

# Digitalization – How does the planning staff cope with this huge amount of data?

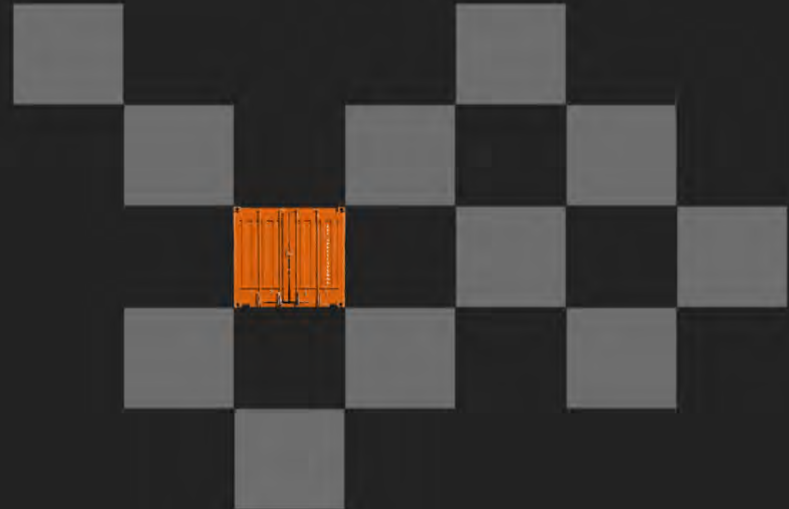


Holger Schuett

ISL Applications GmbH

*16<sup>th</sup> ASEAN Ports & Shipping*

*Johor/Malaysia, July 3<sup>rd</sup> – 5<sup>th</sup>*



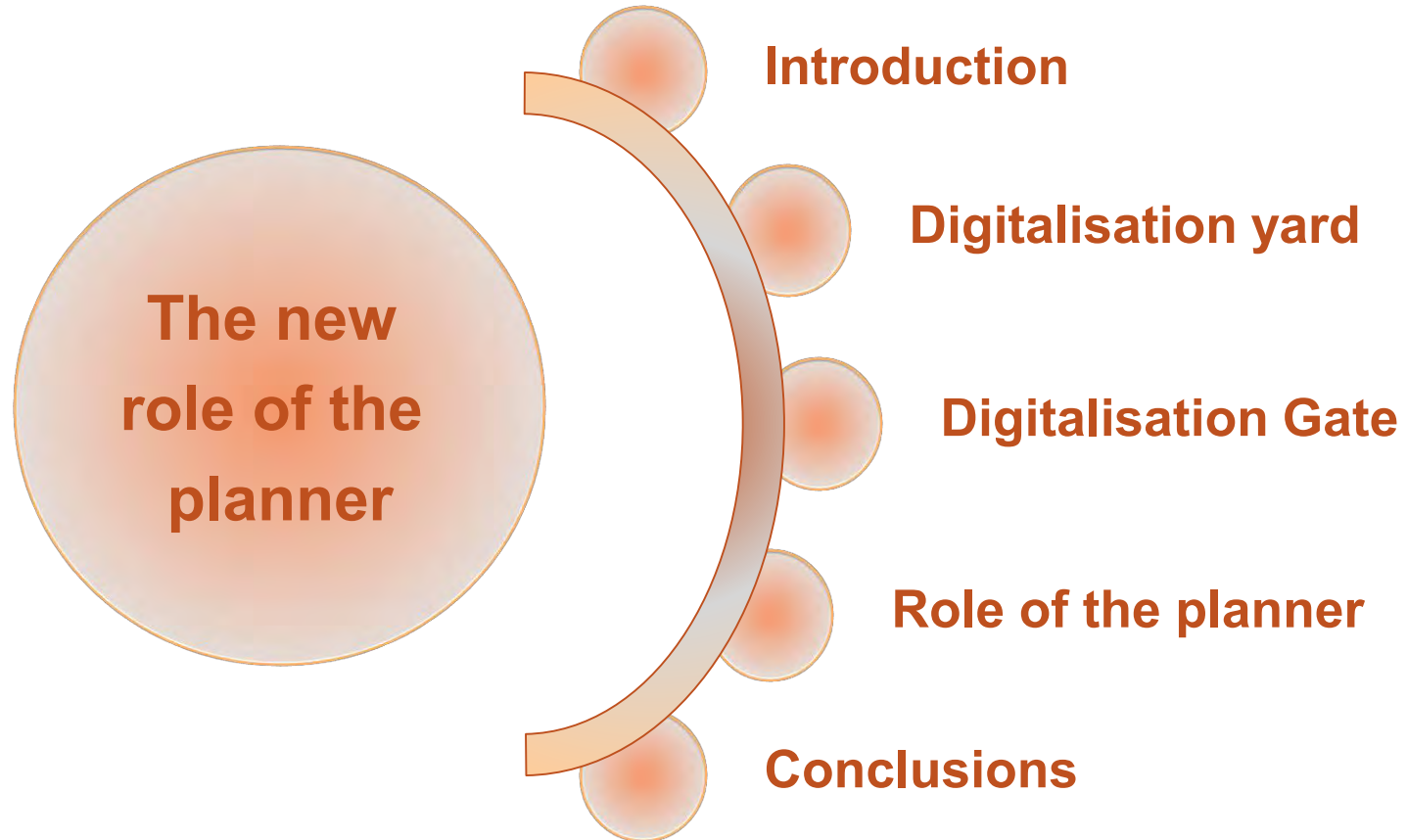
*\*participation funded by:*

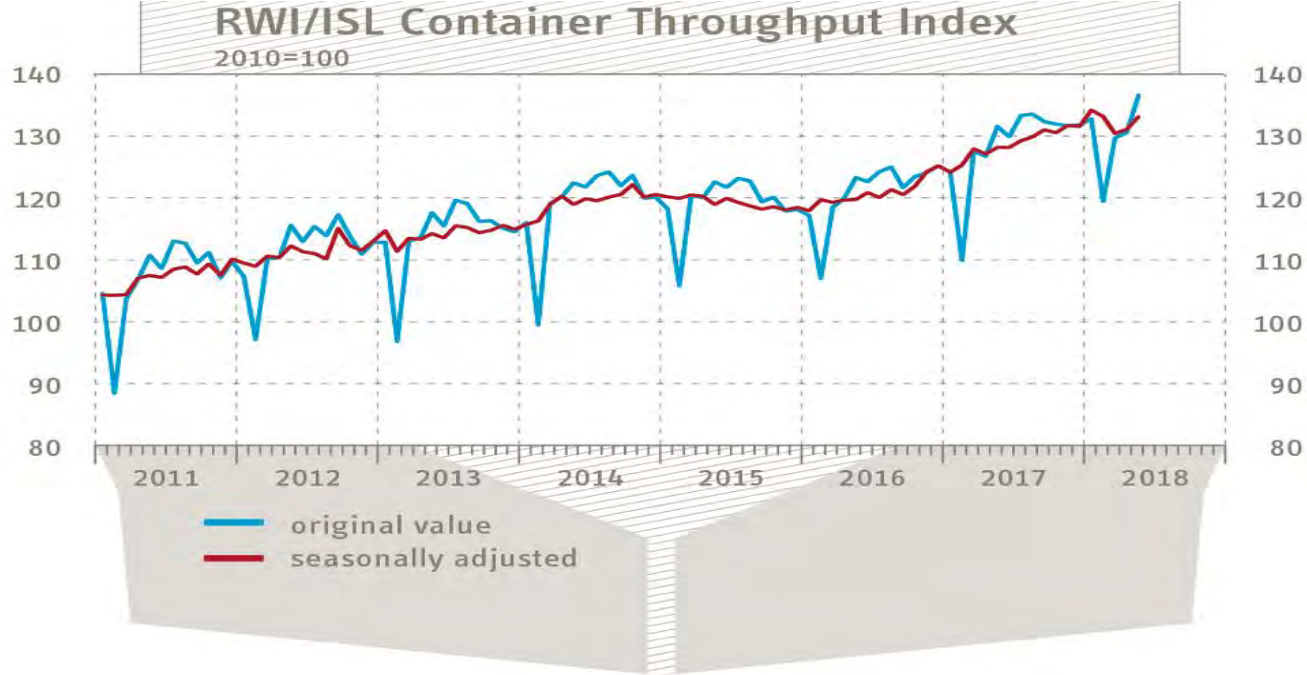


European Union  
Investing in Bremen's Future  
European Regional  
Development Fund



## Agenda





*RWI/ISL computations based on data provided by 88 ports. May 2018: flash estimate.*

**The Container Throughput Index continues its upward trend despite growing trade policy conflicts. In May 2018, it increased from a (revised) 131.1 points to 133.1 points. However, it is still slightly below its record value reached in January this year. .**

***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



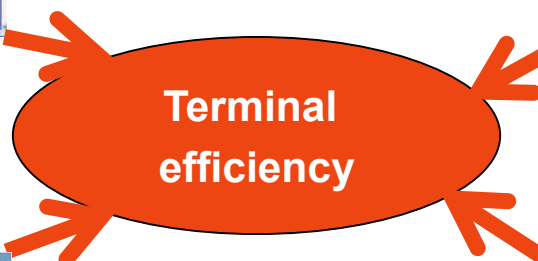
# How to improve terminal's efficiency



**TOS  
Control system**



**Process automation**



**Terminal  
efficiency**

**Equipment**



The first ALV of KMI

source and ©: University of Incheon

**Terminal staff**



Terminal's productivity is driven by

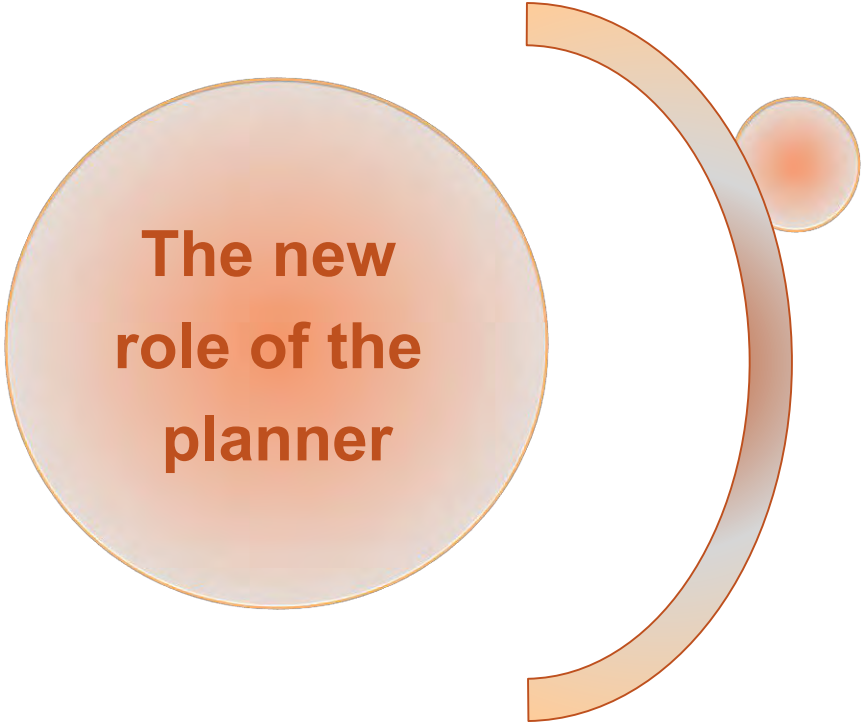
- The equipment
- The control system (TOS)
- The processes

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

