



University of Natural Resources
and Applied Life Sciences, Vienna

AustriaTech – Federal Agency
for Technological Measures Ltd.

Performance Indicators for Inland Waterways PIANC INCOM WG 32

Dr. Reinhard Pfliegl (Austria Tech)
Martin Posset (BOKU, Vienna)

performance indicators
performance indicators
performance indicators

Work out what's really important



Reinhard Pfliegl

- AustriaTech – Federal Agency for Technological Measures Ltd.-
Managing Director – 2005-today
- Via Donau – Deputy Managing Director responsible for RIS
Development- 2000-2005
- Member TRB AW030- Inland Waterway Transport
- Member PIANC INCOM / PIANC ProCOM – 2003-2009
- Member of Committee 220 for Engineering Standards Austria 1995-
- Member of Board of Governors IEEE ITS Society 2007-2009
- Secretary of INA/PIANC (International Navigation Association)
Section Austria



AustriaTech – Federal Agency for Technological Measures Ltd.



Agency of bmvit
For technology
enabling via R&D
projects on EU-level

**Platform Intelligent
Transport Systems**
co-operation and
networking
ITS-AUSTRIA

**Stimulation of
new technology
measures and
deployment (AT/EU)**
e.g. Telem. Master

**Support for
transport and
technology know-how
transfer**

Plan

**Telematic Support
Infrastructure**
operators, transport
providers



Why Performance Indicators?

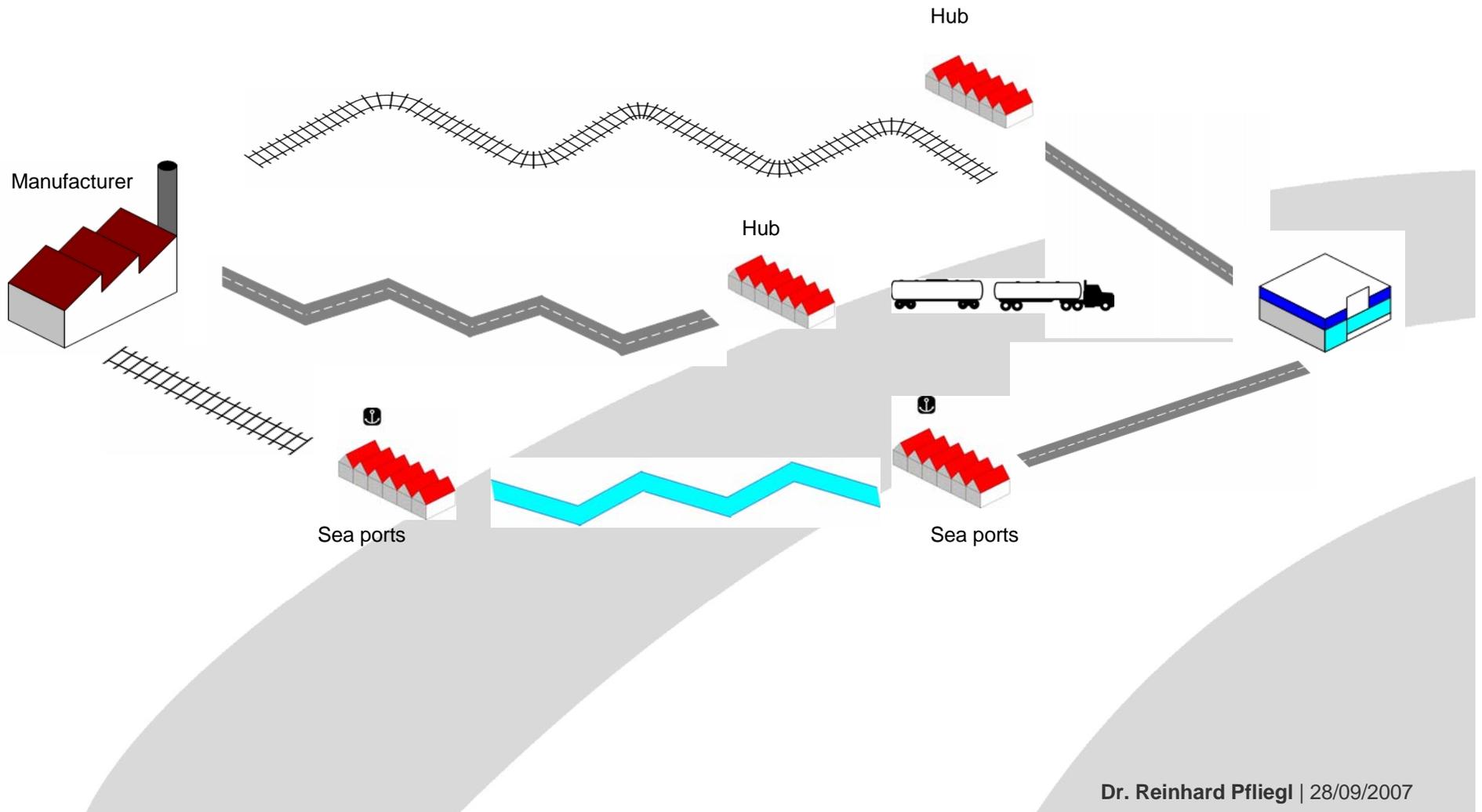


Why Performance Indicators?

- The need to improve acceptance of IWT in modern supply chains
- The need to show capacity, reliability and applicability for intermodal transports
- The need for comparability with other modes of transport
- Acceleration of advanced transport via IWT



Comparability of transport modes





How to achieve a neutral comparability?



Measure to Manage

“Measure everything that’s **measurable** and
make everything measurable that’s **measurable**.”

