

## News

### New LogDynamics Member: Dr. Till Becker Brings Competence in Production and Logistics Systems



Since March 2014 Dr. Till Becker is head of the newly created cooperative research group Production Systems and Logistic Systems of the Production Engineering faculty at the University of Bremen and of the BIBA institute. The aim of the research group is to improve the cooperation between the faculty and the BIBA, especially enhancing and strengthening the area of logistics. Dr. Becker joined the research cluster LogDynamics in May 2014.

Till Becker studied business information systems in Münster and worked after his graduation with PricewaterhouseCoopers in Düsseldorf as a consultant and IT auditor for two years. Following this he joined the Jacobs University Bremen as a research associate and worked for the SFB 637 in the area of autonomous control. His PhD project focused on interdisciplinary modelling of biological and logistical processes. In that time he also spent three months as a visiting researcher at ETH Zürich. He completed his PhD in 2012 with special distinction and stayed as postdoctoral researcher at the Jacobs University until he joined University of Bremen.

The research group focuses on the interplay between topology and dynamics in complex networks in manufacturing and logistics, robustness in production systems, and the utilization of large-scale data sets in logistics. In August two new scientists joined the team of Dr. Becker.

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### Support for LogDynamics from the Jacobs University: Prof. Julia Bendul



Since May 2013 is Dr. oec. Julia Bendul junior professor for Network Optimisation in Production and Logistics at the Jacobs University Bremen. In May 2014 she joined the LogDynamics Research Cluster as 20 member.

Together with her Team consisting of nine people she is now looking for innovative approaches for designing and controlling machine, transport and infrastructure networks. Tools that are going to be used are data mining, mathematical optimisation methods and simulation studies. The focus of the team is in particular on an interdisciplinary cooperation between biology, psychology, physics and informatics to identify new problems and solutions in network research.

The team supports different businesses of different sectors developing intelligent planning and controlling approaches in situations with high complexity.

### Bremen Research Cluster for Dynamics in Logistics

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The activities exceed concept development and can also enclose developing an integration of such IT systems. Human perception and decision making are therefore regarded. The team provides an important contribution to the realisation of the controlling side for the realisation of Industry 4.0.

Another focus of the research activity is social production. Here the team studies approaches for simplifying production and assembling for development cooperation or cooperating with psychological or physical handicapped persons.

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## Projects

### Joint Work of Humans and Robotic Systems

Mighty robots with huge physical power are used in the industrial production. Only separated by a huge distance from robots or protected through walls human labour can be done. This strict separation due to work safety leads to reduced productivity and a high degree of planning for the production line. Effective cooperation works differently. The Technologie-Zentrum Informatik und Informationstechnik (TZI) at the University of Bremen and the Bremer Institut für Produktion und Logistik GmbH (BIBA) want to change this in the three years lasting project InSa, which is funded with 2.2 million Euro, by the German Federal Ministry for Economic Affairs and Energy in the context of the future topic area "AUTONOMIK for Industry 4.0".



Together with the project partners: Neusta Mobile Solutions GmbH as project coordinator, Thyssen Krupp Systems Engineering GmbH and S-GARD Schutzkleidung, the institutes aim to ensure the safety of the human worker through sophisticated sensor technology. "The robot needs to notice a barrier and stop or move out of the way straight away. The robots have to react in less than 20 Milliseconds. This is a challenge", explains Eckhard Wellbrock, in charge of the project at Thyssen Krupp System Engineering. The robot is supposed to interact with sensors integrated in the clothes of the human worker. "Furthermore it has to guaranty the safety distance through a sort of aura", is what S-GARD Schutzkleidung CEO Bruno Schmitz explains. The prototypes, which are being developed will be tested at Thyssen Krupp System Engineering, where industrial production lines are manufactured.

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## Demographic Change and Progress: Competence in Labor Processes Development



Considering the demographic, technological and structural changes, classic work organisation, labour politics and competence models are reaching their limitations. Even in medium terms there is a need for a solution. This is what a research project coordinated by the BIBA – Bremer Institut für Produktion und Logistik GmbH is currently occupied with.

