Launching port automation forward with best practices

The end of pen and paper

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Agenda

- Saab in the maritime world
- Fairway to Freeway concept
- Pen and paper in the maritime world
- The way forward in port automation

Saab in the maritime world

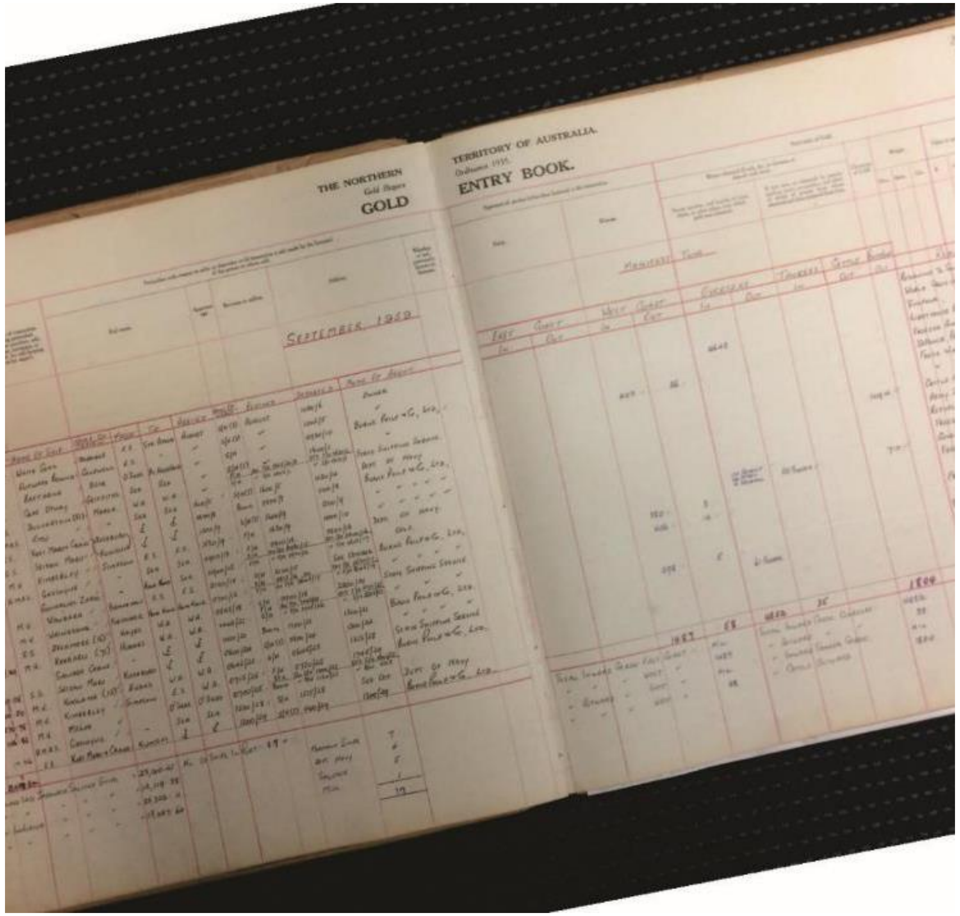
- Over 30 years of experience
- Active in 8 of the top 20 container ports
- Over 70 Vessel Traffic Services (VTS) centres implemented
- Instrumented national coastlines with AIS of:
  - China,
  - India,
  - Sweden,
  - Portugal,
  - Spain;
  - plus inland systems in Belgium, The Netherlands and Germany

  (over 800 AIS base stations in total)
- Our systems track at least a quarter of all the world's commercial shipping