A stylized graphic of a person or figure, composed of a large circular head and a curved, open-bottom body. The head is a light orange circle with a gradient, containing the text 'The new role of the planner'. The body is a thick, curved orange line that forms a semi-circle, with a smaller, solid orange circle at its top right end, representing a hand or a head. The entire figure is rendered in a light orange color with a subtle gradient.

**The new  
role of the  
planner**

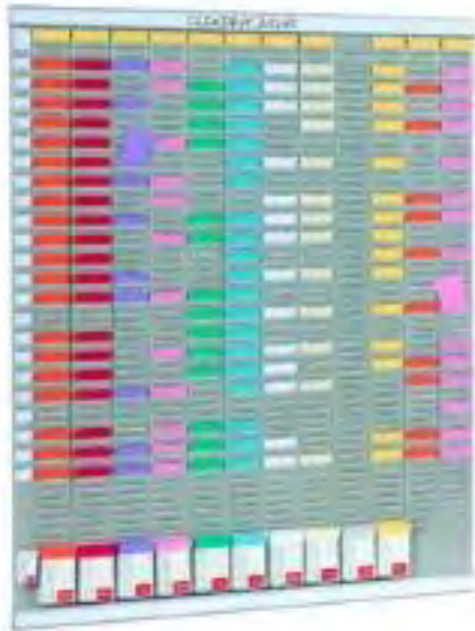
**Digitalisation yard**



# Digitalisation – a new technology???

- 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



## 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 yard planning

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

The screenshot displays the 'Terminal Operational Package - TopX-Expert - TOPX' software interface. The main window shows a Gantt chart for '20/01 Wed' with a time scale from 10:00 to 06:00. The chart lists various vessel types (G01-G09) and their durations, with values such as 86, 168, 202, 73, and 301. Below the Gantt chart is a detailed view of vessel operations, including 'P01' through 'P03' and 'N01' through 'N03'. A 'Birds-eye View Filter' panel on the right shows 'Color By: Wl Type' and 'Selected Filters:'. Below that, 'Vessel Properties' are listed, including 'Vessel Service' (Unknown, 12542), 'FS' (1186), 'AE-1' (998), 'CEM' (500), 'ELV' (500), and 'ACL' (155). At the bottom, a 'Scenarios' table and a 'Messages' panel are visible.

