



View across the Skandinavienkai towards the Baltic Sea, showing the new port building

photo: LHG/Vogele

Passenger and cargo handling benefit from the latest software development environment

Mobility in the Integrated Port Logistics System of the Lübecker Hafen-Gesellschaft

By Nikolaj Budzyn

Due to immense fluctuations in world-wide transport, commercial parts are constantly facing significant changes. However each change is an opportunity, as the Port of Lübeck has integrated the process management of mobile units into the self-developed Integrated Port Logistic Systems, providing benefits for all involved.

The Lübecker Hafen-Gesellschaft mbH (LHG), with about 1,050 employees, operates the public ports in the Hanseatic City of

Lübeck, making it Germany's largest port operator on the Baltic Sea. From five terminals, ferries travel to Scandinavia, Finland, Russia, the

Baltic states, and directly to Philadelphia. In 2008, LHG handled 28.5 million metric tons of cargo.

Core business

The core business of LHG includes the handling of paper products from RoRo (roll-on/roll-off) ships. Paper and cellulose are taken from the ships with mobile units like roller trailers, stored, and kept ready for distribution to the entire European continent. Processes in the port also include the handling of units like semi trailers and containers, the management of carrier units, truck handling, rail car handling, storage planning, and many additional services for customers and partners.

IHS

LHG's integrated port logistics system IHS is a powerful system for handling all the logistical tasks of a port in which all goods flows are modeled. It provides interfaces for participants such as distribution companies and shipping companies for the exchange of ETA notifications, arrival notifications, and loading confirmations, as well as an

even used spares can be found only with difficulty. The software used to date on the mobile devices is a purely text-based custom development in C, which has been extended over time to varying customer requirements, but cannot be ported to hardware currently available. Against this background, LHG is replacing the hand-held and vehicle devices currently in use with a new generation of data terminals, and replacing their current C solution with the IHS-Mobile software at the same time.

IHS-Mobile

IHS-Mobile directly provides all the information relevant for the

model special cases and individual customer requirements, while still largely preventing incorrect operation.

The highlight of the non-functional requirements for IHS-Mobile is a high capacity for offline operation. Instabilities in radio network coverage – such as building changes, changing ship docking positions, and the influences of weather – should be smoothed over by IHS-Mobile, so that the user can continue to work without interruption in these cases.

Requirements management

A prototype phase initiated by LHG (the first development cycle) demonstrated the feasibility of a Java solution. In this phase, many new technical requirements were discovered at the same time, which also increased complexity. Here, LHG took the opportunity to make use of an incremental methodology in a second development cycle (see also the article on p. 20) incorporating a more detailed requirements management system to describe the functional and non-functional requirements as well as the overall design of operating procedures. One particular challenge was to combine requirements from the points



photo: LHG/Klein

The management headquarters of LHG in the port building on the Skandinavienkai

System for modeling all logistical tasks and all goods flows in the port

interface for the display and editing of data on the PC and for the preparation of reports.

Mobile data entry

A core component of IHS is the use of mobile devices, in use at LHG since 1996. In the past few years, however, the error cases have increased, repairs are costly, and

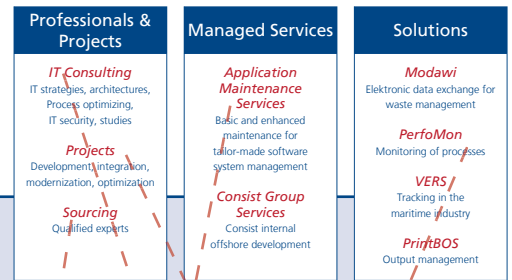
working processes of a port worker. And employees can also use the application to enter data on all goods received and cargo movements directly in the port. This data is exchanged with the central data storage facility by radio. During data entry, the focus is on fast, intuitive operation so that a gentle learning curve is assured. IHS-Mobile provides sufficient process flexibility to

LHG and Consist

Since 2005, Consist has been working with LHG in different roles and tasks. It began with a study of the future prospects of the then-existing IT. Many of the measures proposed, such as development with Java and the construction of the lhg24 Internet portal, were developed in the following years, with the result that LHG now has a modern software development and runtime environment.

The business and technical competence of LHG employees and Consist experience with development methodologies over the entire lifecycle of an application is the ideal blend for success. Not just one study, but many successful projects allow a new software production environment to gain trust.

Consist's service portfolio represents an excellent basis for work



at LHG. The new IT strategy was worked out in the context of our IT consulting services, and was implemented by specialists from our Projects and Sourcing divisions. Workshops have also been held at LHG on the topics of our service offers such as AMS and PerfoMon.

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of view of the different stakeholders – port workers, machine drivers, administrative management, IT operators – into a single coherent application. All special cases, exceptions, and customer specifics in the old application must be ported to the overall design, so that from the perspective of usability an easily learnable and efficiently operated system could result.

The requirements management performed by Consist is the basis for LHS project management. On this foundation, LHG carries out prioritization, plans release steps, and can track project progress in detail. Moreover, the unified architectural framework recommended by Consist for Java-based applications after the study (see LHG and Consist) is also maintained. So the integration of IHS-Mobile into the long-term IT strategy of LHG is ensured. Be-

sides requirements management, Consist is also involved in the development of IHS-Mobile.

Schedule

The IHS-Mobile / paper handling module entered an initial pilot phase in Fall of 2008. Since the start of 2009, the Lübeck-Schlutup terminal is nearly exclusively using hand-held devices with the IHS-Mobile application. The users in handling operations consider the application thoroughly understandable. The training of new users can be carried out during ongoing operation. A training time of 25 minutes is sufficient.

In February, 2009, IHS-Mobile was put into production in the Nordlandkai terminal. At the same time, the design and development of the next component of IHS-

Mobile has commenced: the handling of roller trailers, containers, and semi trailers with a new vehicle application.

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