IHC SYSTEMS

The Dredge Fleet Monitoring System (DFMS), an Industry 4.0 Component

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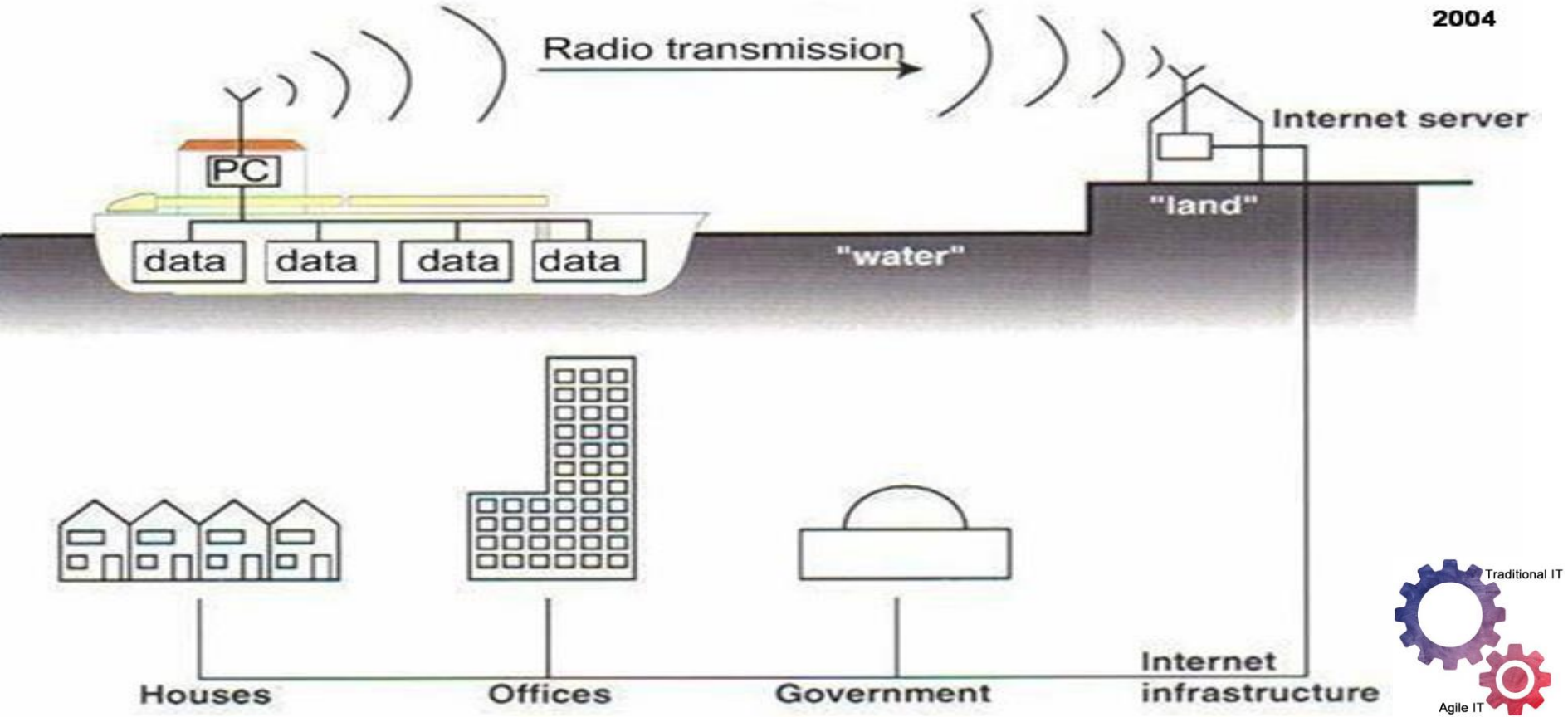
THE TECHNOLOGY INNOVATOR.

ROYALIHC.COM

IHC SYSTEMS > CONTENTS

- Historical context
- Dredge Monitoring
- Edge Analytics
- DFMS
- True insight
- Conclusions