The research project “Arbeitsprozessorientierte Kompetenzentwicklung für den Hafen der Zukunft” (ArKoH), which is due to last 39 months, mainly considers the maritime economy, but the results can also be transferred to other industry branches. The scientists are investigating the future development in the production and installation of offshore components and other port oriented activities. The project is funded by the German Federal Ministry for Education and Research and is supervised by the DLR (German Aerospace Center). Project partners are the BIBA, the ITB, the TST – Trainingscenter für Sicherheit und Transport GmbH (Bremen), the M.I.T. e-solutions GmbH (Friedrichsdorf) and the Logistik Service Agentur GmbH (Bremerhaven). The BIBA is doing the projects coordination. Furthermore the Bremen Chamber of Commerce, the Maritime Cluster Norddeutschland (Hamburg) and the Puma-cy Technologies AG (Berlin) are involved. Among other things, they support the project with their expertise.

The goal of the partners is to focus on the technical, economical and demographical development and analyse the working process, to derive further educational concepts and recommendations for organising work. This is where they rely on learning with the help of games (Serious Gaming), which can be used effectively, cheap and timesaving while working.

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## The Monthly RWI/ISL Container Throughput Index

Since early 2012, the Institute of Shipping Economics and Logistics (ISL) and the Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI) are publishing a monthly index for global container throughput which aims to provide reliable conclusions on short term trends in worldwide economic activity. The RWI/ISL Container Throughput Index uses the fact that international trade is primarily handled by ships and containers, which means the container throughput in ports is an important indicator of global trade. Currently, the database consists of 75 international ports covering more than 60% of world container handling. These ports are continuously monitored by the ISL as part of their market analysis.



Calculating the Container Throughput Index starts about 25 days after the end of each month with a flash estimate. At that time several ports have already published information about their activities in the last month, details are available at relatively short notice. A month later, the data of more than 65 ports are usually available for the previous month. Thus, in addition to the initial estimate for the actual month, a correspondingly revised value for the previous month is published. This makes the Container Throughput Index to a significantly faster instrument than other used indicators of the international exchange of goods.

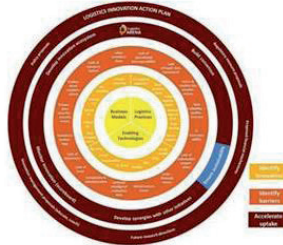
Calculations since 2007 show that the Container Throughput Index is very closely correlated with the data on world trade, which are published by the International Monetary Fund (IMF). In particular, during the financial and economic crisis in 2008/2009, the index provided reliable data. As the German economy is heavily export-oriented, the assessment of the international economy is an essential basis for analysis. Against this background, the RWI/ISL Container Throughput Index helps to forecast the German economy effectively.

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## Logistics Innovation Uptake

The EU funded project LOGINN, in which both BIBA and ISL participate, focuses on innovation uptake in Logistics. But what is actually Logistics innovation and why is the uptake so slow? Trying to decompose this issue we got valuable insight on the ways it can be fostered. Based upon a review on research projects and relevant scientific journals, LOGINN has identified a number of innovative solutions related to each one of its innovation dimensions. These solutions included business models such as crowdsourcing and the green supply chain, practices involving e-freight & paperless transport and best practice collection and exchange tools, and supporting technologies such as big data and cooperative systems, at the same time also several barriers.



LOGINN also provides access to more industrial driven initiatives. The search for relevant information on new innovations implemented within the logistics and transport sector can be seen as one of the major barrier, as it is often both difficult and time consuming. To this respect LOGINN provides a collaboration platform where you can access the findings, discuss and get the latest news on research with in the field ([www.logisticsarena.eu](http://www.logisticsarena.eu)).

In addition, to enhance the capability to search for relevant content, the LogisticsArena has been invited to join a new initiative: the Supply Chain Brief ([www.supplychainbrief.com](http://www.supplychainbrief.com)). It aims at delivering content specifically relevant for logistics professionals. This site and newsletter brings together the largest set of industry thought leaders writing about Supply Chain Management, Logistics, Transportation, Warehousing, Manufacturing and other topics for Supply Chain and Logistics professionals. It uses tools like social network analysis to register trends, interests and activities among supply chain and logistics professionals.