Galileo Galilei
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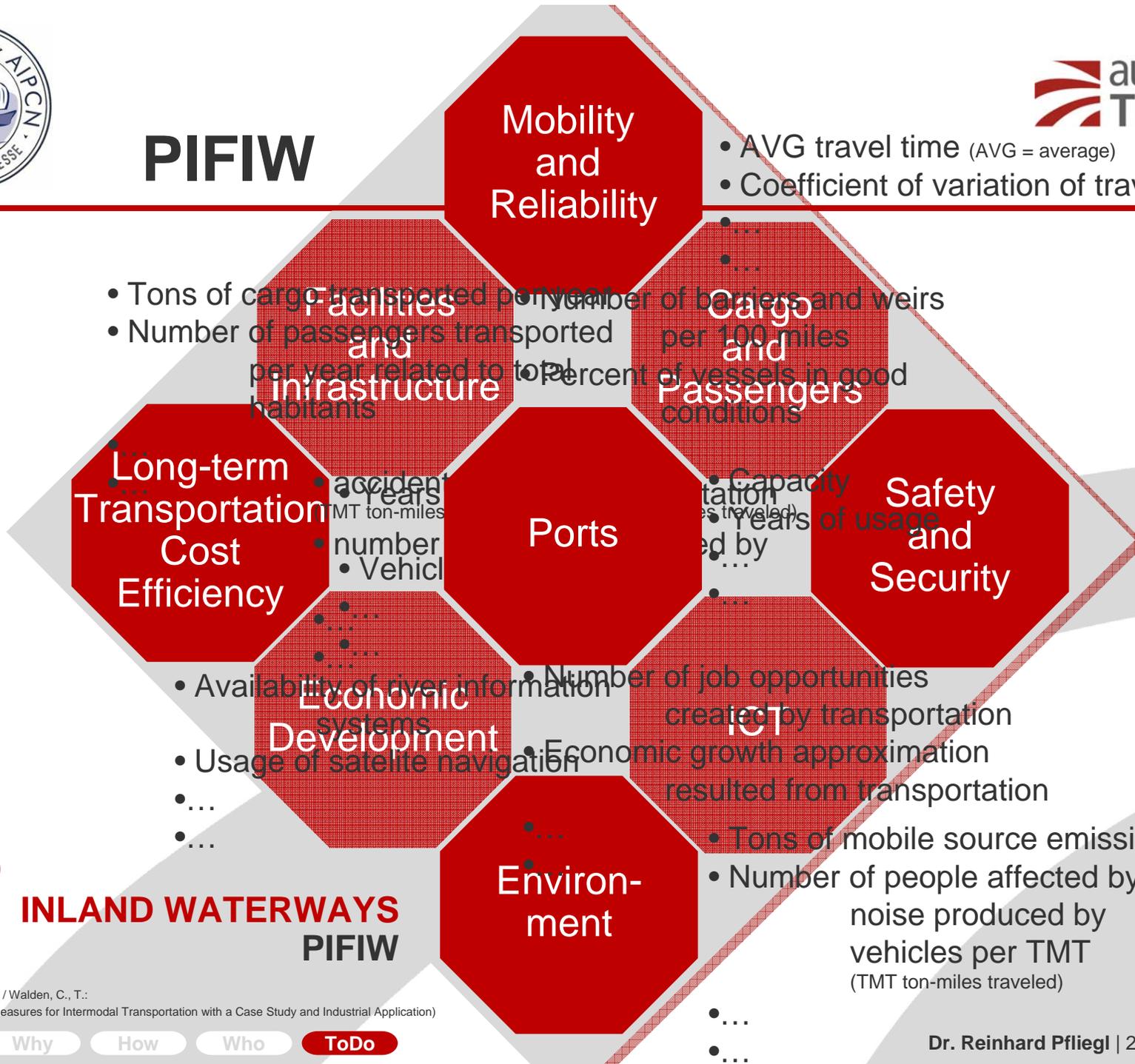
... to enable a common understanding of performance indicators
within the inland waterway transportation industry...



PIFIW

- AVG travel time (AVG = average)
- Coefficient of variation of travel time

PERFORMANCE INDICATORS FOR INLAND WATERWAYS



Mobility and Reliability

- Tons of cargo transported per year
- Number of passengers transported per year related to total habitants
- Number of barriers and weirs per 100 miles
- Percent of vessels in good conditions

Facilities and Infrastructure

- accident years
- TMT ton-miles
- number of vehicles

Cargo and Passengers

- Capacity of usage
- years of usage

Long-term Transportation Cost Efficiency

Ports

Safety and Security

Economic Development

- Availability of river information systems
- Usage of satellite navigation
- ...
- ...

Environment

- Number of job opportunities created by transportation
- Economic growth approximation resulted from transportation

Environment

- Tons of mobile source emissions
- Number of people affected by noise produced by vehicles per TMT (TMT ton-miles traveled)

(see: Jin, M. / Wang, H. / Walden, C., T.: System Performance Measures for Intermodal Transportation with a Case Study and Industrial Application)



WHY are performance indicators important



Conventional Logistics

- **Operational Components**
 - Transport, Warehousing, Handling
- **Special Components**
 - Order picking, Just-in-Time, Finishing
- **Disposition Components**
 - Management, Efficient Consumer Response

added value by additional services and components

PAST

FUTURE

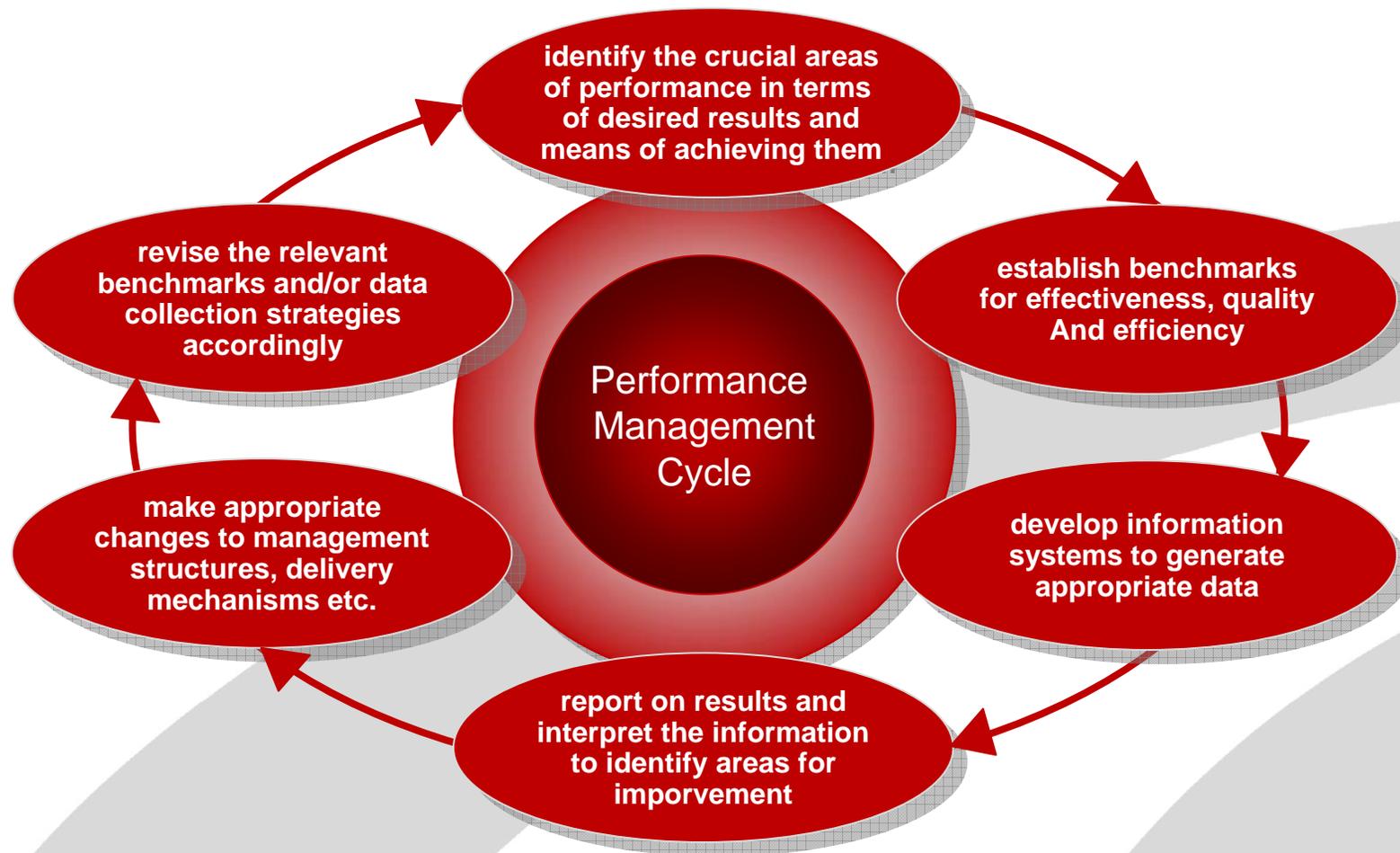
Cutting-edge Logistics

- **Customer Focus**
 - Transport, Warehousing, Handling
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 - Order picking, Just-in-Time, Finishing
- **Industry Focus**
 - Management, Efficient Consumer Response, Supply
- **Management of Interfaces in Engineering and Organization**
 - Standardization, Telematics, Supply Chain Management

fast, project-oriented, fully qualified



Performance Management





Some examples from other modes?



