

# How does digitalization change the workflow of terminal planners?

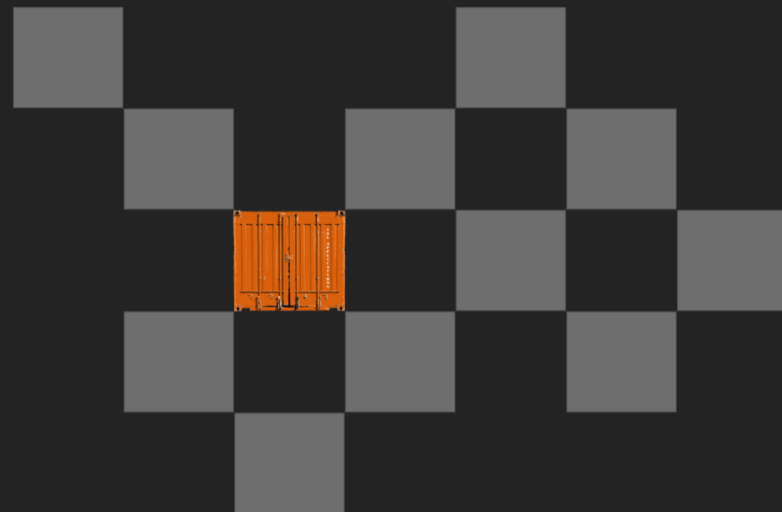


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ISL Applications GmbH

*PTT 2017*

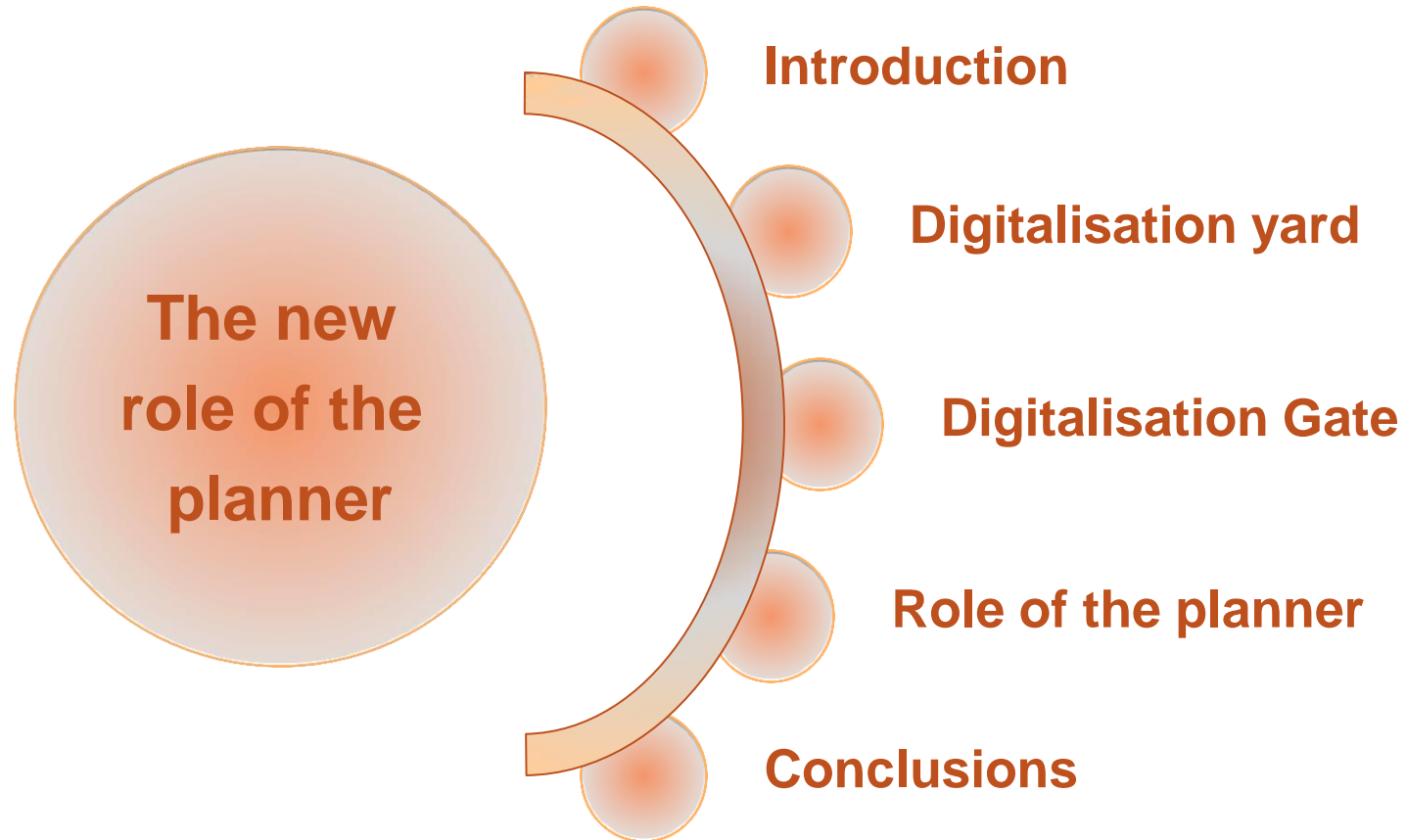
*Charleston/USA, April 17<sup>th</sup> – 18<sup>th</sup>*

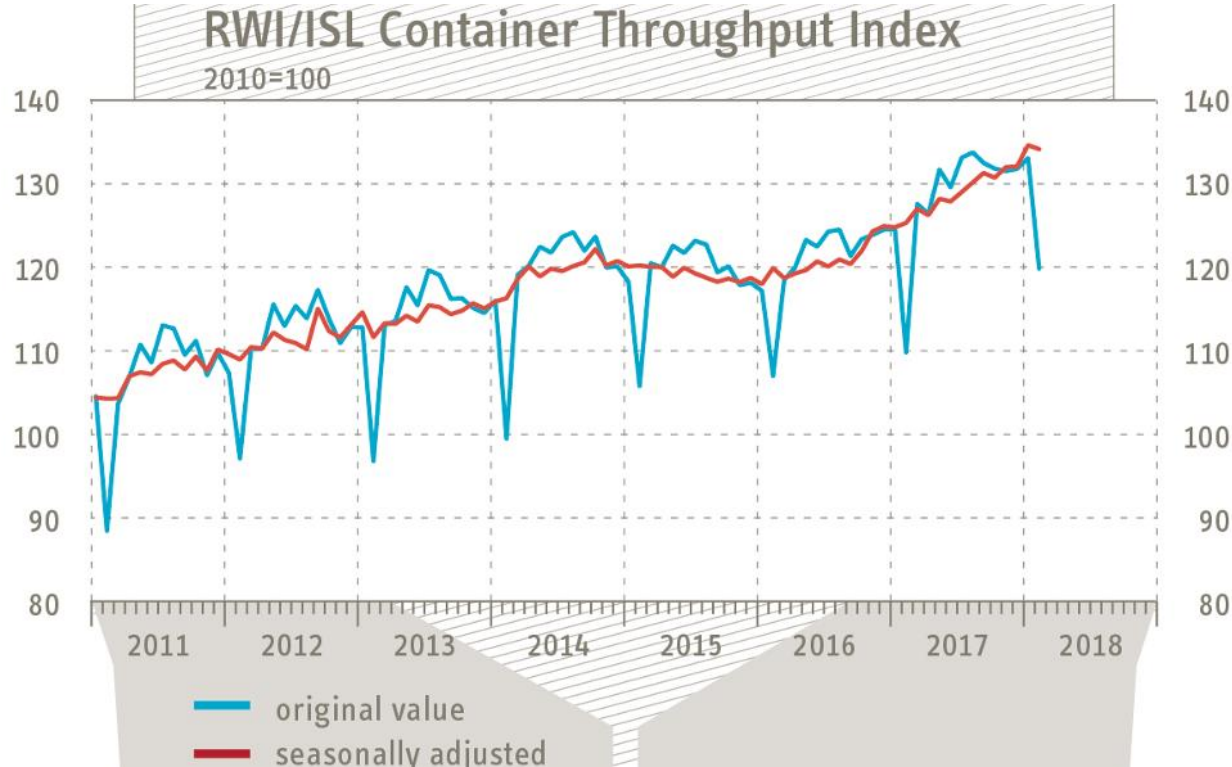
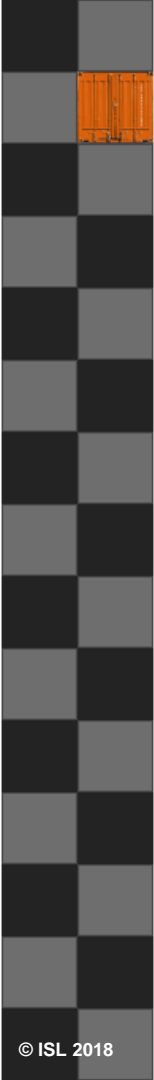


*\*participation funded by:*



## Agenda





The Container Throughput Index experienced a small decrease in February 2018 as it fell from 134,6 (revised figure of January) to 134,1. The Index remains on a high level, close to its all-time record. This development indicates a continuing strong world trade.

