PARADIGMA applies advanced management science techniques to address strategic issues and to take advantage of business opportunities on behalf of her clients.

- PARADIGMA consultants have experience reconciling and harmonizing data from different transport modalities, application of proven logistic and supply chain management concepts, as well as model building and predictive analyses studies.

PARADIGMA draws upon an extensive network of academic research partners and customers, built through participation in international and European projects. PARADIGMA is a SPACE TIME RESEARCH Business Partner and has gained experience with SUPERSTAR components from numerous customer engagements.

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APIS Analytical Port Information System

# APIS

## Analytical Port Information System

## Summary

**Maritime ports must not only develop inter-modal transportation services but information and data services. To provide a competitive, efficient, and compelling intermodal service as the most important node in the transportation network requires information and data. Data must be collected, used and shared.**

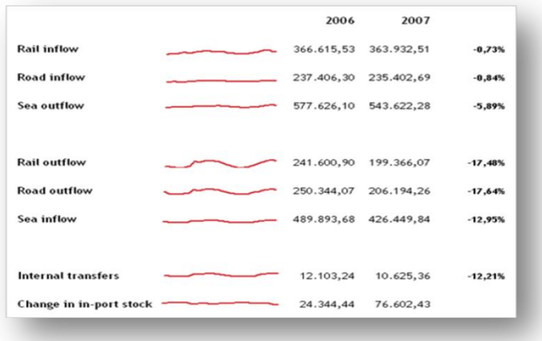
**The APIS Analytical Port Information System has been specifically developed to address the challenge for maritime ports to provide not only intermodal transportation services, but information and data services for themselves and their stakeholders. APIS provides quality data consolidation, data analysis, data reporting and visualization.**

PARADIGMA

# APIS
# Analytical Port Information System

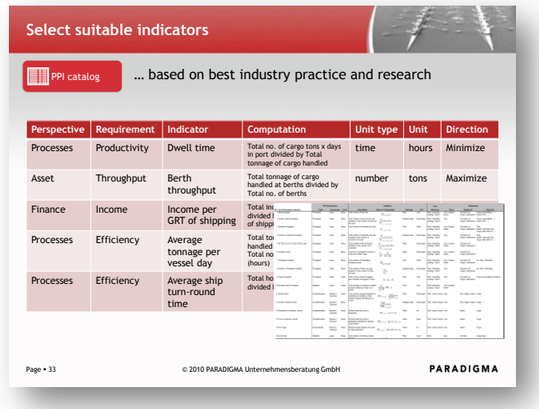
**The APIS Analytical Port Information System** has been **specifically developed to address the challenge for maritime ports** to provide not only intermodal transportation services but information and data services for themselves and their stakeholders. **APIS provides quality data consolidation, data analysis, data reporting and visualization.**

- ✓ **APIS consolidates trade data**, maritime, road and rail transport data, traffic count data as well as vessel and vehicle positioning data. APIS uses open source tools to extract data from existing operational port community systems and to transform and load the high periodicity and micro-level data into the analytical data repository.
- ✓ **APIS supports data quality** by use of Standard classifications. APIS uses SUPERSTAR technology to store and present this micro level data in a format amenable to statistical and econometric analyses and research purposes.
- ✓ **APIS provides analysis of the data** using ad hoc analytics tools that include privacy protection and confidentiality of the data and are tailored for users from statisticians to casual users.

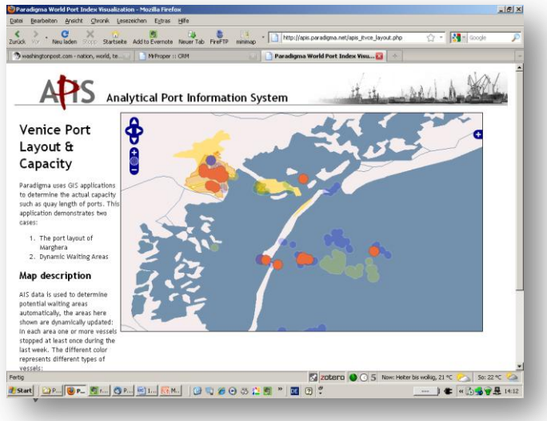


| | 2006 | 2007 | |
|---|---|---|---|
| Rail inflow | 366.615,53 | 363.932,51 | -0,73% |
| Road inflow | 237.406,30 | 235.402,69 | -0,84% |
| Sea outflow | 577.626,10 | 543.622,28 | -5,89% |
| Rail outflow | 241.600,90 | 199.366,07 | -17,48% |
| Road outflow | 250.344,07 | 206.194,26 | -17,64% |
| Sea inflow | 489.893,68 | 426.449,84 | -12,95% |
| Internal transfers | 12.103,24 | 10.625,36 | -12,21% |
| Change in in-port stock | 24.344,44 | 76.602,43 | |

