial scales. Consequently they have difficulty in realising their positions and competences on the spatial scale of MCRs.
- Secondly, the communication between these different "worlds" is complex and challenging. There are not only differences of interests, professional competences or sectoral policy issues which are deemed relevant, but there are also distinct spatial realms of activity.

In the process of creating awareness of the new urban phenomenon of MCRs, communication has two main tasks or functions: the adequate transmission of the analytical findings on MCRs to the different actors, creating understanding and insight, and the motivation of these actors by showing links and interfaces between the different "worlds" and consequently opening up room for manoeuvre.

The three components analysis, visualisation and communication have been regarded separately so far, although the paper has also highlighted points of contact. Value is

added primarily when AVC work together in a coordinated and strategic way. AVC add to one another in different relationships. The value-added process doesn't run only in a linear way, but simultaneously in multiple directions. Analysis adds value to visualisations by providing the contents to be visualised, as well as to communication by detecting the different "worlds" of the actors. Visualisations facilitate understanding of analytical results as well as communication with the actors. Communication provides the knowledge for the goal-oriented transfer of contents and examines the effectiveness of visualisations for different types of recipients. To explore the potential of these different interactions, further theoretical and empirical research work needs to be done.

In the following case study the conceptual framework of AVC outlined so far will be applied and tested on a complex multi-level governance issue. The objective is first to structure very heterogeneous facts and circumstances of the awareness issue around the conflict in connection with an international gateway infrastructure in the MCR of Munich. By doing so we try to illustrate and verify the applicability and power of the value chain approach.

3   Case study

The motivation for applying AVC is provided by a large infrastructure project in the MCR of Munich. The project will secure one of the important gateway functions of the MCR of Munich, the Munich Airport International (MUC). In summer 2005 the airport enterprise, the "Flughafen München GmbH", announced the expansion of the airport. They want to build a third runway to upgrade the capacity of the airport. Many of the local communities are against the expansion. In autumn 2005 the airport enterprise started the planning process.

This project opens up the opportunity to analyse the awareness of the stakeholders. The project can show us

- how the stakeholders deal with the announced expansion;
- whether the stakeholders know about the importance of the gateway function for the MCR;
- whether the stakeholders can deal with the various spatial scales from a local to a global view;
- how the planning process works; and
- whether the project integrates a wider view of the conflict about the gateway function and the emerging MCR of Munich.

The case study will show that AVC is a practical instrument for the analysis of a typical conflict of spatial development in MCRs. The single elements of AVC, analysis, visualisation and communication, will be applied to the planning process in connection with the announced third runway.

3.1   Expanding Munich Airport International

Munich Airport International is one of the fastest growing airports in Europe. In 2005 the airport had 27 million passengers. The largest airport in Germany, Frankfurt Airport, had 52 million passengers. In recent years MUC has caught up, because Frankfurt Airport had serious problems with its expansion. The planning process in Frankfurt for a new runway has been operational for several years. Now the home carrier of MUC,

Lufthansa has decided to expanse its activities at MUC. Lufthansa is beginning to take long-haul route employees away from Frankfurt, to Munich.

In 2005, intercontinental flights grew more than European and national flights (Kerkloh 2006: 3). And also the number of transfer passengers increased to 34% in 2005 (ibid.). MUC developed its hub function, which means that MUC is used as a transfer point for passengers on the way to their final destination. "It is part of a hub and spoke model, where travelers moving between airports not served by direct flights change planes en route to their destination" (Wikipedia 2006).

MUC is a young airport, opened in 1992. Before 1992 there was a small city airport just south of the City of Munich. The present airport is located in the "Erdinger Moos", a sparsely populated area 30 km to the north of the City of Munich. The MUC site belongs to the two administrative districts of Erding and Freising. Freising is one of the administrative districts with the lowest unemployment rates in Germany.

MUC has two runways, on which planes can take off and land independently. That allows nearly 90 flights per hour, the same capacity as London Heathrow Airport. But London Heathrow has many more passengers than MUC, 68.0 million compared to MUC with just 27 million And London Heathrow also has two runways. This is an important fact and an argument for the opponents of the third runway. They ask, why should the airport expand if it has the same capacity as the third biggest airport in the world, London Heathrow?