***RWI/ISL Container Throughput index***

- 88 ports worldwide
- ~ 60 % of worlds throughput
- available 3 weeks in new month [www.isl.org](http://www.isl.org) → news

# More than 25 Years Simulation Experience



1989 1991 1993 1995 1998 2000 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2013 2015 2017



Products rebranding:  
CAPS  
SCUSY  
ViTO



CHESScon



## Optimisation and Simulation – References (selected)

ASEAN Terminals, Philippines

Bromma, Singapore

Centerm Terminal, Vancouver, Canada

CSX, Jacksonville, USA

DP World, Australia

EUROGATE, Germany

HHLA, Hamburg, Germany

HPA Hamburg Port Authority, Germany

HIT, Hong Kong

JadeWeserPort, Germany

Cargotec / Kalmar Industries, Finland

CMSA ICTSI, Manzanillo, Mexico

MCT, Gioia Tauro, Italy

MTL, Hong Kong

Noell Crane Systems, Germany

NTB, Bremerhaven, Germany

Port of Tacoma, USA

PORTEK International Ltd., Singapore

PSA International, Singapore

Red Sea Gateway Terminal, Jeddah, KSA

SPIA ICTSI, Columbia

Tata Consultancy Services, India

TCP Valparaiso, Chile

TecPlata ICTSI, Buenos Aires, Argentina

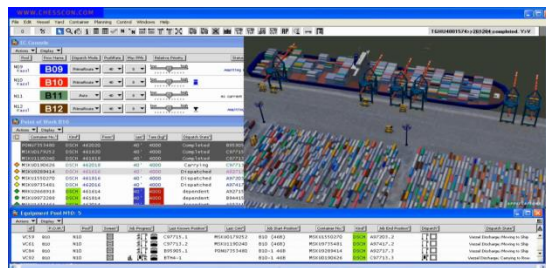
Terminal Investment Ltd, Netherlands

TotalSoftBank, Korea

TPT, South Africa

Warsteiner Brewery, Germany

# How to improve terminal's efficiency



**TOS**  
Control system



**Process automation**



The first ALV of KMI



**Terminal staff**

**Terminal  
efficiency**

Terminal's productivity is driven by

- The equipment
- The control system (TOS)
- The processes

Terminal Automation (processes as well as equipment) prepares for optimised operation, but more than ever very skilled control staff is required.

The last sentence within the Singapore Maritime Gallery (opened 09/2012):

**„ It is man making the difference“**

# Agenda



**The new  
role of the  
planner**

**Digitalisation yard**



- Digitalisation is an ongoing process!
- Let's have a look at the yard planning

**Wenn I started in CT logistics,  
container information was  
„stored“ in cards in  
a board at the wall**



## Digitalisation – a new technology???

- Digitalisation is an ongoing process!
- Let's have a look at the yard planning

... and first data was typed into computers



Source: Rama & Musée Bolo, modified by NeonZero - Apple II-IMG 7067.jpg

# Digitalisation – a new technology???

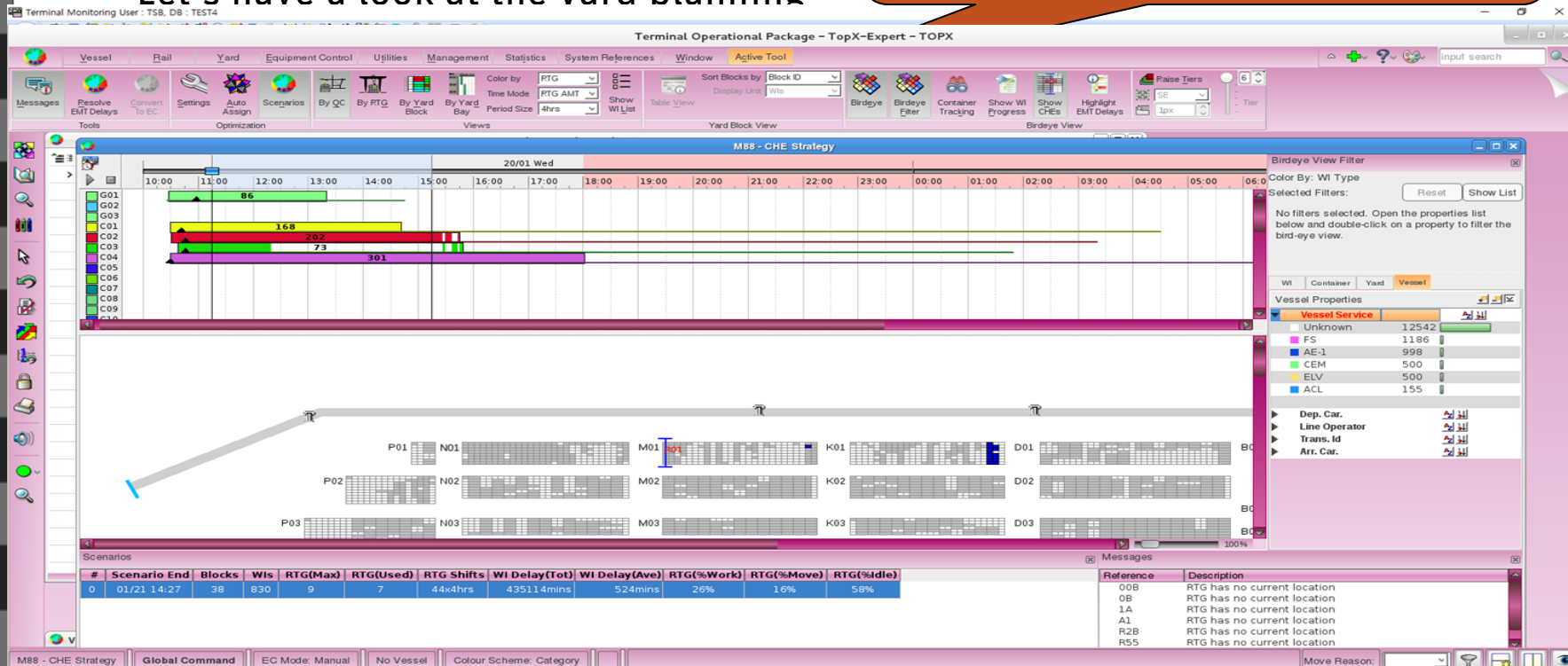
- Digitalisation is an ongoing process!
- Let's have a look at the yard planning

With the years more and more  
data is available

# Digitalisation – a new technology???

- Digitalisation is an ongoing process!
- Let's have a look at the vard planning

And is displayed in the TOS  
(examples TSB, Navis, RBS)