Generic KPI for Air Freight Industry



Generic KPI's

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Performance indicators for the road sector



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Forecast values of road costs vs. actual costs	Development of benchmarks, that road administrations emphasise the reduction of project cost overruns.
Overhead percentage	Costeffectiveness of the road administration Comparison of relative performance
Value of assets	Asset valuation to improve systems and methods of road administration
Roughness	Depending on the development level of the country Level of mobility and user safety
State of road bridges	Definition of a standardised method to evaluate successful practices
Satisfaction with road system	Descriptor of the long-term performance of the road programme Definition of the road system Monitored results for all components of the defined road system Categorisation of road users and their level of satisfaction Existence of a standard process to measure trends and changes Utilization of the indicator for strategic planning and resource allocation

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UPS environmental and social indicators



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UPS Environment indicators	
Fines as percentage of environment related agency inspections	
Water consumption	Water used to wash vehicles in cubic metres.
Energy footprint	Electricity, natural gas, propane, heating oil, gasoline and diesel expressed in gigajoules of energy.
Ground network fuel efficiency	Road, Rail and Air fuel consumption divided by total ground and air packages.
Global aircraft emissions	Total emissions divided by max. structural payload capacity.
Percent of fleet that meets noise requirements	Cumulative noise as measured by effective perceived noise decibels.
Greenhouse gas emissions footprint expressed as CO ₂ emissions	Stationary and mobile sources of energy.



PIANC INCOM WG 32

Performance Indicators for Inland Waterway Transport



Terms of Reference (ToR)

- Reflect the critical success factors
- Improve the overall performance of IWN
- Set common definitions, standards, and measurements
- Encourage industry-wide adoption
- Increase attractiveness for users
- 6 technical and non-technical performance criterias
- Evaluation of the 6 elements
- Development of a list of criterias or indicators for each element to validate
- Determination of an assessment method to rank

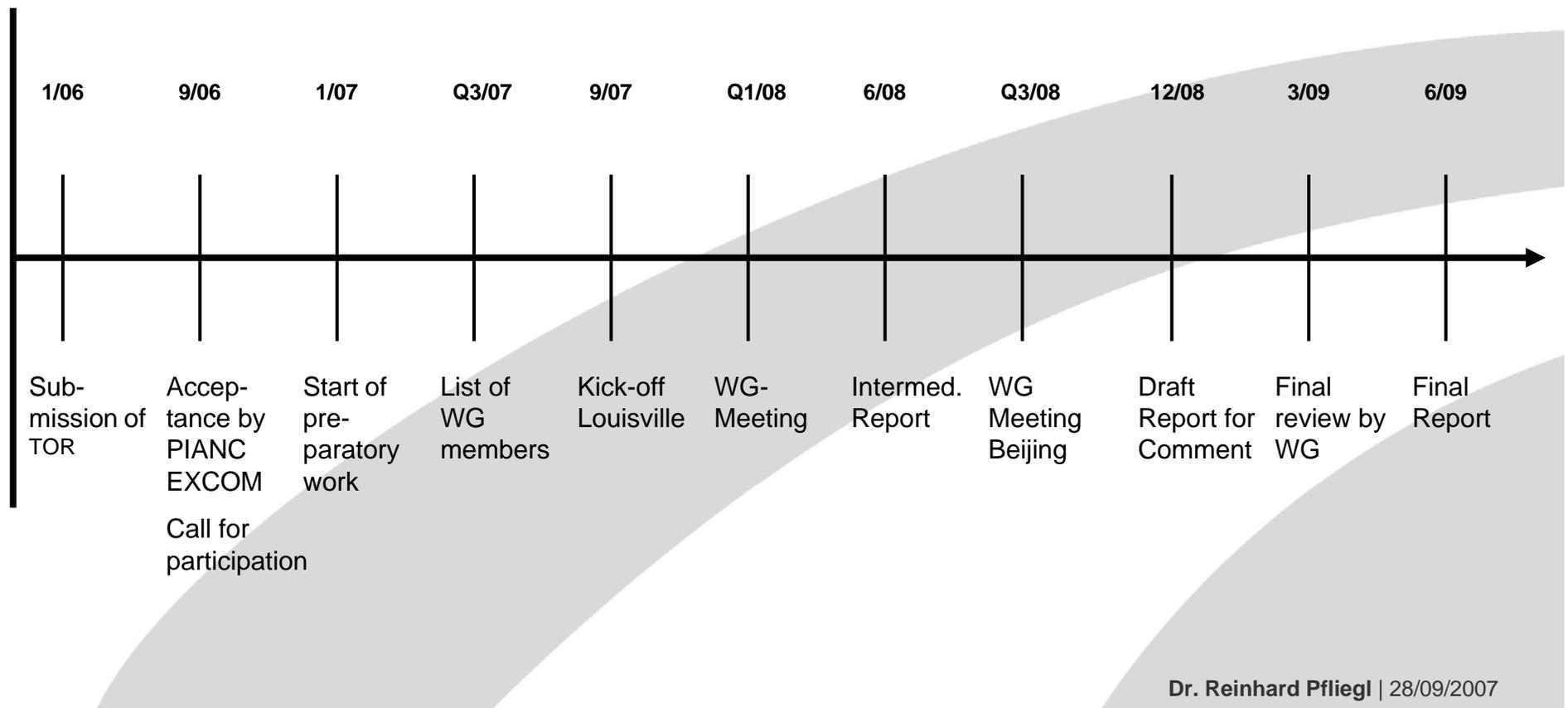


WG 32 Members

- U.S.:
 - William T. HARDER
- Austria:
 - Gerhard GUSSMAGG
- Germany:
 - Matthias KUSSNER
- Belgium:
 - Jacques HACOURT
- Netherlands:
 - Robert HEKKENBERG
 - Wouter BIJMAN
- France:
 - Benoit DELEU
- Spain:
 - Francisco CAFFARENA



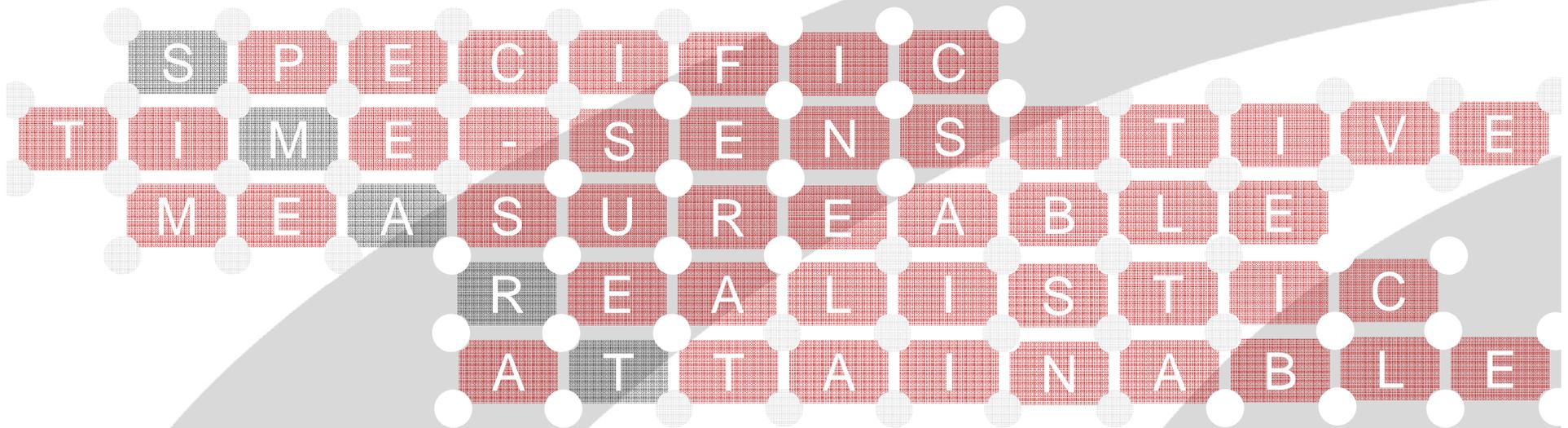
Timeline





Selection of PIFIW

- S P E C I F I C
- M E A S U R E A B L E
- A T T A I N A B L E
- R E A L I S T I C
- T I M E - S E N S I T I V E



(see: Shahin, A. / Mahbod, M., A. (2007): Prioritization of key performance indicators)