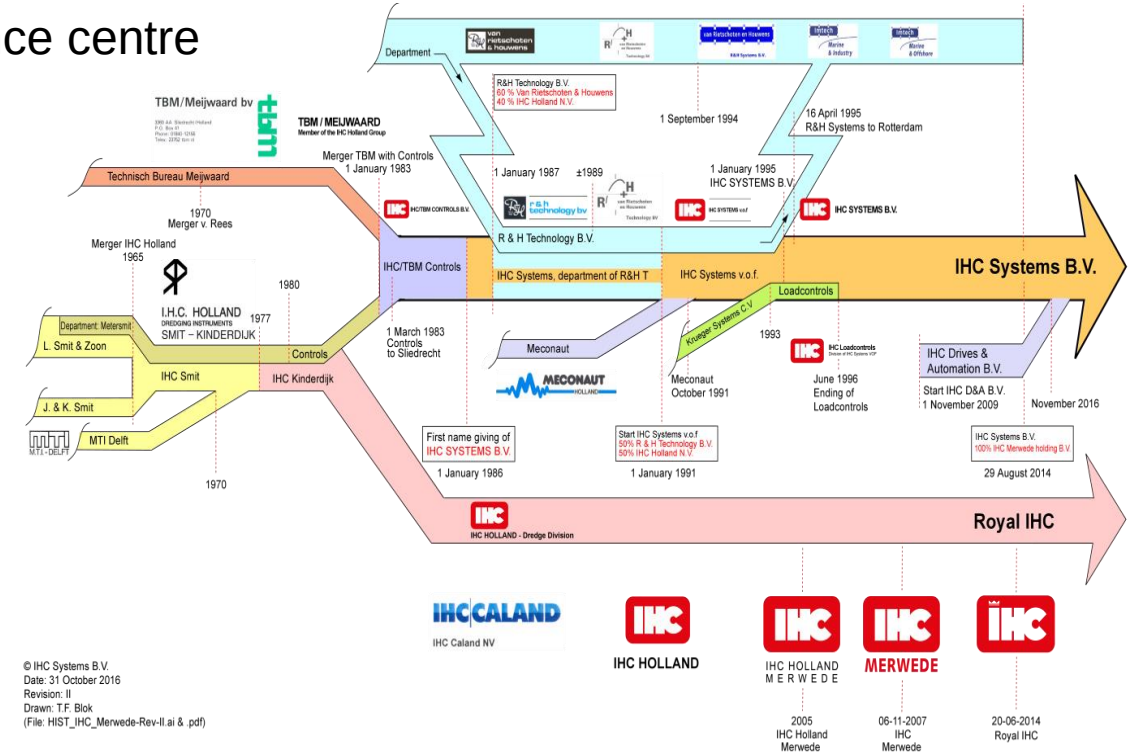
IHC SYSTEMS > 15 YEARS AGO, A VISION



IHC SYSTEMS > COMPETENCES

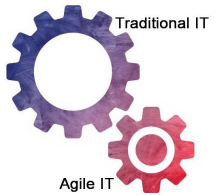
COMPANY PROFILE & MISSION

- Royal IHC E&A competence centre
- Ca. 200 people @ work

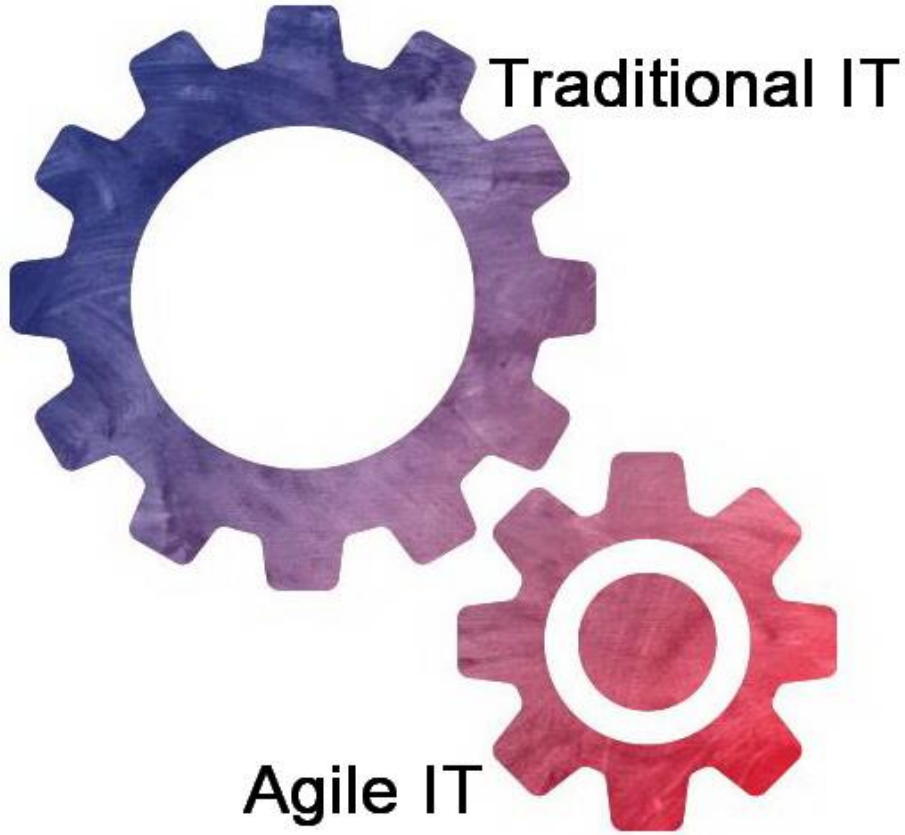


IHC SYSTEMS > BIMODAL IT IN DREDGING

- Traditional IT as applied in the control, measurement, monitoring and automation systems on the dredger
- Agile IT where applications are rapidly produced and changed, pending dredging projects etc.

