Optimize Operations and Cut Costs with the Fraunhofer IFF

– Kranbau Köthen Reduces Production Cycle Time by One Third
– Salutas Pharma GmbH Optimizes Its Logistics Operations
– Systematic Perishable Goods Logistics: Depotless Distribution Is Becoming Reality
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Dear Readers,

All businesspeople want to cut their costs. And whenever possible, to organize their processes more efficiently, too. Where is one to begin, though? The best place is wherever still unused potential lies dormant. Such potential has to be identified in the first place, though. This is not so easy when the everyday routine, often influenced by the effects of the global economic crisis, is confronting businesspeople with new challenges every day. This is the starting point for research and development from the Fraunhofer IFF. Our experts have exact knowledge of companies’ needs. Their extraordinary know-how has been formed by years of experience in industry projects and work in distinct corporate environments. They support their partners with their creativity and researching spirit, develop customized concepts for corporate practice and, in the process, help implement new ideas for innovative products and processes.

Some examples of implemented sustainable concepts are presented in this issue of the IFFocus, the magazine of the Fraunhofer Institute for Factory Operation and Automation IFF in Magdeburg. For instance, Kranbau Köthen GmbH searched together with the logistics experts in Magdeburg for potentials that accelerate manufacturing. With success: They were able to reduce the cycle time of their crane production by one third, while intensively involving their employees all the while.

Salutas Pharma GmbH also had its sights on a very concrete goal an also relied on the support of the Fraunhofer’s logistics to achieve it. The warehouse and shipping department was already a model of advanced and efficient logistics. Nonetheless, it could be and was optimized even further.

The company Fresh Parcel comes from a completely different industry. The company is using a completely new distribution methodology for its perishable goods logistics, which functions entirely without depots. The logistics experts from the Fraunhofer IFF are also collaborating on optimizing the distribution system. Intelligent localization technologies produced and tested in the Galileo Test Bed’s development lab are playing a key role here.

What technologies will be your compass pointing to the future? What innovations will secure the crucial edge for your company over the competition? I would be pleased when this magazine gives you inspiration for new ideas and projects. Then, the researchers from the Fraunhofer IFF in Magdeburg would be glad to support you in order to help you perfect your products and processes and, thus, optimally prepare you for the next challenges in the future.

Your,

Prof. Michael Schenk
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SAXONY-ANHALT GALILEO TEST BED’S DEVELOPMENT LAB OFFICIALLY OPENED IN MAGDEBURG

Germany’s most advanced development lab for localization, navigation and communication in transportation and logistics was officially opened in March of this year. Here, the Fraunhofer IFF, Otto von Guericke University Magdeburg and its research partners will be developing and testing state-of-the-art satellite applications for the transportation and logistics industry, public transportation, telematics and radio communication.

The long range goal is to combine different transportation, logistics and mobility technologies to develop new logistics services, e.g. by integrating dynamic traffic data for intelligent and environmentally conscious delivery logistics in the smart city, by developing new container concepts for perishable goods logistics of the future or integrating new radio technologies for an intelligent port. With Germany’s most advanced test bed, the Fraunhofer IFF and its partners are establishing a center of expertise for innovative transportation and logistics systems.

“Transportation and logistics industries emphatically welcome the Galileo development lab in Saxony-Anhalt,” according to Prof. Michael Schenk, Director of the Fraunhofer Institute for Factory Operation and Automation IFF Magdeburg, “because telematic applications of globally operating companies such as the world’s leading logistics provider Deutsche Post DHL or even local carriers can be systematically tested and refined here.” The new logistics provider Fresh Parcel operating throughout Germany presented itself at the opening of the Galileo test bed as a future partner.

The nearly three million euros of investments in this Galileo project are being financed by funds from the state and the Economic Stimulus Package II. Regional partners in the operation of the test bed are the Institut für Automation und Kommunikation ifak, the Fraunhofer Institute for Factory Operation and Automation IFF, the Hallesche Verkehrs-AG (HAVAG), the City of Magdeburg and the Magdeburger Hafen GmbH.

13TH IFF SCIENCE DAYS: NEW LOGISTICS PLATFORM FOR THE GALILEO TEST BED OPENS

Despite the economic crisis, everyone is looking ahead. The Fraunhofer IFF’s major annual conference concentrated on the future topics of digital engineering and logistics. Over 500 experts from industry, research, academia and government gathered at the research institute for the 13th IFF Science Days on June 15 to 17, 2010.

The highlight of the 13th IFF Science Days was definitely the opening of the Saxony-Anhalt Galileo Test Bed’s new logistics platform in Magdeburg’s port. After the satellite traffic guidance systems established in collaboration with the Hallesche Verkehrs AG and the Galileo Test Bed’s development lab in Magdeburg, this is the third high-tech facility of this kind in Saxony-Anhalt.

The importance of the new positioning technologies for the economy was underscored by the signing of a strategic cooperation agreement between the world’s largest logistics provider DHL and the Fraunhofer IFF during the opening.

For more information, visit http://www.wissenschaft-stagde.iff.fraunhofer.de.
IMPRESSIONS
OPENING OF THE SAXONY-ANHALT
GALILEO TEST BED’S DEVELOPMENT LAB ON MARCH 10, 2010
TIMBER WITH ANTENNAS

Wood-based radio tags will optimize logistics processes in forestry in the future. The RFID transponders basically consist of paper and lignin, an integral part of plants. Thus, they make it possible to capture entire truckloads of bulk timber without disrupting the processing of logs.

Forest hikers are most familiar with the colorful markings on logs waiting along trails to be hauled away. Only insiders know how to interpret them though. “In principle, every forester or forest owner has his or her own marking system,” explain Mike Wäsche from the Fraunhofer IFF in Magdeburg. Together with colleagues from the Fraunhofer IZM, the Thuringian State Forestry Hunting and Fishing Agency and other partners from forestry and the wood processing industry, the timber expert intends to replace markings with standardized RFID transponders, i.e. radio tags. At the same time, they all intend to establish a logistics standard based on RFID for the exchange of data between forest owners, logging and hauling operations and commercial end users. Everyone involved – even the small and medium-sized operations primarily responsible for logging and transport – could profit from integrated electronic data exchange in conjunction with RFID. Data such as the origin, quality, quantity and destination of logs would only have to be recorded once. Moreover timber can be allocated rapidly and reliably, which expedites invoicing and facilitates transportation control.

High-grade logs for furniture or parquetry are already frequently marked with numbered tags or radio tags. However, the partners in the project “Intelligent Wood - RFID in Timber Logistics” desire a more practicable solution that is suited for marking all types of wood – even the more than thirteen million cubic meters of industrial timber produced in Germany each year. Industrial wood is defibered and processed into pulp, paper or composite wood panels. “Since the profit margins in this sector are slight, the RFID transponders used may neither cost much nor disrupt further processing of the wood,” project manager Wäsche points out. Hence, the team at the Fraunhofer IZM has developed a new wood-based transponder. With the exception of its antenna, the tag consists of paper and lignin. Large quantities of this resin-like polymer are yielded when cellulose is extracted from wood. “The transponder’s fraction of metal is far below the typical levels of impurities in and around wood,” explains Christine Kallmayer, group manager at the Fraunhofer IZM.

To keep costs down, only a numeric code is stored on the radio tag. All other information is stored in the individual actors’ management and accounting systems. Tags are read when a vehicle drives by. When making a delivery to a mill, a truck and its cargo pass through a reader gate. All delivered logs are captured in bulk while still on the vehicle. Theoretically, one to two RFID transponders per truckload suffice to uniquely identify everything. The researchers have determined that, depending on the size of the individual loads, at least every twentieth or thirtieth log in a load of timber originating from multiple suppliers must be marked in order to allocate it reliably.
HANDS-ON LOGISTICS

Magdeburg presented itself with an exciting program on the 3rd nationwide Logistics Day in April. In order to vividly present the diversity of work in the logistics sector, numerous industrial, retail and service companies allowed a look at their operations on April 15, 2010. The German Logistics Association’s initiative is intended to provide the general public and school and university students in particular insight into logistics operations and to broker jobs in logistics.

One of the enterprises involved was the Magdeburg Zoo. The zoo inspector talked about animal transports and the organization of animal feeding. Visitors to Magdeburg’s university hospital learned about logistics operations there. Magdeburg’s Theater allowed curious visitors to look backstage. Magdeburg’s branch of Europcar allowed visitors to test their logistics skills in a management game. In addition to many other actively involved partners, Förderanlagen Magdeburg FAM, Magdeburg’s port and ENERCON all opened their doors to the interested public. Visitors ended the day by attending the Logistics Guest Lecture Series at the Fraunhofer Institute for Factory Operation and Automation IFF.

Logistics Day in Magdeburg was jointly hosted by the German Logistics Association, the Fraunhofer Institute for Factory Operation and Automation IFF Magdeburg, the Institute of Logistics and Material Handling Systems ILM at Otto von Guericke University Magdeburg and DACHSER’s office in Magdeburg.

27TH GERMAN LOGISTICS CONGRESS: NORDIC COUNTRIES HOSTED IN BERLIN

Networks, innovation, risk management as well as communication and human resource development are topics that will play a role in the congress’s program. Under the congress’s motto “Intelligent Growth”, the German Logistics Association will be welcoming the Nordic countries as its guest region in which logistics is facing special challenges. This year, humanitarian logistics will be highlighted. The earthquakes in Haiti and Chile in recent months have revealed its necessity with dramatic relevance.

Among the main speakers, the host will be welcoming Barbara Kux, Member of the Board of Siemens AG, Hans-Otto Schrader, Chairman of the Board of Otto Group, Heiner Kamps, Chairman of the Board of HK Food Group, and Prof. Jan-Eric Sundgren, Senior Vice President of Public and Environmental Affairs of the Volvo Group.

The complete congress program and registration form are available on the Internet at www.bvl.de/dlk.

PLANT ENGINEERING OF THE FUTURE: EXPERTS INTEND TO BRING ENGINEERING BACK TO GERMANY

With its main theme of “Efficiency in the Plant Life Cycle”, the conference on “Plant Engineering of the Future” was held in March. For two days, some 150 attendees from industry, research and government exchanged views on the latest trends in and prospects for plant manufacturing.

The Fraunhofer IFF and its co-host the Eastern State Chapter of the Association of German Machinery and Plant Manufacturers VDMA, the Northeast Association of the Chemical Industry VCI, the Central German Business Initiative and the Saxony-Anhalt Association for the Promotion of Machinery and Plant
IN A FLASH

IMPRESSIONS
PLANT ENGINEERING OF THE FUTURE
CONFERENCE ON MARCH 4-5, 2010

Photos: Viktoria Kühne
Manufacturers FASA gathered German’s experts in Magdeburg for the conference. At the kick-off, they unanimously agreed that engineering must be brought back to Germany from abroad. What was once financially advantageous, has turned into a loss of knowledge. German plant manufacturing will only be able to maintain its edge in know-how when plants are again engineered where they are built. Moreover, the EU intends to increase energy efficiency by by 20 percent by 2020.