Thank You for Your Attention

Performance Indicators for Inland Waterways

...cause change happens

- What
- Why
- How
- Who
- ToDo

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Wave Plus
 ADEFFERONT
 TMRIFRGINA
 ERNIFYICFIVD
 WAYSTRATION
 ENTANCESL





Introduction of all participants

Expectations?

Experiences?

Areas of interest?



Performance Indicators

Overview of application USACE point of view

presented by

Bill T. Harder



Lunch Break

Have a nice meal!



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and Applied Life Sciences, Vienna

Performance Indicators for Inland Waterways

PIFIW (Performance Indicators for Inland Waterways)

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Martin Posset (BOKU, Vienna)

performance indicators
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performance indicators

Work out what's really important



About Performance Indicators

- **What** is Performance Management
- **Why** is there a need for Performance Indicators
- **How** to select Performance Indicators
 - Management of Performance
- **Who** reports on Performance
- **ToDo** Conclusion & Outlook



Measure to Manage

“Measure everything that’s **measurable** and
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Galileo Galilei
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Manage to Control

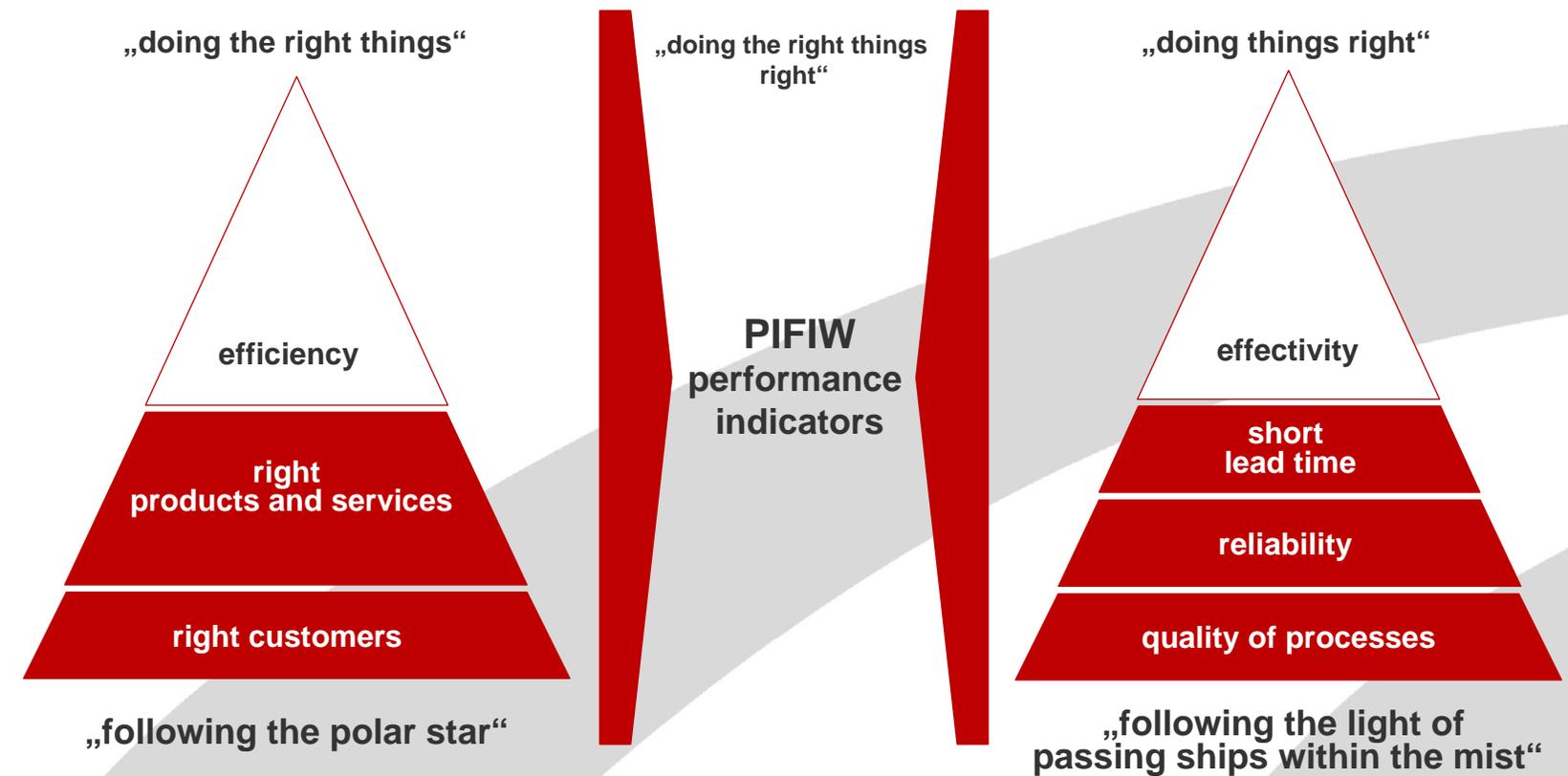
- **Identify an organization's success**
- Analyze whether customers and stakeholders needs are met
- Make an organization understand its strengths and weaknesses
- Help to understand one's processes and control them
- Find out where problems exist, bottlenecks exist and where it is necessary for improvements
- To make decisions are based on facts and not on intuition
- Control for improvements

(see: Gunasekaran, A. / Bulent, K. (2006), Performance measures and metrics in logistics and supply chain management: a review of literature (1995-2004) for research and applications)



Function of PIFIW

(PIFIW: Performance Indicators for Inland Waterways)





WHY Performance indicators

Basis of decisionmaking

- Performance indicators enable organizations to monitor trends and actively counteract against undesirable development
- The competitive environment of business forces participants to have intelligent interfaces to their financial and operational key factors
- Long-term successful players must have a reference or measurement standard for internal and external comparison to ensure effective progression
- Liberalization, commercialization and globalization have increased business growth, complexity and competitiveness, driving the need for performance indicators
- Performance indicators and benchmarking, internally and against others, is used to gain insight into one owns operations to improve efficiency
- Linking different processes business units with performance goals and benchmarks helps to increase overall performance and strengthens the whole sector



Strengthening inland waterways



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Performance Indicators
added value by additional services and components

PIFIW

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fast, project-oriented, fully qualified