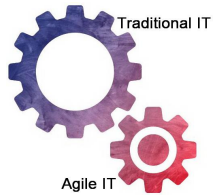


IHC SYSTEMS > THE INVENTION OF THE WHEELS



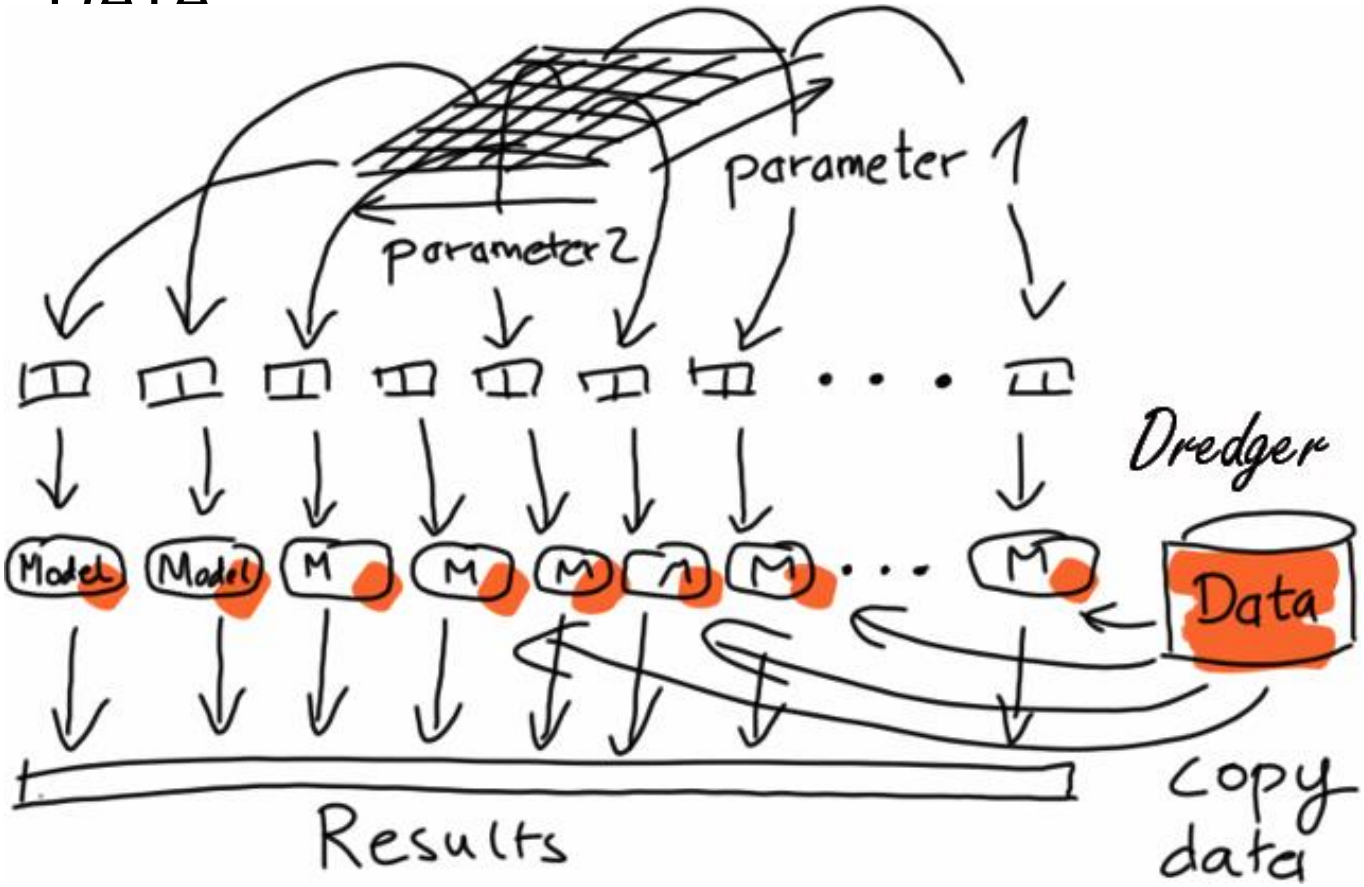
IHC SYSTEMS > DREDGER LIFECYCLE CHALLENGE

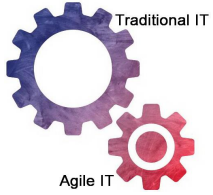
- A dredger for 30 to 50 years (steel hull)
- Traditional IT for 7 to 12 years (Printed Circuit Boards)
- Agile IT for a month to 3 years (software version or App)



IHC SYSTEMS > T.S.H.D. MAGDALEN

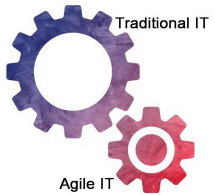
IHC SYSTEMS > EDGE ANALYTICS & BIG DATA



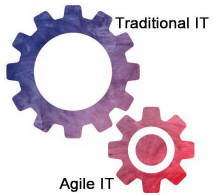


IHC SYSTEMS > DATA SHARING LIMITS ?