Germany is committed to global environmental protection. Economical and green manufacturing now matters more and more. Enhanced energy and resource efficiency is a central concern uniting the industry. “German machinery and plant engineering is the engine of innovation in this sector,” pointed out Dr. Manfred Wittenstein, President of the Association of German Machinery and Plant Manufacturers (VDMA). The industry’s technologies have already contributed 30 percent to achieving Germany’s total reduction obligation in compliance with Kyoto.

All this will only be achievable when companies are readily open to new technological advances. “In order to survive the cost pressure of international competition, small and medium-sized companies in particular may not miss the boat when it comes to advanced technologies. These enterprises constitute the majority of machinery and plant manufacturers in Saxony-Anhalt,” explained Dr. Reiner Haseloff, Saxony-Anhalt Minister of Economics and Labor on the occasion of the conference. According to the VDMA, Eighty-eight percent of these enterprises employ fewer than 250 employees. Eighty percent of large plant manufacturing enterprises receive their contracts from abroad. Government and research will have to make a contribution and enable these enterprises to work with state-of-the-art technological methods and tools. Then, they will be able to collaborate with major internationally operating companies as suppliers.

For more information, visit www.tagung-anlagenbau.de.

ENERGY ON BOARD: MS WISSENSCHAFT TOURS GERMANY

The converted freighter MS Wissenschaft has an interactive exhibition on board. This year’s theme is all about energy. An exhibit from Magdeburg’s Fraunhofer IFF is along for the voyage.

The hands on exhibition on board the energy ship is directed toward visitors ten years and older. It presents research’s contribution to organizing the energy supply of tomorrow to simultaneously maximize its reliability, cost effectiveness and environmental compatibility. Around thirty-five exhibits from research organizations examine not only technical systems for energy generation, storage and distribution but also social, political and economic aspects.

Visitors can interact with many of the exhibits. They can make diodes glow, engines start or observe the making of electricity from biomass.

The Fraunhofer IFF’s process and plant engineers use a model of a fluidized bed reactor to demonstrate the production of effective heat and electricity with the aid of fuel and air. “It vividly demonstrates the conversion of industrial residues into power and heat with the aid of air currents,” explains Dr. Matthias Gohla. “Well mixed is half burned,” says the energy expert getting to the heart of the principle. Therefore, the simulator also shows three different options for combustion. The specialists are not just researching for research’s sake.

“We have already engineered several plants and overseen their construction,” reports Dr. Gohla. Such plants are interesting for companies that accumulate combustible residues, e.g., the wood processing and food industries. However, municipalities that want to supply neighborhoods with power and heat could also use this technology.
2010 SCIENCE SUMMER: MAGDEBURG AT FULL POWER

Over 40,000 people took advantage of the opportunity to take a look behind the scenes of research at 100 different events during the week-long Science Summer in Magdeburg. In keeping with the Science Year 2010, the “Future of Energy” is the theme of this major science festival with which the initiative Wissenschaft im Dialog (WiD) showcases a different city every year.

The festival is intended to bring research and society into dialog and arouse young people’s enthusiasm for research. In tents on market square, the people of Magdeburg were able to experiment and discuss current issue of research with researchers. Especially teachers with classes took advantage of the offerings and booked tours through the exhibition “Magdeburg wants to know” on market square.

The Science Summer revealed the capabilities of research in our common interest as well as the need to support young researchers if we in Germany intend to continue to perform cutting-edge research,” stated Minister President Böhmer, summing up the situation.

SAFE SYSTEMS FOR HUMANS:
THE FRAUNHOFER IFF AT THE 2010 HANNOVER MESSE

The Fraunhofer IFF in Magdeburg is an important business partner. An engine for innovations always with an eye on effective marketing, it is constantly producing new products. The research institute presented itself at this year’s Hannover Messe in April.

In the special exhibition section on “Mobile Robots and Autonomous Systems”, the robotics experts showcased the results of recent research work. At a second booth, the researchers showed high-tech developments from the fields of logis-
FIT THROUGH KNOWLEDGE

Knowledge is the key factor for success in global competition. Many companies have recognized knowledge’s importance but only few have gathered experience with its systematic use, i.e. its management. Medium-sized companies especially need to catch up. The results and experiences from these projects were presented at the conference “Fit through Knowledge: Knowledge Management Solutions for SMEs” at the Federal Ministry of Economics and Technology in Berlin. The ministry is supporting various projects including ProWis as part of its initiative “Fit for Knowledge Competition”.

Young and old are fascinated by the artificial skin, which the Fraunhofer’s experts developed for robots. The tactile skin enables robots to sense whether they are encountering a person or an obstacle and to respond accordingly. Photo: Dirk Mahler

as a city of research. Many of Magdeburg’s residents, first and foremost young people, sought discussions with the researchers. The researchers from the participating institutions succeeded in explaining their work comprehensibly and arousing interest in research,” said mayor Dr. Lutz Trümper.

Researchers at the Fraunhofer Institute IFF and IPK are providing small and medium-sized companies support to organize their knowledge processes more efficiently and thus optimize their operations. To this end, they have been collaborating on the project ProWis since 2006.

Exchanging experiences and networking were just as important to attendees as attending the actual conference sessions. Photo: Dirk Mahler

The results and experiences from these projects were presented at the conference. In six different forums, over 120 attendees learned about approaches to a fitness program for effective knowledge management.

Young and old are fascinated by the artificial skin, which the Fraunhofer’s experts developed for robots. The tactile skin enables robots to sense whether they are encountering a person or an obstacle and to respond accordingly. Photo: Dirk Mahler

Protective barriers have to be dispensed with if robots and humans are to be able to work right next to one another. The robotics specialists from Magdeburg presented their technology for dynamic safe area monitoring, which detects people and their movements in a work area. Photo: Fuchs

Photo: Dirk Mahler
THAI PRINCESS VISITS FRAUNHOFER TRADE FAIR BOOTH

The team from the Fraunhofer IFF Regional Office in Bangkok showcased the Fraunhofer-Gesellschaft at the annual conference of the National Science and Technology Development Agency (NSTDA) in March 2010. The theme of the conference was “Science and Technology for our Society and Planet”. Her Royal Highness Princess Maha Chakri Sirindhorn opened the event. Later, the princess visited the booth where she learned about the Fraunhofer-Gesellschaft’s range of services.

SCHAVAN: “INVESTMENTS IN THE FUTURE – NOW MORE THAN EVER!”

Federal Minister of Education and Research Annette Schavan presented the national research and innovation report in May. “The report impressively reveals how much investments in research and development (R&D) pay off,” said Schavan after the cabinet approved the report. “Research-intensive products and services account for over forty-five percent of the value added in Germany, more than in any other industrialized country. The number of publications and patents have each risen by twenty percent since 2000.” At the same time the federal government has continually increased spending on research and development in recent years. Investments in R&D climbed twenty-one percent in the period from 2005 to 2008 alone. That equals 1.9 billion euros.

Despite the economic crisis, business has continued increasing spending by around nineteen percent (or 7.4 billion euros). According to the minister’s remarks, these figures very clearly demonstrate the significance of research investments. “Given the developments in international financial markets, investing in research and development is more essential than ever in order to protect Germany as a center of business — and thus also the future prosperity of our society,” said Schavan. The intensity of R&D in Germany stacks up very well internationally. We have to secure and consolidate this position,” said Schavan. According to preliminary estimates of the Federal Ministry of Education and Research, R&D investments accounted for 2.64 percent of the gross domestic product in 2008. In
Looking Back Fifteen Years Ago:
Factory Planning: Potentials for Savings through Clever Logistics Concepts

In 1995, Bosch Siemens Hausgeräte GmbH was building a new facility in Bad Neustadt. It was planning to cut the sizes of production lots while increasing the number of lots in order to attain greater customer proximity and reduce inventory. Hence, it anticipated profound changes in the sorting, handling and storage of products in its factory and logistics units'. The logistical challenges were focused on the dispensing of products, the efficiency of the sorting system and the storage system at existing locations.

Bosch Siemens Hausgeräte GmbH had already collaborated with the logistics from the Fraunhofer IFF in 1993 to optimize the material flow in its factory in Berlin. In 1995, too, they entrusted the researchers in Magdeburg with the factory planning work. Integrating the new factory required identifying technical solutions that guaranteed rapid unloading of trucks and additionally facilitated loading the sorting system under the specific spatial conditions. The combined packaging and sorting system on hand at the facility could not simply be eliminated.

For the new location in Bad Neustadt, the logisticians and planners from the Fraunhofer IFF additionally analyzed the range of vacuum cleaners manufactured by Bosch Siemens Hausgeräte GmbH for the variety of models and resultant number of type and parts.

Together with their project partner, they implemented self-regulating control loops. The potentials for savings in the company identified in the process amounted to millions. The processed data provided the company the solution needed to make decisions to reduce and effectively manage variants. The various models allowed short-term reductions of the number of variants and were simultaneously usable in the overall strategic concept to develop core businesses.

"The message is clear: Now is the time to stay the course."

In this context, Minister Schavan also referred to the importance of foreign trade: "Once again it is essential for Germany as an exporting nation that foreign trade of technological goods supports new room for growth and the consolidation of public budgets. In this sense, research and innovation are a shield against economic fluctuations. Hence, investments in new technologies are a core element of the federal government’s policy."

More reliable technology thanks to virtual reality: The Federal Ministry of Education and Research is supporting the project ViERforES with 7.5 million euros as part of its initiative “Advanced Research and Innovation from the New States”. Photo: Dirk Mahler
Interview with Marc Hackländer, CEO of FPL FRESHParcel Logistik GmbH & Co. System KG

In early 2011, the refrigerator on wheels will become reality with the launch of FRESHParcel, the first parcel service for perishables requiring cooling between two to seven degrees Celsius. The company is employing a new and one of a kind distribution method that operates fully without depots and sorts all shipments one time only, namely at the main hub. In an interview with IFFocus editor Stefanie Härtel, FRESHParcel CEO Marc Hackländer explained the FRESHParcel system and the role of the Fraunhofer IFF in Magdeburg in it.

We all purchase and consume from refrigerated cases nearly every day. And everyone knows that refrigerated products are transported from point A to B without spoiling in the process. On the other hand, more than a handful of parcel services and carriers offer a wide variety of solutions. Nonetheless, you claim that the market had been waiting just for you. What makes you so confident?

Because we know exactly what we’re doing. We are entering a niche with a technological innovation, which has enormous potential for growth as well. This enables us to provide our service less expensively than the usual providers – and to do so as demand in the temperature range of two to seven degrees Celsius has been rising.

What makes you different from ordinary parcel services?

Our unique distribution system. Unlike classic distribution systems, we only need one building in the middle of Germany where we do our sorting at night. Everything else is done with regional carriers that we involve as partners for pickup and delivery. They transport shipments in closed interchangeable containers that can be transferred from one vehicle to another without having to handle the goods. This is how we transfer freight and eliminate the many regional facilities ordinary parcel services have.

… which is why you also call this new system “depotless distribution”.

Right. The only thing our partners in the system need are six to seven specially equipped local service vehicles with swap bodies and approximately 1500 square meters of space – we call this area FreshPoint. This is where all operations converge early in the evening, meaning the individual trucks, which have collected shipments during the day, unload their swap bodies. All this will happen at fifty-eight locations in Germany, all the FreshPoints where the swap bodies will be transferred to tractor trailers that can accommodate seven such swap bodies. A semi will drive with these seven refrigerated containers to the hub.