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## CASSANDRA - Improving Security through Visibility

As one of ISL's security research projects, CASSANDRA - Common Assessment and Analysis of Risk in Global Supply Chains, funded by the EU Commission's 7th Research Framework Programme, was successfully completed in spring 2014. The aim of CASSANDRA was to improve security by optimizing the visibility of the already existing information. To do this, 26 partners from 10 different European countries worked together with a focus on electronic data traffic to develop a new data sharing concept on the basis of a risk-based approach for businesses and authorities.

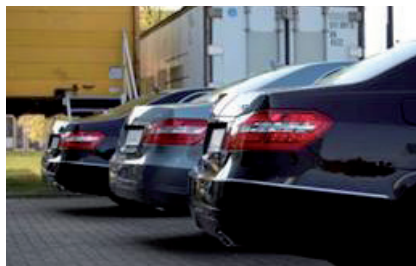


To be able to efficiently exchange more secure and more reliable data on the whole supply chain, harmonization was required of the systems operated by the logistics and IT companies involved, as well as the customs and border control authorities, not to mention the different players involved in the ports. The most important innovation derived from this project in this context is the development of a Data Pipeline for exchanging information along the whole supply chain, to enable the establishment of an open, flexible and standardized communications setup. Furthermore, Dashboards to support businesses and customs for risk management and supply chain visibility have been implemented. Another significant building block of CASSANDRA is the Piggy-backing Principle. Businesses can share supply chain data for risk management, and the same data can be optimally re-used for governmental purposes. The existing data paths and data channels have been investigated in so called Living Labs, in an exemplary way for the three global trade routes: Asia-Europe, Europe-USA, and Europe-Africa. The Living Lab Europe-USA for instance involved ISL working together with the Bremen Senator for Economy, Labour and Ports, and dbh logistics IT AG, in analyzing the data traffic at the Bremerhaven container terminal. Special attention has even been paid to the Data Accuracy and the restrictions specified by businesses with respect to data exchange and data security.

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## Survey about Optimization Potentials at the Interface of Production and Distribution in Vehicle Manufacturing



The distribution of vehicles has great potential for optimizing key performance indicators and the customer satisfaction. Due to the outsourcing of vehicle transportation to third party logistics providers there is a cross company interface in adjacent processes of production and distribution. This interface however brings challenges, which leave room for improvement potentials.

In order to identify these improvement potentials, interviews with experts, who are working in the vehicle distribution, are held. In the course of these interviews very interesting results have been received. By an online survey these results are supposed to be verified and investigated in detail.

If you are one of these experts from the field of vehicle distribution, **we would appreciate your participation in the online survey which you can find at the following link:** [umfrage.ips.biba.uni-bremen.de](http://umfrage.ips.biba.uni-bremen.de)

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## Online Poll Concerning the Relevance of ‘Smart Textiles’ to Support Aging Worker in Production and Logistics

Within the project EUNA, funded by the German Federal Ministry of Education and Research (BMBF), the BIBA at the University of Bremen together with the ITA at RWTH Aachen University conduct an online poll about the potential contribution of ‘Smart Textiles’ to enable participation of aging employees at the labor market in production and logistics oriented branches. The project results will be disseminated by a vision paper and video.

**It would be very kind and helpful if you support the poll and fill out the associated questionnaire: [umfrage.ips.biba.uni-bremen.de](https://umfrage.ips.biba.uni-bremen.de)**

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## Logistics Experts from Jacobs University Supporting the “Smarty” Social Project by Mercedes-Benz



Jacobs University logistics specialists are bringing their expertise to a social project initiated by Mercedes-Benz managed by Martinshof (represented by Andreas Beyreitz) and in cooperation with the University of the Arts Bremen, the Faser Institut Bremen and InnoWi.

The idea behind the Smarty project is to develop an ultra-light and practical „Bollerwagen“ (handcart) that can be used in kindergartens and daycare centers. The Smarty handcart will be produced by people with disabilities in a production facility run by Martinshof. It has been designed by Martin Jünemann and Silke Grimmelmann from the University of the Arts Bremen with face-to-face seating arrangements for eight children to foster interaction between the kids. An innovative 4-wheel steering system (patent pending) developed by Dr. Christian Heßling (Mercedes-Benz) ensures that the Smarty can be easily maneuvered while the use of composite materials and unique body design leads to a reduced weight of the cart.