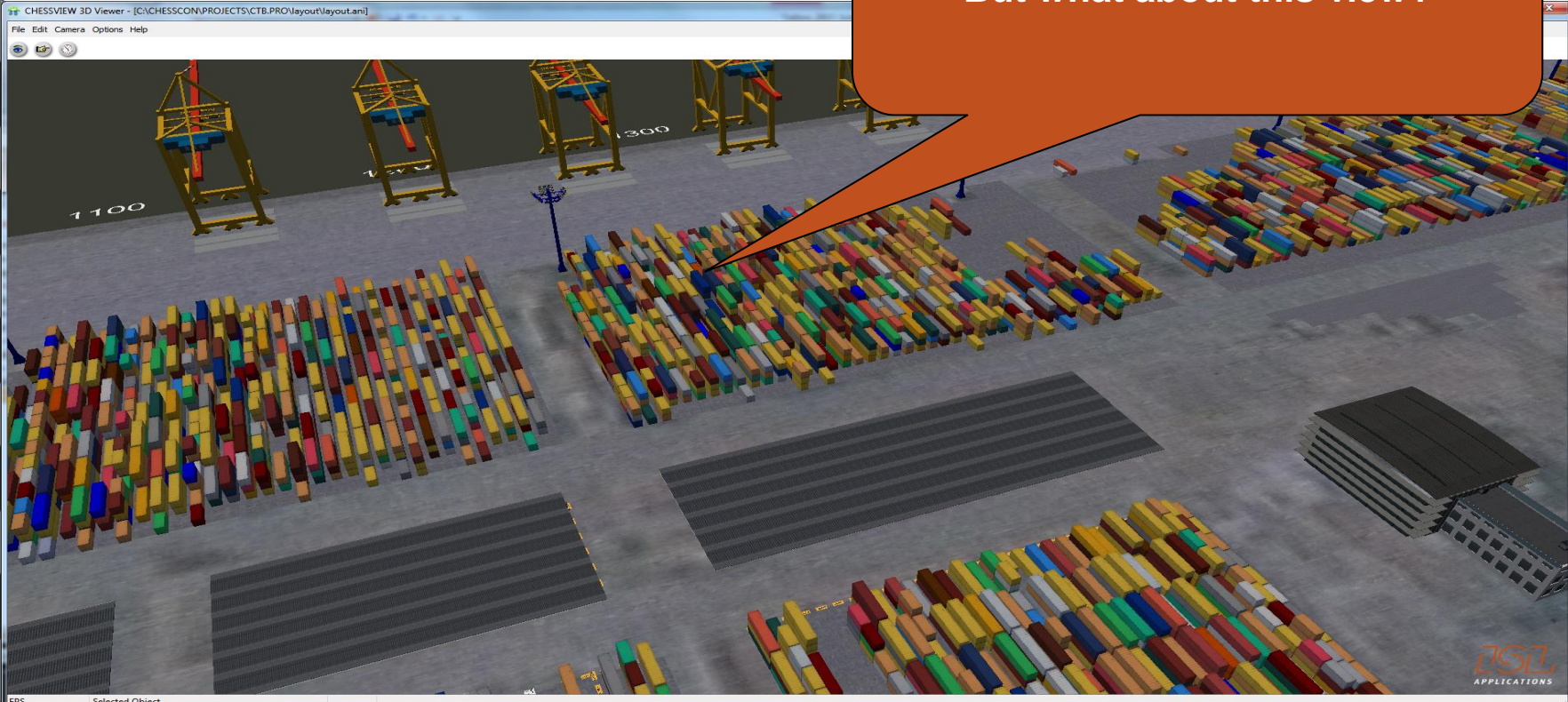




# EXAMPLES



But what about this view?



# HOW DOES IT WORK

- TOS writes the container inventory to a flat file
  - ✓ online connection also possible
- this flat file can have an unlimited number of attributes
  - ✓ POD, POL, Voyage, ....
- Yard View reads this flat file
- the user can create container filter like in Excel **User defines filters**
- get a 3D overview with just one click

Only one click to show filter in 3D

TOS writes inventory

The screenshot shows the TOS SPARCIS N4 22.42 software interface. It features a menu bar (File, Edit, Vessel, Train, Yard, Container, Planning, Control, Windows, Help) and a toolbar. The main window displays a table of container inventory data with columns for ID, ISO, Length, Weight, Area, X, Y, Z, Flow, Empty, and Arrival. Below the table, there are sections for 'Equipment Pool QC 3.5' and 'Point of Work QC3'.

ID	ISO	Length	Weight	Area	X	Y	Z	Flow	Empty	Arrival
ECMU121213	2201	20	2200	EM6	EM6-039	F	2	EXPORT	E	TRUCK
GESU205680	2201	20	2100	EM6	EM6-039	E	2	EXPORT	E	TRUCK
ABU1078569	2201	20	2200	EM6	EM6-039	E	1	EXPORT	E	TRUCK
IPU1415382	2201	20	2300	EM6	EM6-039	F	3	EXPORT	E	TRUCK
SJLU267602	2209	20	6600	CKY	CKY-109	E	1	TRANSHIP	E	OSHAH
SJLU466902	4001	40	6600	CKY	CKY-102	E	1	TRANSHIP	E	OSHAH
MSKU812376	4501	40	4000	CKZ	CKZ-004	B	1	EXPORT	E	TRUCK
TELU284704	2201	20	2200	EM6	EM6-039	F	1	EXPORT	E	TRUCK
CLU2601793	2201	20	2200	CKY	CKY-013	C	1	EXPORT	E	TRUCK
CMBU481964	4310	40	3900	CKZ	CKZ-006	B	4	TRANSHIP	E	SCOMAR
CAU2027024	2201	20	2200	OM6	OM6-049	E	1	TRANSHIP	E	TESS088
SJLU1974890	2201	20	2300	OM6	OM6-049	F	1	TRANSHIP	E	TESS088
SJLU1779693	2201	20	2300	OM6	OM6-049	E	4	TRANSHIP	E	TESS088
SJLU1414222	2201	20	2300	OM6	OM6-049	F	2	TRANSHIP	E	TESS088
SJLU151404	2201	20	2300	OM6	OM6-049	F	2	TRANSHIP	E	TESS088
HJLU1799482	4002	40	4300	OM6	OM6-049	F	1	TRANSHIP	E	TALAD06
POW4777174	4501	40	3900	CKZ	CKZ-004	A	1	EXPORT	E	TRUCK
HJLU697160	4509	40	4300	CKY	CKY-048	D	2	TRANSHIP	E	TAM001
CSU1914632	2219	20	2000	CKZ	CKZ-055	B	1	EXPORT	E	TRUCK
TELU1820775	4501	40	4300	OM6	OM6-064	C	1	TRANSHIP	E	TALAD06
XJLU4260990	4300	40	4300	CKZ	CKZ-006	B	3	EXPORT	E	TRUCK
MAKU808700	4501	40	3700	CKY	CKY-014	E	4	IMPORT	E	BUCK117
HJLU267623	2209	20	2200	CKZ	CKZ-019	A	1	EXPORT	E	TRUCK

The screenshot shows the CHESCON Yard View software interface. It features a menu bar (File, Edit, Help) and a toolbar. The main window displays a 3D overview of a container yard with various containers and cranes. A filter dialog box is open, showing a table of filter criteria.

Filter Name	Tier	Flow	Reefers	Empty (726 Cts)	Empty	OOG	Voyage BARC026	Empty
Empty (726 Cts)								
Empty								
OOG								
Voyage BARC026								
Re								