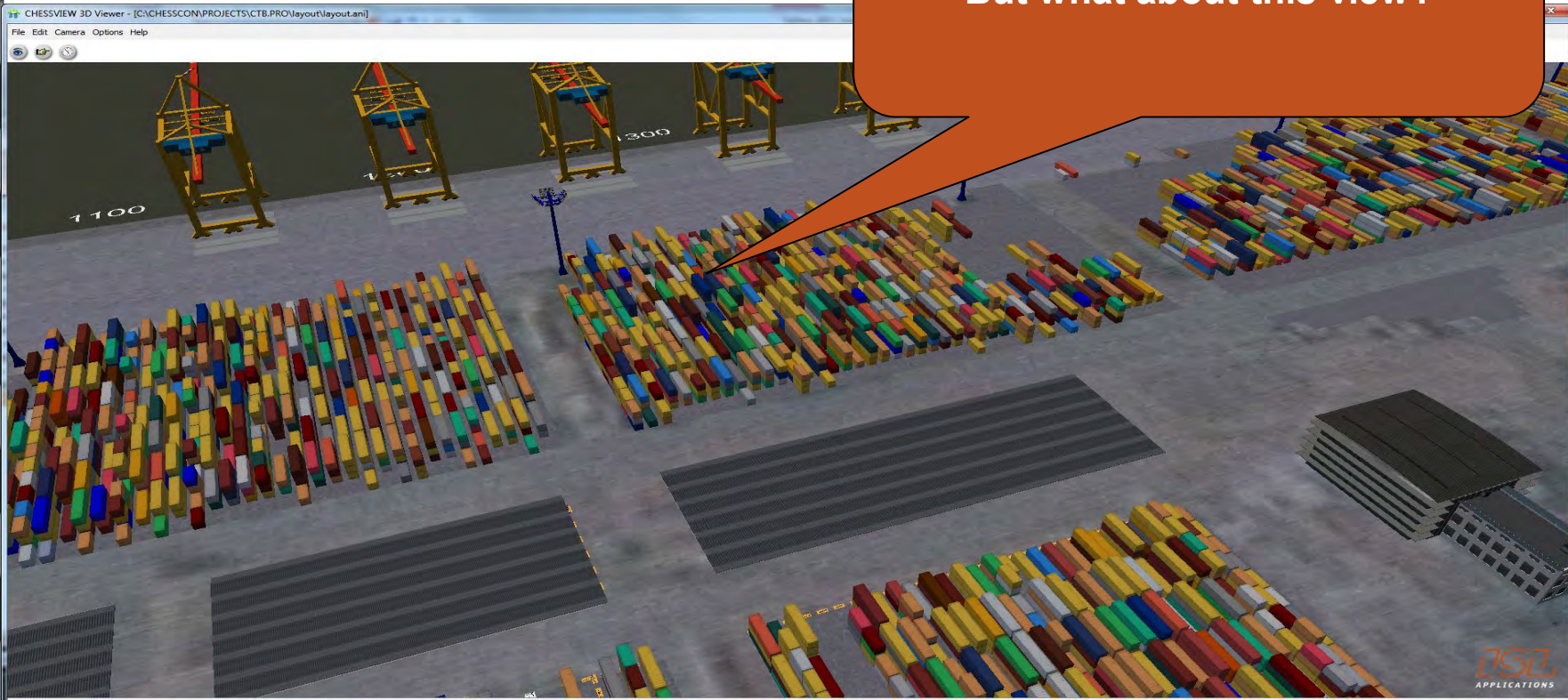
| # | Scenario End | Blocks | Wis | RTG(Max) | RTG(Used) | RTG Shifts | WI Delay(Tot) | WI Delay(Ave) | RTG(%Work) | RTG(%Move) | RTG(%Idle) |
|---|--------------|--------|-----|----------|-----------|------------|---------------|---------------|------------|------------|------------|
| 0 | 01/21 14:27  | 38     | 830 | 9        | 7         | 44x4hrs    | 43514mins     | 524mins       | 26%        | 16%        | 58%        |

| Reference | Description                 |
|-----------|-----------------------------|
| 00B       | RTG has no current location |
| 0B        | RTG has no current location |
| 1A        | RTG has no current location |
| A1        | RTG has no current location |
| R2B       | RTG has no current location |
| R55       | RTG has no current location |

# 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
- get a 3D overview with just one click

TOS writes inventory

| Container ID | Stack  | Type | Moat Type | Inbound Carrier | Moat Floor | Outbound Carrier | Moat Trf    |
|--------------|--------|------|-----------|-----------------|------------|------------------|-------------|
| POM2448398   | DSCH   | 4310 |           | 0705            | 700490     | TRUCK            | BD3.25.38.1 |
| MSK0163079   | DSCH   | 4310 |           | 0705            | 700290     | TRUCK            | BD3.25.38.1 |
| POM2675112   | DSCH   | 4310 |           | 0705            | 700090     | TRUCK            | BD3.29.38.1 |
| SO23         | BD3.25 |      |           |                 |            |                  |             |
| MSK0605131   | DSCH   | 4310 |           | 0705            | 700190     | TRUCK            | BD3.31.38.1 |

User defines filters

| Filter Name    | Tier | Flow | Color |
|----------------|------|------|-------|
| Empty (20 Cts) |      |      |       |
| Empty          |      |      |       |
| VOYAGE         |      |      |       |
| Voyage BARC026 |      |      |       |
| Re             |      |      |       |