In order to facilitate and clarify the assembly process in a scientific manner and take into account the assembly requirements for putting the project into practice, the Production and Logistics Network (PLN) group at Jacobs University recently held a workshop for all parties involved in the project. The logistics experts under the lead of Julia Bendul, Assistant Professor of Network Optimization in Production and Logistics, brought together all the knowledge from the project, in order to work out and consider the challenges and restrictions such a production process could pose for people with disabilities.

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### International Research Collaboration between Izmir University of Economics and Department of Logistics Management



Assistant Professor Dr. Isik Özge Yumurtaci from Department of Logistics Management at the Izmir University of Economics was visiting the Department of Logistics Management as guest researcher from 31st of July until the 19th of September 2014. Her research is focused on supply chain/logistics management, retail supply chains and performance measurement. The goal of Dr. Yumurtaci's stay in Bremen was the intensification of an on-going research collaboration in the area of theory development in Supply Chain Management. Together with Prof. Dr. Herbert Kotzab, chair of Logistics Management at the Faculty Business Studies & Economics, a questionnaire for a large-scale empirical survey research amongst leading Turkish manufacturing companies was developed. The focus of this research is in the investigation of the relationship between Supply Chain Management Practice, Supply Chain Performance and Firm Performance.

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### From Asia to Europe – and Vice Versa

On 8th September Lucy Schott started a study visit in China funded by the Erasmus Mundus project FUSION (Featured Europe and South Asia Mobility Network). In this mobility programme she is the first undergraduate from Bremen to study a semester of Production Engineering at the Zhongyuan University. FUSION is one of three exchange programmes between Asia and Europe of the International Graduate School for Dynamics in Logistics (IGS). The programmes foster exchanges on any university's qualification levels, funded by the EU until the end of 2018. cLINK (Centre of Excellence for Learning, Innovation, Networking and Knowledge) started in 2013, gLINK (Sustainable Green Economies through Learning, Innovation, Networking and Knowledge Exchange) will start in December.



14 fellows from Asia arrived already in Bremen. 6 returned to their home countries as ambassadors of the excellence of the international education within *LogDynamics* at the University of Bremen. One of them returned as doctoral candidate. That is a success of ERASMUS MUNDUS and an indicator for the increasing international visibility of the IGS. Lucy Schott could be one of the future doctoral candidates of the IGS. Considering her interest in international exchange she would go best with these interdisciplinary doctoral training programme of *LogDynamics*.

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## Logistics for Wind Energy – Challenges and Solutions for the Modern Wind Plants Industry Symposium



Date: December 3, 2014  
Location: BIBA, Bremen

The wind energy sector on sea (Offshore) and on land (Onshore) is confronted with the task of cutting expenses in the production of electricity. Substantial efficiency potential lays in a lifecycle crossing view and an optimisation of the whole supply chain – from the product development over the transportation to the recycling. The term “wind energy logistics” combines different concepts, processes and technologies that provide a crucial contribution to this goal. The industry symposium “Logistics for Wind Energy – Challenges and Solutions for Modern Wind Plants“ brings together important stakeholders and research facilities of the sector. Task and approaches to logistic question marks along the lifecycle and the successful dealing with elements of uncertainty (wind, weather, gearbox failure etc.) along the supply chain are being discussed. As a critical success factor for the expansion of the industry sector in Germany and Europe, the symposium offers valuable impulses for the future development of logistics for wind energy.

The symposium is supported by: Research Cluster *LogDynamics*, ISL – Institut for Shipping Economics and Logistics, BIBA – Bremer Institut für Produktion und Logistik GmbH, Wirtschaftsförderung Bremen (WFB) und WAB e. V.

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## Robotics in Interaction with Innovative Information and Communication Technologies – Seminar and Innovation Workshop



Date: November 13, 2014  
Location: BIBA, Bremen

Modern technologies are a basis of innovations which meet specific tasks or open doors for completely new products and services. In the context of the project Robotics in Logistics, *LogDynamics* Lab provides individual workshops for companies. The competences are transferred in the following three steps:

- 1) Technology and basic knowledge
- 2) Experience and explore technology
- 3) A moderated workshop for identifying potentials in the companies.