No limits in filtering container inventory



**Yard View – Visualize your Yard**

**Where are the boxes for the next 31 vessel?**

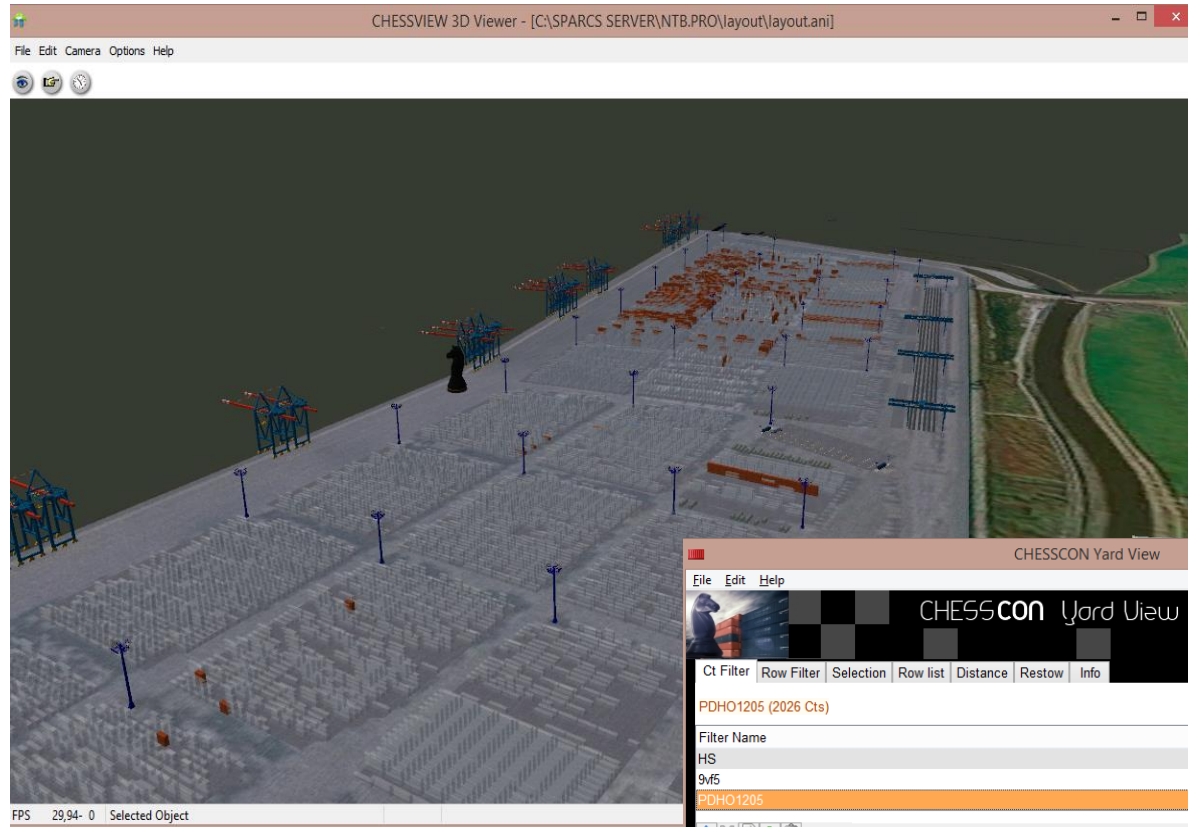
**... and how many restowers will occur?**

**Are the hazardous stacked properly?**

**How utilised are my stacks / areas?**

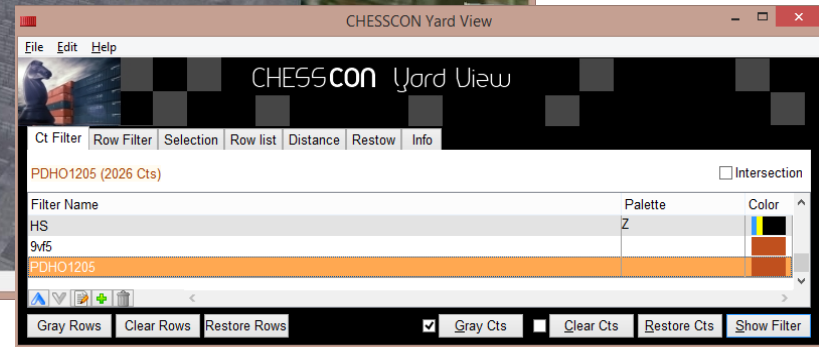


# EXAMPLES



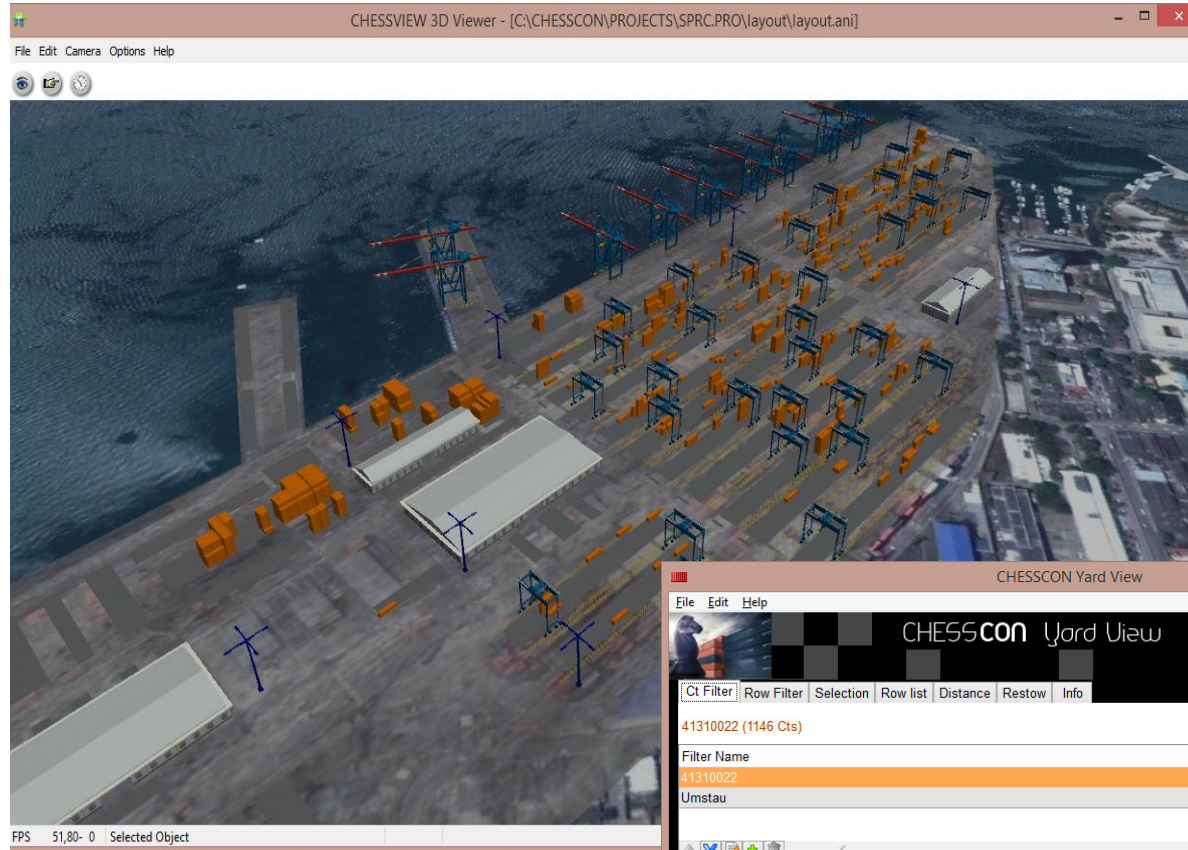
## Straddle carrier Terminal

- Prestow for a “3I” class vessel



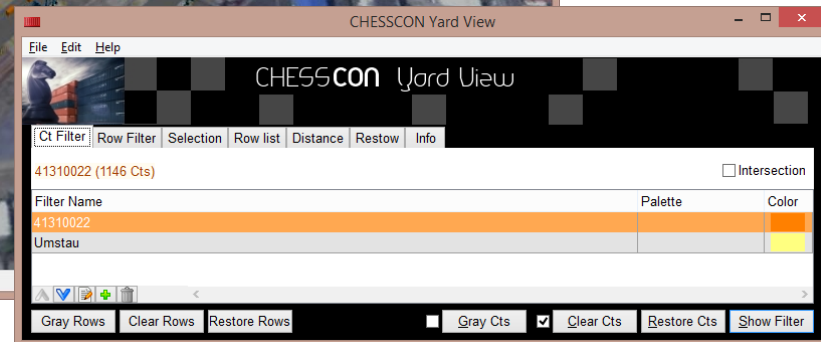


# EXAMPLES



## RTG Terminal

- Prestow for the next vessel





**A picture shows more than 1000 words**

**→ ... and is more intuitive than 100 tables**

# Agenda



**The new  
role of the  
planner**

**Digitalisation Gate**

## Digitalisation Gate

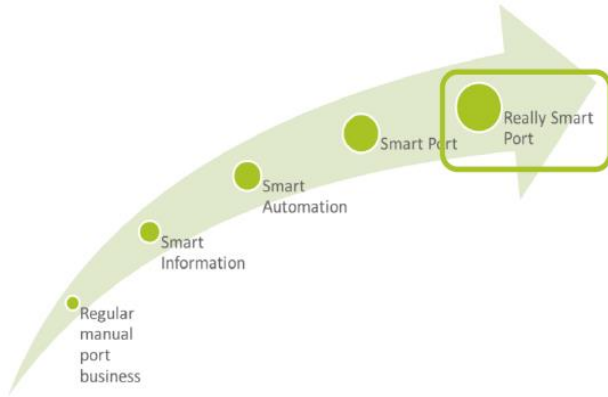


Which truck is arriving at the terminal  
Who's the driver (access allowed)?  
Which container is on it?  
What's about the container content?  
- hazardous?  
- reefer?  
Where will the container go next?  
What's the final destination?