Only one click to show filter in 3D

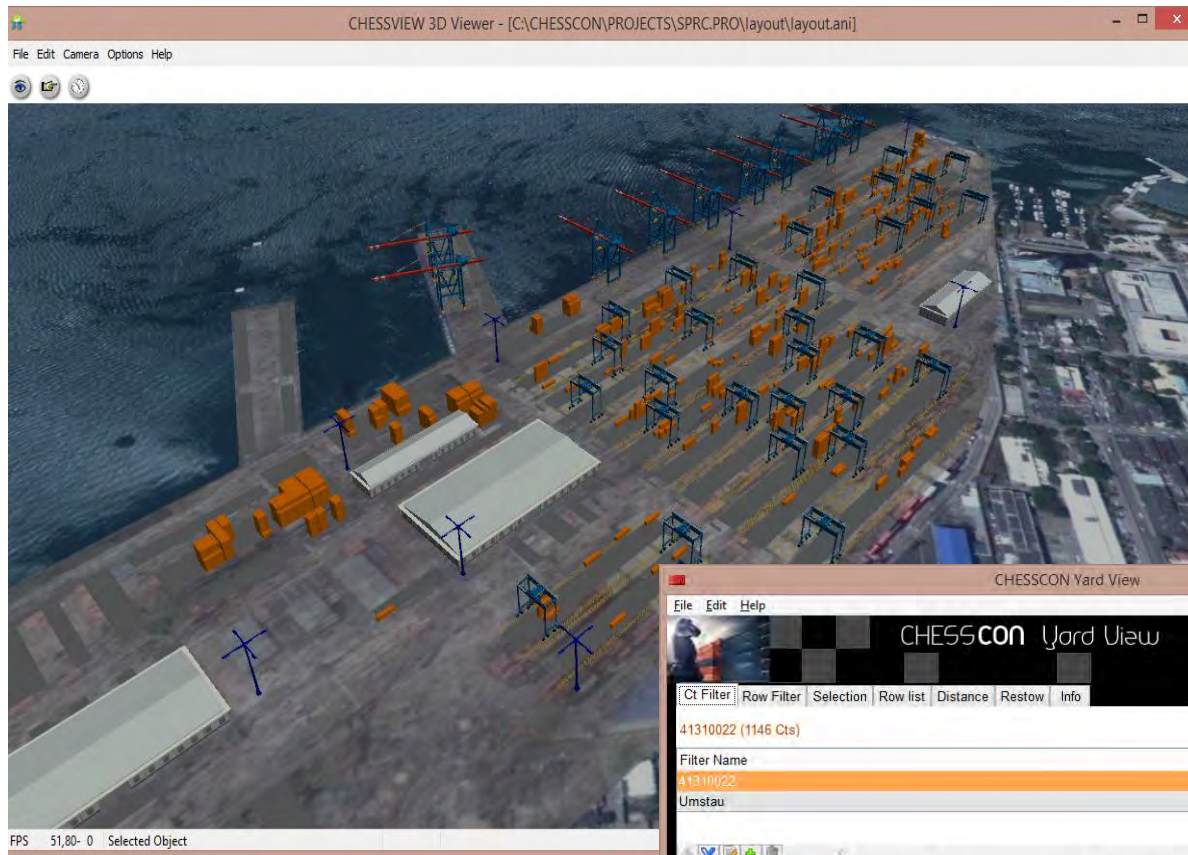


No limits in filtering container inventory



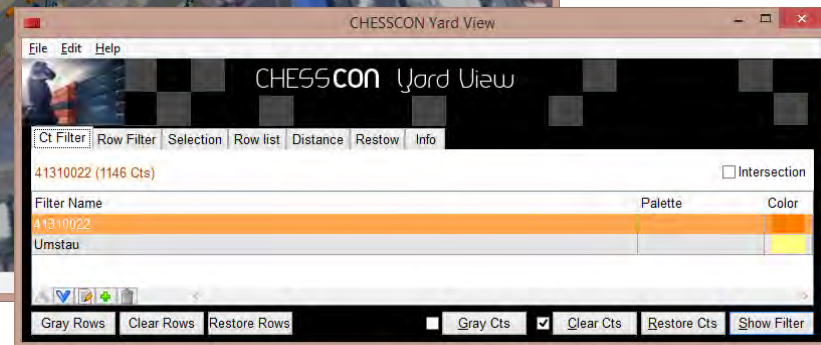


# Examples



## RTG Terminal

- Prestow for the next vessel

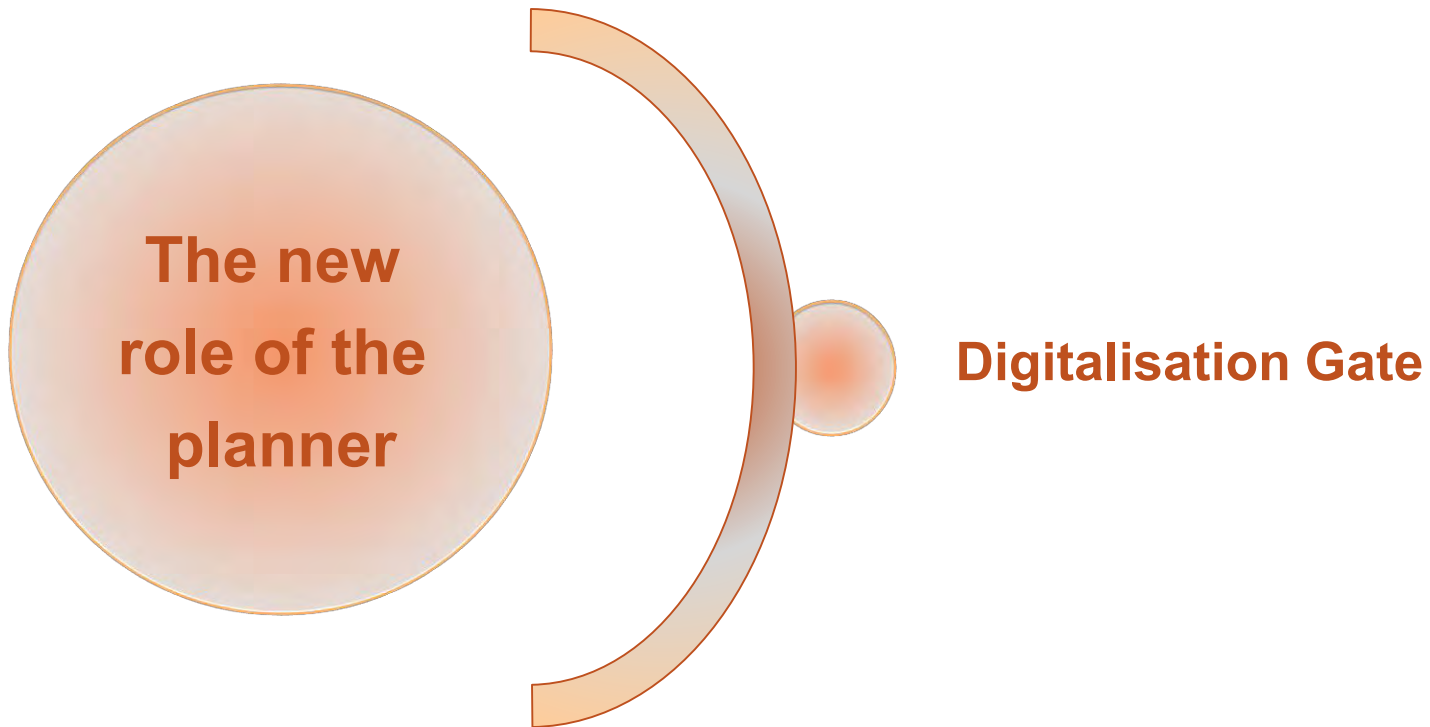


A large, light orange thought bubble with a black outline, containing text. To its right are three smaller, light orange circles of decreasing size, also with black outlines, arranged in a line to suggest a thought process.

