KombiConsult
beraten planen umsetzen

K+P Transport Consultants
Hans-Paul Kienzler

UIC
UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
INTERNATIONAL UNION OF RAILWAYS

Developing Infrastructure and Operating Models for Intermodal Shift (DIOMIS)

HOW CAN CAPACITY UTILISATION BE OPTIMISED IN INTERNATIONAL COMBINED TRANSPORT TRAINS?

DIOMIS

Basic idea and approach

KombiConsult
beraten planen umsetzen

K+P Transport Consultants
Hans-Paul Kienzler

UIC
UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
INTERNATIONAL UNION OF RAILWAYS

Assumption in the “UIC - capacity study”: 80% use of available train length in 2015

Objective and approach

- Providing examples of methods and features (good practices), which enable an improved use of train capacity
- Interviews of intermodal operators that are employing specific capacity management features
  - Factors, which determine the actual use of capacity beyond the realm of operators' influence, and measures to cope with suboptimal use of capacity
  - Factors within the realm of operators’ influence and measures to cope with suboptimal use of capacity

- Capacity management depends on the question “who bears the risk” ➔ segmentation of the markets

DIOMIS

Interview partners from intermodal operators

	Company	Today's speakers
Shipper market		
	Ambrogio	Livio Ambrogio
	Hangartner	
	Crossrail	
Maritime market		
	IFB	Wilfried Moons
	Italcontainer	Javier Casanas
	Transfracht	
	Rail Link	
Forwarder market with line production system		
	HUPAC	
	Novatrans	
Forwarder market with network production system		
	Kombiverkehr	Konstantinos Papadopoulos