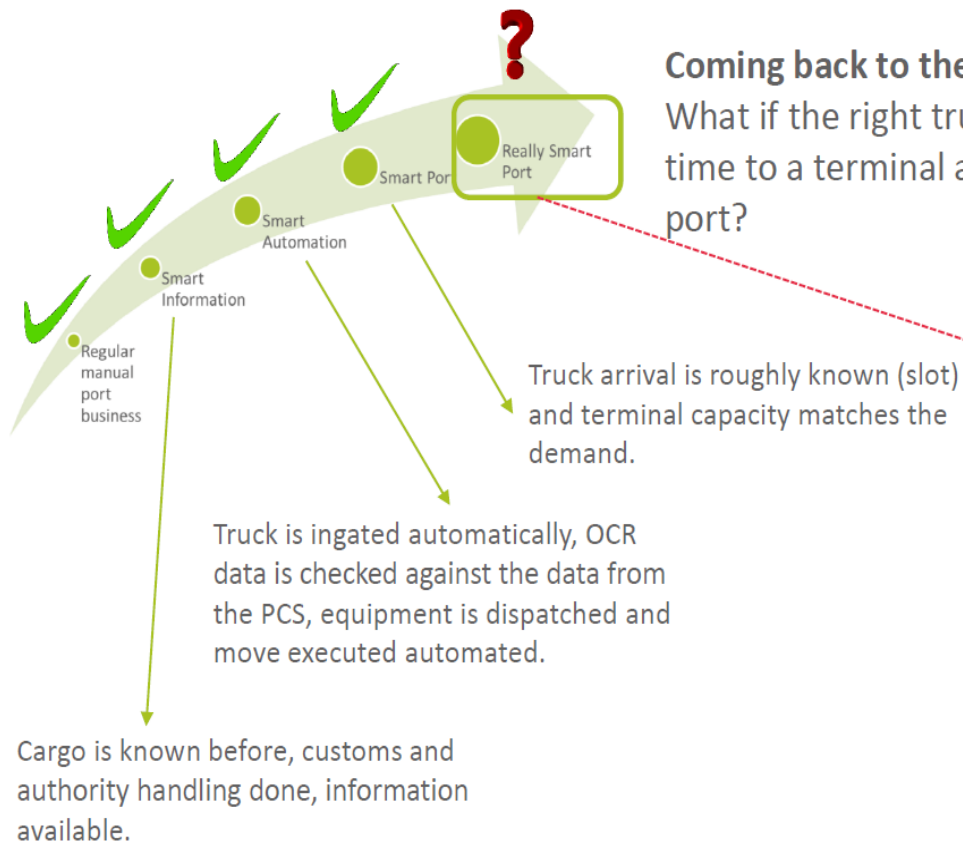
...



# Smart Port Approach – Step-wise: More smart?



# Smart Port Approach – Step-wise: More smart?



## Coming back to the initial question:

What if the right truck would come always at the right time to a terminal and uses the best rout through the port?

## The vision on this process:

Based on the demand, capacity and the actual traffic conditions, truck flow in the port is actively and smart managed. E.g.

1. Trucks are called of the highway to take a break and park, if the container is not ready yet, the terminal is jammed or other things.
2. The traffic flow to available capacity is smoothened by intervention with traffic lights, bridges and other infrastructure.





**MANILA**



**< BEFORE**



Source: 9th Philippine Ports and Shipping 2017, Manila, February 23th – 24th 2017