What will happen there?

The semi will dock at a right angle, the containers will be opened and the rolling cages will be taken into the refrigerated building where sorting will then begin, which meets all HACCP standards by the way.
What is special is that our IT system will have already processed all the shipping orders and grouped them in appropriate delivery runs. That means local delivery runs will already be assembled in containers at the hub in the sequence of their delivery. Then, we will again drive one truck with seven containers to the FreshPoint where a forklift will transfer them to individual vehicles and drivers will be able to start their delivery runs following routes optimized by a navigation system. In addition to routes, a monitor will furnish drivers corresponding data on shipments. All the information on shipments and temperature data will also be retrievable from the Internet. Every refrigerated container will transmit its status four times an hour. Should any damage occur, not only the driver but also the manufacturer of the refrigerated container will be alerted.

For whom is your concept interesting?
For manufacturers, retailers and shippers of perishables, for which a carrier is out of the question given the shipment’s size. Let’s take a master butcher from Bavaria who wants to supply Weisswurst to customers in the north or let’s take an organic and gourmet food store that perhaps wants to order something special as well as deliver to customers, too. Or let us consider a pastry shop. In the summer, chocolate must be delivered chilled – many manufacturers refrain from such shipments when temperatures are high. Who knows, perhaps Mon Chérie will no longer disappear during the summer one day… We are venturing into a niche, which is presently not being catered to at all, even though the demand exists.

Business can be so simple sometimes.
Yes, the idea is simple indeed. However, its implementation is not. All the commercial parcel services have firm structures. They have vehicles, handling facilities, IT technology. An idea like FRESHParcel can only be realized when you start from scratch. While all of us have contributed abundant knowledge of the industry and experience, there is no infrastructure – for all intents and purposes, we planned the system starting with a blank sheet of paper and that is precisely why it will function. This all took two years by the way.

FRESHParcel intends to launch in January 2011. How far are you today?
We have signed contracts with all the system partners and designated fifty-eight FreshPoint sites in Germany. We chose a spot near Kirchheim Triangle as the main handling facility. From there, every corner of the republic can be reached overnight. Even the IT system already exists. All the shipment and temperature data converge in the computer center, which in turn constitutes the basis for dynamic route optimization. We will be working together with the Fraunhofer IFF on refining the distribution system. RFID will be an option in the future.

You advertise with the slogan “Don’t leave freshness to chance”. When one listens to you talk, you even plan your success …
Of course! We already even know the volume we will start with. On the morning of the first day, 223 delivery runs will set out from our FreshPoints at eight o’clock sharp. If we didn’t know this, we wouldn’t even start at all.

BRIEF C.V.

Marc Christian Hackländer
September 16, 1967, born in Leverkusen
May 1988, graduation from high school
August 1989, certification as freight forwarding specialist
March 1992, Field transport consultant, trans-o-flex, Weinheim
April 1995, Region west sales manager, trans-o-flex, Weinheim
October 1999, Manager of international and corporate development, trans-o-flex, Weinheim
April 2002, International director, trans-o-flex, Weinheim
October 2005, CEO EURODIS GmbH,
June 2009, Member of the executive board of FP Logistikentwicklungs mbH, Osnabrück
January 2010, CEO of FPL FRESHParcel Logistik GmbH & Co. System KG, Cologne
OPTIMIZING MANUFACTURING OPERATIONS WITH FRAUNHOFER

How Kranbau Köthen GmbH Reduced Its Crane Production Cycle Time by One Third

Dr. Frank Ryll, Nadine Doden and Dr. Ulf Achenbach
The crane building specialists at Kranbau Köthen GmbH produce high performance technology in demand worldwide. In order to continue maintaining its competitive edge, the company does not shy away from unorthodox methods to optimize its performance. Together with the logistics experts at Magdeburg’s Fraunhofer Institute, they sought and found potentials that accelerate production with tremendous success.

Nothing Off the Rack

Off the rack cranes are hardly to be expected from the specialists in Köthen though. The factory primarily concentrates on high quality custom products, including the installation of complicated electronic control systems. They are used in diverse settings ranging from port terminals to steel mills and foundries to special solutions in the processing industry. In keeping with the particular requirements of their later use, the cranes are developed individually and thus modified for their intended application. The company produces around thirty cranes each year.

People in Köthen are proud of its excellent position in the global market. Cranes from here are exported throughout the world. Customers come from all over Europe, Asia, Africa and South America. Thus, the international market is an important factor. However, it also confronts the crane manufacturers with other challenges. After all, global competitors are not sleeping. Kranbau Köthen’s particular focus on quality, delivery reliability, crane performance and solutions for customers’ individual problems guarantee its excellent position. Yet maintaining an edge, i.e. always being a bit better, always being a bit faster while retaining or even improving the cost base, is and will remain essential in the future too.

Model Cycle Time Analysis Project

In 2008, Kranbau Köthen was so busy with orders that it was unclear how it would handle all the work. The existing philosophy of completing everything simultaneously as soon as the engineering was finished resulted in a loss of complexity and jeopardized quality and delivery dates. In keeping with Little’s law, the fog would have to be dispersed and the cycle times of the individual cranes reduced. Fewer cranes would have to be worked on simultaneously while the output would remain the same. The focus on fewer crane was intended to increase productivity and thus cut costs. Management announced its goal of cutting cycle time in manufacturing from eight to six months.

Therefore, a decision was reached in early 2009 to call in the logistics experts from Magdeburg’s Fraunhofer IFF and jointly perform an analysis of cycle time in the factory in a model project. The central issues were the time it takes to manufacture a complete crane from start to finish, the duration of every work step and the reason. The goal was to search for potentials for optimization in the workflow.

Research, Bach and Crane Manufacturing

Anyone who has occasionally taken the train from Magdeburg heading south to Halle or Leipzig, for example, is certainly familiar with the city of Köthen. Even when most only know it as an unassuming, somewhat drab train station in between, which is less than appealing to travellers at first glance. The community of just under 30,000 residents lies approximately halfway between Saxony-Anhalt’s capital and one of the new states’ centers of industry, the chemical triangle of Halle and Leipzig. Given the panorama presented and the typically provincial charm of this city, which appears to be virtually confined by industrial agriculture, who might hit upon the idea that anything interesting is there? Yet, a glance at history books is surprising. No one less than Johann Sebastian Bach, the master of Baroque music, spent some of his most creative years here, composing his Brandenburg Concertos, among other works. Beyond that, city chroniclers do not tire of reciting the number of artists and scientists produced by the city over the course of its 900 year history.

Today, Köthen is primarily known as the home of Anhalt University of Applied Sciences, formerly a technical college. 3000 engineering students populate its campus. That is ten percent of the city’s residents, by the way. The economy is also picking up again after the turbulent past decades. One of the guarantors of the revival of industry is Kranbau Köthen GmbH. The successor of the former major East German enterprise VEB Förderanlagen is now a flexible and innovative medium-sized company and subsidiary of the Georgsmarienhütte Holding. This conglomerate is at home in the fields of steel production and processing, forging, founding, rail equipment and machinery and plant manufacturing and serves customers in international markets. Kranbau Köthen and three affiliated companies make up the conglomerate’s crane business unit. Of the approximately 420 employees, around 270 work directly at the facility in Köthen. Its annual turnover of 70 million euros makes Kranbau Köthen a regional leader.
Intensive Employee Involvement

The involvement of the employees and the works council was particularly important to everyone in the project for its success. This follows not only the principles practiced by management at Köthener Kranbau but also the key fundamental ideas of the experts from the Fraunhofer IFF.

If a company is to have sustainable success, changes are best developed with intensive employee involvement. Kranbau Köthen values its experts’ knowledge and experience. Therefore, it attaches great value to a human resource policy based on its workers and early involvement of the works council in any processes of change. Here, rationalization means retaining jobs. People at the company like to point out that no employee has ever had to be let go for operational reasons, even during the economic and financial crisis. Flexible timesheets and sustainable human resource planning are relied on instead.

A Novelty: Image-based Logistics Analysis

The team of staff from the Fraunhofer IFF and executives from the company decided to implement a three-stage approach. The cycle time analysis was to be based on an image analysis. Thus, they broke new ground. No comparable project ever drew on photographic documentation to improve logistics operations. Pictures of work status at sixteen critical points in manufacturing were taken from defined positions at the same time every day for several months. Picture by picture, this delivered a clearly structured reconstruction of the construction of a crane, which everyone could follow. Afterward, the pictures were compared with the nominal data and evaluated.

In a second parallel step, hours of work were documented in detail. Every work step, every advance and every delay was recorded in writing and the results were visualized afterward in simple overviews. The visualizations especially helped make employees aware of both deficits and progress when planning their own work.

In a third parallel step, personal interviews were conducted with select employees. In them, the work progress photographed and the hours of work documented in writing were jointly evaluated. Reasons for deviations or interruptions in manufacturing required exploration. In addition, the experts themselves were surveyed in order to actively incorporate their know-how and opinions in the project. They were asked to identify problems, bottlenecks and potentials for improvements in operations. Weekly meetings to collectively evaluate the interviews with production management and the forepersons from the different units rounded out the analysis. Not least, consolidating and correctly evaluating this valuable information ultimately helped the specialists on the Fraunhofer team identify potentials for optimization in the workflow.

The management of Kranbau Köthen decided to put the logisticians from the Fraunhofer IFF to work on the potentials for optimization in their manufacturing operations.
A Clear Outcome

The completed analysis delivered the proof that management’s goal of significantly shortening the cycle time was right on the mark. According to the numbers, the implemented proposals from the Fraunhofer team reduced the overall time to manufacture a crane by one third. Wonders did not have to be worked. The workflow in the plant’s different units merely had to be modified to boost performance. This included rigorously focusing organization on assemblies and a crane’s critical path.

The Fraunhofer IFF supported the collection of facts on a challenging issue together with the affected employees and involved them at the same time. The Fraunhofer IFF’s status as an independent, nonprofit research organization was also extremely helpful. Employees found it significantly easier to open up and not perceive the experts as management’s emissaries or even as a threat to their own jobs. The professional approach of the specialists from the Fraunhofer IFF bred transparency, trust and creative collaboration. The proposed changes developed collectively with the assistance of the colleagues from the Fraunhofer IFF entered into the reorganization of work planning and organization.

Transparent Production

The particularly great importance attached to the creation of transparency in production was new. To this end, so-called team boards were introduced, which display every team’s progress and the general situation in production. Now, all employees can themselves follow the current order situation and the specific status of production in every unit. This enables them to relate to production as a whole, organize their own work better and coordinate with other manufacturing teams. This is supported by weekly meetings of teams at the team boards with their production manager, the individual in charge of operations planning and scheduling and the team leader of the upstream work step where they jointly discuss the current status of production, problems from the preceding week and potential proposals for improvements.

A Competitive Edge

Everyone involved considered the project a great success. In fact, it cut the cycle time for a crane by one third. This is a significant advantage as global competition steadily intensifies. Thus, the experts from the Fraunhofer IFF clearly supported management’s goals. At the same time, concrete subsequent steps were identified and developed with employees during the ongoing project. Köthener Kranbau is now doing everything necessary to effectively implement these tested measures in production as quickly as possible.