- Bedrooms
- Earning models, definitely in dredging

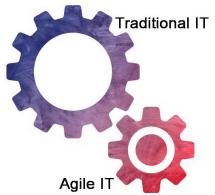


IHC SYSTEMS > TO BE OR NOT TO BE



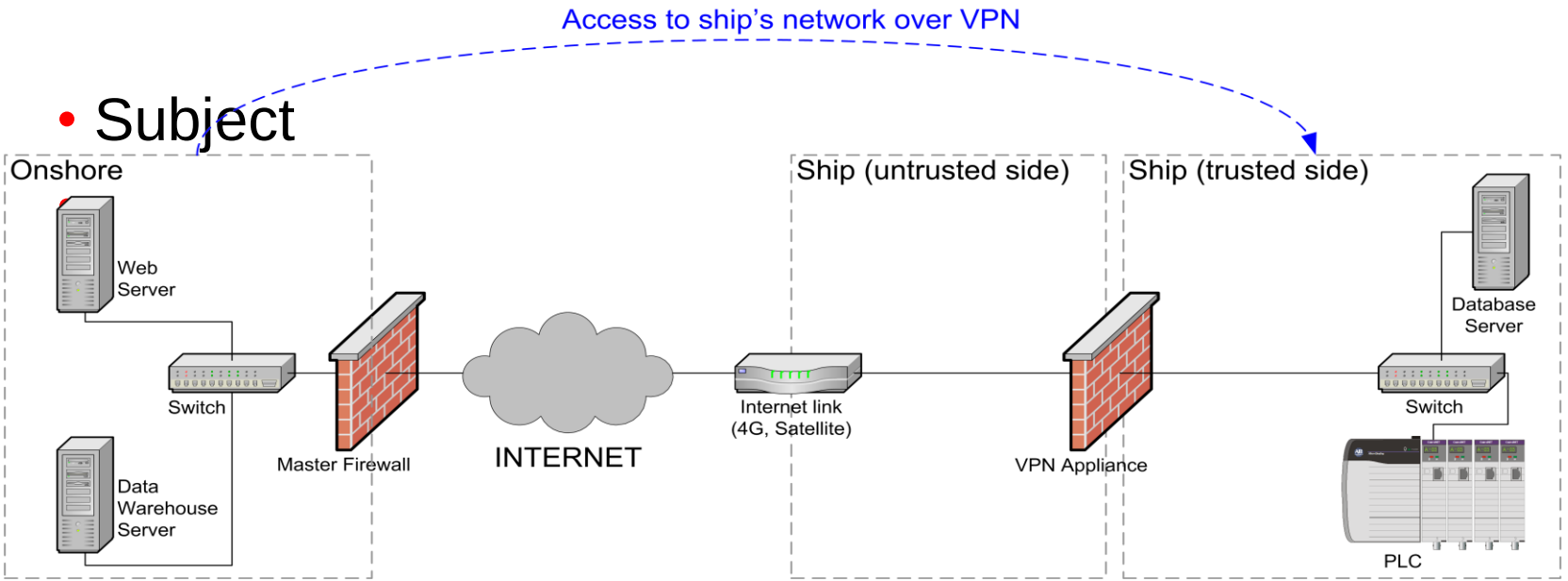
IHC SYSTEMS > INFORMATION FOCUS

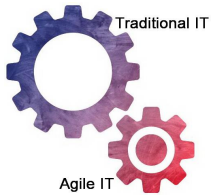
- Safety
- Maintenance
- Operations



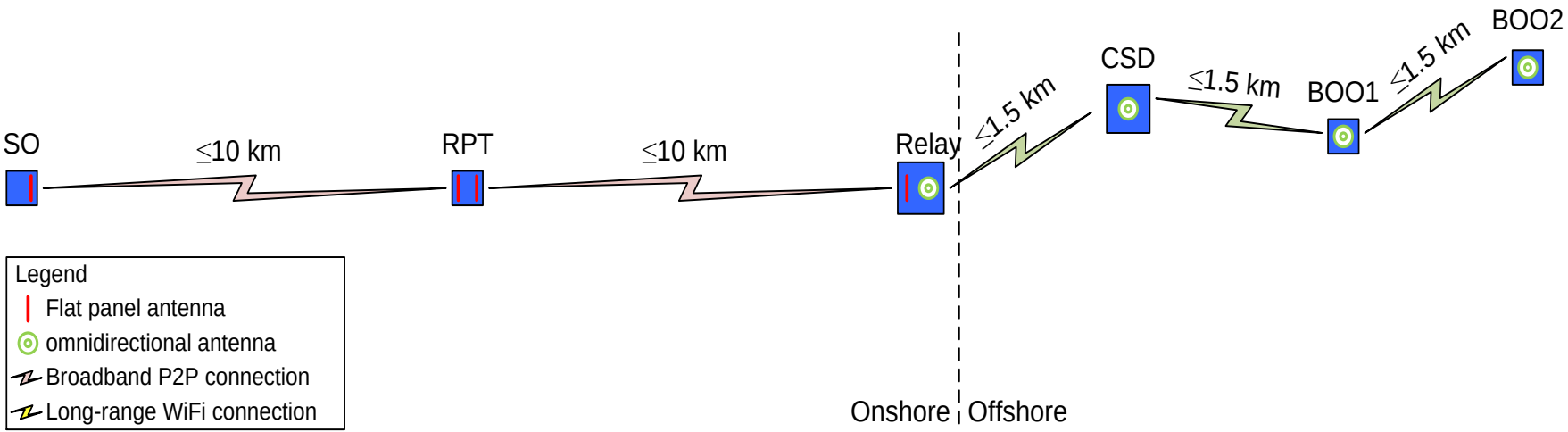
IHC SYSTEMS > SECURE BY IHC CONNECT

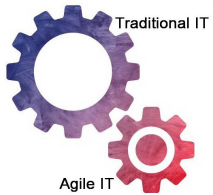
- Subject





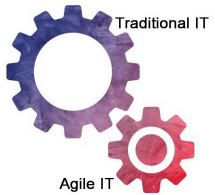
IHC SYSTEMS > BROADBAND WIRELESS ACCES (BWA)





IHC SYSTEMS > BIG DATA ARRIVAL

- Dissapearing connection restrains
- Ship data = Shore data
- Usefull… or just nice to have?