Bigger aircraft carrying more passengers per flight take off from London Heathrow than from MUC. There are two reasons for this. Firstly, the catchment area of London Heathrow is much bigger than the catchment area of MUC and thus there is a much larger number of potential flight passengers. The second reason is the different structure of the destinations. MUC has a large number of European flights, for which MUC acts as a hub. For this, many flights with small planes are needed. London Heathrow has a large number of direct international flights to world cities like Tokyo and San Francisco, which require high capacity aircraft. If MUC shows the same fast growth as it has in the past, maybe the differences described above will decrease in future.

Today MUC has enough capacity to cope with the number of flights for which there is demand. The airport enterprise estimates that the first bottlenecks will appear in 2008 and the capacity of the two runway system will reach its limit in 2010 (FMG 2006: 1). And so the airport enterprise wants to expand the capacity of the airport from just under 90 flights per hour at present to 120 flights per hour. On the one hand, the airport enterprise wants to build the third runway as soon as possible, on the other hand, it is aware of the opponents of the third runway. And so the company emphasises the necessity of incorporating the interests of the local communities around the airport in the planning process.

In Germany there are currently planning processes under way to expand the capacities of many international airports, such as Berlin and Frankfurt. And the planning procedures in Berlin and Frankfurt are both supplemented with non-formalised processes, mediation processes, which are not regulated by law. These non-formalised processes have existed in Germany for about 15 years. It is becoming ever clearer that the opposition to the building or expansion of such large infrastructures is constantly on the increase. Criticism focuses on the huge demand on land, the growing aircraft noise, the increasing road traffic and the conflicts with local spatial development needs. The gap between the rising aircraft traffic and infrastructure demands and local requirements gets larger and larger.

The problem now is that the strong opposition produces a long planning procedure and involves more legal action. And questions are left unanswered if the spatial development conflicts are effectively reduced through the planning processes. If MCRs are to develop in a more sustainable way, these problems should be solved. The traditional sectoral planning procedures in Germany are definitely not able to solve the planning conflicts about the extension of airports, so there is a strong need for coordination of the growing gateway infrastructures in MCRs.

In Munich the airport enterprise started a new approach for the planning process. The usual formal procedure in Germany is a two-stage procedure. First, there is the regional planning procedure (Raumordnungsverfahren), then the plan approval procedure. Before starting the regional planning procedure, the airport enterprise established a board, which will accompany the planning process concerning the expansion of MUC. Local communities should be involved in discussions about solutions to the conflict. The chairperson of the forum is an independent individual. The "Neighbourhood Forum", as it is called, became operational in the autumn of 2005. Members of the Neighbourhood Forum are 24 local communities, action groups, pressure groups, aviation businesses, the Munich regional planning association and the owners of the airport enterprise (see figure 1). The owners are the Bavarian State (51%), the Federal Republic of Germany (26%) and the City of Munich (23%).

3.2   Applying AVC to the planning process

The AVC is now to be applied to the planning process introduced for the expansion of MUC. The analysis will start at the beginning of the planning process. The airport enterprise began by informing the public about its plan to build a third runway. The initial question concerns the way in which the company argues in favour of the announced expansion. Then we ask what the current issues in the Neighbourhood Forum are. Here, we can show the diffuse and fragmented perception of the MCR of Munich using the example of the gateway infrastructure, its importance of, and special conflicts surrounding it. And thirdly, we ask about the composition of the Neighbourhood Forum and discuss the strategy of the shareholders of the airport. This aspect shows the inability of the players to become aware of their positions and responsibilities in the metropolitan governance process.

3.2.1   The announced expansion from the point of view of the airport company

The first question is what the airport enterprise communicates about the expansion of the airport. What are the main topics from the point of view of the airport company? The answer to these questions will tell us about the *communication* and about the *analysis.* We don't know specifically what kind of relevant information was gathered before starting the process, but we can see some of the results by analysing the pages of the airport enterprise website relating to the announced expansion (www.airport-munich.de) and printouts of speeches from the airport enterprise CEO, Michael Kerkloh (Kerkloh 2006).

One page on the website is "frequently asked questions". Most of the questions and answers are about the capacity of MUC in comparison to other airports (see also above, 3.1). An important question is what impact the building of a third runway will have on the region. The answer by the airport enterprise firstly suggests increased noise, then the possibility for airlines to expand, particularly possibilities for increasing long-haul traffic. And the final part of the answer is about the economic impact. The text

about this is a mere three lines and it simply tells of the growing number of employees, quoting a survey.