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How can something that already functions well be improved? Salutas Pharma GmbH wanted to optimize its warehouse and shipping unit, already a model of advanced, high-tech and efficient logistics. This constituted a complex and difficult challenge, which the logistics experts from the Fraunhofer IFF in Magdeburg mastered quickly and effectively.
A European Showpiece in Barleben

Salutas Pharma GmbH in Barleben, Saxony-Anhalt, is one of Germany’s most important manufacturers of generic drugs. Its factory north of Magdeburg is one of the most advanced and efficient pharmaceutical manufacturing and logistics centers in all of Europe. The Hexal subsidiary’s with over 1,400 employees produces over one million capsules and tablets every year.

A member of the Sandoz Group, Salutas produces generic drugs for seventy of the group’s affiliates throughout the world. The independent subsidiary additionally accepts orders from third party customers. At the same time, more than just the products it manufactures are stored in Barleben. Large parts come from other production facilities. They are also collected and reassembled for orders at the logistics center in Barleben.

364 million packages of tablets and capsules are filled each year. They are stored in giant high-bay racking several floors high, which can hold nearly 50,000 Euro pallets at one time. Each container, which subsequently receives new picked items, provides room for 148,000 reusable containers. Automated logistics systems provide efficient and smooth storage, packaging and picking of items. The correct handling and prompt shipping of the immense volume of goods is a job that demands a great deal from everyone involved. This puts Hexal’s reputation on the line because customers value the drug company for which Salutas produces not least for its dependability and its delivery reliability and speed.

Just-in-Time

Nevertheless, developments are not sparing manufacturers and service providers, no matter how technologically advanced and efficient they are. The entire industry is facing an ongoing trend toward increasingly less stock-keeping and simultaneously shorter ordering cycles. Just-in-time has also reached the generic pharmaceutical industry. That is a great challenge for companies and necessitates constant optimization in the entire production and supply chain, including delivery to the final customer. One effect is the continually diminishing size of shipments since customers are now only placing orders selectively and based exactly on their needs. However, this also means that the delivery itself must be made faster than before.

Normally, shipments, no matter how small, have to be at a customer’s one day after receipt of the order. In an extreme case, a manufacturer has to respond from one minute to the next in order to deliver every product in the desired quantity at the earliest time. No one can allow bottlenecks or snags in their logistical planning. All over the world, competitors are just waiting to pounce. The pharmaceutical and especially the generic pharmaceutical market is hotly contested.

Optimal Logistics is Especially Relevant to the Market

Therefore, even with its sophisticated logistics concept, Salutas is constantly striving to further optimize its factory’s output. In 2009, this ultimately resulted in a contract with the Fraunhofer Institute in Magdeburg to analyze the potentials at the factory in Barleben and develop proposals to boost the efficiency of the company’s logistics unit. The Fraunhofer IFF was thrilled to take on this job since it was the first time the logistics experts at Magdeburg’s Fraunhofer Institute had received such a contract from the pharmaceutical industry, an exceptional sign of confidence in the researchers’ capabilities and the concept they had submitted. The contract called for fully optimizing

*Norman Scheider, head of logistics at Salutas Pharma GmbH (left) and Eyk Flechtner, process planner at the Fraunhofer IFF, in the factory’s receiving unit. The outcome of their collaboration will expedite the entire shipping process.*
and expediting the entire shipping process, beginning with receiving in the warehouse through transport by carriers. Improvements in this unit’s performance have great significance for the entire company, not only because of the particular relevance of more flexible and expedited shipping operations for the market. This is also the unit in which turnover is ultimately generated. Every additional package that can be shipped in the same or less time translates into more turnover.

**Small Cogs with a Big Impact**

The project began with an intensive analysis of all the operations and flows of products within the factory and included receiving, shipping and all the stages in between.

**Reorganizing Operations**

While modifying the logistical operations, the researchers also had to continually make provision for a number of general conditions, e.g. the regularly occurring fluctuation in order quantities because of varying seasonal demand for instance. In order to respond to this correctly, a number of other factors must also be included in the deliberations, e.g. human resource planning, supplier management, stocking strategy and carrier management. Above all the latter constitutes an important but unfortunately often unknown quantity. They are external elements not directly anchored in the system and thus difficult to control.

Their perfect integration in the operations of advanced just-in-time production and delivery is a tremendous logistical challenge for every manufacturer. They are the interface. Ultimately, they have to meet delivery dates. Hence, the delivery of goods must proceed extremely punctually.

Subsequently, the Fraunhofer IFF developed a multi-stage model to be followed to modify the logistics center. Parts of a first stage were already partly initiated during the still ongoing analysis. This primarily concerned the optimization of smaller operations that could be performed without problems and major changes. As expected, the modification of the operational organization already discernibly and profitably boosted efficiency.

**Systems Optimization**

A next step will focus on the systems engineering itself, certainly not a simple undertaking. After all, its highly automated system makes the Salutas factory in Barleben one of the most advanced logistics centers in Europe. At least in part, technical changes would affect more than just the operations. They are also linked with investments. Moreover, time will be needed to initiate the necessary steps.

This is a real but worthwhile challenge for management and employees. Once implemented, a further significant increase in efficiency can be expected. Once the anticipated result has been achieved, the planned investment in the restructuring of the logistics system will be recouped in short time. Everyone involved will be more than satisfied with the increased sales that can be expected then.

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*Assembled orders are sent to the shipping line. Assembled Pharmaboxes are securely packed and prepared for shipping.*

*Photos: Dirk Mahler*
TAKE OFF WITH A GOOD FEELING

Solutions for More Security in Freight Traffic
Additionally Furnish Potentials for Savings

Prof. Klaus Richter and Martin Kirch

Who would have thought it? Despite strict EU rules that provide for continuous monitoring, there are still considerable gaps in security where air freight is concerned. These gaps increase the security risk for transport management worldwide. The consequence can be disrupted logistical operations. This terrible piece of news for shippers and anyone involved in logistical operations is not just hot air. Rather, it comes from a study of the International Transfer Center for Logistics (ITCL) and the Technische Universität Berlin, which was contracted by the World Cargo Center GmbH in Frankfurt, the market leader in development and investments concentrated on air cargo real estate. This is one more reason for the researchers at the Fraunhofer Institute for Factory Operation and Automation IFF to continually intensify their efforts to increase security at airports. In a field test at Leipzig-Halle Airport, the researchers from Magdeburg demonstrated the effectiveness of their solutions that rely on state-of-the-art positioning and identification technologies.

Most of the DHL staff at Leipzig-Halle Airport begin working when others are going to bed. The night shift begins at 10 p.m. sharp. From then on, everything runs like clockwork to ensure operations run smoothly. Every night, around sixty airplanes land and take off about every five minutes between midnight and four in the morning. Handling the loading and unloading without error requires precise work, an interplay of advanced technologies, employees accustomed to stress and excellent organization. Nonetheless, even Europe’s most advanced air freight handling center cannot eliminate every contingency. After all, 100 percent protection is no more possible there than anywhere else.

A joint study by the International Transfer Center for Logistics (ITCL) and the Technical Universität Berlin contracted by World Cargo Center GmbH revealed that, despite revised EU rules, there are still considerable gaps in security where air freight is concerned. Moreover, the number of non-standard regulations and certificates for air and freight security particularly present problems.
While fifty-six percent of the logistics providers consider the lack of security concepts covering all stages of delivery to be the greatest security problem, sixty-one percent of the shippers primarily find fault with security awareness among their own and external staff. Technical and structural aspects also play a role. Twenty-four percent of the logistics providers and thirty-nine percent of the shippers consider the monitoring systems in air freight centers to be inadequate. Control of access to freight centers is judged to be an even more critical situation. A large number of the logistics providers surveyed also consider building security and cargo inspection to be inadequate.

**Continuous Tracking of Goods**

According to the opinion of experts, the transparency of airports is presently around ninety-two percent. Problems in distribution usually arise wherever goods are handled. Goods can be improperly transported or stored, be located in the wrong place or impossible to find promptly. In the worst case, they even disappear. Logistics providers always bear full responsibility for their goods in transit and could be held liable for damages when goods are lost or damaged. Mistakes entail a loss of not only money but also image and trust.

In order to further increase transparency on the apron, the researchers at the Fraunhofer IFF are relying on monitoring, i.e. continuous tracking of goods with the latest RFID technologies, which employ alternating electromagnetic fields to transmit data without contact. Thus, data can be read automatically without manual intervention and objects can be identified even when they are moving. RFID technology is versatile but no one systems solution is suitable for every domain. An identification or positioning system alone appears insufficient for many logistics applications since different problems have to be addressed. Combined use of different technologies can be expedient wherever any solitary system reaches its limits. In the project GNSS-INDOOR, funded by the Federal Ministry of Economics and Technology, the Fraunhofer IFF and six other partners closely examined the options for integrating radio technologies in different scenarios. They intensively researched and tested different technologies that localize people, vehicles and goods in different types of buildings and in their direct proximity. The results revealed that transport and warehouse operations can be
watched currently and in detail by cleverly combining identification and positioning systems and substantially more efficient control points can be defined to analyze operations in near real time. A comparison of the detailed automatically generated maps of current transport status with detailed targets delivers the desired answers. Thus, appropriate actions to control operations can already be inferred when there are slight deviations and before freight is irreversibly damaged or transportation delayed.

**Freight Information for the Control Center**

The Fraunhofer researchers rigorously tested the integration of radio technology in a logistics node at an airport at the DHL Hub at Leipzig-Halle Airport. To this end, they first outfitted the equipment, e.g. tow tractors and trailers, with active telematic units. The air freight units (containers) and the goods themselves received passive transponders (a neologism combining “TRANSmitter” and “reSPONDER”). While active transponder’s have built-in batteries that provide them with their own power supply and can be read and written, passive transponders obtain the power they need from the reader’s electromagnetic frequency field.

When containers are loaded onto the trailers, the two tags are “coupled”. From then on, containers and cargo form one unit and, as such, can be monitored continuously by the control center, in real time with data on current position. This increases transparency in the logistical opera-
The RFID glove has an integrated antenna, thus leaving the wearer free to use his or her hands. This facilitates the flow of information between the glove and handled cargo by RFID transponders during normal handling operations and eliminates additional process steps to write and read the RFID information common among conventional handheld devices.

However, the accuracy of radio positioning is not necessarily sufficient for the demands of logistics. It often leaves much to be desired, especially outdoors, whether because of poor weather conditions, unanticipated interfering factors such as metallic bodies or the use of certain systems that only deliver exact results at ten meters. The Fraunhofer researchers from Magdeburg advise anyone in need of precise results all the time to employ a combination of radio and video positioning systems. While primarily radio technologies are relied on when goods are in transit, images integrate another level of analysis for handling and storage operations. Films of logistical operations taken by video cameras are analyzed by image difference methods. The results can be used to determine assets’ location and position. They can be identified by radio. Their ambient conditions (e.g. weather, lighting and asset properties) and logistical operations make airports non-cooperative environments for sensor systems since a camera’s embedded evaluation logic can only partially compensate for interference and changed operations.