**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

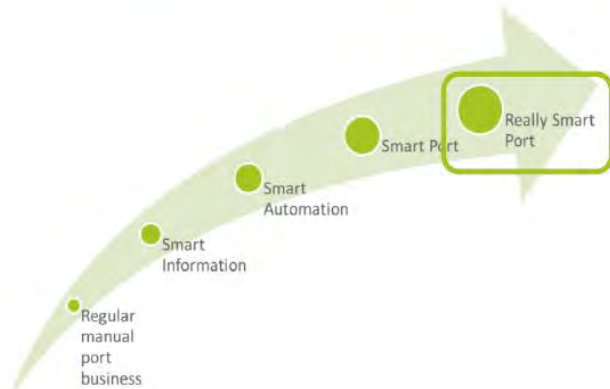


Which truck is arriving at the terminal  
Who's the driver (access allowed)?  
Which container is on it?  
What's about the container content?  
- hazardous?  
- reefer?  
Where will the container go next?  
What's the final destination?

...

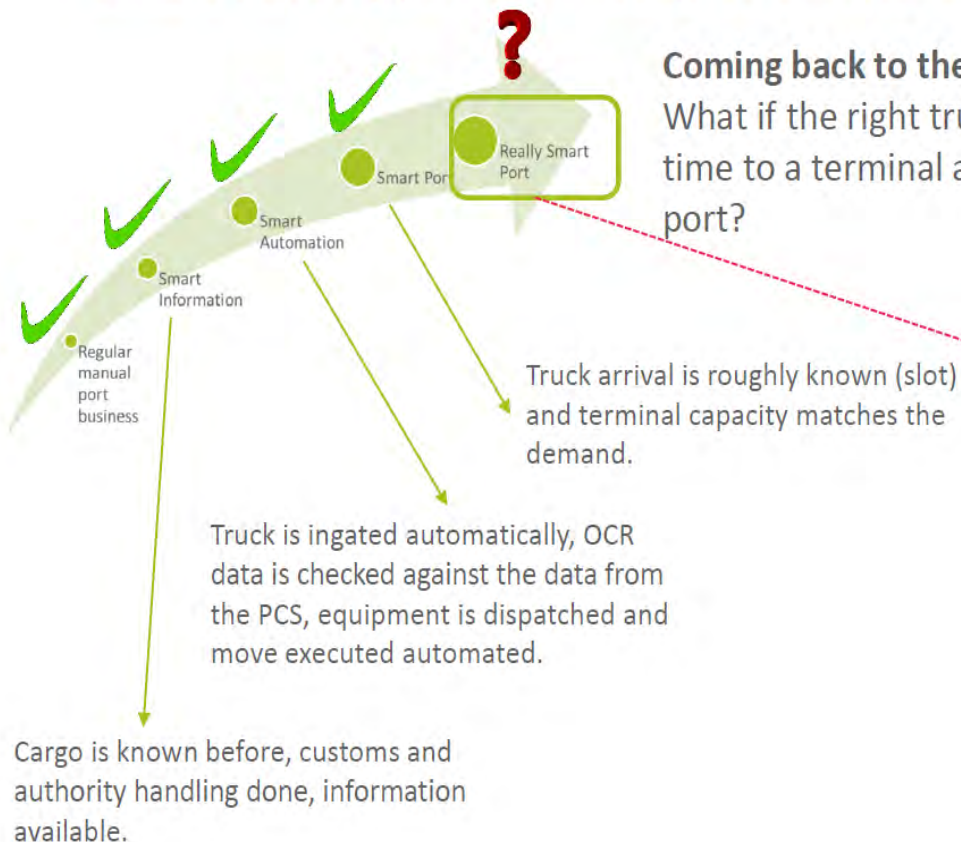


# Smart Port Approach – Step-wise: More smart?





# 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**

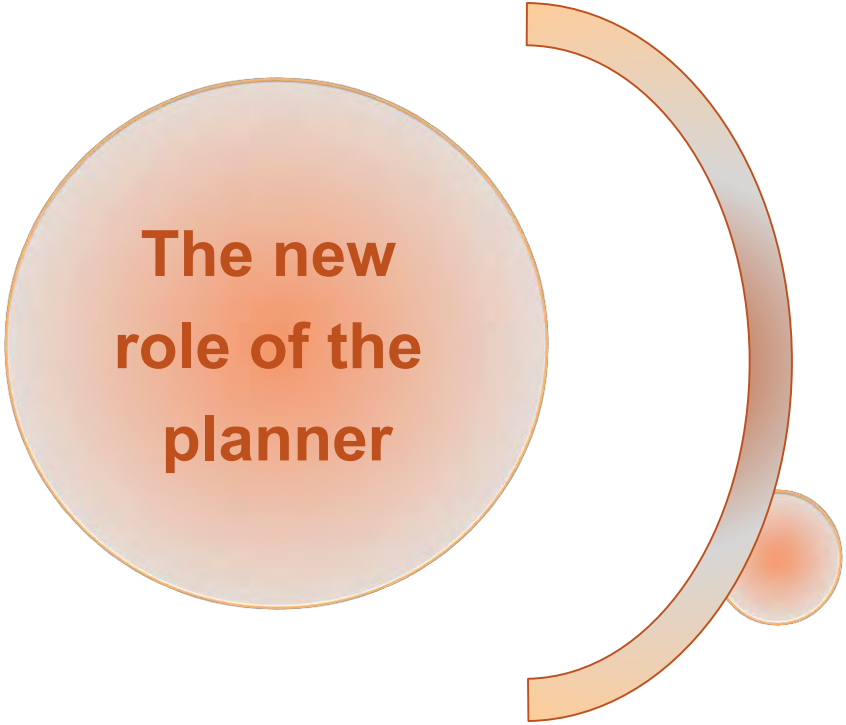