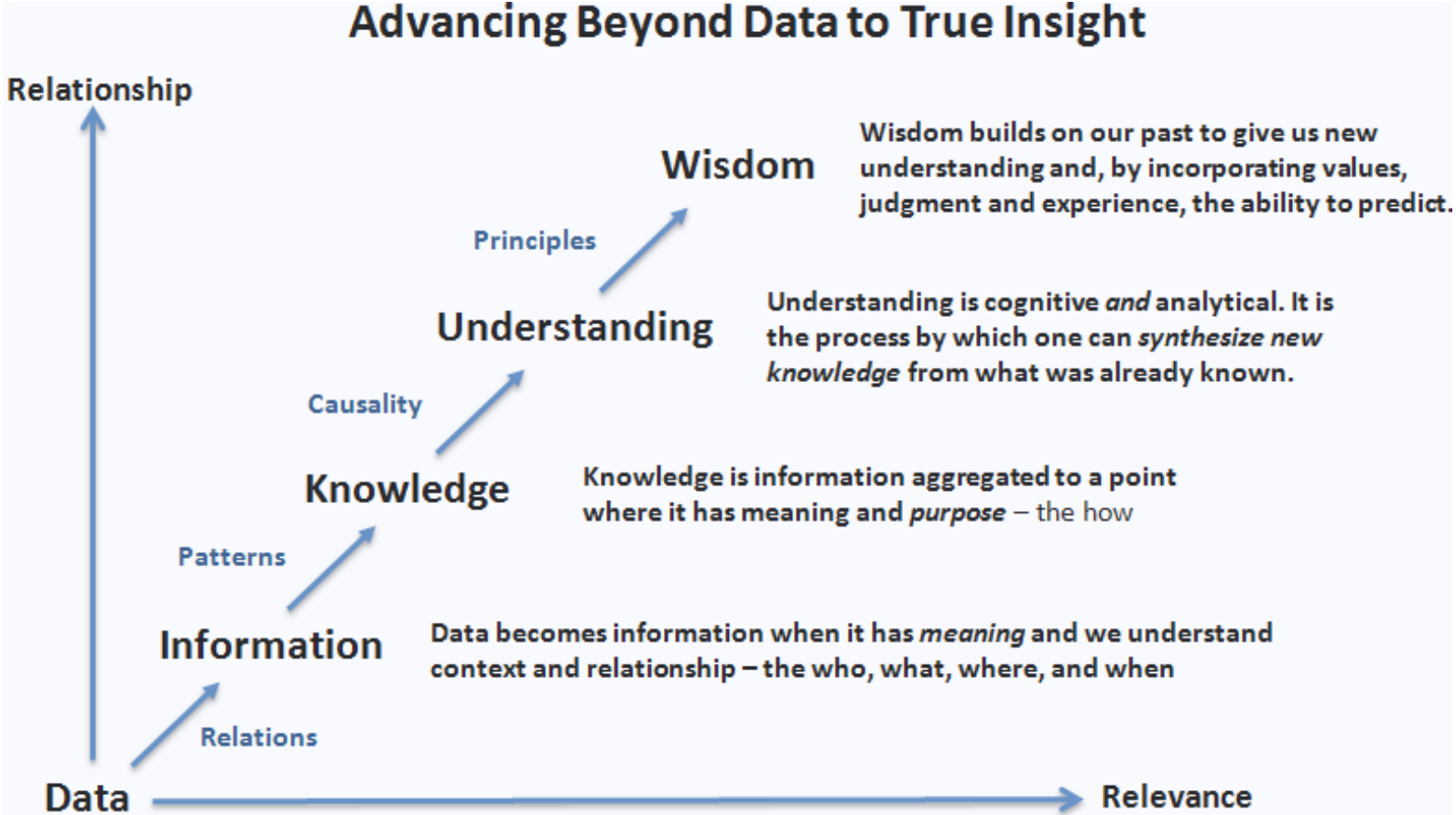


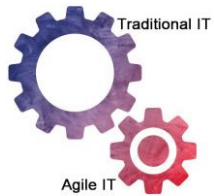
IHC SYSTEMS > THE PITFALL

“The greatest enemy of knowledge is not ignorance,
it is the illusion of knowledge.”