The answer does not say anything about the nature of the estimated new jobs or about low or high qualification jobs. There is no detailed analysis of the economic importance of the airport for the airport region, the MCR of Munich, the Bavarian State, or the Federal Republic of Germany. Today, all we know is that there is a correlation between airport growth and the growth of jobs. But we don't know how this correlation comes about, and to know that is very important for the planning process for the third runway. Because knowing that, the airport enterprise can argue in a very different way why MCR Munich requires an expansion of the airport. If that information is lacking, the position of the airport enterprise in the conflict is difficult and the opponents are doing the right thing in asking about the economic benefits of the expansion.

Here we can show exactly how fragmented the perception of MCRs is. The arguments of the airport enterprise are only about the physical functional approach. The non-physical part is missing completely. And it is obvious that the airport enterprise focussed on the airport to such an extent that we might think of the airport as a single infrastructure in an empty space. Nothing is said about other influences on the region, for example about the influences of the emerging Airport City or the function of the airport as a hub for street traffic, railway traffic and air traffic.

There is a second very important missing fact. The airport enterprise argues little about the correlation to other airports. There is only the reference to the expansion of the Frankfurt Airport. But MUC is part of a national and an international network infrastructure. It is important to know that in Germany the responsibility for airport planning lies with the federal states, rather than the central government. So every federal state plans a growing airport infrastructure with a large number of small airports. Nearly every semi rural district has its own airport, and many subsidies are given to the expanding airport infrastructure.

The airport enterprise need not go into the whole of this argument, but it would be helpful if the airport enterprise would emphasise the role of MUC within the national airport system. An analysis of one of the last speeches of the airport enterprise CEO, Michael Kerkloh (Kerkloh 2006), shows the same point of view as the answers to the frequently asked questions discussed above. There is a lack of

- awareness of MUC as part of the gateway infrastructure of the MCR of Munich
- analysis of the functional correlations in the MCR of Munich and the role of MUC in relation to this
- information about the role of MUC in the national airport system.

And this is how the expansion of the airport has been *communicated*. There is poor information, no information on any correlation with the emerging MCR of Munich, and no further *visualisation*. The only thing we find in the airport documents about the airport expansion are technical maps, for example possible locations for the new runway. Because there is a lack of awareness, we find nothing about functional correlations between MUC and the MCR and other airports. The recipient is only aware of the territorial point of view, any further information is missing. And given this, the stakeholders of the planning process will probably continue with their traditional points of view. As shown, communication and visualisation of functional correlations could add value to the planning process. But at first a thorough analysis is required.

3.2.2   What are the current conflicts in the infrastructure project?

In this section we try to show the diffuse and fragmented perception of the MCR of Munich, using the example of the main planning conflicts and the institutions responsible. Regarding the analysis, the Neighbourhood Forum is informed about all the surveys of the planning procedure. The main surveys concern the possible location of the new runway, because the location has consequences for the noise diffusion and – no less importantly – for the people living there. They have to leave their houses, if the runway is to be built on their sites. The Neighbourhood Forum is entitled to be involved in the commissioning of surveys. But these rights of the Forum do not make any difference to the direction and the focus of the planning process, which is described in section 3.2.1, a focus on the traditional topics, a mostly territorial point of view, and a lack of functional topics.

For several months one of the most important topics of the Neighbourhood Forum has been road and railway traffic in the airport region. The problem is that the responsible institutions, the Federal Republic of Germany and the Bavarian State, promised a large expansion of the road and railway networks the moment MUC was initially planned. There has been an expansion, but not as promised, and several projects have failed. And now the local communities are pushing for a further expansion of the road and railway networks and will only stay in the Neighbourhood Forum if there are concrete steps towards expansion (Nachbarschaftsbeirat 2006). The local communities propose a functional point of view: they focus on a topic which is related to the expansion of the airport. If the number of passengers will increase as in recent years, there will be increasing traffic and the road and railway networks which are already overloaded, will be completely overwhelmed. The airport enterprise is aware of the conflict, but does not do much about it. And the company is also not the right institution to manage the conflict.

It is obvious that a comprehensive concept is needed which includes the whole MCR of Munich. The planned expansion of the airport concerns many more than the players in the Neighbourhood Forum, as the expansion of the road and railway networks concerns the whole of the MCR. There are more stakeholders, who are required to solve these conflicts. One of these stakeholders is the City of Munich, because the City of Munich is strongly affected by the traffic in the airport region. And then we have the Bavarian State and the Federal Republic of Germany, because they are responsible for the announced expansion of the road and railway network.