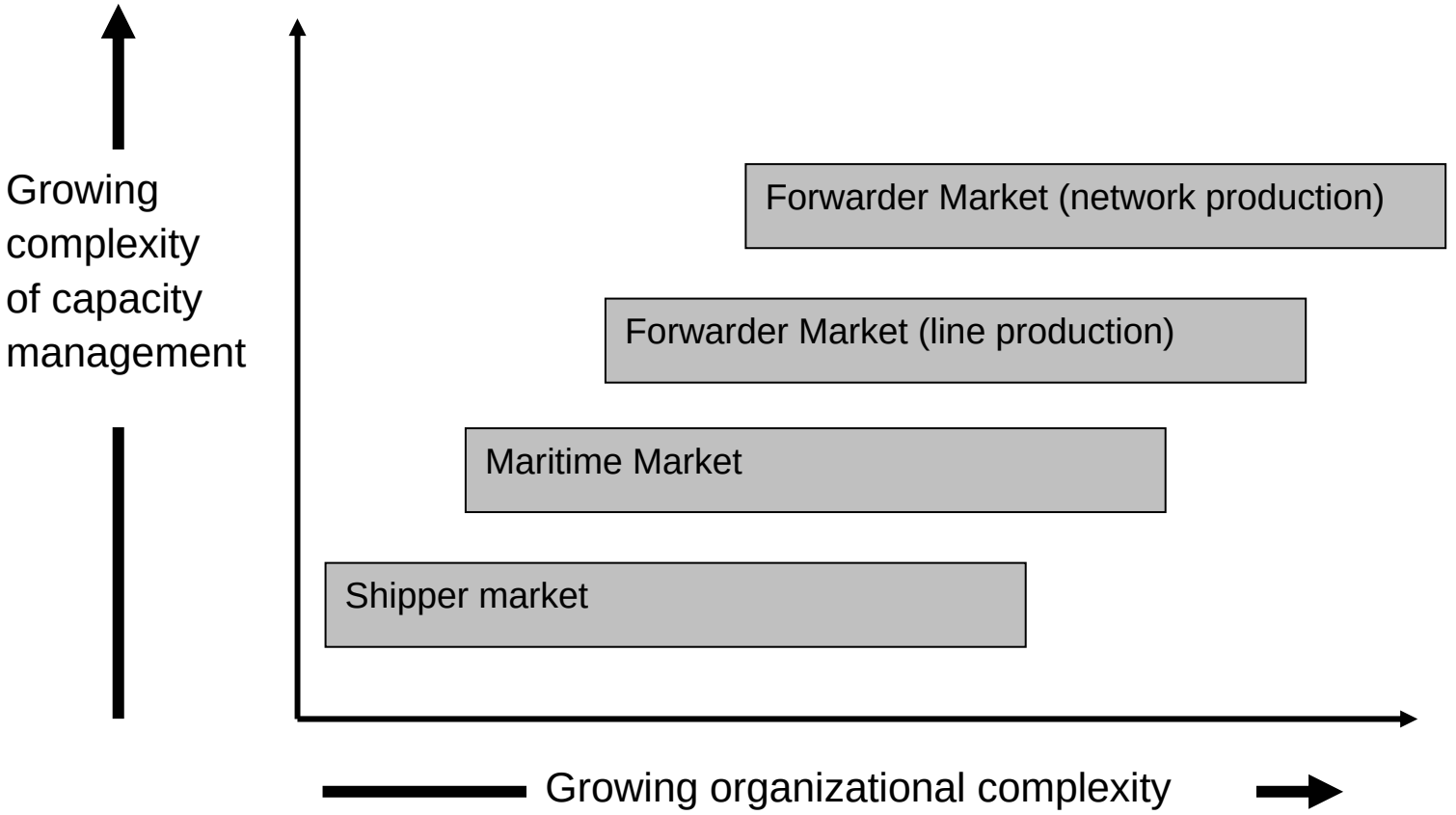
Segmentation

- Shipper market
  - More than 50 % of the loading are regular shipments of the key clients.
  - Free space on the train will be filled with own empty load units.
  - Shipments exceeding the train capacity are rejected.
- Maritime market –carrier haulage-
  - High volumes concentrated on a few clients
  - In many cases the capacity risk is bared by the shipping company purchasing a complete train at the operator.
  - Free capacity on the train is used for a reallocation of empty containers.

Segmentation

- Forwarder market -line production system- and maritime market –merchant haulage-
  - Concentration on axis with high volumes and –sometimes- standardized products.
  - Adapting the offer on the demand
- Forwarder market –network production system-
  - Highly complex capacity management systems, since the capacity has to be optimized not only on a train level but also on a service (first origin-final destination) level that may comprise different trains

Improving the use of available train length



KombiConsult
beraten planen umsetzen

K+P Transport Consultants
Hans-Paul Kienzler

UIC
UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
INTERNATIONAL UNION OF RAILWAYS

DIOMIS

Improving the use of available train length

During talks with intermodal operators, we detected a multitude of measures and features to improve the use of available train length.

- Booking procedures, service types
- Operational procedures
- Sharing of risk
- Hardware
- Fully developed CMS

- **Good practices in the view of applicability?**
- **Good practices in the view of transferability ?**
- **Impact of the practices on the capacity of the network?**