Daniel Borstin, in *The Discoverers* (1983)

IHC SYSTEMS > TRUE INSIGHT

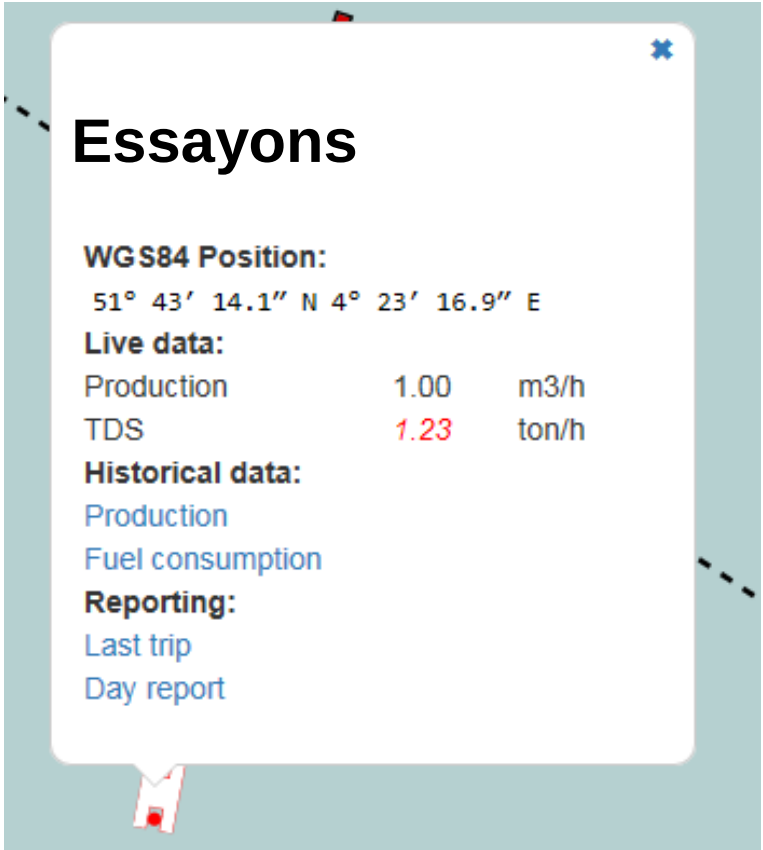


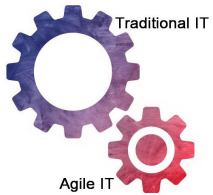


IHC SYSTEMS > TRIP AND OR DAY REPORT

- Live data
- Production

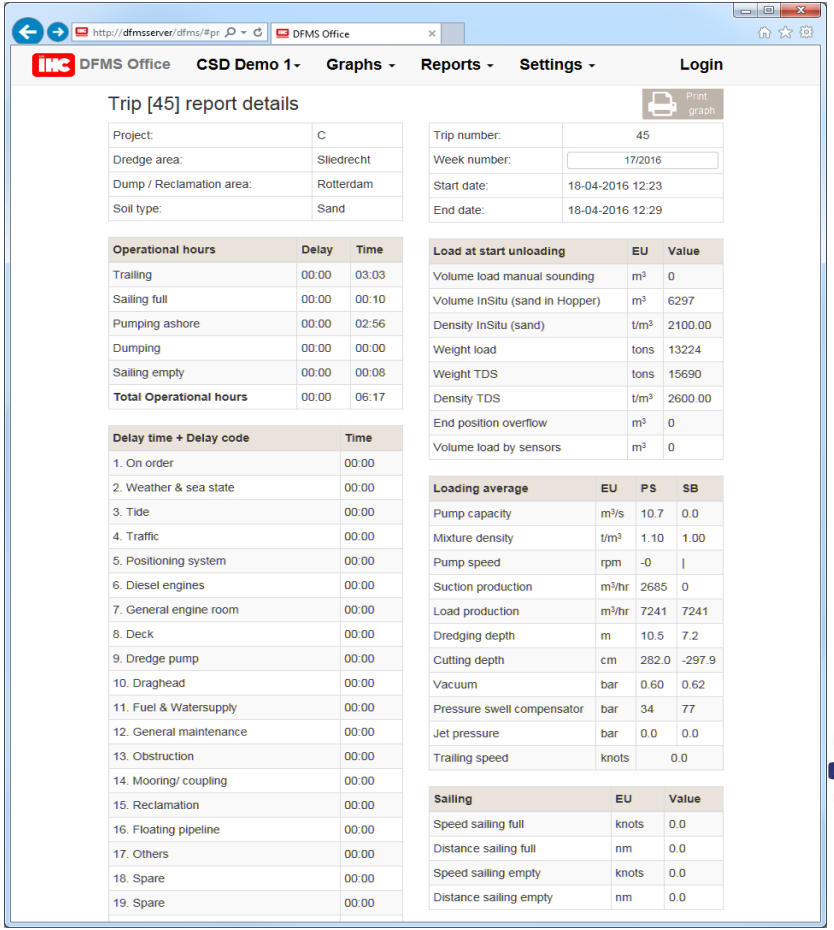
- Historical data
- Production
- Fuel consumption





IHC SYSTEMS > DFMS DATA TABLE EXAMPLE

- Custom data set
- User change
- Windows
- Graphics
- Exportable to file
- Trip comparison



Project:	C
Dredge area:	Sliedrecht
Dump / Reclamation area:	Rotterdam
Soil type:	Sand

Trip number:	45
Week number:	17/2016
Start date:	18-04-2016 12:23
End date:	18-04-2016 12:29