Fairway to freeway

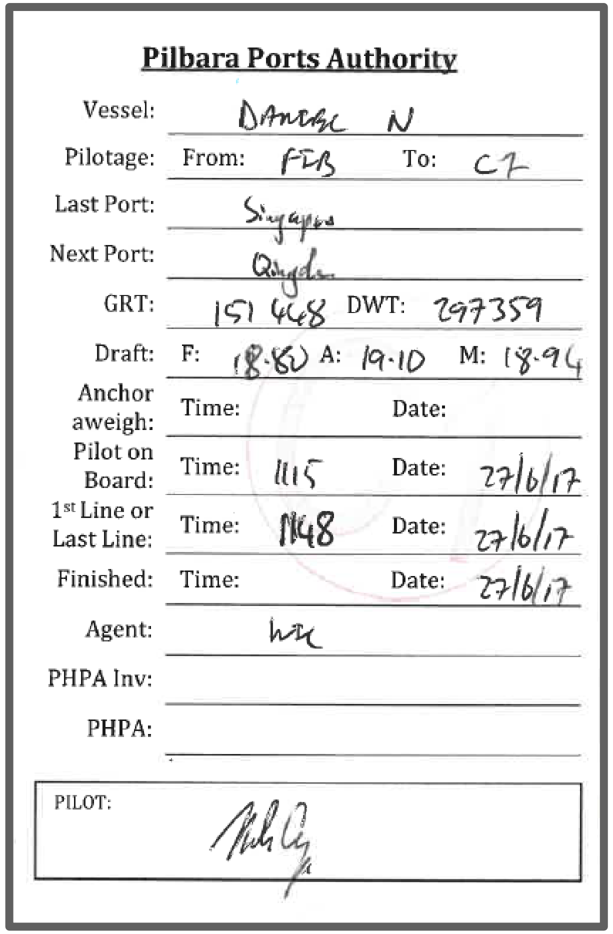
Pen and paper in the maritime world

- During a tour among customers saw many instances where pen and paper are still used
- Drawbacks:
  - Data is available in one place only
  - Double entry of information
  - Transcription errors
  - Mistakes due to poor legibility
  - Delay in availability of data
- Example from the medical world:
  - Depending on the type of data, 1.6% to 8.1% of the numbers had transcription errors
  - Out of 234 patients, 25 got the wrong insuline dose because of these errors



Cause and solutions

- Is it the software? No:
  - Many ports make full use of the software
  - Software configured to follow existing procedures after requirements analysis
- It is a matter of:
  - Culture / tradition
  - Change management
- Solutions:
  - Cut away unneeded verbal communication
  - Use of agent portals
  - Use digital data entry in the field
  - Educate management and end-users



Pilbara Ports Authority

Vessel: DANTAC N

Pilotage: From: FIB To: CZ

Last Port: Singapore

Next Port: Qingdao

GRT: 151 468 DWT: 297359

Draft: F: 18.80 A: 19.10 M: 18.94

Anchor aweigh: Time: Date:

Pilot on Board: Time: 1115 Date: 27/6/17

1st Line or Last Line: Time: 1148 Date: 27/6/17

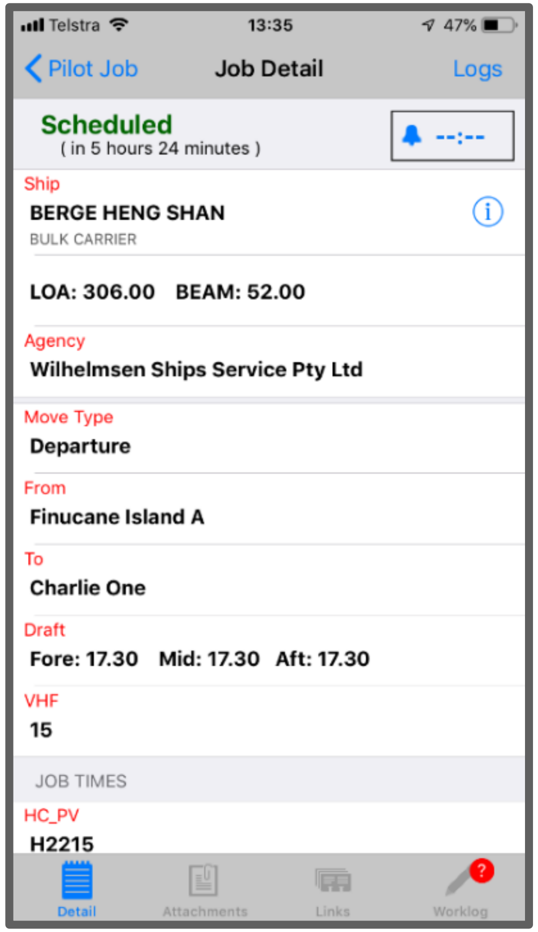
Finished: Time: Date: 27/6/17

Agent: WSS

PHPA Inv:

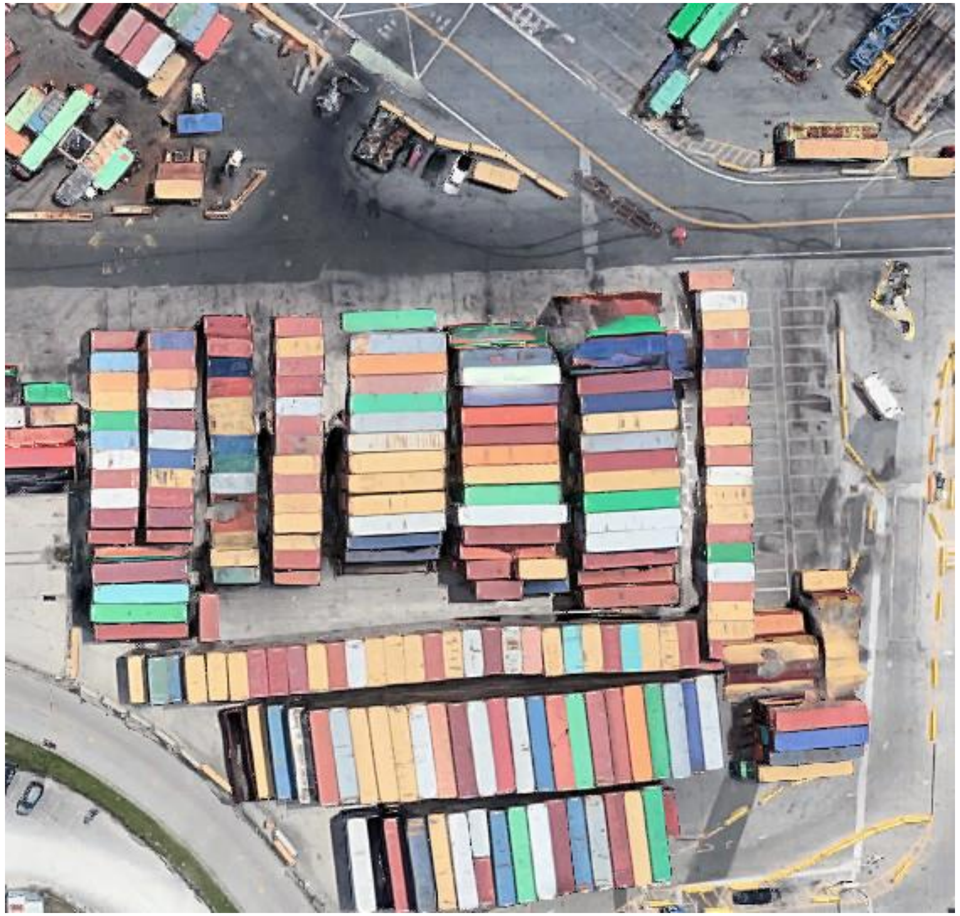
PHPA:

PILOT:



Landlord port case

- One of our US port clients is a landlord port that leases out buildings and land
- Some companies have overspill on neighboring terrains
- Agent portal frees up employees from clerical work so that they can survey and invoice overspill
- Result:
  - Better service to agents
  - More accurate data
  - More income for the port