Thus, multi-level governance would be a more appropriate perspective from which to look at the unfolding conflict. The planning process currently in progress is more like a kind of "mono-level governance", "mono-level" because important (functional) topics and scales, for example the German airport system, are not included. When we talk about multi-level governance, we have to focus on the announced expansion of both the airport and the road and railway network as a challenge for the MCR stakeholders. The MCR stakeholders should manage the conflict together with the responsible stakeholders on the federal and national scale.

MUC is the eighth biggest European airport and is experiencing a strong growth. So this should determine the appropriate steps for the planning process, but as things stand we see a planning process which is more suited to the importance of a regional airport. The stakeholders act as if they were dealing with an airport of regional importance and nothing more.

In order to focus on visualisation it is important to have figures which show the main planning conflicts and the respective institutions responsible. At present, the major important stakeholders behave like bystanders; they are not integrated in the planning process as they should be. And this will be shown in the next section.

3.2.3   How is the Forum composed and what is the role of the shareholders?

The Neighbourhood Forum is fully dominated by territorial members, which are the 24 local communities, the action groups, pressure groups, and the Munich regional planning association. The Munich regional planning association could be a stakeholder in the planning process, which integrates a wider view on the conflict about the gateway function and the emerging MCR of Munich. But the planning association follows a strict territorial point of view and is without exception focused on a traditional role of regional planning.

The institutions in the Neighbourhood Forum which could take a broader perspective on the conflicts are the Federal Republic of Germany and the Bavarian State, because they naturally handle different scales and act within the multi-level governance of the European Union. They are accustomed to having access to more than one point of view; at least, they are aware of their own interests and of interests at higher levels, e.g. the European Union.

But there is a problem, which began when the Neighbourhood Forum was set up, and this is a problem of a lack of analysis. The Federal Republic of Germany and the Bavarian State should be members of the Forum, but they are not. They are only observers, not members. This is probably a problem of analysis, because as we will show, these two players are very important stakeholders in the planning process.

1. The Federal Republic of Germany has the responsibility for determining the Federal traffic infrastructure plan *(*Bundesverkehrswegeplan*)*, which configures the expansion of the national highways and the expansion of the railway network.

2. The Federal Republic of Germany also has the responsibility for the Aircraft Noise Act, and a draft for a new Aircraft Noise Act is currently under discussion. The new Aircraft Noise Act is important for the planning process in Munich because there are fears that a new third runway will cause increased air traffic noise. In the past the local communities and action groups could set higher standards of noise reduction with legal action. Now they are interested to know which standards the new law will establish.

3. The various roles of the Bavarian State are also obvious. It is not only a shareholder of the airport enterprise, but also grants permission to operate the airport and, specifically, the third runway. Thus there is a major conflict of corporate governance, because here, two responsibilities are combined, which do not fit together. This conflict of corporate governance is not communicated by the airport company.

In consequence, the main stakeholders in the conflict are bystanders in the Neighbourhood Forum and their responsibilities are not shown nor discussed. This could block the whole planning process. The planning process may possibly continue without the Neighbourhood Forum. At present we are in a difficult phase for the Neighbourhood Forum, because the local communities will only stay in the Forum if there are concrete steps towards the announced expansion of the road and railway networks, referred to above (3.2.2). The role of the Federal Republic of Germany and the Bavarian State in

this case is obvious. They have the authority to push forward the road and railway networks, and should act accordingly now.

The required minimum would have been an analysis showing the importance of the announced expansion of the airport on the different scales and the emerging MCR of Munich. Thus it is absolutely essential to improve the awareness of this multi-level conflict and the correlation with the MCR of Munich. The responsibilities of the members of the Neighbourhood Forum should be analysed and communicated. Because these basic aspects are missing, we can see a planning process which is very narrow and which stands on shaky ground. This planning process will presumably not provide a platform for innovative solutions.

4   Conclusions

AVC has the function of structuring complex multi-level problems as a supporting instrument in research and practice. Its aim is to secure a comprehensive approach to spatial development processes. It can be understood as a guide to posing the right questions in the right dimensions of the issues at stake. The instrument provides a structure that enables complex governance problems to be analysed according to the three categories AVC, and decisive interrelations to be identified.

As the case study has demonstrated, crucial questions of awareness can be identified along the three dimensions of AVC. The first and main obstacle to awareness of the multi-level governance problem is the choice of the appropriate analytical approach.

