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Competitiveness Monitor: an integrated Foresight Platform for the German Leading-edge Cluster in Logistics

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Purpose

In 2010, the German Federal Ministry of Education and Research launched Germany's biggest research initiative in the area of logistics and supply chain management. A broad range of companies and research institutes are participating in a cluster aimed at shaping a sustainable future for the region, the logistics industry and beyond. We will present the current concept of the joint research project Competitiveness Monitor, its planned architecture, and its expected contribution to the cluster, the foresight field, and the community involved.

The Leading-edge Cluster in Logistics

The *EffizienzCluster LogistikRuhr* is synonymous for the leading-edge cluster in logistics and supply chain management (SCM) in the German Ruhr area (larger Rhine-Ruhr metropolitan region of more than 12 million people in North Rhine-Westphalia). Like all leading-edge clusters, it aims to boost innovation and economic growth in Germany by bridging the gap between science and industry (BMBF 2010). Through strategic partnerships between research institutions, companies, and other stakeholders, it fosters research with innovative potential relevant for future developments. Although leading-edge clusters are regional concentrations within Germany, they contribute to finding new ways to growth and employment that gear not only Germany's but the European Union's economy towards greater sustainability.

The EFP is financed by the European Commission DG Research. It is part of a series of initiatives intended to provide a 'Knowledge Sharing Platform' for policy makers in the European Union. More information on the EFP and on the Knowledge Sharing Platform is provided at www.foresight-platform.eu

The global goal of the *EffizienzCluster LogistikRuhr* is to secure individuality in terms of mobility and distribution in the world of tomorrow with 75% of the resources required today. Supported by the German Federal Ministry for Education and Research, the cluster aims at utilising the joint innovation capacity of scientific institutions and a variety of companies, including many small and medium size enterprises. In their work, the cluster participants address the conflict between future individuality (i.e. the demand side) and resource scarcity (i.e. the supply side).

More than 130 stakeholders from academia and business are participating in order to tackle the three central challenges: (1) efficient management of resources, (2) secure urban supply and (3) facilitation of individuality in mobility. In order to reduce the complexity associated with these challenges, each joint research project be-



longs to one of seven lead topics. These lead topics represent the central innovation schemes enabling the cluster to realise its ambitious target. Figure 1 illustrates the seven lead topics and their strategic position in relation to the three challenges identified.

As illustrated in Figure 1, different lead topics have different strategic roles in tackling the three central challenges. In this paper, we focus on the lead topic 'Activation of Cluster Potentials' as this is the area where the Competitiveness Monitor (CoMo) belongs and to which it contributes. The research project CoMo has set out to develop a foresight toolbox that builds futures knowledge around the three central challenges and supports cluster stakeholders in evaluating new strategies, processes and technologies in light of these challenges. While all innovations in the *EffizienzCluster* ultimately result in competitive advantages, the CoMo innovation especially intends to increase foresight potential and future robustness in decision making within the cluster. The integration of three foresight tools into a future-oriented IT platform where academia, business and politics co-operate will ensure a sustainable competitive advantage for all stakeholders in

the leading-edge cluster on logistics and supply chain management.

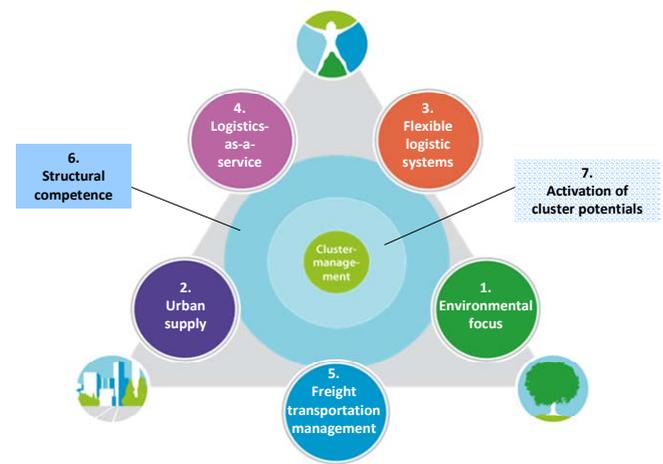


Figure 1: Lead topics and central challenges (source: ECM 2010)

The Need for Futures Orientation in Logistics

Logistics has developed from its role of delivering the right things at the right time to deciding how the right things get there in the right time (ECM 2010). During the past 50 years, logistics has evolved from individually managed, product-flow related activities to an integrated set of processes managed across the multiple echelons of a supply chain. The future of the logistics industry is characterised by many upcoming challenges and opportunities (e.g. Ruske et al. 2010). Due to the increased competition in the industry, its business has become more volatile and uncertain. In addition, the trend towards globalisation has steadily increased resulting in longer and more complex supply chains (Meixell and Gargeya 2005). Moreover, advancements in information and communication technology are currently revolutionising logistics processes. Intelligent solutions based on information and communication technology (ICT) are an essential operation, control and support instrument of such worldwide networks. Conclusively, logistics nowadays means acting in complex networks of independent but interdependent organisations. To manage these systems efficiently is one of the major challenges for the logistics service industry today.