What

Why

How

Who

Next

Dr. Reinhard Pfliegl | 28/09/2007



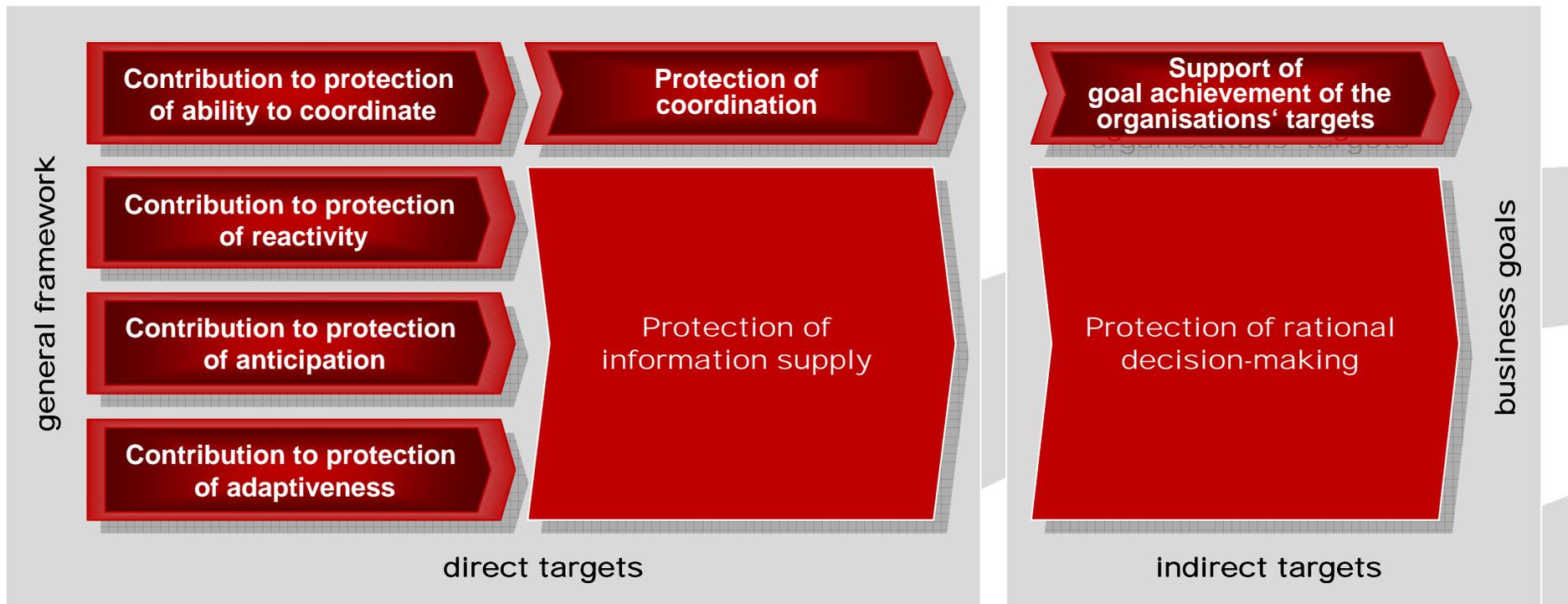
Reasoning

- **The importance of mobility to ease the movement of people and goods.**
- Enabling the accessibility of transportation facilities. Accessibility is strongly related to the use of transportation facilities.
- Transportation has to be safe and need to figure out critical points.
- The transportation sector has a considerable liability towards the preservation and protection of the environment.
- Decision making in the transportation sector is interwoven with many dimensions. Public involvement is very important in the sector of waterborne transportation.

(see: Jin, M. / Wang, H. / Walden, C., T. (2004): System Performance measures for intermodal transportation with a case study and industrial application)



Targets



PERFORMANCE INDICATORS

Rapko, P. (2001): Kunden-Controlling, Konzeption und Angrenzung, Tectum Verlag, Marburg)