Therefore, a Fraunhofer project group devoted itself to evaluating radio and image sensor methods and systems by means of virtual scenarios that simulate potential operational and ambient conditions so that the quality of the information for the monitoring of logistical operations under the widest variety of influences can already be determined when a sensor system is being planned.

Snoops in Action

The monitoring of cargo’s condition can be just as important as its continuous tracking if, for instance when goods are refrigerated and perishable with chains of custody and specific temperature limits must be observed or when they are sensitive electronic components. The German Electrical and Electronic Manufacturers’ Association (ZVEI) published a guideline on “Identification and Traceability in the Electrical and Electronics Industry” for the entire value added chain, which, taking manufacturing and assembly operation as its starting point, is also intended to rigorously examine all logistics activi-
ties in the supply chain as far as the recipient. Fraunhofer experts have developed a special early warning system, the so-called Tag-Head, to monitor conditions. The versatile unit is equipped with sensor, communication, positioning and RFID systems. The sensors monitor temperature, moisture and shocks. When a predefined threshold is reached, the Tag-Head triggers an alarm. The sensor and positioning data can be retrieved by GSM for instance or written on an RFID transponder with the aid of the Tag-Head. The Tag-Head transmits status reports to the control center at regular intervals or on demand.

If the sensor readings leave the defined margin of safety, an alert is automatically transmitted. Simultaneously, important readings can be written on a passive transponder.

No More Claims

Security specialists have already been won over by the advanced positioning and identification technologies. Now, businesses are also taking a closer look since there are solid reasons for implementing RFID, which add up financially. Electronic lookouts organize secure supply chains that are traceable and thus enable service providers to make binding statements about the time and place of a shipment’s delivery and its condition. Carriers able to prove that all the products entrusted to them were delivered in perfect condition, would eliminate across-the-board discounts. This opens tremendous potentials for savings to logisticians. Claims management becomes less important when supply chains are documented end-to-end. Entirely new budgets and profit margins are imaginable. It would be best if the future started right now!

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Development Lab and Test Bed for Positioning, Navigation and Communication in Transportation and Logistics

SETTING OUT FOR NEW DIMENSIONS

Prof. Michael Schenk, Prof. Klaus Richter, Andreas Müller and Olaf Poenicke
freight amounts to several billion euros every year. According to information from the Transported Asset Protection Association (TAPA) it is continuing to rise.

One solution that meets the growing demands for secure supply chains is the continuous monitoring of goods in real time with information on current positions and conditions of goods. Intelligent infrastructures are needed in handling nodes and intelligent transport equipment in shipping in order to ensure that goods are continuously tracked and monitored. This is corroborated by the specific demands from individual freight sectors, e.g. for refrigerated and perishable goods with chains of custody and specific temperature limits that must be observed, and the electronics industry. In November 2009, the German Electrical and Electronic Manufacturers’ Association (ZVEI) published a guideline on “Identification and Traceability in the Electrical and Electronics Industry”, which, also examines supply chains.

In order to implement such continuous monitoring of freight and goods throughout the supply chain, the Fraunhofer Institute for Factory Operation and Automation IFF is developing identification and positioning solutions and testing them in the Galileo Test Bed where extensive measurement and simulation...
systems are available. Scientific tests can be performed under lab or real traffic conditions or in the setting of real logistics operations. For instance, the cooperation partner Magdeburger Hafen GmbH is involved in issues of localizing and identifying logistical assets in the productive setting of the Hansa Port.

**Differently Sized Intelligent Containers**

The researchers in Magdeburg are relying on radio identification and positioning technologies to make the secure supply chain a reality. They have developed and patented a variety of intelligent container concepts with which individual items or complete shipments can be continually tracked and identified. For instance, the intelligent transportable container uses RFID to automatically take an ongoing inventory of the freight transported in it on the level of items or auxiliary handling equipment (e.g. pallets). Several RFID antennas are integrated in the transportable container. The strength of the field is evenly distributed. This establishes the basis for reliably detecting all the transponders located in the container. This evenly distributed field strength and the reflective surfaces built into the container allow reliable reading of every tagged object in the transportable container, even under the most difficult conditions. Thus objects are identified, which even RFID systems have problems detecting.

**Reaching Destinations More Flexibly**

The swap body was already introduced years ago as the basis of new logistics concepts. Its principle assumes that the load carrier is not permanently mounted on a vehicle and can be removed like an ocean container. Designed for use on 3.5 ton vehicles, several swap bodies are combined on appropriate trailers for long-distance service and transported on light trucks to customers as needed and with pinpoint accuracy to the “last mile” – low-volume commercial traffic being the operative term. Since the entire container is transferred for long-distance distribution, goods do not have to be picked anew between long distance transport and terminating traffic. This increases security in the transport chain. Colleagues from the Institute of Logistics and Material Handling Systems at Otto von Guericke University will be researching the further development of this swap body and the refinement of the logistics system based upon it at the Galileo Test Bed in the project OBJEKT. The use of electric vehicles for transport to final destinations down to the “last mile” will be a central task, which will be analyzed in further research projects. (OBJEKT is being supported by the BVL/AIf; project ref. no. 16165BR/1)

Swap bodies become even more precise when they are outfitted with RFID technology and the appropriate infrastructure for automatic and continuous indoor monitoring by means of a wide variety of sensors (e.g. temperature, acceleration, ultrasound). Researchers at the Fraunhofer IFF are also testing and researching precisely this in the Galileo Test Bed. Both further technological development of the sensor system (in the project TransMat being supported by the BMWi; project ref. no. 19G7025B) and its connection to planning and control center systems (in the project IMOTRIS being supported by the BMWi project ref. no. 19G8021B) are playing a role. The researchers in Magdeburg are also focusing their work on automatic cargo handling: The swap body is being introduced into the workplace of a robot able to remove individual shipped items from the swap body. Since the robot additionally has an infrastructure to read RFID, it is able to identify individual shipments.
One of the Magdeburg researchers’ first industry partners intent on implementing the swap body principle is the new logistics provider Fresh Parcel, a carrier of fresh foods shipped at temperatures between two to seven degrees Celsius. The company wants to perform its nighttime sorting at a single main handling facility. Actively refrigerated interchangeable containers that provide autonomous cooling both on carrier vehicles and tractor trailers will be used for shipments. The investors are collaborating with the Fraunhofer IFF’s logistics experts in the Galileo Test Bed to make this “refrigerator on wheels” even more efficient and flexible. The logistics provider DHL was also impressed by the Galileo Test Bed’s infrastructure. It is working on organizing DHL Express’s pickup and delivery of express parcels to be faster, more reliable and more environmentally compatible by means of a newly developed dynamic scheduling and routing system. Dr. Keith Ulrich, Head of the Research & Innovation Division at DHL explains, “For us, this is essentially about adaptable management of flexible logistics networks. Satellite navigation opens entirely new possibilities for us. The development lab will enable us to develop new logistics concepts that use current spatial data to respond to traffic jams or road construction for example."

The Fraunhofer IFF is testing the principle of continuously inventorying a transportable container with RFID technology for DHL on a SmartTruck, which DHL researched and developed with various research partners and is really using. It is a DHL delivery vehicle equipped with RFID systems so that the interior can be partially or fully scanned. The inventory is combined with routing by referencing data on the current traffic situation to calculate the optimal route to deliver parcels.

DHL’s SmartTruck has obvious advantages. On the one hand, its intelligent routing cuts kilometrage and thus reduces CO₂ emissions significantly. On the other hand, it guarantees correct loading and unloading by monitoring the interior. The SmartTruck also benefits delivery drivers. At a stop, the rack displays the position of the next parcel to be delivered. This expedites access to the correct parcel.

In the near future, parcel identification and delivery vehicle positioning will enable logistics providers to furnish precise information on the delivery or pick up of a parcel by a delivery vehicle. This will establish new value added services in the transport chain for customers.
RFID Tunnels: The Next Generation of RFID Gates

International transport chains are full of action. New actors enter the market and new logistics providers are selected and assembled in teams virtually on a daily basis. This increases demands to monitor the completeness and condition of shipments. The experts at the Fraunhofer IFF have extended the principle of the intelligent transportable container to gate applications in order to prevent disruptions in continuous monitoring during handling operations.

An RFID tunnel with a clearance of three by three meters facilitates reliable identification of tagged freight and goods transported through the tunnel. All the advantages of the intelligent transportable container are retained. The field strength is homogeneously distributed inside it, a transponder’s position is unimportant and the read zone is clearly defined. Thus, the RFID tunnel eliminates the problems among conventional RFID gates currently in use, i.e. irregular field strength distributions, consideration of the polarity of tags passing through a gate and undefined zones with false positive scans.

Other than a gate, an RFID tunnel clearly detects whether a tagged item has actually passed through the tunnel and really been loaded or unloaded. This eliminates a gate’s unintentional reading of every transponder that passes by it. The RFID tunnel provides an additional advantage when used to continuously monitor the condition of temperature controlled cargo for instance. The log data stored on the transponder can be read and analyzed in real time.

An RFID gate in the Saxony-Anhalt Galileo Test Bed’s development lab. Even the condition of temperature-controlled cargo can be monitored continuously.

Photo: Dirk Mahler
To do so, the Fraunhofer IFF and other partners are developing passive transponders with integrated sensors, a solution for continuous condition monitoring directly on goods, which is less expensive than active systems. The power supply for the sensors located on the tag is maintained by the RFID tunnel’s homogeneous radio field so that the sensor data can be captured in continuous cycles. This is practicable particularly for the delivery of refrigerated and perishable freight at the interfaces of supply chains.

With their RFID tunnel, the researchers in Magdeburg have presented an applied solution for precise bulk identification but they are not resting on their laurels. At present, the RFID specialists are taking a closer look at an American positioning system for warehouse logistics that localizes passive transponders.

Whether SmartBox, intelligent container, swap body or RFID tunnel – the Galileo Test Bed is an ideal development and testing infrastructure for the Fraunhofer IFF and an integration platform for the widest variety of solutions.

The testing facility functions as a handling node where the continuous localizability and identifiability of tagged items are tested. The test bed next door is available as a testing infrastructure for contract research and direct use by companies. State-of-the-art indoor and outdoor identification and positioning systems are on hand.

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The project TransMat is being supported by the BMWi; project ref. no. 19G7025B.

The project IMOTRIS is being supported by the BMWi; project ref. no. 19G8021B.

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An International Network of Logistics Brokers Is Optimizing SMEs’ Transport Management

BETTER CONNECTED
A Broker for Companies and Logistics Providers

Environmental protection and commercial success have long since ceased to be mutually exclusive. On the contrary, more and more industries are successfully establishing conditions for sustainable ecological management and also profiting from them. However, entirely new innovative technologies that promise profits or an overriding desire to act ecologically are not always enough to make a difference. Quite mundane corporate interests such as increased efficiency, lower resource consumption and time savings are often priorities.

Business interests and environmental protection complement each other excellently in the EU project KASSETTS aimed at forming a European ICT network to optimize industrial companies’ cross-border logistics operations. A total of eight international partners are collaborating in the project, which was launched in 2008 for three years and is being funded by the EU’s INTERREG IVB “Central Europe” program. KASSETTS is building on the positive experiences from a predecessor project initiated one year earlier in Modena, Italy where the present concept was already tested in that region with outstanding results for industry and the environment.