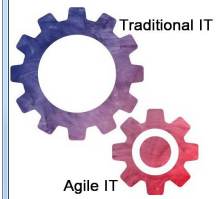
Operational hours	Delay	Time
Trailing	00:00	03:03
Sailing full	00:00	00:10
Pumping ashore	00:00	02:56
Dumping	00:00	00:00
Sailing empty	00:00	00:08
Total Operational hours	00:00	06:17

Load at start unloading	EU	Value
Volume load manual sounding	m³	0
Volume InSitu (sand in Hopper)	m³	6297
Density InSitu (sand)	t/m³	2100.00
Weight load	tons	13224
Weight TDS	tons	15690
Density TDS	t/m³	2600.00
End position overflow	m³	0
Volume load by sensors	m³	0

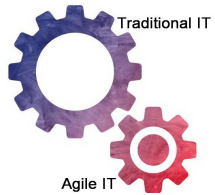
Delay time + Delay code	Time
1. On order	00:00
2. Weather & sea state	00:00
3. Tide	00:00
4. Traffic	00:00
5. Positioning system	00:00
6. Diesel engines	00:00
7. General engine room	00:00
8. Deck	00:00
9. Dredge pump	00:00
10. Draghead	00:00
11. Fuel & Watersupply	00:00
12. General maintenance	00:00
13. Obstruction	00:00
14. Mooring/ coupling	00:00
15. Reclamation	00:00
16. Floating pipeline	00:00
17. Others	00:00
18. Spare	00:00
19. Spare	00:00

Loading average	EU	PS	SB
Pump capacity	m³/s	10.7	0.0
Mixture density	t/m³	1.10	1.00
Pump speed	rpm	-0	|
Suction production	m³/hr	2685	0
Load production	m³/hr	7241	7241
Dredging depth	m	10.5	7.2
Cutting depth	cm	282.0	-297.9
Vacuum	bar	0.60	0.62
Pressure swell compensator	bar	34	77
Jet pressure	bar	0.0	0.0
Trailing speed	knots	0.0	

Sailing	EU	Value
Speed sailing full	knots	0.0
Distance sailing full	nm	0.0
Speed sailing empty	knots	0.0
Distance sailing empty	nm	0.0