# MANILA

## AFTER >



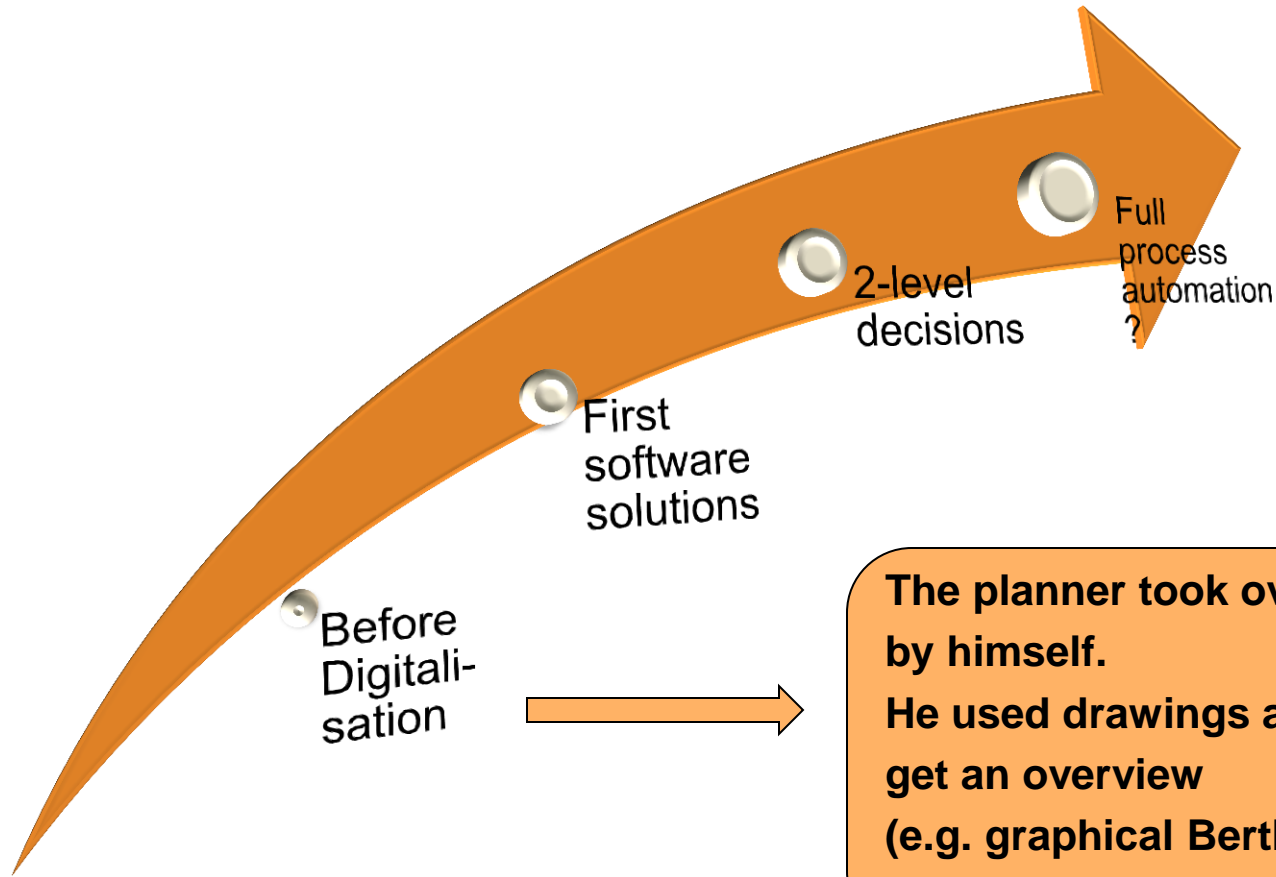


## Agenda



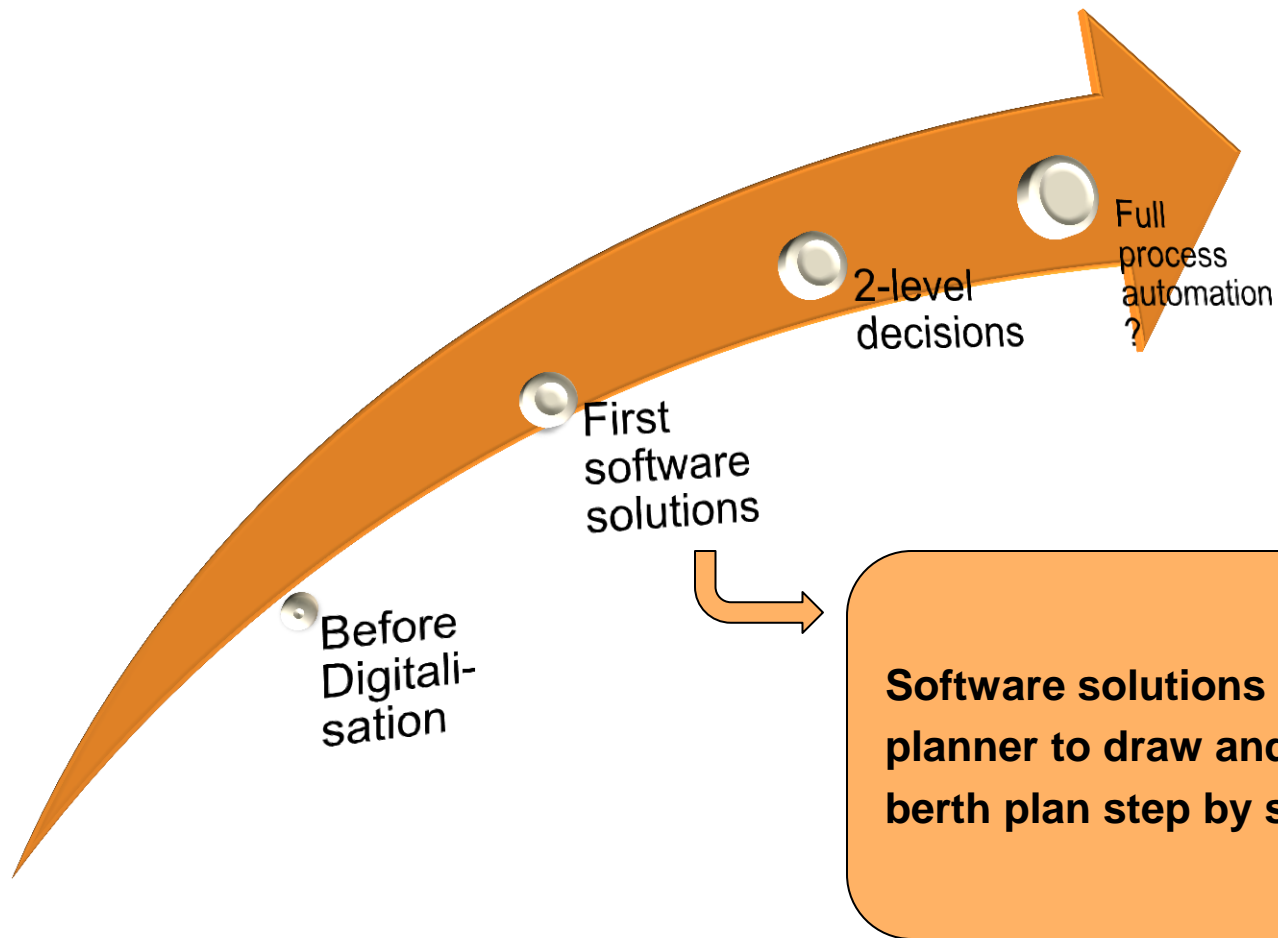
**The new  
role of the  
planner**

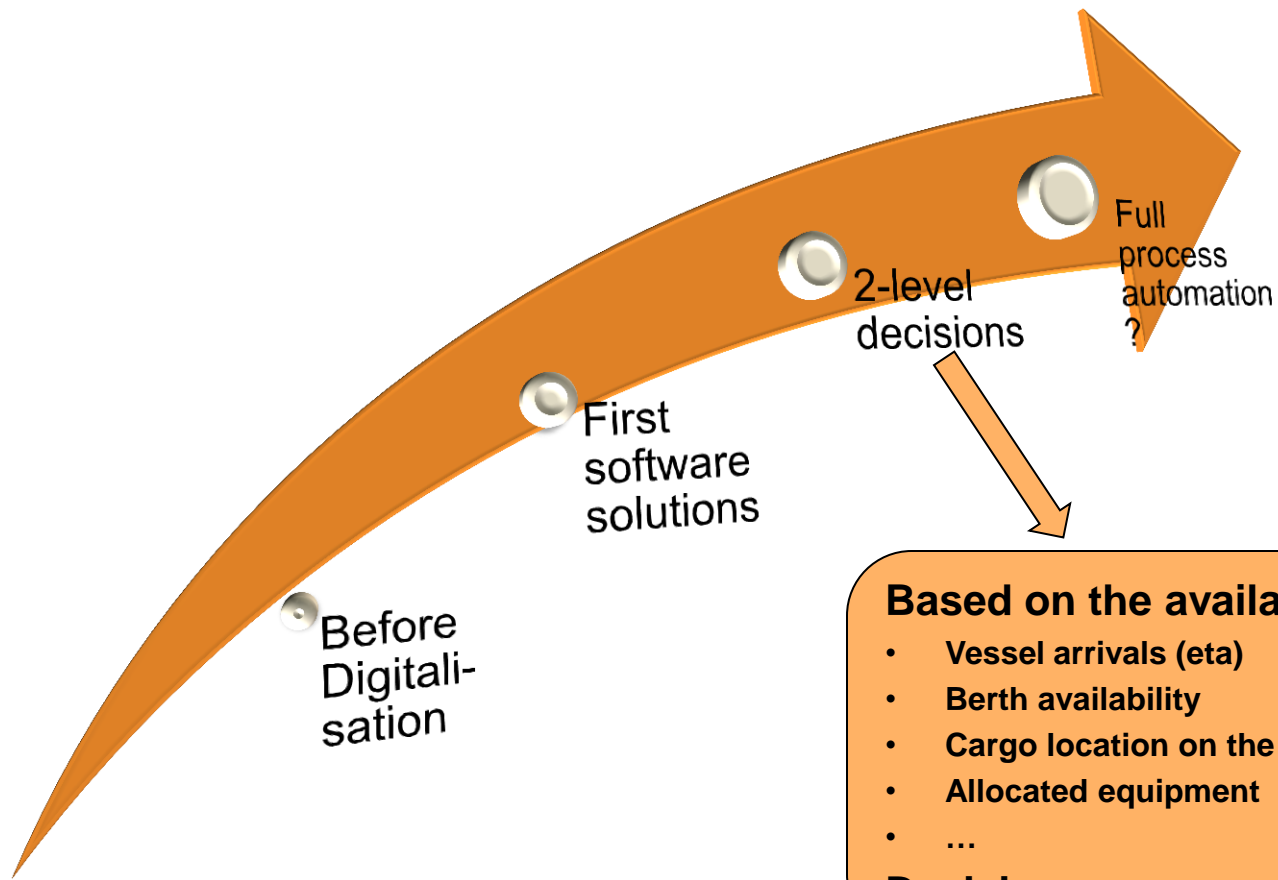
**Role of the planner**



**The planner took over all decisions by himself.**

**He used drawings and tables to get an overview  
(e.g. graphical Berth-plan – to be Revised 5-times a day)**

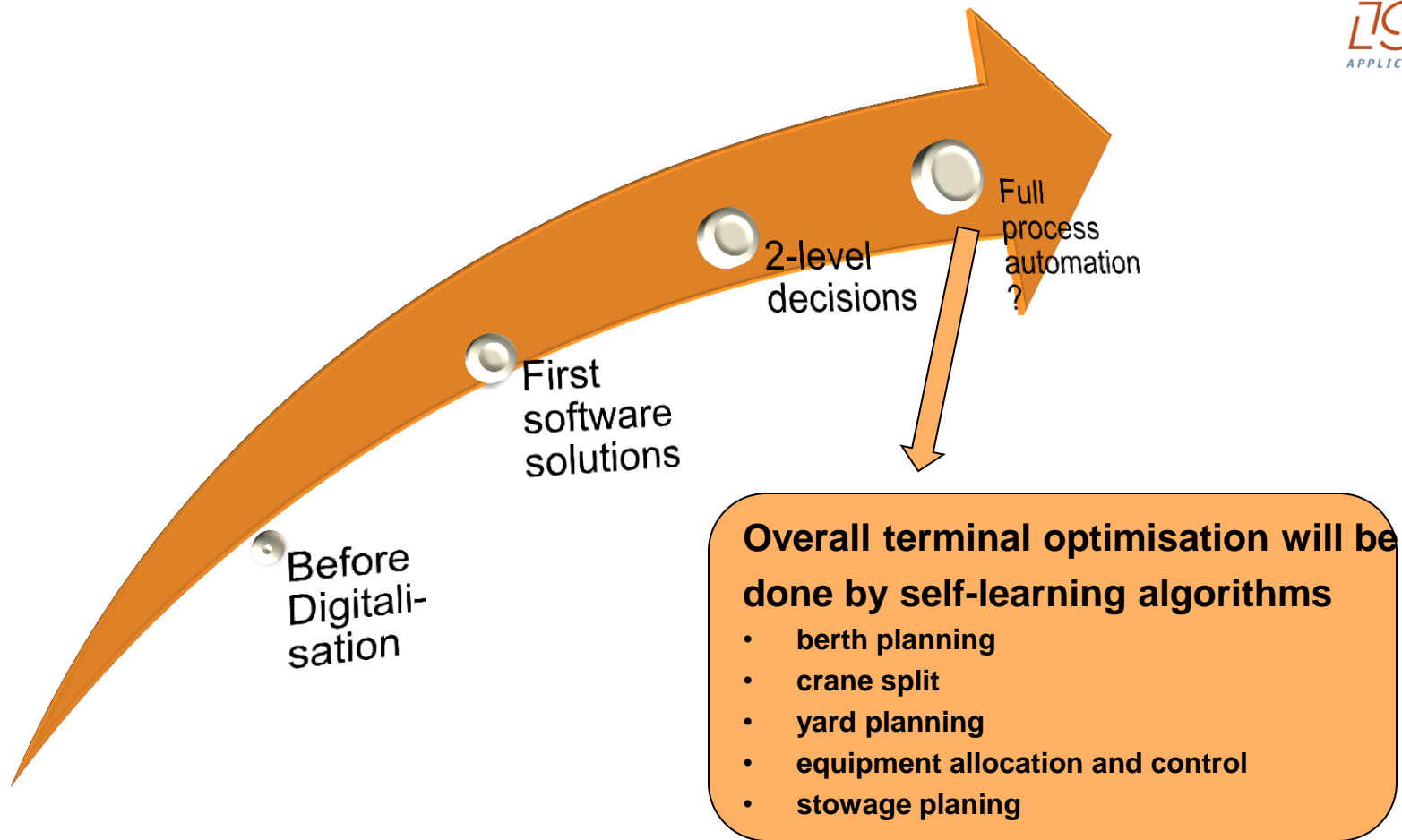




### Based on the available data

- Vessel arrivals (eta)
- Berth availability
- Cargo location on the yard
- Allocated equipment
- ...

**Decisions are proposed automatically**



# IT architecture

ERP  