The workshop provides the participants with the knowledge on how to use RFID effectively in their processes. They will learn about state of the art RFID technologies and about the standards and potentials in the context of automation and robotics. A focus is set on the integration in business information systems. Qualified and experienced experts will introduce the RFID technology in the context of robotics and automation.

The content of the workshops can be according to your requirements:



- Introduction, overview of storage devices, encoding
- RFID compared to barcode and other technologies
- Coupling with existing IT systems, automation and robots
- Practical experience of the installation, use and maintenance of different RFID systems.

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## ISL Maritime Conference 2014



Date: October 1 - 2, 2014  
Location: City Hall, Bremen

On 1st and 2nd of October, the Institute of Shipping Economics and Logistics invites to the ISL Maritime Conference 2014 in Bremen and continues its traditional convention series. As in previous years, the participants are expected to listen to exciting presentations, discussions and outlooks concerning the present state and perspectives of the global maritime sector. The focus of the referents from economy, science and politics is on the shipping market, the ports and the hinterland. The planned sessions are: "Changes in the Global Transport Markets I + II", "New Business Models and Innovation in Maritime Logistics Processes" as well as "Influences of new Information and Communication Technologies to Maritime Logistics". Furthermore, a panel discussion concerning the "Status and Perspectives of the Maritime Alliance" will be held.

This year's additional highlight is the 60th anniversary of the ISL. At the evening of the first conference day, the guests are invited for a reception of the Senate of the Free Hanseatic City of Bremen. The ISL Maritime Conference, which is held in Bremen every two years since 2008 again, has a long history. It stands in tradition of the former Liner Shipping Conferences, which were organized by the ISL in the seventies and eighties as an important event for maritime economics, politics and science.

In this context, the team of the ISL is looking forward to welcome their guests to the Maritime Conference 2014 in the historic Town Hall of Bremen - the place, where the Institute of Shipping Economics and Logistics was founded.

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## The World of Logistics

Date: September 25, 2014  
Location: BLG-Forum, Bremen

Also 2014 there will be a large event organised by VIA Bremen in the BLG-Forum: "The World of Logistics – More than a Job and Career" is traditionally addressed at the young audience. The event offers exhibition, presentations and further activities. Log-Dynamics is again participating in the event and presents itself on a common booth with its member institutes BIBA and ISL.



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## RFID Congress 2014

Date: September 29 - 30, 2014  
Location: Rheinterrasse,  
Düsseldorf



It is already the fourth time in a row that the magazine "RFID im Blick" invites users, technology providers, and all those who want to change processes using RFID in the future to visit the trade conference in Düsseldorf. New this year is that the conference will take place on two days. The first event day focuses on technological topics from the developer's point of view. An advisory board composes the lecture program innovatively and up-to-date, substantially addressing representatives from technology companies. The first event day is the Developer Day.

Also this year the Bremen Research Cluster for Dynamics in Logistics (Log Dynamics) and its member institute BIBA will be represented within the trade exhibition demonstrating innovative solutions for the logistics sector.

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## LogDynamics at the 31st German Logistics Congress

Date: October 22 - 24, 2014  
Location: InterContinental und  
Pullman Berlin Schweizerhof,  
Berlin



The 31st German Logistics Congress in Berlin themed "Complexity, Costs, Cooperation" takes place on 22nd to 24th of October 2014. The research cluster LogDynamics is again participating in the parallel exhibition – for the first time on the common booth with the VIA Bremen. We invite all congress participants, who are interested in innovative solutions for logistics to the LogDynamics booth No. 5 in pavilion (PV/05). This year we will highlight innovative technologies to realize Industry 4.0.

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## BIBA and BIK at the WindEnergy 2014

Date: September 23 - 26, 2014  
Location: Messe Hamburg

The Bremer Institut für Produktion und Logistik GmbH (BIBA) and the Institute for Integrated Product Development (BIK) will show their innovative concepts and research results in the area of offshore wind energy at the leading international wind industry fair „WindEnergy“ in Hamburg. Both research institutes work on technological developments along the life cycle of offshore wind energy plants. Beginning with the first idea for the development the research focus also includes the process from the production to logistics until the implementation of the plant at sea and the operation and service. From 23rd until 26th of September 2014 scientists from both institutes will be presenting selected projects and inform about their research and development results at the fairground in Hamburg (Hall B4 EG, Stand 112).