What

Why

How

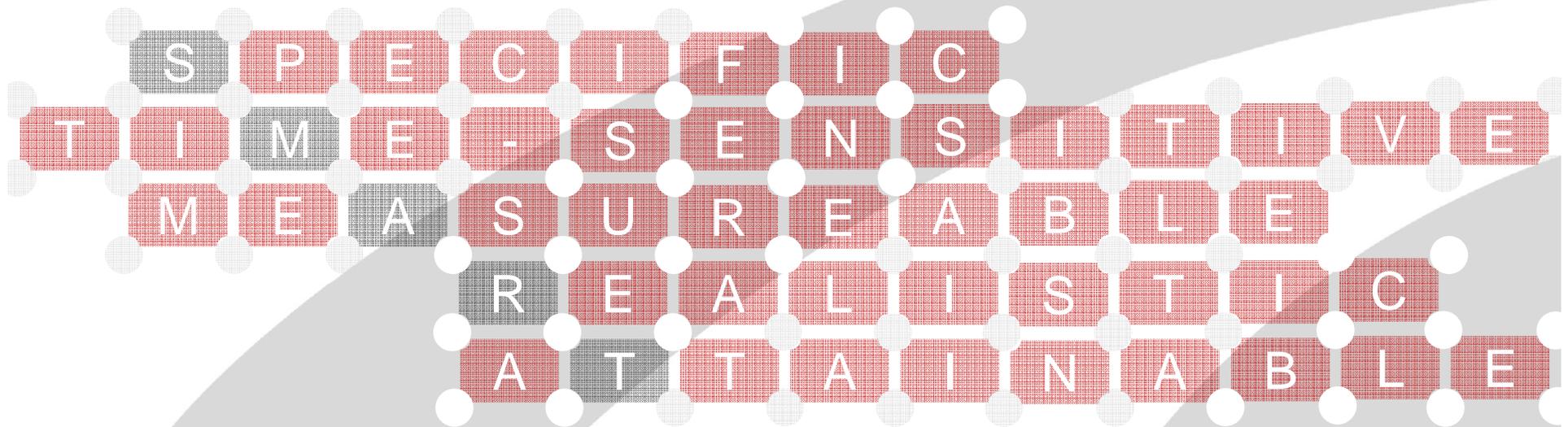
Who

ToDo



Selection of PIFIW

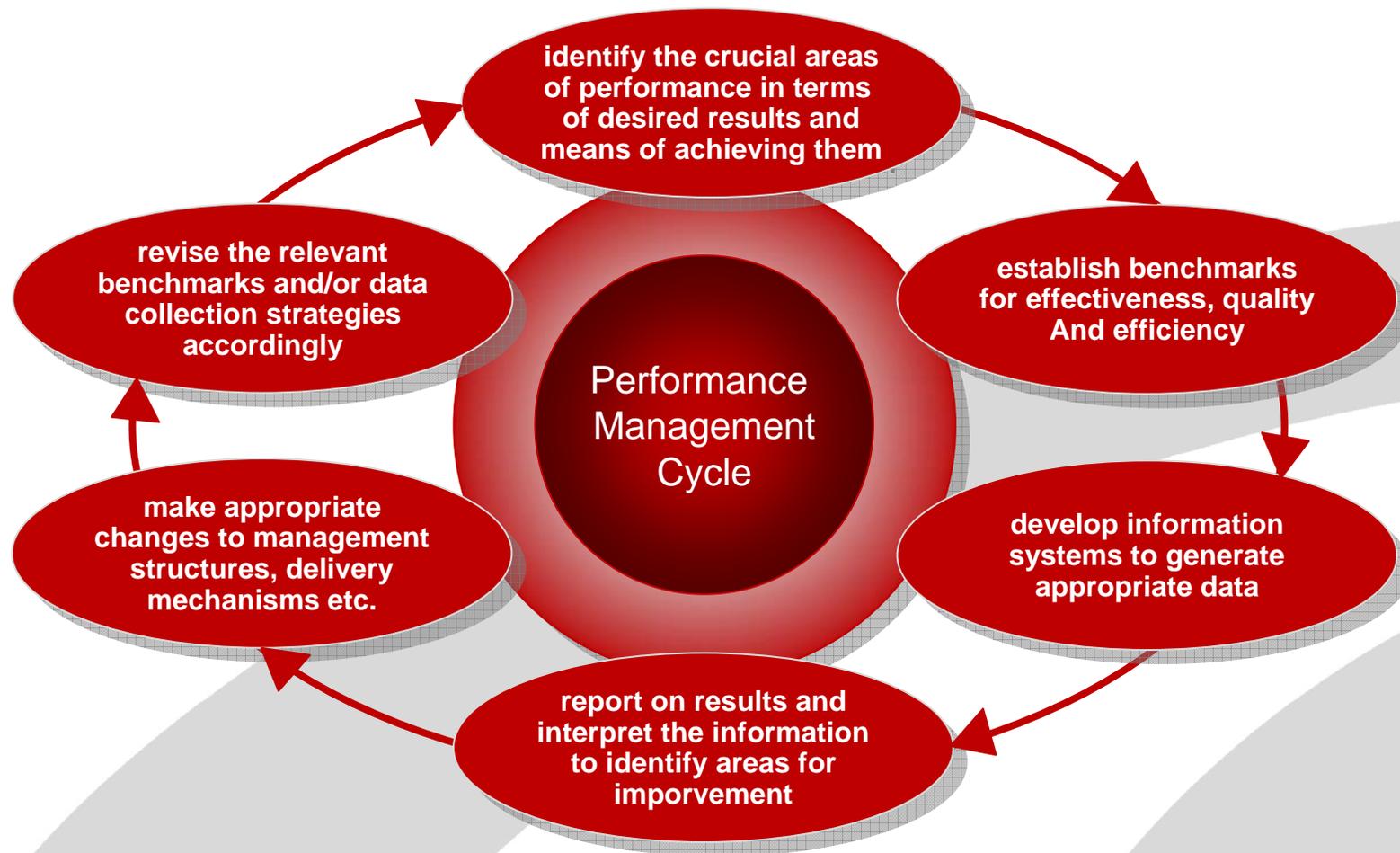
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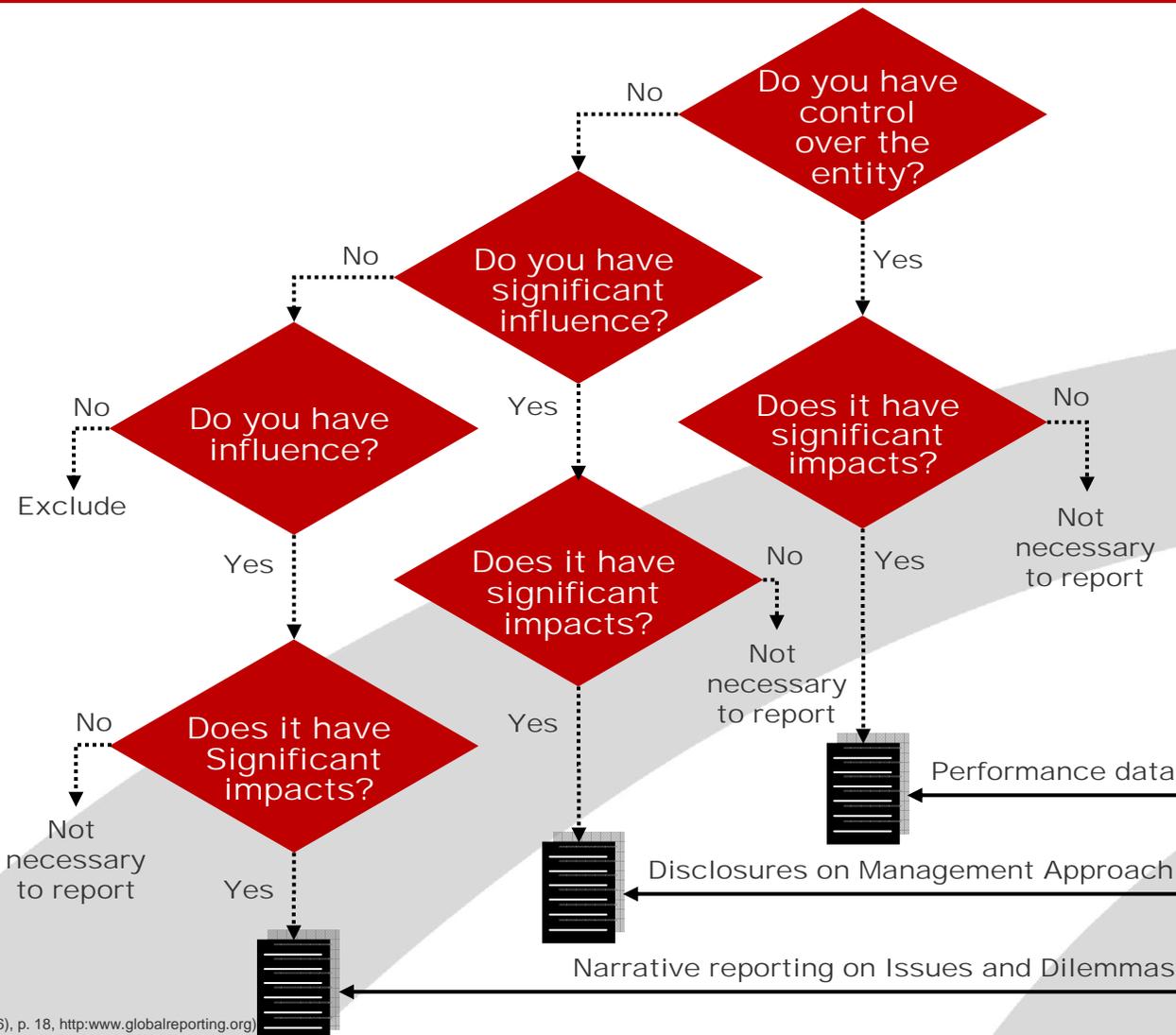