Pilot Model in Modena

In 2007, the Institute for Transport and Logistics in Bologna, the University of Modena and private and municipal enterprises in the region hit upon the idea of installing an independent logistics broker who would manage freight and broker contracts between industrial companies and freight forwarders. A broker would facilitate communication between both parties and organize the companies’s freight shipments more efficiently on their behalf.

However the initiators of the project in Modena were pursuing more than business objectives alone. They were equally interested in the ecological benefits connected with more efficient transport logistics. They hoped that optimized regional freight traffic would additionally lower the volume of trucks, which in turn would mean less environmental pollution and thus more ecologically sustainable development of the infrastructure.

Small and medium-sized enterprises frequently have to invest time, money and human resources to organize their occasional shipping orders. Above all, cross-border shipments sometimes prove extremely difficult to plan. An international network of neutral logistics brokers is intended to remedy this.
Like a Line of Taxis

Why, though, should this require a completely new logistics system? After all, companies are already able to fall back on freight and transport exchanges to organize their shipments. The problem with freight exchanges is their passivity. They merely provide an open platform, like a bulletin board, on which carriers offer their services and wait for jobs like taxis in a line. Contracts are awarded solely on the basis of availability and price. It is not easy to optimize schedules and combine freight.

Moreover, small and medium-sized enterprises often have limited capacities to optimize their procurement and distribution management on their own. Unlike large firms, they have only a sporadic volume of freight. Thus, the effort required of small and medium-sized enterprises without internal logistics units to organize the transport of their goods from point A to point B is comparatively high, especially when shipping internationally. Obtaining and comparing bids, communicating with service providers, scheduling or responding to randomly occurring changes all cost time and tie up resources. On the other hand, many carriers are contending with underutilized capacities. Frequent deadheading is common. Average capacity utilization in freight business planning is estimated to be just over sixty percent. Unprofitable indirect routes frequently have to be driven in order to even achieve this.

A Logistics Broker for Both Parties

An intelligent logistics broker system counteracts such problems. Rather than being a new logistics company, a broker improves the correlation between supply and demand for the participating businesses. To do so however, the broker functions like a logistics firm. Over the Internet, the broker receives companies’ shipping orders, electronically collects and aggregates them and subsequently optimizes the routes and numbers of vehicle. Only then are the combined orders forwarded to the logistics providers. Nothing else is necessary. An agent or operator, a laptop and an Internet connection are the only requirements to begin working with the system. Thus, potentials to cut freight and transport costs are exploited. Logistics providers profit too. Combined orders result in better utilization of transports and that always affects their cost structures positively.

The costs of the project are quite manageable. Everyone involved in the model project in Modena made a one-time special payment to fund it. This money was chiefly used to pay the operators. In return, the companies profited by reducing time and labor and combining their freight. In addition, valuable human resources were freed up. In turn, the freight forwarders benefitted from better fleet utilization and reduced kilometrage. The development of the long-term cost distribution will also depend on the extent the system spreads to other regions in the future, on the business models other logistics brokers imple-

The solution is a logistic broker between industry and freight forwarders. Photo: MEV-Verlag
ment and on their degree of networking with one another.

Cost Savings of Twenty Percent

The Italian logistics broker really commenced work in May of 2008 following an initial trial phase. Regional medium-sized industrial companies, e.g. pump, engine and generator manufacturers and a commercial printer, were involved. The broker accepted their shipping orders twice a day in order to coordinate them with the freight forwarders’ available capacities. Depending on the customers’ needs, the broker selected the least expensive or the fastest providers, optimized shipments and subsequently awarded contracts. Pickups were combined since the routes had been precisely planned beforehand based on the bookings. The increased market transparency was an additional bonus for the companies.

The project’s great success confirmed its initiators expectations. Andrea Casagrande, President of Consorzio Attività Produttive (CAP) and co-initiator of the project, was thrilled. “Thanks to the collective, optimized routing and shipping, the average cost savings were around twenty percent,” he said, summing things up. “We noted approximately thirty-seven percent fewer kilometers driven among the freight forwarders while keeping the total volume of freight the same. In addition, the number of transport routes dropped by approximately thirty-seven percent. Thus, the transport companies and the environment also benefitted.” Word of their success has spread of course. The project initially started with four companies. Today numerous firms from the entire Emilia-Romagna region are involved. These positive experiences provided the impetus for the EU project KASSETTS in which the logistics broker concept is being refined qualitatively and quantitatively. The intention is to establish an international network with a total of seven such brokers in seven European countries by 2011.

The Fraunhofer IFF Is Developing a Broker Network

The researchers at the Fraunhofer IFF in Magdeburg are in charge of creating this network. One of eight European partners in the KASSETTS project, they took on the job of developing the necessary basis for networking and creating a German version of the software. The experts at the Fraunhofer IFF are also developing the future brokers’ individual business models, which will form the basis for the network’s future success.

Thus, the logistics network is gradually being adapted to the new, significantly more complex basic conditions of cross-border freight traffic. Ultimately, it will very soon be used to help plan efficient transnational supply chains while allowing for the different manufacturing companies’ specific order and delivery data. However, the new regional brokers have to be established first, most likely in Germany, Italy, Czech, Slovenia, Hungary, Poland and Slovakia. Once that is done, they will be interconnected in a second step. This will enable regional agents to fall back on their national or transnational partners when needed. Advanced ICT technologies will be used to produce a wide-ranging network of intelligent broker systems with which it will ultimately be possible to plan and handle international material flows highly efficiently, even for small and medium-sized enterprises.

A Logistics Broker for Magdeburg

The Fraunhofer IFF is installing one of these first seven regional logistics brokers in Magdeburg, too. As it now stands, the Fraunhofer Institute will even assume the function of a neutral agent at the start. At any rate, the technical and logistical challenges have been effectively resolved. The recruitment of regional firms, which want to be the first involved in the project, has started. Interested companies can find more information on the website www.kassetts.iff.fraunhofer.de.

The pilot model in the Magdeburg region will finally start toward the end of 2010. The researchers expect their experiences with the logistics broker to be as good as those of their colleagues in Modena. Like there, success in Saxony-Anhalt will depend on intense interaction between public and private stakeholders. Success will translate into a win-win situation for everyone involved, in which combining the benefits for business and the environment will blend public and private interests together.

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ELECTROMOBILITY: ON THE ROAD IN THE FUTURE

Dr. Przemyslaw Komarnicki, Tobias Kutzler, Prof. Zbigniew A. Styczynski, Prof. Gerhard Müller, Dr. Matthias Gohla and Holger Seidel
The German government has declared increased numbers of electric cars on our roads to be a goal. In addition, the reduction of CO₂ emissions and sustainable energy recovery are priorities in a novel transportation and energy concept. However, the appropriate vehicle technology is still in the development stage and the necessary supply concepts are still being finalized.
Future Electromobility Development Plan

In the future, electric vehicles will be an important part of an ecologically sustainable transportation concept. The German government also concurs with this and is supporting the development of the necessary technology with its National Electromobility Development Plan with the strategic objective of making Germany the world’s leading market for green transportation and energy recovery concepts. The Ministry of Education and Research is investing 200 million euros in this plan. From 2005 to 2013, the federal government will be spending a total of 700 million euros on it, largely funds from the Economic Stimulus Package II.

If everything runs as planned, around one million electric vehicles will be driving on Germany’s roads by 2020. This will be just the beginning. They are supposed to have completely replaced cars with combustion engine by the time oil eventually runs out in this century. In combination with entirely new mobility concepts, they will define transportation in the future. In a way, this is a rematch between long-time rivals. Electric vehicles were being successfully built thirty years before the first gasoline cars. They were quiet, efficient and fast. Nonetheless, around one hundred years ago, they lost out to competing diesel and gasoline cars, which were more rugged and more easily fueled.

Renewable Energies Instead of Fossil Fuels

Finally making the dream of efficient electromobility reality will require not only clever vehicle and electricity storage technologies. Reliable, standardized supply networks and an idea whence the energy for the vehicles will ultimately come are at least just as important. Renewable energy sources will presumably cover the energy requirements of future electric fleets without any problem. Chairman of the German Advisory Council on the Environment Prof. Dr. Martin Faulstich recently asserted before the German Bundestag’s environment committee that “Germany can be supplied one hundred percent by green...
power from renewable energies in 2050.” Given current resistance throughout the country, its actual implementation by then is still debatable. Nonetheless, the probability of having fully switched to renewable power generation by 2050 is high. After all, it is more cost effective than the exploitation of still extant fossil energy sources.

**Harz.EE-mobility Research Project**

What might a concept for future mobility actually entail? A group of prominent regional and national partners from business, academia and research have been working on an answer since August 2009 in the project Harz.ErneuerbareEnergien-mobility or Harz.EE-mobility for short. The consortium intends to design a prototype mobility concept by 2011, which is based entirely on the utilization of electricity principally supplied by renewable sources. The main challenge is to ensure that individuals’ mobility is not appreciably affected, despite the imponderables, when renewable energies are utilized to power vehicles. The partners intend to visibly demonstrate that this is not an unsolvable problem but absolutely realistic. A small fleet of electric cars relying on a model area-wide electrical infrastructure for their power supply, will soon be driving around the Harz region.

The starting point and prerequisite for Harz.EE-mobility is a large share of renewable energies in the power generated in entire Harz region. Over sixty percent of the energy is already being recovered from wind, sun and other alternative sources. The project RegModHarz (Harz Model Renewable Region), in which the Fraunhofer IFF is also involved, intends to make them available, including for use in the electric vehicle network being established. To this end, RegModHarz is developing a virtual power plant with which energy from different renewable sources can be fed into a functioning and stable supply network. It will form the foundation for further development of renewable energies and thus also the basis for their use in the electric vehicle network of tomorrow.
Aims

So that future travel in electric vehicles will be reliable, Harz.EE-mobility is chiefly pursuing three aims. First, the cost effectiveness of electromobility will be expanded by maximizing the share of renewable energies. Second, the certainty of supply in the grid will be guaranteed nonetheless. Third, the reduction of CO₂ emissions in passenger traffic will advance climate protection.

The Fraunhofer IFF and its partners in the consortium share related tasks. In particular, the Fraunhofer IFF is responsible for the development of a mobility control center and vehicle communication and management system, including the control of all the related logistical operations. At is also responsible for the development of a data management system in the overall electric vehicle network.

Ultimately, the results of this project will set the course for the operation of future electric vehicle networks. The researchers at the Fraunhofer IFF in Magdeburg are extremely aware of the importance of this work and are intensely working on a system that controls logistical and electrical processes for vehicles to ensure full mobility. The fundamental problem with vehicles’ capacity to store electricity has still not been definitively solved and must be factored into the logistics, e.g. when planning the infrastructure or the charging stations. What should they look like? Where, in what intervals and at which locations will they be situated optimally?

Determining the Demand for Mobility

Three scenarios form the basis of related studies: urban areas with their infrastructure, rural areas with their characteristic options for mobility and industrial environments that impose different demands on electromobility. The individual mobility requirements will be determined for each of these areas. In addition to their flows of traffic, the characteristics of mobility will be analyzed in order to identify the places and lengths of time vehicles can be parked. In the future. This time will be used to charge cars. The outcome will form the basis for subsequent planning.