# MANILA

## AFTER >



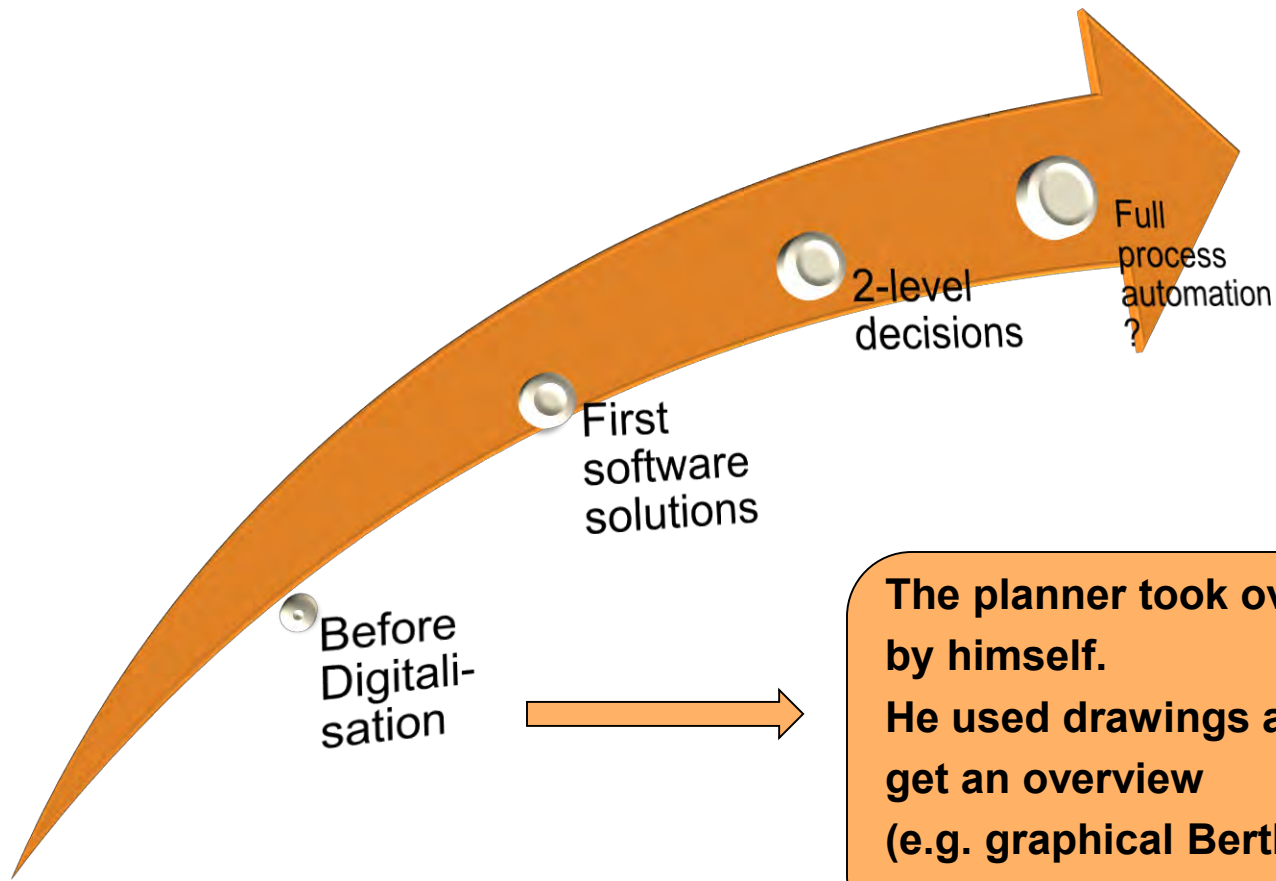
## Agenda

A decorative graphic consisting of a large, light-orange circle with a thin orange border. To its right is a thick, curved orange line that starts at the top of the circle and curves downwards and to the right, ending in a small, solid orange circle.

**The new  
role of the  
planner**

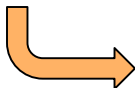
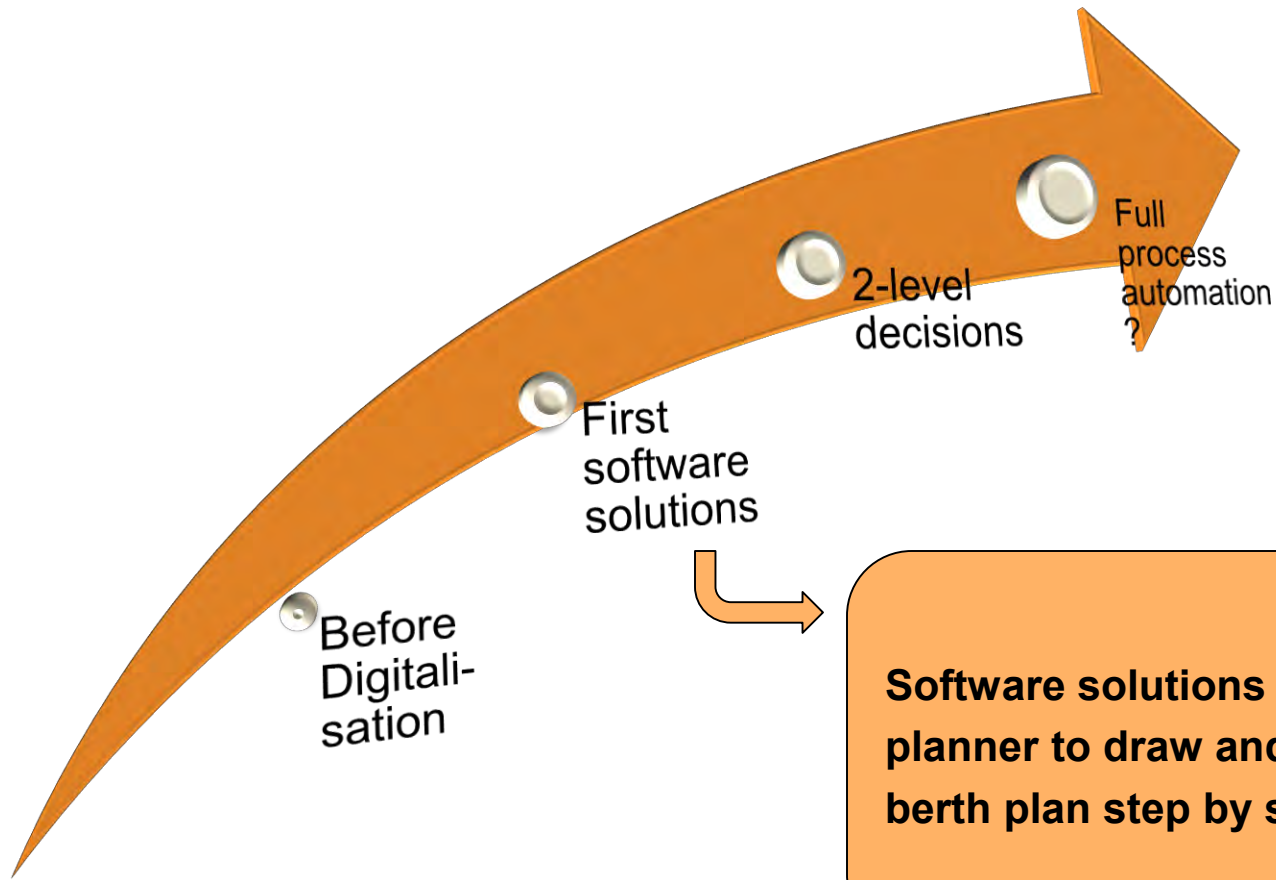
**Role of the planner**