The issue of the expansion of the airport is not yet understood as a multi-level problem. The multi-level character is present in two respects: the importance and spatial reach of the airport as an international gateway infrastructure within the MCR of Munich, and the structure of the stakeholders of the airport enterprise that are active on different spatial scales.

Since the first aspect of the multi-level character is not revealed in the process of analysis the nominal stakeholders are not aware of their position and responsibilities in the planning process. There is only a little knowledge about the relationship between the airport and the local, regional and metropolitan economic structure. A second weakness at the analysis level that is not addressed at all concerns the competition for location between primary and secondary hubs in Europe and the resulting role of MUC within the European airport system.

Consequently, the conflict is negotiated at an inadequate spatial scale – it is viewed from a regional and local perspective only – and results in problems of communication and motivation of the actors involved. The communities are on the verge of resigning from the planning process unless concrete steps to realisation of the announced expansion of the road and railway networks are taken. On the one hand, the lack of any appropriate visualisation is the direct result of the deficient analysis; on the other hand, the need for such visualisation is not acknowledged. The missing visualisations are an indication of an adherence to familiar images of space – predominated by a regional and local territorial approach. Moreover the importance and challenge of negotiation and reconciliation in the planning process and the associated potentials and functions of visualisations are not recognised. Thus the difficulties of communication are intensified, misinterpretations arise. Not only is the awareness of the actors insufficient, but also the remaining actors in the planning process have little motivation. Consequently there is only little room to manoeuvre.

What has been achieved? This ex-ante application of the value chain approach of AVC to the early stages of a spatial planning process proves that the approach is a powerful instrument. Now the main opportunities and threats in the process can be better understood. Particularly crucial interactions between the three aspects of AVC have been revealed. We can further recommend some applications of the value chain approach in this planning process.

What remains to be done? The claim is that the value chain approach of AVC can be developed into a practical instrument of planning. Therefore the single components AVC have to be elaborated further. In the case study the components AVC could not be applied and assessed in equal intensity because the main obstacles in the recently-started planning process concerned mainly questions of analysis. Besides, the conceptual framework of visualisation and communication has to be set out in detail. Moreover, the value chain approach of AVC has to be conceived as an iterative process that enables the actors to start a shared learning process. Finally, generalisations about the power and applicability of the value chain need to be applied further in other equally demanding case studies. Finding the appropriate level between abstraction and contrete application is decisive for the elaboration of AVC as a workable tool for spatial planning processes.

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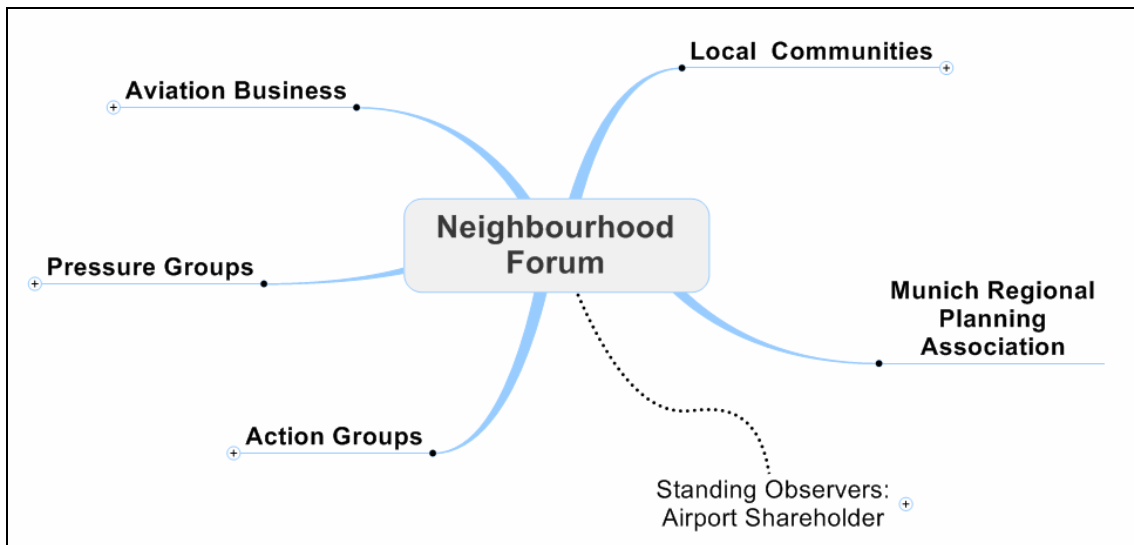
Figures

Figure 1