Mobility Control Centers Will Support a Distributed Energy Supply

What will this look like? The vehicles themselves will play an important role. Their batteries are intended to become mobile electricity storage systems in the grid of the future. Therefore, for example, locations where vehicles can park long enough are being studied. Parking lots at residences or places of work are the most likely possibilities but long-term parking garages are also potential locations. While electric vehicles will charge power at charging stations, they could also return power to the grid. Thus, connected to the grid, they would support a distributed energy supply controlled by mobility control centers where all data on power and traffic converge. Central control centers would recommend a charging station when drivers ask or when their battery charge is low. Drivers would additionally receive other important information on their navigation systems. They would be informed which charging station is occupied at the moment, which one will be free soon or where power is currently cheapest. In the case of a traffic jam, the control center would direct vehicles with low charges to the nearest charging station.

Just as important to the researchers is the question of how to compensate car
owners for regularly tapping their batteries. Although the concept itself is environmentally compatible, electric vehicle batteries do not last forever and are expensive. Naturally, constant charging and discharging is a stress on them. Hence, supplying energy ought to pay off for a driver. An answer to this question will ultimately depend on the business models developed. Different scenarios with electronic marketplaces and electromobility services are customized solutions. Direct financial benefits are conceivable for example. Another idea is to provide batteries to vehicle users at no cost.

**Individuality and Data Privacy**

Although vehicles’ supply systems will be centrally accessible, no one will have to fear any unwanted tapping of their power. All drivers will be able to decide if they want to resupply energy to the system as well as when and how much. If they do not want to be part of the system at all, they will be able log off completely. However, they would no longer benefit from the advantages then, e.g. the ability to reserve any charging stations by cell phone and Internet, or to participate in special bonus programs for cheaper power.

Primarily mobile terminals with telematic technologies will be used to communicate with the control center, access online services in the vehicle, monitor charging and customize settings. Thus, the system will be able to issue an individual analysis of the places and times a vehicle is parked, which will be used to individually determine mobility profiles and related energy requirements anytime and anywhere. A vehicle will get to know its driver and often know in advance where it will be driven mornings and how large the day’s energy requirement will be. This will enable the system to independently plan battery charging and discharging in advance or reserve a charging station at one’s place of work. In order to assuage reservations about data privacy, settings for data use and transmission can be customized at any time.

**The Need for Standardization**

As much as this still sounds like wishful thinking, the first electric cars will already be underway in the Harz region toward the end of 2010. The charging terminal infrastructure will have to be standardized internationally so that electric cars will one day really be able to drive everywhere unimpeded in a complete and functioning system. Charging terminals, charging stations and identification and billing systems all need to be compatible throughout Europe or even the world. This is a challenging task to which the Harz.EE-mobility project is making an invaluable contribution. Once this has been done, an even far greater challenge awaits, namely the development and installation of the complete network.

The project partners are extremely confident, even where the concept’s long-term success is concerned. The test phase in the Harz region will have concluded by mid 2011. Afterward, electric cars will be regularly driving through Magdeburg and the cities in the Harz region. Later, they will be made available to commuters between Magdeburg and the Harz region.

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The success of electric cars will stand or fall with the power supply. Acceptance of this technology will rise once vehicles can be charged anytime and anywhere with green electricity from renewable energy. Hence, charging stations will have to be located smartly so that an electric car can even reach a city sixty kilometers away without any problems. Photo: Dirk Mahler
INDIA’S FUTURE, EUROPE’S OPPORTUNITY

The Indian Logistics Industry’s Prospects
Kay Matzner and Holger Seidel
The Indian market for logistics services is huge and steadily growing. Yet there is still tremendous potential to improve efficiency and cost effectiveness. The expertise of European and, not least, German technology companies are in great demand for the development of an effective and above all sustainable and green sector. However, they are still having difficulty gaining a foothold on the subcontinent. Under the guidance of the Fraunhofer IFF, the newly established European Business and Technology Centre provides European companies support that makes their entry in the Indian logistics market less complex.

India, Land of Superlatives

India’s capital Delhi is one of the largest megacities on our planet. Including the outlying metropolitan region, an estimated nineteen million people live there. Delhi is only India’s second largest city. With a similarly estimated population of twenty-one million, the port city of Mumbai on the west coast even surpasses this. Nobody knows the exact numbers though. It is too difficult to count or just estimate people in a country where there is no functioning birth and registration records and, even today, caste membership all too frequently determines whether neighbors take notice of an individual or not.

The first complete census of India’s population, which is likely already the largest ever, is planned for 2011. At that time, all of the presently estimated 1.1 billion Indians will be issued personal identification. The feasibility of this plan remains to be seen. At least it will provide a certain clarity and a figure that allows reasonably certain forecasts and thus planning for the subcontinent’s development and as well as an idea of the circumstances to which the country owes its development thus far, the risks they harbors and the opportunities for the future. The Indian government is spending 580 million euros just to compile a national registry.

Soon the World’s Third Largest Economy

Without a doubt, India is a country of contradictions and superlatives. Soon, it will supersede China as the country with the largest population on earth. Just like neighboring China, India is also one of the largest and fastest growing markets in the world. The country’s economy has grown nearly nine percent in the last five years. Even the global economic crisis only curtailed this growth to a certain extent. Its gross domestic product was approximately 794 billion euros in 2008-2009. At this tempo, the sheer size of its economy and its demography alone will make its gross domestic product the third largest in the world after China and the USA by the middle of the century. Unlike its northern neighbor, India is also encouraging this growth by stimulating demand. Thus, it offers outstanding opportunities to do business, even for European companies. Nevertheless, European business activities with India currently account for just 1.8 percent of the EU’s total volume of trade. Europe’s market share in India has even been declining. Therefore, a number of initiatives were established in recent years, which are intended to intensify European companies’ activity on the subcontinent.

The European Business and Technology Centre

One of these projects is the European Business and Technology Centre of EBTC in New Delhi, the geographic and political epicenter of the Indian capital. Launched in 2009 for four years at first, it is part of the Global Europe strategy and the Small Business Act and is intended to promote the technological expertise of European small and medium-sized enterprises in a globalized market.

Contact Point and Adviser for European Companies

The EBTC considers its central task to be the facilitation of European small and medium-sized enterprises’ entry in the Indian market. It acts as a contact point, coordinator and adviser for European companies and research organizations, which intend on establishing fruitful business contacts. After all, entry into the Indian market is still not easy for European firms. The formerly planned economy, has been experiencing successive deregulation and privatization only since 1991. Although the Indian government has been aggressively facing the challenges of globalization since then, a multitude of bureaucratic obstacles, complicated tax codes and an administration and government geared toward “special contributions” have impeded economic development.

Focus on Green Technology

On top of everything, India is also definitely noticing the impacts of environmental pollution and climate change. In order to assure its development is sustainable, the country is encouraging certain industries in its booming economy to principally focus on green technologies. This is where close collaboration between European and Indian companies, academic institutions and research organizations is particularly important.
Given this situation, the EBTC is primarily relying on the support of European SMEs that would like to capture the Indian market focused on green technologies. Run by Eurochambres, the center oversees over thirty European organizations and concentrates its activities in four key sectors: energy, environment, transport and biotechnology. In each of these sectors, top research organizations have joined forces with leading companies and universities.

The Fraunhofer IFF Heads the Transport Sector

One of Germany’s leading research institutes specialized in logistics, the Fraunhofer IFF in Magdeburg is heading the development of the transport sector and is in charge of managing it sustainably. The Fraunhofer IFF sees great promise in the development of the Indian logistics sector because of its great potentials for efficiency. Currently growing around fifteen percent every year, the logistics sector is hardly able to keep pace with the rising gross domestic product. Reasons are both structural impediments, e.g. bureaucracy and the poor transportation infrastructure, and the still inadequate communication infrastructure. The cellular phone sector is one of India’s strongly growing industries since landlines and thus the Internet are still not sufficiently widespread. This generates a significant lack of transparency when clients’ and business partners’ orders are processed, which in turn increases costs, labor and time requirements.

Solutions

The work of EBTC’s transport sector is intended to provide support from European firms to resolve these dilemmas. They will help precisely identify, define, prioritize and implement solutions and actions. This will also include persuading the Indian government to create more legal foundations for fair competition. Efforts will also be focused on improving and upgrading the infrastructure, above all highways, but also examining whether alternative transport routes such as inland waterways and railways deserve directly support from subsidies. In partic-
ular, it will be essential to upgrade the communication infrastructure all over the country.

In the first year of the project, EBTC’s logistics sector headed by the Fraunhofer IFF concentrated on conducting initial studies and holding a related international conference for professionals. Discussions at the conference focused on identifying the problem areas of the Indian logistics sectors and defining practicable and efficient solutions. In conjunction with this, EBTC’s logistics sector also advised the European Union. EBTC’s appraisals of the specific situations in India are much in demand in the country. Among other things, efforts are being made to provide the most accurate information about government planning, analyze Indian development programs and inform European companies how to take advantage of them.

The structures and networks created already appear to be functioning excellently. Although the systematic initiation of business has not yet been the priority, some successes have already been achieved here. The EBTC’s liaison work in India has already enabled a French logistics planner to launch its first promising project. This is a good omen that the EBTC will function effectively as an intelligent, synergetic interface between existing service providers from EU member states and their Indian counterparts.

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Trade Mission to India

The Fraunhofer IFF will head the first trade mission to Delhi before this year is out. The companies involved will benefit from special aid and support in their search for suitable business partners in India, a challenge that frequently causes small companies in particular to shrink from entering India. Twenty-five companies from all over Europe will be able to take part in the project. The eligibility requirements are demanding though. Only technologically advanced companies active in the green technology sector and be considered. This will guarantee that know-how is systematically transferred from Europe to India.

The European Enterprise Network will announce the names of the participants. Applying is worthwhile because this assistance will significantly increase prospects to quickly and successfully gain a foothold in the Indian market.

The European Enterprise Network will announce the names of the participants. Applying is worthwhile because this assistance will significantly increase prospects to quickly and successfully gain a foothold in the Indian market. The structures and networks created already appear to be functioning excellently. Although the systematic initiation of business has not yet been the priority, some successes have already been achieved here. The EBTC’s liaison work in India has already enabled a French logistics planner to launch its first promising project. This is a good omen that the EBTC will function effectively as an intelligent, synergetic interface between existing service providers from EU member states and their Indian counterparts.

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India’s infrastructure desperately needs to be upgraded. This applies not only to highways but also other transport routes such as railways.

Photo: Dieter Schütz/pixelio.de
MÜLLER NAMED HONORARY PROFESSOR IN KHARKIV

The Fraunhofer Institute IFF’s Deputy Director, Dr. Gerhard Müller, was named honorary professor on May 28. Prof. Volodymyr Kriftsov, President of the Ukrainian Kharkiv Aviation Institute, conferred the honorary title from Kharkiv Aviation Institute on him during the festivities marking the renowned National Aerospace University’s eightieth anniversary. With this award, Professor Kriftsov recognized Müller’s outstanding achievements as an engineer and his abiding commitment to intensifying research relationships between the National Aerospace University in Kharkiv and the Fraunhofer IFF.