Good practices detected

Chapter	Features	Conditions	Market segment currently affected
	Features concerning booking procedures and types of services		
3.2.1	Last minute prices	No particular conditions required	All segments
3.2.2	Standby bookings	Sufficient volume of consignments with low priority	All segments
		Suboptimal use of capacity on particular trains	
3.2.3	Price differentiation for consignments with varying priorities	Efficiency in the Terminal operation	All segments
3.2.4	Price differentiation in the case of an extended service	Lacking capacity on existing services	Forwarder market with line production system
		Overflows not sufficient for a extension of existing services	
3.2.5	Penalties for late cancellations (no show)	No particular conditions required	All segments
3.2.6	Time buffers of one day on long distances	Daily services with day A - day B quality	Forwarder market with line production system
		Customers acceptance of day A - day C quality	
	Features concerning operational procedures		
3.3.1	Gateway system	Market situation has to allow for additional handling costs	Maritime market and forwarder market
3.3.2	Hub system	Sufficiently large terminal or a shunting yard in a suitable position	Maritime market and shipper market
3.3.3	Multiple daily departures	High volume axis	Forwarder and maritime market
3.3.4	Short-notice booking or cancellation of trains	Regulations with railway undertakings	All segments
3.3.5	A combination of heavy and voluminous transports and a combination of conventional freight wagons and intermodal wagons	Terminals for intermodal traffic and sidings for conventional trafic must be located close to each other	At the moment this is only done occasionally
3.3.6	Filling up of trains from maritime transports with continental transports and v.v.	Suitable access to the terminals for both types of units	All segments
3.3.7	Direction-dependent combination of maritime and continental transports	Sufficient volumes of continental and maritime shipments in opposite directions	All segments
		Terminals for maritime trafic and sidings for conventional trafic must be located close to each other	
3.3.8	Low price trains	Sufficiently high volume of standard units	Maritime market
3.3.9	Flexibility in pre-carriage	Sufficient capacities for the pre-carriage	All segments
3.3.10	Precise preplanning and monitoring of the entire transport chain of maritime consignments	Sufficient planning tools	Maritime market
	Features concerning risk sharing		
3.4.1	Sale of slots	Customers willing to share the capacity utilization risk	All segments
3.4.2	Sharing of capacity utilization risk between different operators	Operators willing to share the capacity utilization risk	Maritime segment
	Features concerning the hardware		
3.5.1	Overload of terminals	Terminals working at the capacity limit	All segments
		Terminals far from residential areas	
3.5.2	Flexible adaptation of the wagon fleet to types of shipments	Availability of wagons, engines for shunting and engine drivers, suitable infrastructure for shunting	All segments
	Fully developed capacity management system		
3.6	Fully developed capacity management system	Availability of an EDP supported CMS tool	Forwarder market with network production system

KombiConsult
beraten planen umsetzen

K+P Transport Consultants
Hans-Paul Kienzler

UIC
UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
INTERNATIONAL UNION OF RAILWAYS

DIOMIS

Transfer of risk to the railway

Sometimes an efficient capacity management was achieved by transferring the risk (costs) to the railway companies.

Approach

- Interviews of railway undertakings
- “Who bears the costs of a flexible adjustment of train capacities?”

Railway undertakings	Interview partner
B-cargo	
	Johan de Groot
	Helga Colpaert
Rail Cargo Austria	
	Erich Rohrhofer
	Richard Fischer
SBB Cargo	
	Ralf-Charly Schultze
Stinnes Intermodal	
	Sylke Hußmann

Improving the use of available train length

- Methods to offer the operators more flexibility
  - Periodical actualization of long term transport programmes
  - Volume commitments
  - Surcharge of operators for booking services at short notice.
  - Graded charges for train cancellation

- The interviews revealed that the costs of a cancellation are –in theory- mainly passed on to the operators. However, a part of these costs also remain with the railway companies or railway infrastructure companies.

Examples

Examples

- Booking procedures, service types
  - Last minute prices
  - Stand by bookings
  - Price differentiation for consignments with varying priorities
  - Price differentiation in the case of an extended service
  - Penalties for late cancellations (no shows)
  - Time buffers of one day on long distances

Example: Price differentiation in the case of an extended service

- Basic idea:
  - Inhabitant risk of service extensions (2 → 3 departures) is the cannibalization of the existing services
- System
  - Novatrans offers additional departure with lower quality at a lower price (“price and service differentiation”) to lower costs
- Effect
  - Clients depending on shorter transit time stay with the original service
  - Exceeding load units will be shipped with the “low price service”
  - New clients with less priority consignments are attracted by the lower price
- Conditions
  - Lacking capacity on the existing service
  - Not enough volume to create an additional service from the very start
  - Customers with different priority of consignments

Example

- Operational procedures
  - Gateway transports
  - Hub system
  - Multiple daily departures
  - Short-notice booking or cancellation of trains
  - "Combination of heavy and voluminous transports …
  - …or combination of conventional freight wagons and intermodal wagons
  - Filling up of trains from maritime transports with continental transports
  - Direction-dependent combination of maritime and continental transports
  - Low price trains
  - Greater flexibility in pre-carriage

Example: Direction-dependent combination of maritime and continental transports

- Basic idea:
  - Balance imbalanced flows by direction-dependent combination of maritime and continental transports in the case of Rail Link services to/from Marseille
- System
  - Northbound services from Marseille are loaded with continental transports of chemical products, southbound services with maritime containers. Free capacity on the train is used to reallocate empty units
- Effect
  - More than 90 % use of capacity both ways, even though flows are completely imbalanced
- Conditions
  - High volumes of maritime and continental shipments in opposite directions
  - Origins and destinations of continental and maritime shipments close together
  - Stacking areas for empty containers close to the points of loading and unloading