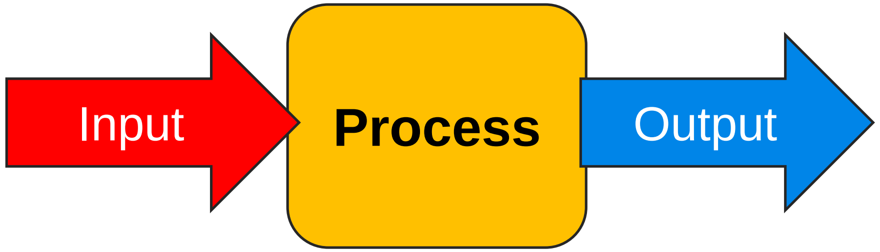


Several other areas to address

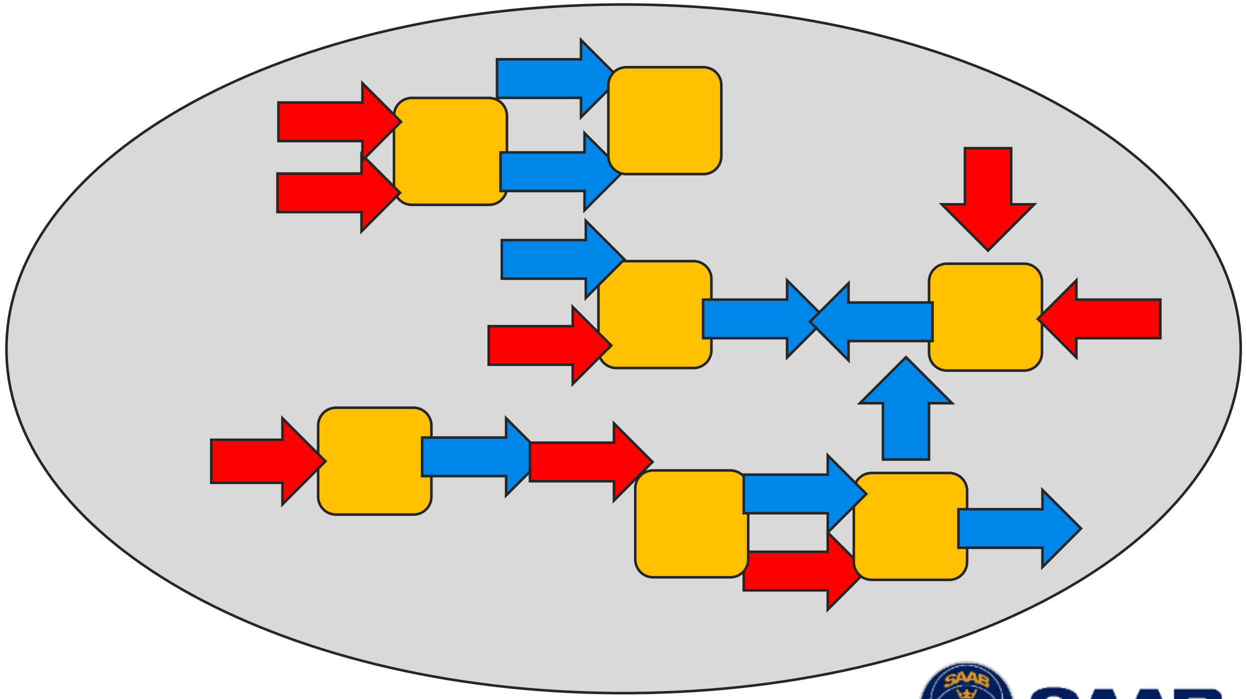
- Silos of information
- Independent processes between departments and groups
- Need to communicate and share accurate data
- Desire to operate in a more efficient and timely way

Systems concept

- Think about the port as a system of systems.
- A process has inputs & outputs
- When you have many parts it gets complex
- Issues to deal with in complex systems thinking:
  - Are the outputs what I want?
  - Are there unintended consequences?
  - Are the inputs going to the right parts of the system?
  - Which parts could be more efficient?



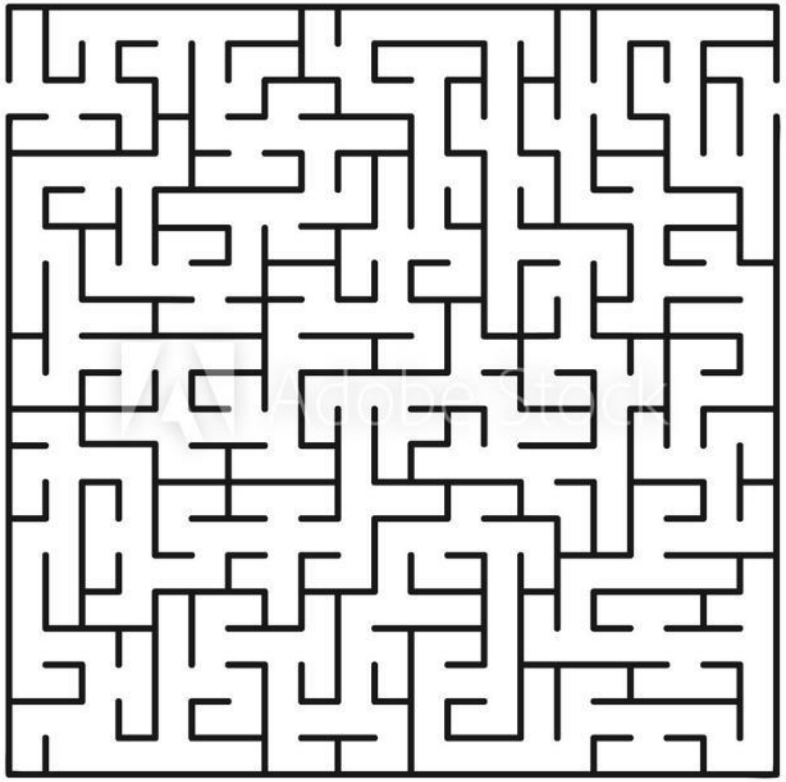
Simple system



Complex systems

How to get there?

1. Expert systems ‘best of class’
   Workflow optimization
2. Planning and real-time integration
   Data availability
3. Integrated communication
   Seamless communication
4. Common Operating Platform (COP)
   Information access
5. Collaboration Decision Making system (CDM)
   Collaborative choices
6. Operational Optimization
   Enhanced safety and efficiency



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Final thoughts

- Paperless is the way to go
- Mobile devices play an important role in going paperless
- There are significant synergistic effects in a system of systems that benefit all parties involved
- Putting the work where it needs to be, enables ports and their customers to generate better business
- Integration and connectivity carry cyber security risks that need to be addressed