(Administration)

Accounting

Statement

TOS  
(Planning)

Berth  
Planning

Crane Split  
Planning

Yard  
Planning

Transport  
Planning

Stow  
Planning

...

TLS  
(Real Time  
Scheduling)

Coordination

FMS  
(Execution)

STS  
Manager

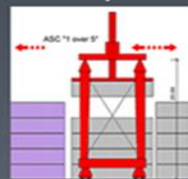
AStC  
Manager

ASC  
Manager

LMTT  
Manager

OHBC  
Manager

EC,SPS  
(Equipment)



# Vessel simulator

- train your control staff (as shipping lines do)





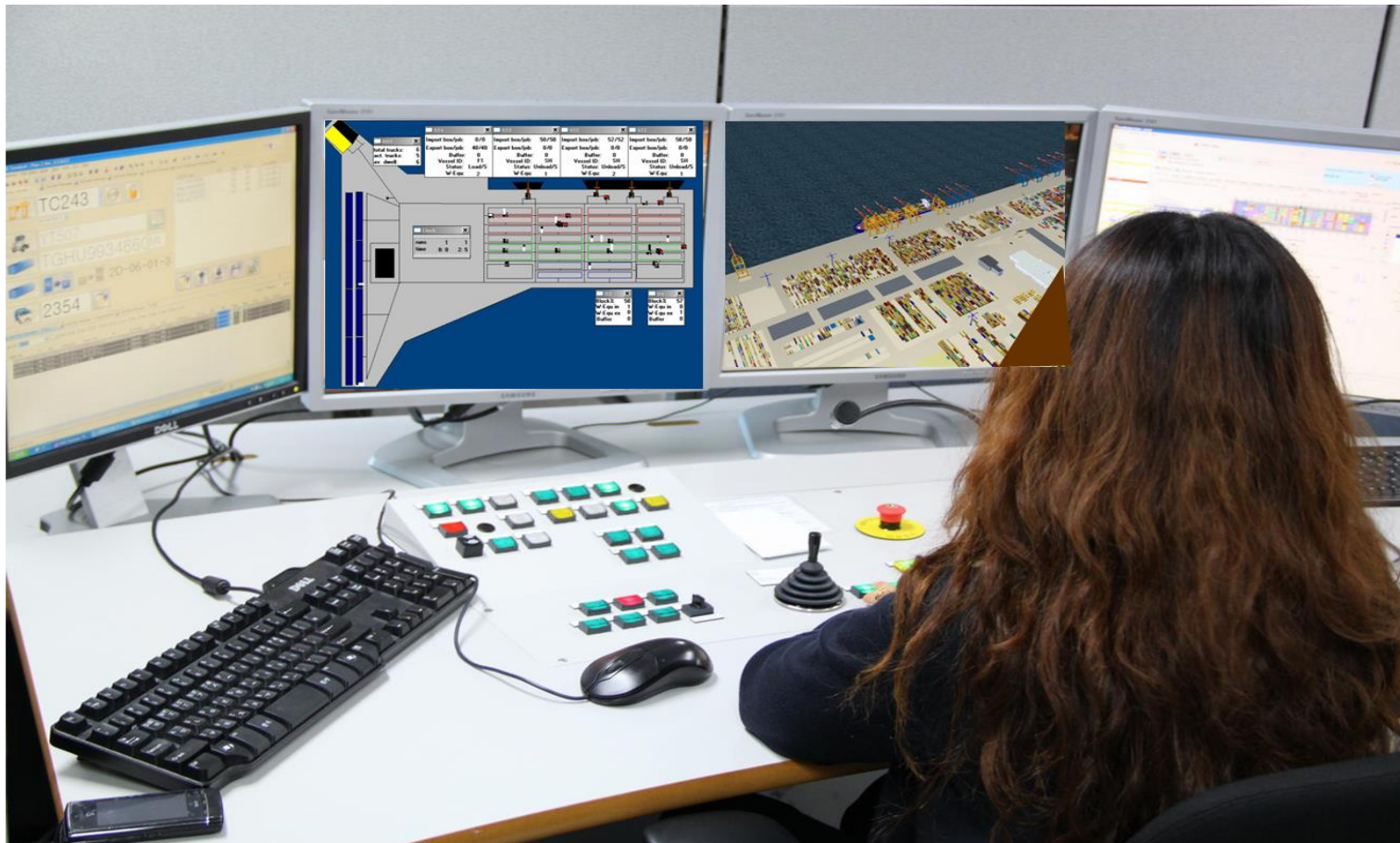
## Crane simulator

- train your control terminal staff (as you do with crane drivers, e.g. Liebherr:)