Performance Management





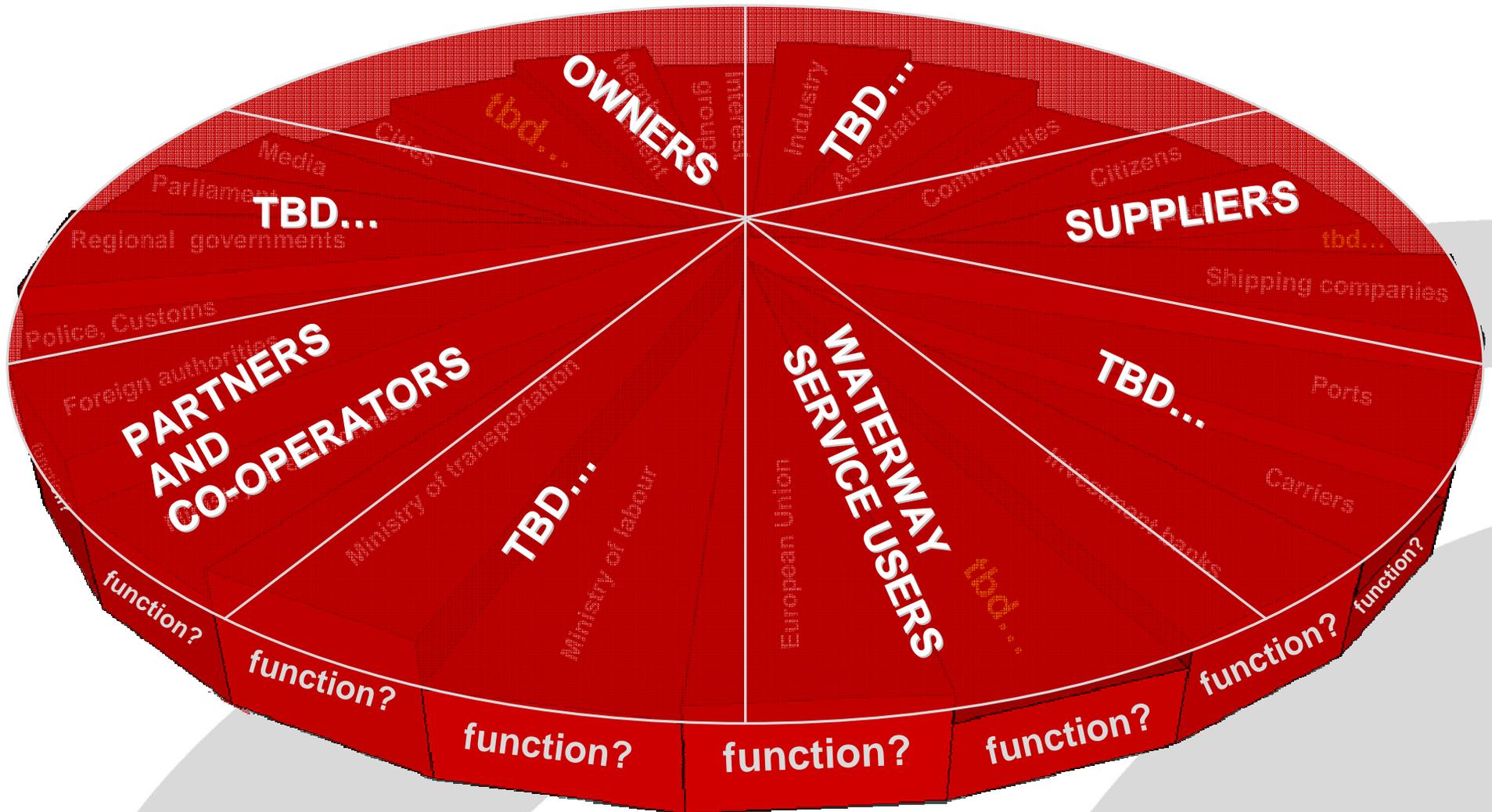
Reporting



(see: Sustainability Reporting Guidelines (2006), p. 18, <http://www.globalreporting.org>)



Actors, Areas and Functions

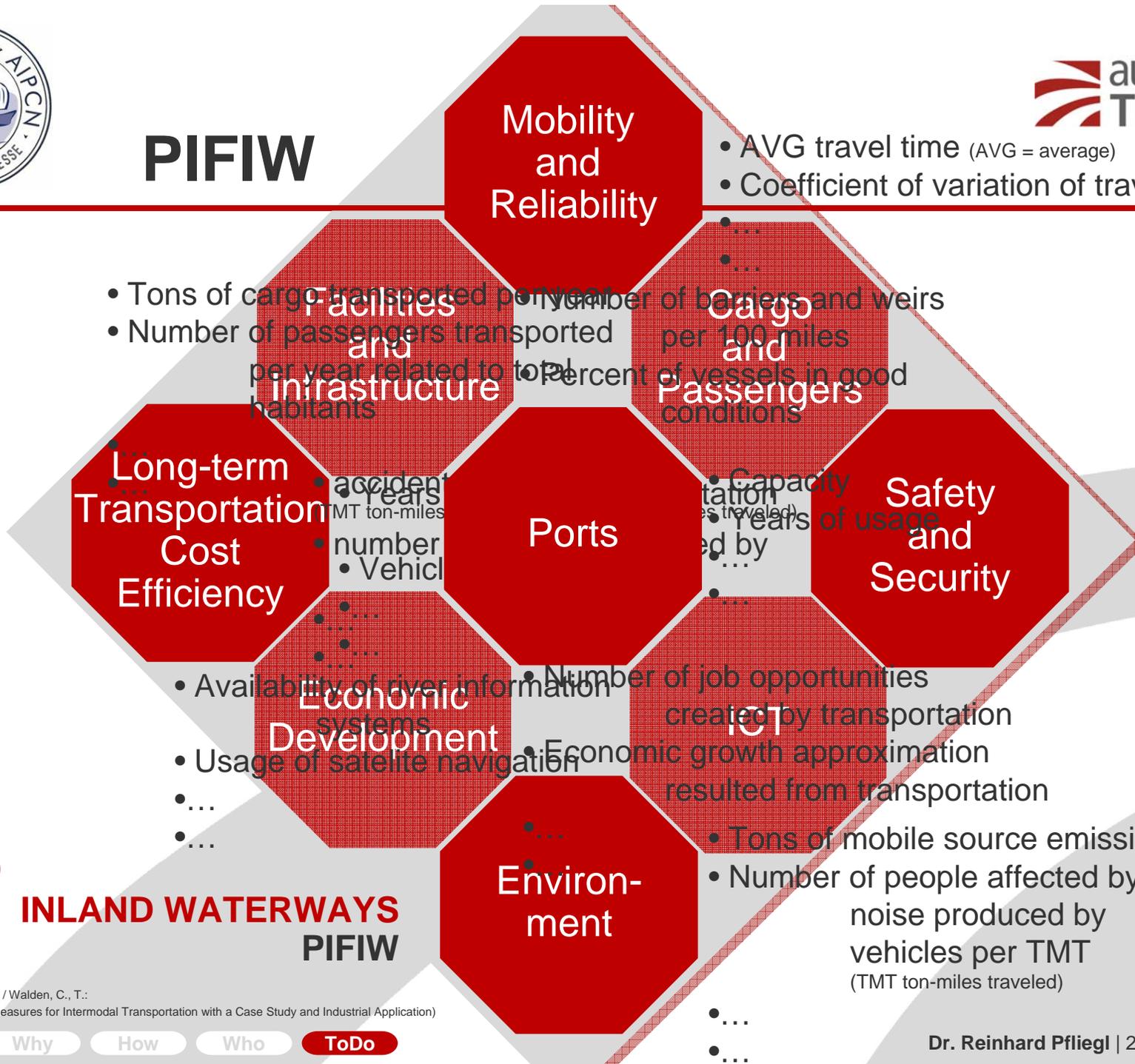




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PERFORMANCE INDICATORS FOR INLAND WATERWAYS



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Cargo and Passengers

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- Percent of vessels in good conditions

Safety and Security

- Capacity of usage
- Years of usage

Ports

- accident years
- TMT ton-miles
- number of vehicles

Long-term Transportation Cost Efficiency

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Economic Development

- Availability of river information systems
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Environment

- Tons of mobile source emissions
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Airport Council International