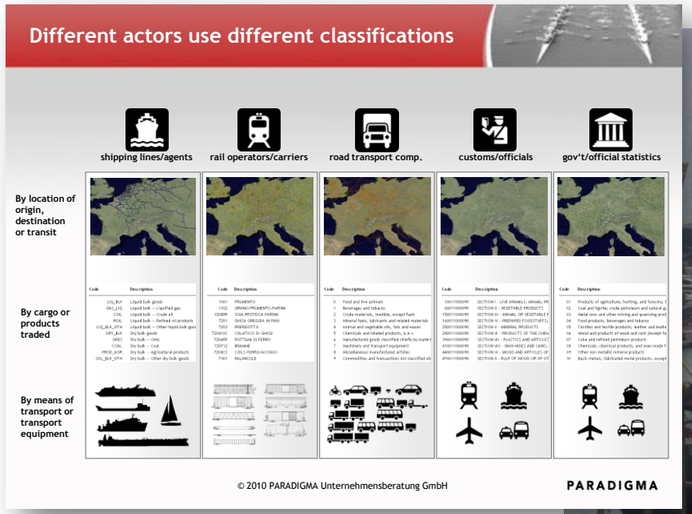
- ✓ **APIS includes a set of predefined key performance indicators** to support a ports management system. Functions are provided to develop indicators, either tailored to a port's particular environment or in response to changes in strategy and management attention.




- ✓ **APIS interactive visualization and reports** use SuperVIEW which can be used separately or easily integrated in existing web portal infrastructures or cloud-based environments.
- ✓ **APIS provides geo-referencing of trade and transport data**, coupled with spatially enabled analysis, allows business development management to easily identify current and potential transport catchment areas based on transit times, existing infrastructure and utilization.




- ✓ **APIS illustrated reports and statistical tables** can be disseminated using traditional publication channels, as well as international data standards such as SDMX. SDMX is a data exchange standard promoted by EUROSTAT, OECD, IMF and others and is supported by the SUPERSTAR component of APIS.

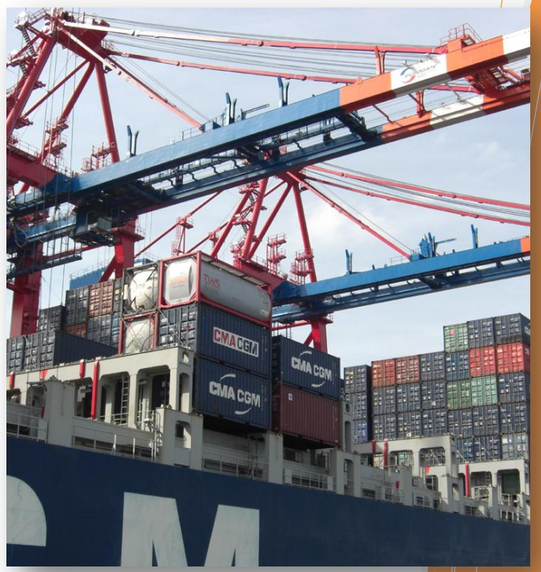



APIS Analytical Port Information System

## Data and Information become important

In the past, maritime ports were simply a public service for a region and funded by local taxes. Modern ports have become important nodes in the global commercial transportation network, expected to recover the costs of their services. To successfully complete this transition, maritime ports must provide not only intermodal transportation services but information and data services for themselves and their customers

- ✓ Volatility in the global economy means variability in the demand for transportation services. Variability presents operational challenges to allocating port resources and planning short and long term investments. Maritime ports will have to collect, use, and share information and data to compete with alternatives and to build a defensible competitive position.
- ✓ Improving the efficiency of door-to-door services as well as the growing adoption of intermodality exerts pressure on port authorities to morph from a maritime port to a multimodal services facility. This transformation requires changes in business models and strategies and use and transparency of data and information.
- ✓ Concerns about the negative impact of maritime, truck, and rail transportation on the environment require ports to respond with actions such as energy conservation, adoption of clean fuel and clean air policies, and transparency of information and data towards the general public.