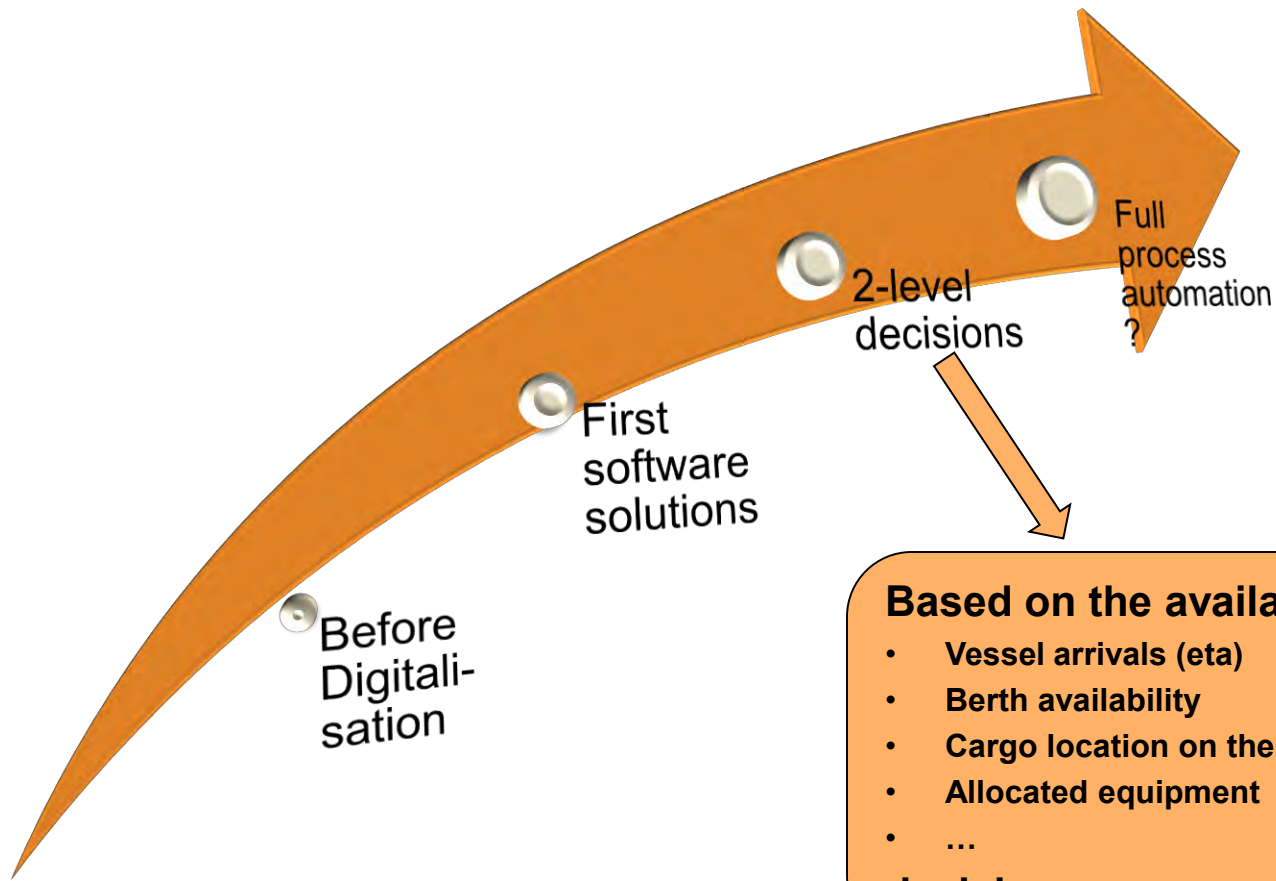
**The planner took over all decisions by himself.**