ACI Traffic Activity <ul style="list-style-type: none"> • Total passengers (originating and connecting) • Total cargo (mail and freight) • Total operations (commercial, commuter and military) 	Airfield Aircraft, Terminal Passenger, and Landside Transportation Processing Efficiency (engineering measure of throughput and levels of service)	ACI Operating and Maintenance Costs	Other Financials
Physical Facilities <ul style="list-style-type: none"> • Number of airports • Land area, runways, taxiways, apron • terminals, concourses, gates, ticket counter, security, and baggage • Parking spaces 	<ul style="list-style-type: none"> • Runway, taxiway, airfield design, layout and aircraft processing efficiency • Airfield terminal area (ramp and gate areas) aircraft processing efficiency • Terminal passenger flows and processing efficiency • Terminal curb and landside processing efficiency 	<ul style="list-style-type: none"> • Personnel costs (salaries & benefits) • Soft costs/outourcing • Suppliers and materials • Repairs and maintenance • communications and utilities costs • law enforcement and fire fighting costs • Other operating costs 	<ul style="list-style-type: none"> • Other non-operating revenues • Cash flow and liquidity • debt (bonds and loans) • return on equity and assets • EBITA and net profit • capital expenditures and costs (actual and projected)
ACI Aeronautical Charges - Airfield <ul style="list-style-type: none"> • Landing and take-off fees • Aircraft apron, parking and gate fees • Aircraft environmental fees • Aircraft fueling fees and other ground handling fees 	Aeronautical Related Charges - Terminal <ul style="list-style-type: none"> • Ticket counter space • Boarding gaes and loading bridges • Administrative office space • Flight kitchens and services • Baggage processing/handling • Passenger lounges • FIS, BIDS and CUTE fees 	ACI Quality of Community Airline Service <ul style="list-style-type: none"> • Number of airlines • airline routes and frequencies • aircraft types and fleet mix • airline competition and airfares 	Quality of Airport Facilities and Services (passenger satisfaction) <ul style="list-style-type: none"> • Quality of experience coming to airport • Quality of passenger processing (check-in, gate, customs and immigration and security) • Quality of airport commercial services • Quality of airport physical facilities
ACI Non-Aeronautical Concession Revenues - Terminal <ul style="list-style-type: none"> • Retail/specialty retail • Food/beverage • News/gifts • Duty free/tax free • advertising • Hotels 	Non Aeronautical Concession Revenues -Landside <ul style="list-style-type: none"> • Parking • Rental cars • Taxis, buses, limos • Rail and train stations • Other commercial vehicles • Hotels, conference centres, office buildings • Shopping centres 		



Generic KPI for Air Freight Industry



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UPS environmental and social indicators

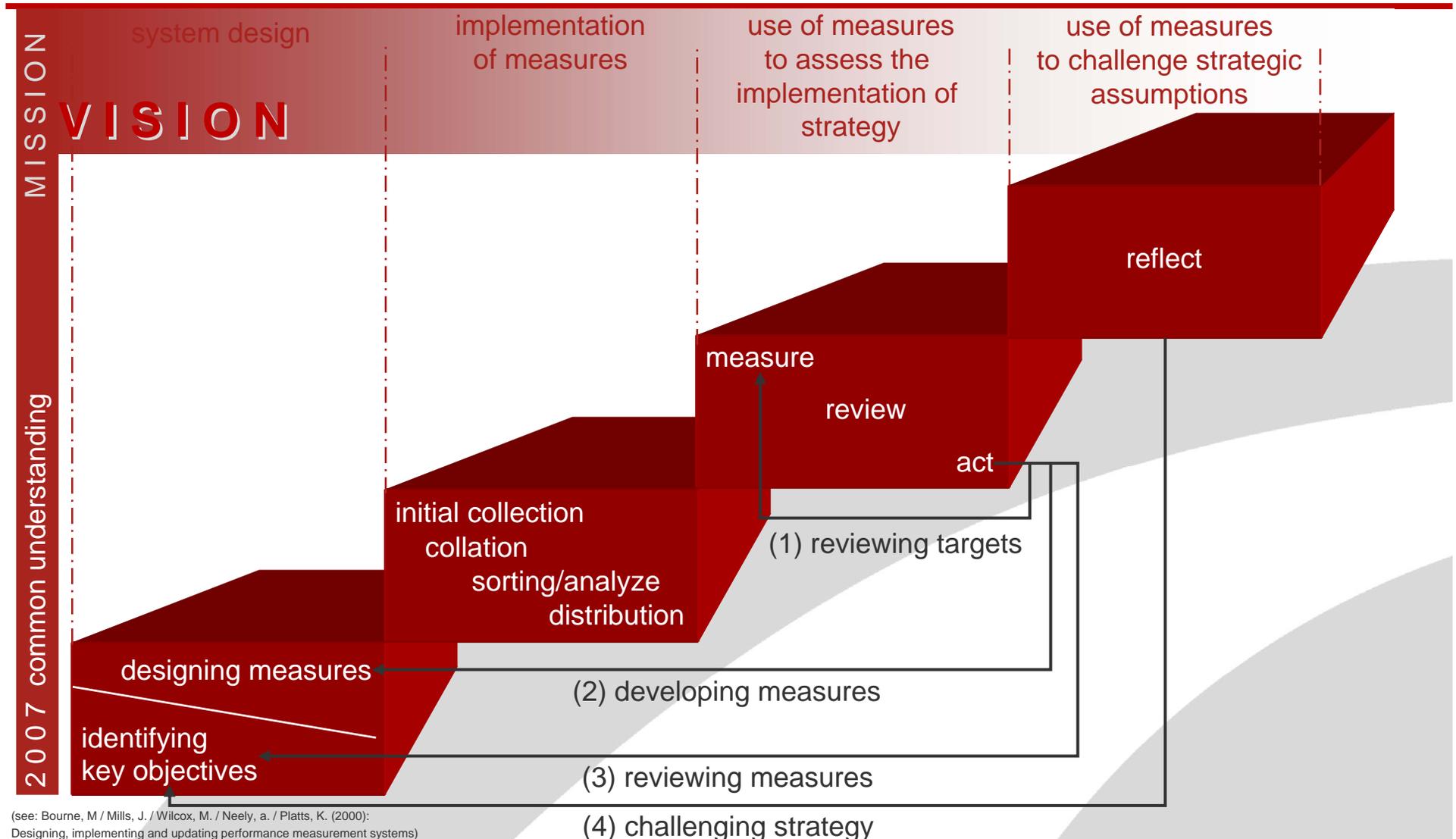


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ToDo



(see: Bourne, M / Mills, J. / Wilcox, M. / Neely, a. / Platts, K. (2000):
Designing, implementing and updating performance measurement systems)

What

Why

How

Who

ToDo



Conclusion

- Measuring performance of processes to make them rateable because management of processes affects current and future performance
- Monitoring adverse impacts and guarding against negative effects
- Setting up performance indicators to structure information and to show the correlation of input, output, outcome and impact of processes
- There is a need for standardized approaches to analyse processes and performance and to evaluate achievements
- Enabling a comparison of processes to show how organizations can proactively improve their processes so that they can appropriately measure how well their processes live up to their customer's expectations
- Conducting a comparison of different organisations to enable a comparison with other modes of transport

THE RIGHT ORGANIZATION TO



WG 32

WORK OUT WHAT'S
REALLY IMPORTANT



Performance Indicators

pi = wwg³²

performance indicators = working group 32

PIANC working group 32...

...the right organization to initiate



Discussion

Terms of Reference

Adaptation?

Extension?

Limitations?

Applications?



Further approach

- Election of chair person, secretary, other functions
- Content of work
- Schedule of work
- Contribution of partners
- Subgroups
- Next steps
- Best way to work
- Next meeting
- Location



Closing remarks



Have a nice evening!