Example

- Sharing of risk
  - Sale of slots
  - Sharing of capacity utilization risk between different operators
- Hardware
  - Availability of capacities in the terminals
  - Flexible adaptation of the wagon fleet to types of consignments
- Fully developed CMS
  - Computer-aided capacity management system

Example: Availability of capcity in the terminals

- Basic idea
  - Capacity shortages in terminals often lead to suboptimal use of the available train length
- System
  - HUPAC offers its clients a bonus-malus system for picking up load units in due time or in off peak hours
- Effect
  - Free capacity in the terminals reduce the necessity of additional lifts to relocate units
  - Free capacity in the terminals reduce the risk that trains cannot be completely loaded in due time
- Conditions
  - The system is favorable for terminals working at the capacity limit
  - The system requires extended opening hours of the terminal
  - The system requires the possibility of pick up during the night

Conclusions

→ This afternoon

Examples

Good practice to avoid „canibalization“ effects

A		
T		
C		

Good practice to offer high frequency on O/D with lower volumes

A	low	Requires specific conditions
T	high	If conditions are fulfilled the feature can be
C		

Good practice to use the available capacity to nearly 100% in the case of imbalanced flows per market

A	medium	Requires specific conditions
T	low	Only in a few cases transferable
C	high	Optimal use of capacity on the network

2 Features					
Features concerning booking procedures an of services					
Last minute prices	No				
Standby bookings	Suff Sub				
Price differentiation for consignments with varying priorities	Effic				
Price differentiation in the case of an extended service	Lac Overflows not suf services				
Penalties for late cancellations (no show)	No particular cond				
Time buffers of one day on long distances	Daily services with Customers accep				
Features concerning operational procedures					
Gateway system	Market situation h handling costs				
Hub system	Sufficiently large t suitable position				
Multiple daily departures	High volume axis				
Short-notice booking or cancellation of trains	Regulations with railway undertakings	market All segments	3	3	3
A combination of heavy and voluminous transports and a combination of conventional freight wagons and intermodal wagons	Terminals for intermodal traffic and sidings for conventional trafic must be located close to each other	At the moment this is only done occasionally	2	2	3
Filling up of trains from maritime transports with continental transports and v.v.	Suitable access to the terminals for both types of units	All segments	3	2	3
Direction-dependent combination of maritime and continental transports	Sufficient volumes of continental and maritime shipments in opposite directions Terminals for maritime trafic and sidings for conventional trafic must be located close to each other	All segments	2	1	3
Low price trains	Sufficiently high volume of standard units	Maritime market	2	2	3
Flexibility in pre-carriage	Sufficient capacities for the pre-carriage	All segments	1	3	1
Precise preplanning and monitoring of the entire transport chain of maritime consignments	Sufficient planning tools	Maritime market	1	2	2