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## SysInt 2014 – A Research Forum towards the Fourth Industrial Revolution



More than 120 scientists from twelve different countries discussed the many facets of intelligent technical systems in the first days of July. The occasion was the “2nd International Conference on System-Integrated Intelligence” (SysInt 2014), which took place from 2nd to 4th of July 2014 at the University of Bremen. The program included 104 lectures, a poster exhibition, workshops and guided tours in the institutes.

The conference topics reached from methods to develop intelligent systems to hard and software that enable these systems. Currently approaches of this kind are in focus of science and industry as so called “Cyber-Physical Systems”. Fields of application can be found in the surveillance of the structural integrity of wind energy plants, airplanes or robotics, production technology, and logistics. Next to the technological background of intelligent systems the use in production and logistics – under the term “Industry 4.0” – will be one of the main topics of the conference.

Organisers of the SysInt conference series are the research clusters of the universities of Bremen, Hannover and Paderborn, which are represented through the research cluster *LogDynamics* and the Scientific Centre ISIS, the collaborative research centre SFB 653 “Intelligent construction parts in their lifecycles” and the top cluster “Intelligent technical systems Ostwestfalen-Lippe”. The research centres were supported by an international program committee, the International Academy for Production Engineering (CIRP) and the German Research Foundation (DFG). After the first conference 2012 in Hannover it took place in Bremen the following year where the number of participants was doubled. The next conference will be held 2016 in Paderborn.

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## Intelligent Food Logistics

An interdisciplinary group of scientists at the University of Bremen has been working since ten years on the “Intelligent Container”. A more accurate monitoring of cooled transports is supposed to reduce the losses in food chains. The project is coordinated by Institute for Microsensors, -actors and -systems (IMSAS) and supported by the Microsystems Centre Bremen (MCB) and the research cluster Log Dynamics.



Now, the “Philosophical Transactions A” from the London Royal Society, one of the most prestigious and oldest scientific magazines has devoted a whole issue to food logistics and has entrusted the teams in Bremen with the publication. The need to feed an ever-increasing world population makes it obligatory to reduce the millions of tons of avoidable perishable waste along the food supply chain. Shelf life as the remaining time span, after which the quality drops below an acceptance threshold, is often reduced by deviations from the optimal cold chain conditions, where the added shelf life loss from deviations is physically invisible until much later in the supply chain. This issue summarizes a variety of approaches to detect and quantify these deviations, making shelf life variation known, by remote monitoring.

Sensor systems measure temperature, humidity and concentrations of characteristic gases and the effect of deviating values is evaluated by biological models. Based on early detection of shelf life losses, it is possible to apply new strategies for supply chain and warehouse management, e.g. intelligent stock rotations and routing according to first-expired-first-out (FEFO) principles. In three case studies it was shown that improvements are possible in almost any perishable food chain by better pre-cooling, adequate postharvest treatments and permanent monitoring of cold chain conditions and product quality.

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## Transparency in Global Automobile Industry Supply Chains: Approaches for Optimising Logistics and Production

The book provides the most important results from the science project RAN (RFID-based Automotive Network), on which Log Dynamics scientists were involved, to a large audience. Dirk Werthmann from the Bremer Institut für Produktion und Logistik GmbH is one of the authors. For the first time ever there is a consistent concept for integrating logistical processes, the definition of the events contained within, the infrastructure for cross-company exchange, the use of RFID-Technology and the monetary valuation of results. These concepts will influence the processes in the car industry for the next years.



The issue describes the requirements of the German car and supply industry, state of art and methods for monitoring the flow of materials in the supply chain and the control of logistics and production processes. It provides knowledge of the networks in the car industry and solutions for a standardised uptake and real time transfer of object following data between different companies. It also shows the potential of RFID to identifying objects and presenting solutions for the evaluation of object following data. This is where it is made distinct that RFID technology does not only optimise the automation of manual processes, but can also assist finding decisions in a variety of processes.

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