# Learning from the huge ones

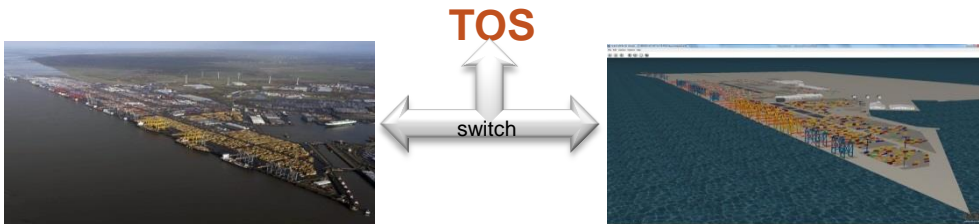


# The main mission of CHESSCON VIRTUAL TERMINAL

what you can do with CHESSCON

## Emulation:

- use your Terminal Operation System (TOS)
- use your software interfaces
- but use a **Virtual Container Terminal**



### Benefits:

- no impact on the real environment
- training under laboratory conditions
- self-learning available
- fine-tune the TOS parameters
- re-run bad shifts

SPARCS 3.7.24.1 - Kassl

File Edit Vessel Yard Container Planning Control Windows Help



navis

Equipment Pool QC06: 6

Actions Display

Handler id*	Icon Only*	Screen*	Dispatch State*	Move D
121			Carrying a container; Waiting at Row	1321+
122			Go to crane; Waiting at Ship	1321+
124			Go to crane; Waiting at Ship	1321+
125			Go to crane; Waiting at Ship	1321+
C06				
033				

Point of Work Q06

Actions Display

Sequence*	Container No.*	Type*	Current Position*	Handler id*	Dispatch State*
1	GATU8091789	45G1	*TR-121*	121/R33	In Progress
2	GATU8588121	45G0	CANX020*0361490	124	Go to Crane
3	FSCU6472343	45G1	CANX020*0361290	125	Go to Crane
4	HLXU6350672	45G1	CANX020*0361090	122	Go to Crane
5	HLXU6273703	45G1	CANX020*0361688		(not evaluated)
6	CPSU6439396	45G1	CANX020*0361488		(not evaluated)

## Agenda



**Learn  
from the  
big Ones**

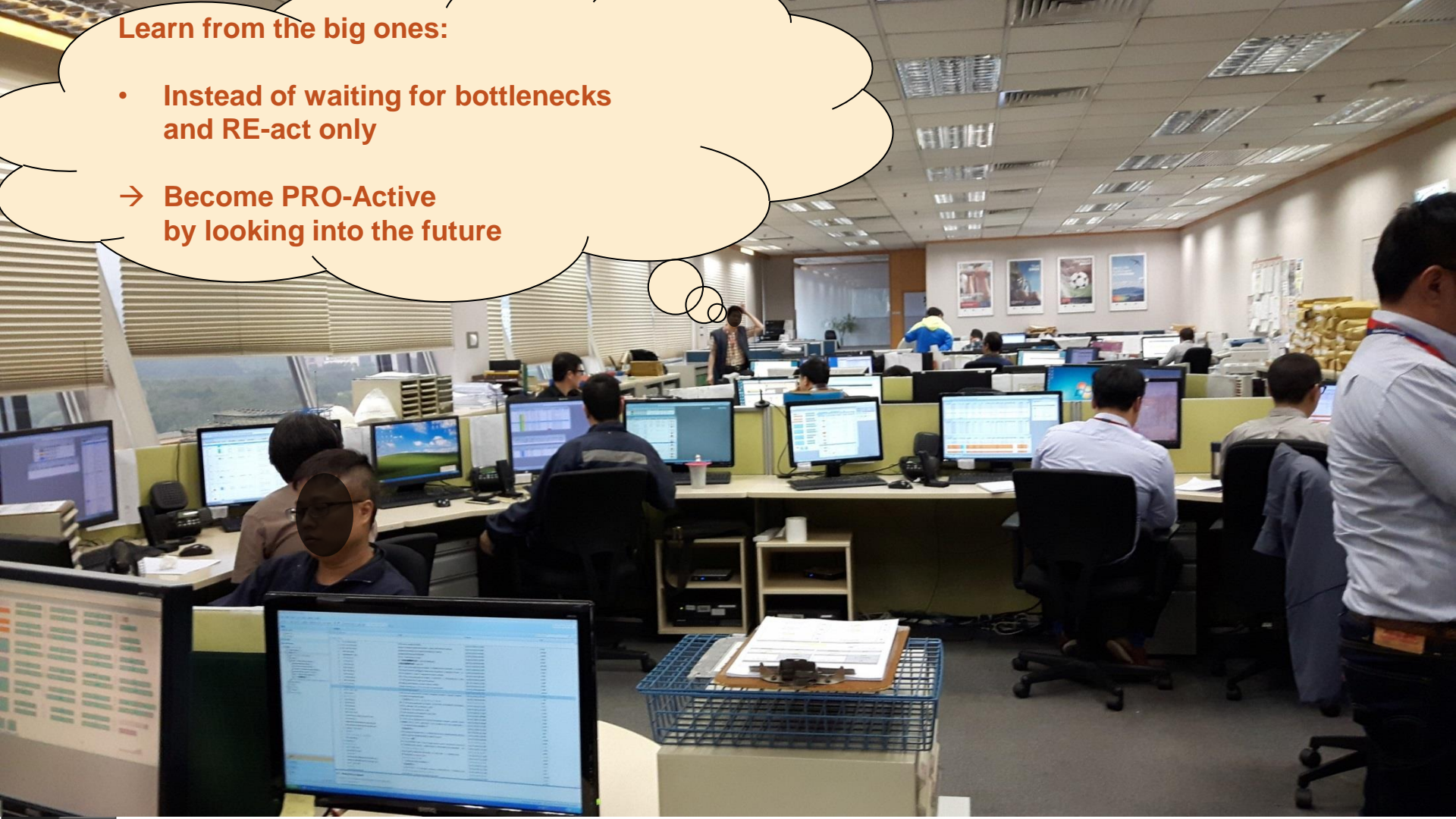
**Conclusions**



Learn from the big ones:

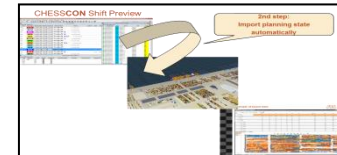
- Instead of waiting for bottlenecks and RE-act only

→ Become PRO-Active by looking into the future

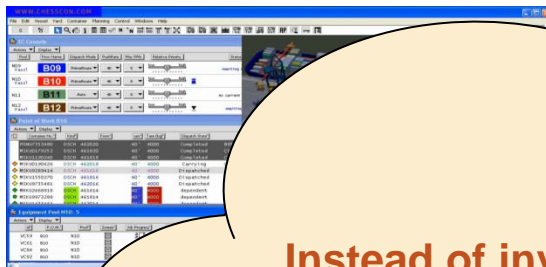


# Conclusion

- Visualise your actual container inventory
- Train your staff with Virtual Terminals
- Look into the future operation

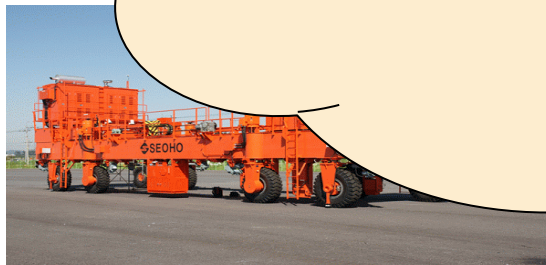


# How to improve terminal's efficiency

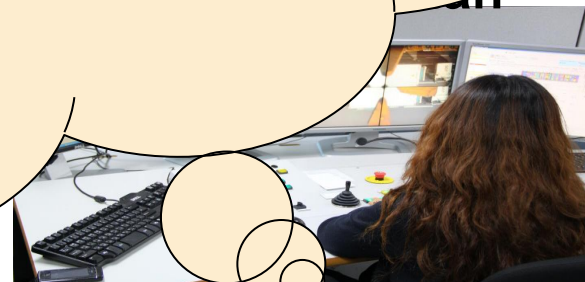


Instead of investing in more and more man and machines:

*Get more out of your existing resources*



The first ALV of KMI





MAKE YOUR RIGHT MOVES!



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VIRTUAL TERMINAL