Examples

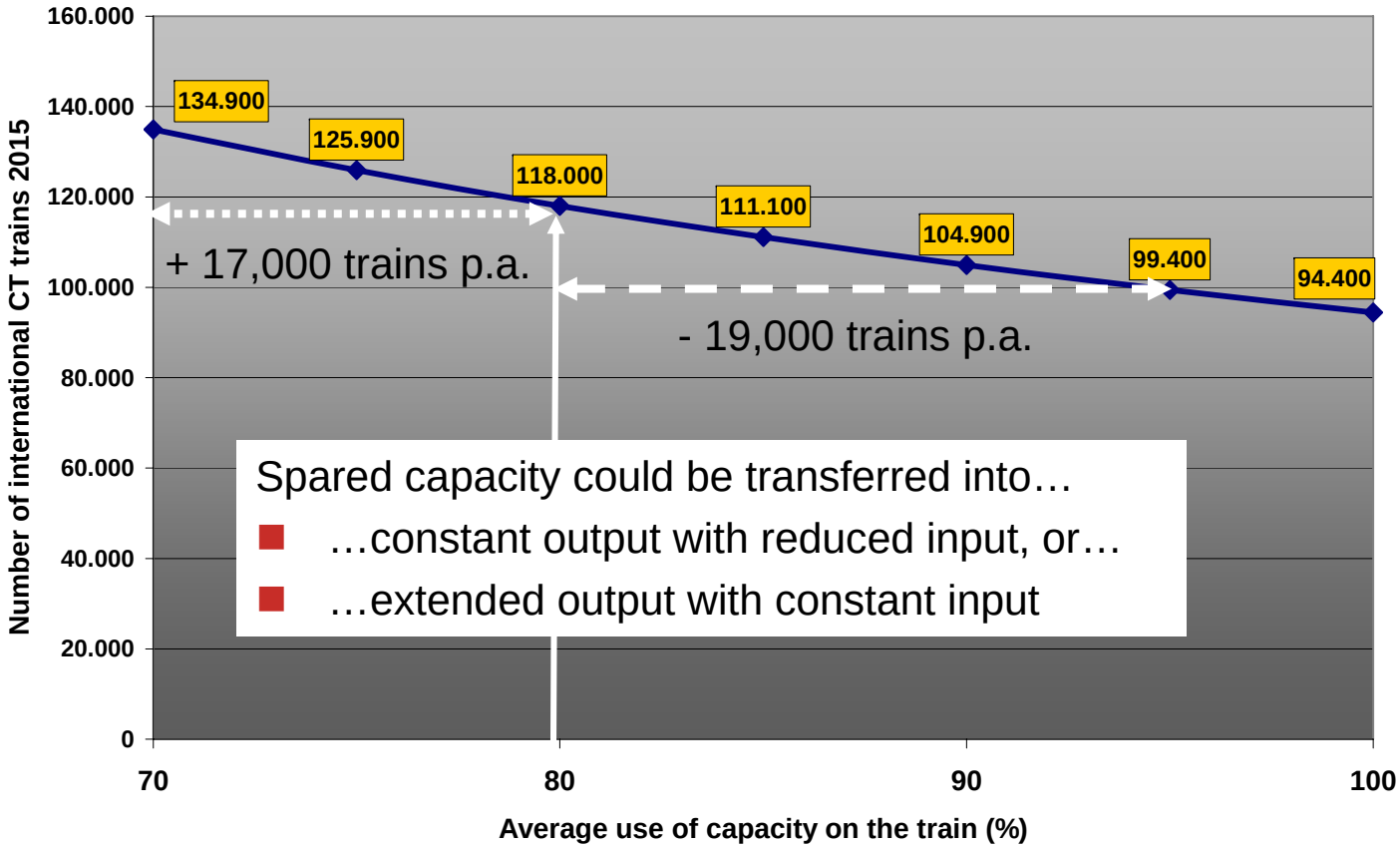
Good practice to avoid suboptimal use of trains due to time problems in the terminals

A	medium	Requires specific conditions
T	medium	Requires important investments
C	high	System allows for a optimal use of capacity

Good practice to optimise the use of capacity on a network production system

2 Features					
Features concerning risk sharing					
Sale of slots	Cust risk				
Sharing of capacity utilization risk between different operators	Oper risk				
Features concerning the hardware					
Overload of terminals	Terminals working at the capacity limit Terminals far from residential areas	All segments	3	3	1
Flexible adaptation of the wagon fleet to types of shipments	Availability of wagons, engines for shunting and engine drivers, suitable infrastructure for shunting	All segments	1	3	2
Fully developed capacity management system					
Fully developed capacity management system	Availability of an EDP supported CMS tool	Forwarder market with network production system	2	2	3

Impact on railway network



KombiConsult
beraten planen umsetzen

KP Transport Consultants
Hans-Paul Kienzler

UIC
UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
INTERNATIONAL UNION OF RAILWAYS

DIOMIS

Thank you for your attention

KombiConsult
beraten planen umsetzen

K+P Transport Consultants
Hans-Paul Kienzler

UIC
UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
INTERNATIONAL UNION OF RAILWAYS

DIOMIS