Given all these facts, there is a considerable need for futures orientation and innovation in logistics. Innovation is an important driver of growth and competitive advantages across all industries, and its impact has significantly increased in the course of the current cutthroat competition in the logistics service industry. In best practice, both innovation management and futures research are linked and contribute to each other (von der Gracht et al. 2010). Futures research helps to cope with uncertainty in the business environment and enables actors to react faster to future developments to realise competitive advantages.

However, the potential of futures research in logistics has by no means been fully realised yet. As a consequence of increased uncertainty, the majority of logistics planners are currently unsatisfied with their planning and forecasting tools and feel that they have to change planning practices in the future. In fact, there is a strong demand to apply new and innovative techniques in strategic logistics planning.

The CoMo addresses the need for innovative foresight methods in strategic logistics planning. Importantly, this is facilitated in an innovative environment provided by the leading-edge cluster in logistics. Thus, the CoMo is not only an innovation in itself but establishes a direct link between the futures field, the cluster and innovation management for a hundred innovations of the future.

Competitiveness Monitor

The CoMo is, in the first instance, a joint research project aiming to create and convey future-oriented knowledge within the cluster. It comprises a future-oriented IT platform where science, business and politics cooperate to ensure a sustainable competitive advantage for all stakeholders and support innovations in the leading-edge cluster. This translates into four major challenges for CoMo:

- (1) Creating, linking and processing information about future macro- and microeconomic developments in logistics and its environment
- (2) Providing educative information on futures studies and teaching future skills
- (3) Incentivizing stakeholders to systematically deal with their futures and foster innovation
- (4) Stimulating cooperation among stakeholders

In order to address these challenges, we developed a CoMo architecture that integrates three innovative foresight tools. The structure and interrelation of the tools is illustrated in Figure 2 and elaborated on in the subsequent sections.

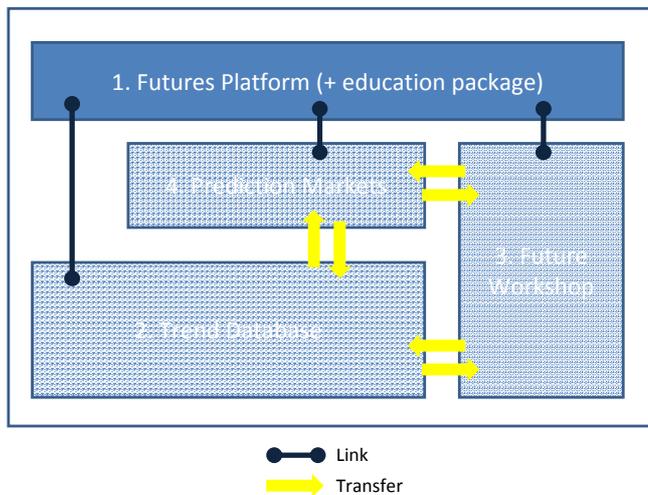


Figure 2: Conceptual framework of the Competitiveness Monitor

Since June 2010, the joint project team has been involved in intense scientific desk research and analysis, requirement analyses, conceptual development as well as multiple participatory workshop sessions with external experts. So far, a solid foundation for the CoMo joint research project has been established. Roughly 1,000 ideas (or requirements) for tool functionalities and interfaces have been identified, classified and prioritised. Requirements have been classified according to applications (Futures Platform, Trend Database, Future Workshop, Prediction Markets, or app-interlinkages), type (functional, non-functional or constraint) and categorical

purpose (e.g. user collaboration). A three dimensional framework consisting of (1) feasibility, (2) innovativeness and (3) importance was developed to narrow down and evaluate requirements. The outcome and status quo of our analysis together with related theoretical foundations are discussed in the following sections.

Futures Platform

Our Futures Platform is intended to serve as the users' personalised login portal. Users can interactively individualise their Futures Platform according to their interests by, for instance, saving trend favourites, displaying related information or following a certain Prediction Market. This flexible and individualised structure offers an individual decision-making environment that increases ease and encourages overall use. Furthermore, users communicate directly through the Futures Platform to elaborate on future-relevant topics. The three applications Trend Database, Future Workshop and Prediction Market are linked to the platform and can be accessed from there; users can ask experts to help them get started and assist them in applying these tools.

Since the provided tools are of an innovative kind, the platform will include an educational self-learning package, structured in a curricular form. This educational part will reduce uncertainty and assure that newcomers to strategic planning and foresight can use the platform to build foresight competencies.