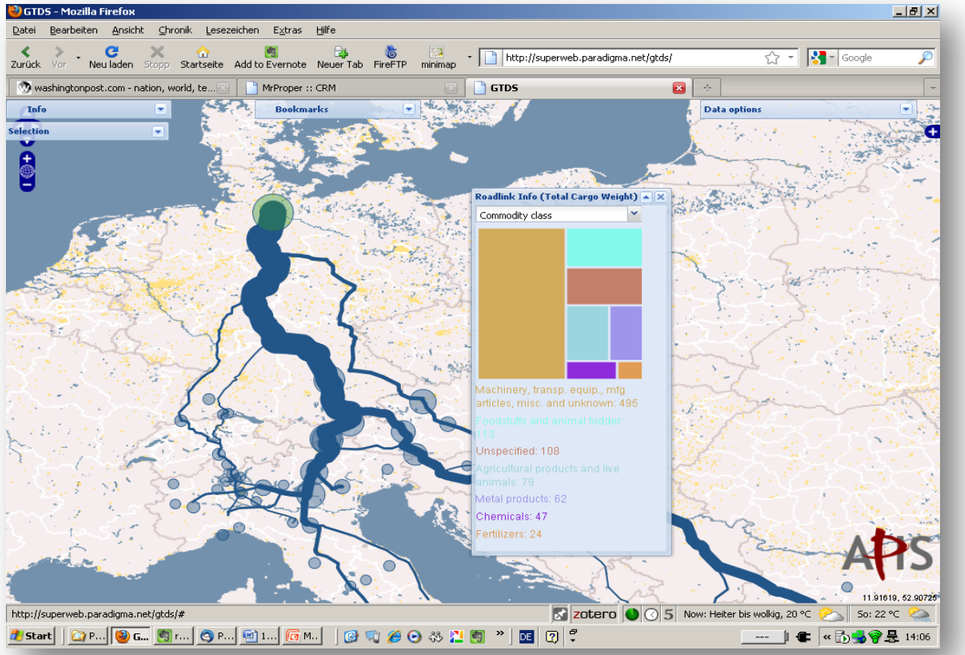



## Data, Data, Data

For ports, the most important nodes in modern intermodal transportation, the transition to a competitive intermodal service provider require data.

Data must be collected, data must be used, and data must be shared. Port authorities need to keep abreast of trends and changes in the market place, analyze historic as well as current demand for transport services at global, national and regional levels, and share data in an ad hoc fashion that allows their stake holders, customers and partners to make good, informed decisions.

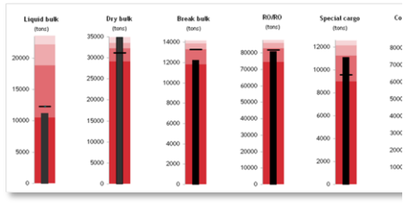
- ✓ Data collection is not straightforward as it requires the combination and reconciliation of data from different sources and data which has been collected for purposes other than forecasting and in-depth analysis.
- ✓ Data collection must be done properly and carefully or data quality will suffer and as a consequence, the data and any insight gained will not be trusted.
- ✓ Data analysis is required for terminal operators and shipping lines to respond to the requirement for greater efficiency in the ports such as queues and waiting zones. Data management and control systems are needed to plan and measure a port's performance level. To measure the efficiency of port services provided, such as port turnover per cargo type, performance indicators must be defined and implemented.
- ✓ Data infrastructure must be used to monitor and identify bottlenecks in the network and gauge the environmental impact of port operations. Implementation of such performance indicators requires current operational data, residing in different areas of port community system as well as satellite systems and their combination with historical data.




## Return on Investment

Port Authority management will be able to use current, detailed and comprehensive data and information to win in the competitive world of maritime ports. Management can gain insight into the port's role in the rapidly changing landscape of transport chains. This insight supports informed decision making at the operational, tactical and strategic level.

- ✓ Statisticians, business analysts, and controllers will be able to devote more of their time to analyze rather than collecting and pasting data from different sources.
- ✓ Analysts will have better quality data to provide them with the empirical evidence that they use for their analyses.
- ✓




- ✓ Port community, harbor masters, customs, terminal operators, shipping line users will be able to access consolidated and aggregated statistics as a benchmark for their own performance. Aggregation and privacy protection, and anonymization ensure that the confidentiality of transaction data is not violated.
- ✓ The ability of the port community to analyze in more depth their own data (which, to preserve the confidentiality of commercial secrets, is not accessible to other members of the port community), allows more meaningful operational programs to maintain or improve their performance levels.
- ✓ Harbor Masters and Customs Authorities will be able to monitor and analyze the development of traffic and cargo movements, combining their own data with data in APIS to detect potential safety and security issues that might be developing and to take preemptive action.

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