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



**Software solutions supported the planner to draw and change the berth plan step by step.**

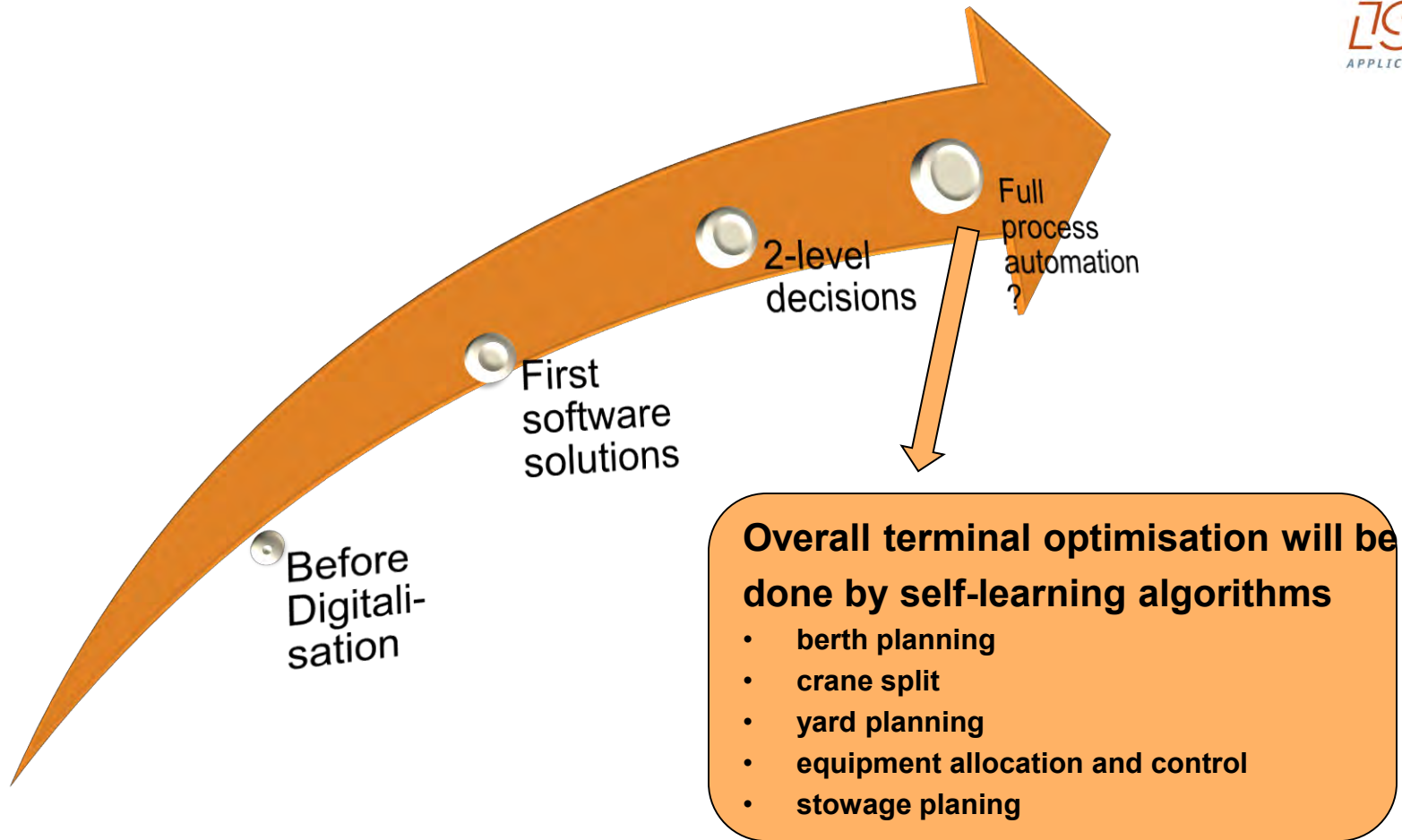




**Based on the available data**

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

**decisions are proposed automatically**



# 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

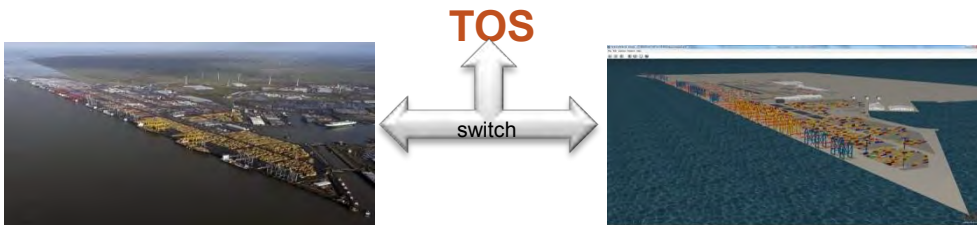


# The main mission of CHESSCON VIRTUAL TERMINAL

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

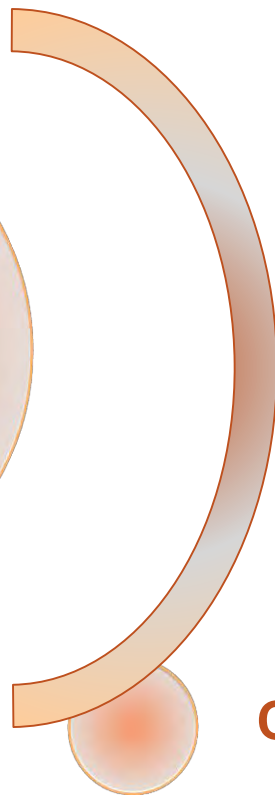
Equipment Pool QC06: 6

| 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         |            |         |                                      |        |

Point of Work Q06

| 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         | CPSU16439396   | 45G1 CANX020*0361488 |                   |             | (not evaluated) |

# Agenda



**Conclusions**

**Learn from the big ones:**

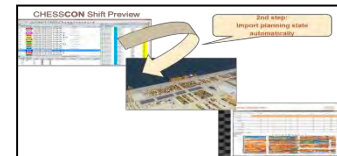
- **Instead of waiting for bottlenecks and RE-act only**
- **Become PRO-Active by looking into the future**





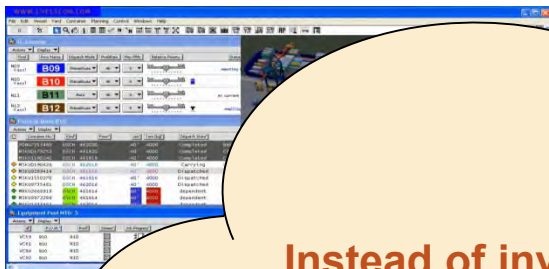
# Conclusion

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



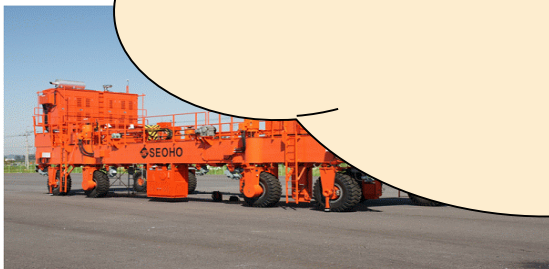


# How to improve terminal's efficiency

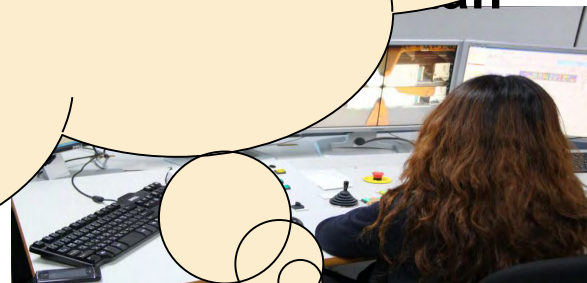


Instead of investing in more and more man and machines:

***Get more out of your existing resources***



source and ©: University of Incheon



The first ALV of KMI

MAKE YOUR RIGHT MOVES!



[WWW.CHESSCON.COM](http://WWW.CHESSCON.COM)

**CHESSCON**  
VIRTUAL TERMINAL

# I'm looking forward to the following discussion!

Holger Schuett, Prof. Dr.-Ing., CEO



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