Trend Database

Our Trend Database concept represents the quantitative and qualitative pool of future-relevant knowledge that is provided to and by the cluster actors. A user may query future-oriented numbers, data and facts about specific logistics-related topics or weak signals, wildcards and disruptive events. Similarly to the Futures Platform, the Trend Database embodies elements for users to cooperate. By allowing and encouraging users to share individual wisdom, overall wisdom increases (Surowiecki 2004). Another characteristic feature of the Trend Database is the linkage of its architecture in three dimensions using a semantic structure: (1) the linkage of trends among each other, (2) the linkage of the Trend Database with the tools Prediction Market and Future Workshop, and (3) the linkage of the Trend Database with external data pools.

In sum, the Trend Database will perform the function of an intelligent unit within the CoMo that generates and links future-relevant knowledge facilitating cooperation among the stakeholders of the cluster and reducing complexity. The possibility to acknowledge trends early and systematically creates significant competitive advantages for the cluster and ensures sustainable management and action in the field of logistics.

Future Workshop

The Future Workshop app represents the element of CoMo where trends are systematically projected into individual futures and recommended options and actions can be derived. The fundamental idea of a Future Workshop was developed by Robert Jungk, Ruediger Lutz and Norbert R. Muellert in the 1970s (originally termed “*Zukunftswerkstatt*” in German; Jungk and Muellert 1988). Our internal analysis as well as experience from the expert workshops has shown that scenario planning, roadmapping, back-casting and Imagineering provide valuable elements for a Future Workshop. This led us to consider best practices from these four approaches in designing the Future Workshop in order to establish a valid and reliable web-based foresight process.

Our Future Workshop app will allow users to use the Trend Database as a discussion basis and digitally collaborate in global or private workshop environments. Stakeholders of the cluster, for example from a certain company, are led through a process of problem identification, innovation and

creativity towards problem solving while spatial boundaries are overcome. In the process, Future Workshops will facilitate a future-oriented strategic logistics planning.

Prediction Market

The requirement analysis for the CoMo Prediction Market app revealed promising applications for stakeholders in the leading-edge cluster. Our CoMo Prediction Market app will supplement Future Workshops and the Trend Database by providing an innovative foresight method that generates futures knowledge and by complementing the CoMo platform. Prediction markets originally evolved in psephology and proved to provide significantly better forecasts than classical opinion polls – for this reason, they have recently been transferred into the business world (Ho and Chen 2007). In the Prediction Market app, CoMo users will be able to bet on the outcome of future events in a virtual environment. A single stock price represents the aggregated wisdom/knowledge of all market players while competition in the market ensures efficiency in aggregating asymmetrically distributed information.

Platform to Enhance Future-oriented Decision-making

The CoMo will provide a platform that utilises the cluster's unique combination of more than 130 partners from business, academia and politics in order to share complementary resources, specifically to share knowledge

that is relevant to their future-oriented decisions. The combination of a Trend Database, a Future Workshop app, and a Prediction Market app will facilitate cooperation, will provide a shared future-relevant knowledge base, and individual future-oriented decision support. Ultimately, the CoMo contributes to the major goal of the leading-edge cluster by enhancing the quality of the stakeholders' future-oriented decisions.

References

- BMBF (2010). Germany's Leading-Edge Clusters. Division for New Innovation Support Instruments and Programmes. Berlin, Bonn, Bundesministerium für Bildung und Forschung / Federal Ministry of Education and Research (BMBF).
- ECM (2010). 100 Innovationen für die Logistik von Morgen. Mülheim an der Ruhr, Dortmund, EffizienzCluster Management GmbH.
- Ho, T.-H. und K.-Y. Chen (2007). New Product Blockbusters: The Magic and Science of Prediction Markets *California Management Review* 50(1): 144-158.
- Jungk, R. and N. Muellert (1988). *Future workshops: How to Create Desirable Futures*. London, Institute for Social Inventions.

- Meixell, M. J. and V. B. Gargeya (2005). Global supply chain design: A literature review and critique. *Transportation Research Part E: Logistics and Transportation Review* 41(6): 531-550.
- Ruske, K.-D., P. Kauschke et al. (2010a). *Transportation and Logistics 2030 – Volume 2: Transport infrastructure – Engine or hand brake for global supply chains?* Duesseldorf, PricewaterhouseCoopers.
- Surowiecki, J. (2004). *The Wisdom of Crowds: Why the Many Are Smarter than the Few and How Collective Wisdom Shapes Business, Economies, Societies, and Nations*. New York Doubleday.
- von der Gracht, H. A., R. Vennemann et al. (2010). Corporate Foresight and Innovation Management: A Portfolio-Approach in Evaluating Organizational Development. *Futures – The journal of policy, planning and futures studies* 42(4): 380-393.

About the EFP: Policy professionals dealing with RTD, innovation and economic development increasingly recognize a need to base decisions on broadly based participative processes of deliberation and consultation with stakeholders. Among the most important tools they apply are foresight and forward looking studies. The EFP supports policy professionals by monitoring and analyzing foresight activities and forward looking studies in the European Union, its neighbours and the world. The EFP helps those involved in policy development to stay up to date on current practice in foresight and forward looking studies. It helps them to tap into a network of know-how and experience on issues related to the day-to-day design, management and execution of foresight and foresight related processes.