Gerhard Müller earned his undergraduate and doctoral degrees from Otto von Guericke Technical College Magdeburg, now Otto von Guericke University. Since 1991, he has been instrumental in establishing the Fraunhofer Institute for Factory Operation and Automation IFF. He first headed the Department of Maintenance and Service Management and later the Division of Planning and Logistics. As Deputy Director, Prof. Müller intensively supports the institute’s Director Prof. Michael Schenk in managing institute business. Prof. Müller is a member of the Scientific-Technical Board of the Fraunhofer-Gesellschaft and an active high-ranking member or numerous organizations such as the VDI, RKW, ZERE and CEESA.

The researcher’s true passion is renewable energies and he particularly foresees a promising future for hydropower. That is why the native of the Altmark region is investing a great deal of energy in preserving the traditional hydropower system on his family’s estate, an old mill.
FULL STEAM AHEAD

Marco Schumann’s academic career has been closely connected with the Fraunhofer IFF from start to finish. In February, he earned his doctorate from Otto von Guericke University with a dissertation on the “Architecture and Application of Distributed VR Based Training Systems”. A computer science major, Marco Schumann already gathered his first experiences at Magdeburg’s Fraunhofer Institute in 1995. The young researcher briefly left his academic home for a year abroad at the University of Wisconsin in the USA. He soon returned to the Fraunhofer IFF. Today, as the manager of the central offices of the strategically most important projects AVILUS, AVI-LUSplus and ViERforES, Dr. Schumann bears great responsibility at the Fraunhofer IFF in Magdeburg. In addition, he heads the regional Harz Center of Excellence, a branch of the Fraunhofer IFF in Wernigerode. “I’m very pleased that I have supported and helped develop the field of virtual reality from the start,” states the researcher.

The native of Halberstadt likes living in the state capital. “Downtown Magdeburg has experienced an impressive transformation and I enjoy going with my family to the municipal park or with my wife to the Theater an der Angel. I also like showing business partners the many lovely spots on the Elbe,” explains Dr. Marco Schumann.

As a child, he actually wanted to become a railroad engineer. Thanks to the virtually unlimited possibilities of virtual reality, the member of Magdeburg’s Friends of the Railroad does not have to give up his dream. The Harzer Schmalspurbahnen GmbH contracted the Fraunhofer IFF to develop a virtual steam locomotive cab. Not only can the Harzer Schmalspurbahnen GmbH use the model to train its apprentices and honorary engineers. Fans of steam locomotives can also familiarize themselves with a new steam locomotive on their computers at home. As it is, Dr. Marco Schumann is always moving full steam ahead.

SCHREIBER NOW HONORARY PROFESSOR IN MAGDEBURG

Werner Schreiber, Manager of Volkswagen Group Research’s Division of Manufacturing and Process Research, accepted an appointment at Otto von Guericke University Magdeburg. The spokesman for the Virtual Technologies Innovation Alliance, a strategic research initiative of the Federal Ministry of education and Research, will be teaching courses on augmented reality in industrial applications in the School of Mechanical Engineering.

Prof. Werner Schreiber was born in Solingen. After graduating from the Technical University of Braunschweig, he worked as a project manager at Diehl GmbH in Nürnberg. Afterward, Schreiber returned to Solingen as a research engineer at Robert Krups GmbH. Prof. Werner Schreiber earned his doctorate in engineering in 1991, the same year he was made an executive at Volkswagen.
Fifty-five young researchers brought a truly fresh breeze to the Virtual Development and Training Centre VDTC with thirty-three projects in March on the occasion of the state’s Jugend forscht competition held by Eon Avacon at the Fraunhofer IFF for the third time in a row.

The projects revealed the up-and-coming talents’ diversity and inventiveness. Whether interactive tickets for sports facilities, subjective factors for railway fuel economizing, autonomous rescue robots, options for intelligent energy savings for cooking or the effects of oral hygiene articles on the population of microorganisms in the human mouth – they all produced unique projects.

However, this year too, only those in first place garnered a ticket to the national Jugend forscht competition in Essen on May 13-16.

Hazardous glare reduced brilliantly by the winners Vivien Zahn and Patrick Günther from Winckelmann High School in Stendal. Photo: Dirk Mahler/Eon Avacon

For instance, Vivien Zahn and Patrick Günther took first place in the discipline of systems with their project “Development of a system that prevents glare from lights in oncoming traffic”. The students from Winckelmann High School in Stendal developed glare-reducing films for car headlights and windshields.

At the end of a long day filled with questions and answers, the sharp young minds were ultimately also allowed to just be spectators for once.

True to this year’s motto “Discover New Worlds”, the young researchers had an opportunity to more closely examine the Fraunhofer IFF’s Virtual Development and Training Centre VDTC during a tour.

In the end, four young researchers from Saxony-Anhalt were able to celebrate a second time at the nationals in Essen. They received special awards in the categories of working world, biology and physics.

Anne-Floriane Hennig from Pforta State High School worked on “Proteomics: A Young Branch of Research to Diagnose Old Maladies”. She inoculated healthy lung cells and lung tumor cells with cadmium. She thus demonstrated that metallothioneins (MTs) actually play a role in protecting cells against damage caused by heavy metals. She won in the discipline of biology.
THE WORLD AS A MENTAL STREET MAP

Very few are able to maintain that they have such knowledge of geography as Andreas Müller, coordinator of the Saxony-Anhalt Galileo Test Bed and chairman of the Association for the Promotion of Satellite Navigation (SANASA) in Saxony-Anhalt.

He learned for this early on. Maps already fascinated Andreas Müller as a young boy. He meticulously copied old maps from his great grandfather’s encyclopedia. After completing school, the native of Salzwedel he was certified as a surveying technician.

During his undergraduate studies of geography in Göttingen and Exeter (GB), Andreas Müller specialized in satellite remote sensing. Since then he has been preoccupied by the question of what all can be done with satellite data. An eventful time establishing the company GeoContent followed. In a leading position there, the degree holding geographer collaborated significantly on enabling the firm in Magdeburg to offer the first complete set of aerial photographs of Germany and making it the market leader.

Google turned to them for its service Google Earth. Andreas Müller also works closely together with other major portal service providers such as Microsoft.

Today, all aspects of Germany’s most advanced development lab for localization, navigation and communication in transportation and logistics converge at Müller. The Saxony-Anhalt Galileo Test Bed is based at Otto von Guericke University Magdeburg’s Institute of Logistics and Material-Handling Systems headed by Prof. Michael Schenk. This year’s special event was the opening of the development lab for the test bed in Magdeburg’s port. “The project is now being filled with life, the foundations have been laid. The Galileo Test Bed can now be experienced,” say Andreas Müller, with obvious pleasure.

The coordinator considers his next major task to be the development of strategic partnerships and establishment of networks of excellence in logistics and transportation.

After work, when it is dark and his two children have gone to bed, Andreas Müller still enjoys looking skyward. He observes the stars and satellites through his telescope, a present from his grandfather. Sometimes, the Galileo coordinator is even able to pick out “his” Galileo satellites.
Germany’s most advanced lab for localization, navigation and communication in transportation and logistics is located in Magdeburg’s Port of science. State-of-the-art logistics solutions, e.g. automatic inventorying of shipments by means of RFID systems, are developed and tested at the Galileo Test Bed.
2010 Science Summer in Magdeburg:
Numerous events aroused the enthusiasm of 40,000 inquisitive visitors. Thousands embarked on an expedition of discovery through Magdeburg’s research organizations on the Long Night of Science. The researchers at the Fraunhofer IFF’s Virtual Development and Training Centre VDTC even resurrected dinosaurs before everyone’s eyes – and thus especially made the youngest future researchers’ hearts beat faster. No problem with augmented reality. This technology superimposes images from a virtual environment on reality.
How can renewable energies be used efficiently to generate power? The Fraunhofer IFF’s experts in process and plant engineering are working on concepts that utilize particularly abundant biomass. They are employing fluidized bed gasification.

So far, the fuel gas produced and subsequently cleaned has been supplied to gas engines for consumption. Fuel cells now do this significantly more efficiently. During a test, André Herrmann connects two heavy-duty electric cables to an SOFC fuel cell.
Meet up with researchers from the Fraunhofer Institute for Factory Operation and Automation at these events. Come talk to us!

13th IFF science Days
June 15-17, 2010, Magdeburg

31st VDI/VDEh Maintenance Forum 2010
June 23-24, 2010, Hürth

CARS 2010 Computer Assisted Radiology and Surgery
June 23-26, 2010, Geneva, Switzerland

Gas Compressor Station Maintenance
June 29-30, 2010, Düsseldorf

VCBM Visual Computing for Biology and Medicine
July 1-2, 2010, Leipzig

PIERS 2010 Progress In Electromagnetics Research Symposium
July 5-8, 2010, Cambridge, USA

Condition Monitoring
July 8, 2010, Lübeck

Interforst 2010
11th International Trade Fair for Forestry and Forestry Technology
July 14-18, 2010, Munich

3rd International Conference on Applied Human Factors and Ergonomics AHFE 2010
July 17-20, 2010, Miami, USA

General Meeting of the Institute of Electrical and Electronics Engineers IEEE
July 25-29, 2010, Minneapolis, USA

20th International Conference on Pattern Recognition
August 23-26, 2010, Istanbul, Turkey

8th NEMO-SpectroNet Collaboration Forum
August 26-27, 2010, Jena

2nd Central German Logistics Forum
August 30-31, 2010, Leipzig

FIT for Knowledge Competition with ProWis
September 9-10, 2010, Magdeburg

Workshop on Effective Order Processing in Plant Manufacturing
September 14, 2010, Kaiserslautern

InnoTrans
September 21-24, 2010, Berlin

33rd Annual German Conference on Artificial Intelligence
September 21-24, 2010, Karlsruhe

VDI Fachausschuss Holistic Production Systems
September 24, 2010, Döden

AMB International Exhibition for Metal Working
September 28 – October 2, 2010, Stuttgart

Fraunhofer Vision Technology Day 2010
September 29-30, 2010, Stuttgart

EXPO REAL 2010 International Trade Fair for Commercial Property and Investment
October 4-6, 2010, Munich

Federal Agency for Agriculture and Food BLE Innovation Days
October 6-7, 2010, Stuttgart

International Conference on Biomass Logistics
October 12-13, 2010, Hohenexleben

International Conference on 3D Body Scanning Technologies
October 19-20, 2010, Lugano, Switzerland

27th German Logistics Congress
October 20-22, 2010, Berlin

1st Railroad Conference
October 26-28, 2010, Katowice, Poland

eChallenges Conference
October 27-29, 2010, Warsaw, Poland

7th Virtual Reality Guest Lecture Series: Humans and Machines in Interactive Dialog
October 27 – December 1, 2010, Magdeburg

ProWis-Connect Mitte
November 3, 2010, Mönchengladbach

14th Cooperation in Plant Engineering Industry Working Group
November 4, 2010, Stendal

Vision
November 9-11, 2010, Stuttgart

Annual Colloquium on Image Processing in Automation
November 10, 2010, Lemgo

Conference on Quality Indicators in Production
November 23-24, 2010, Weinheim