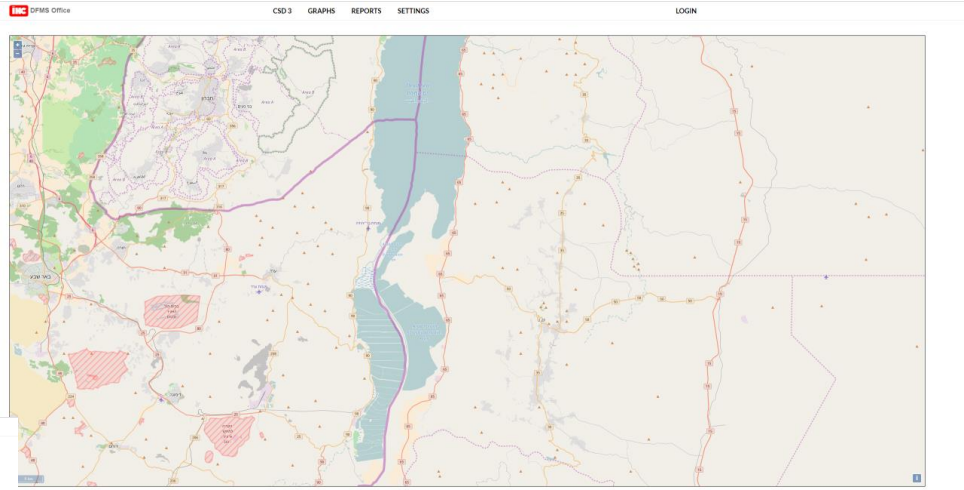


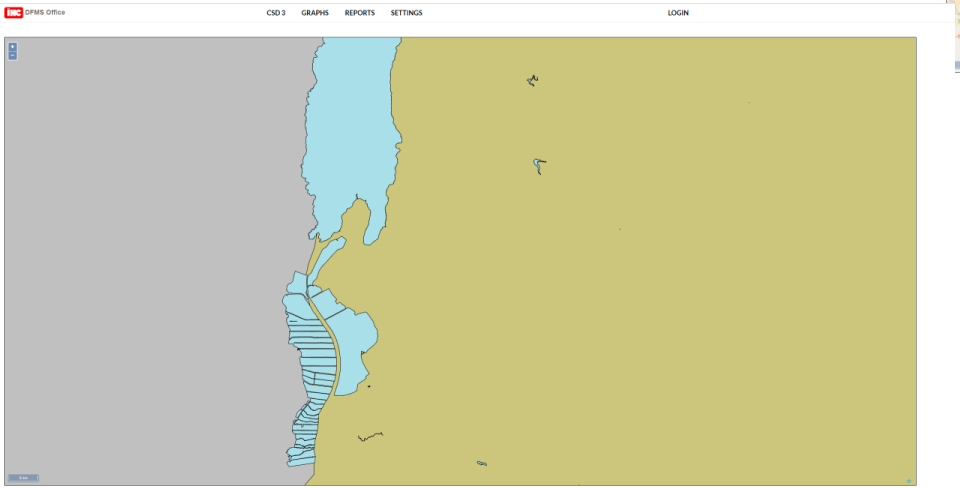
IHC SYSTEMS > DFMS GRAPH EXAMPLE

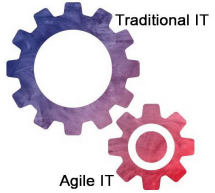


IHC SYSTEMS > OPEN STREET MAP

- Open street map
- Fall back map



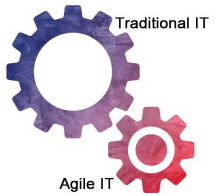




DFMS Office
TSHD 1
GRAPHS
REPORTS
SETTINGS
LOGIN
TSHD 1
Traditional IT
Agile IT

IHC SYSTEMS > CONCLUSION

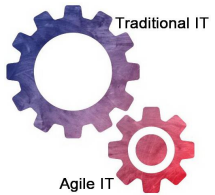
- The dredger is in 2017 part of the internet of things
- Development in Industry 4.0
- An autonomous machine, monitored over the internet

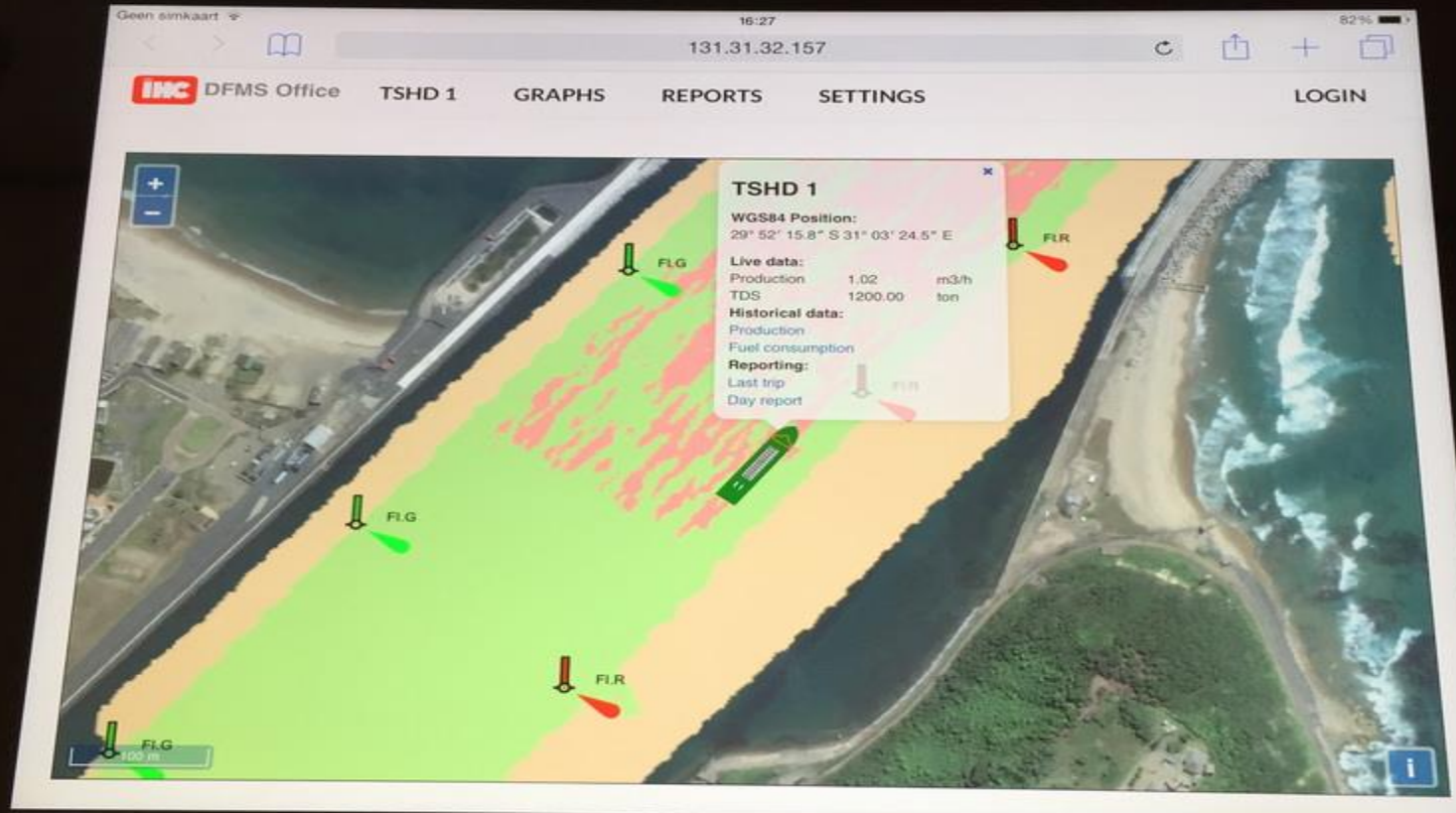


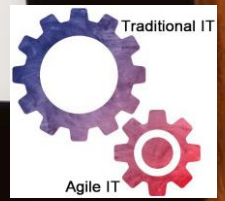
IHC SYSTEMS > LOOKING FORWARD

- Development in Industry 4.0

- A dredger monitored over the internet
- An autonomous dredger monitored over the internet
- An autonomous machine controlled over the internet

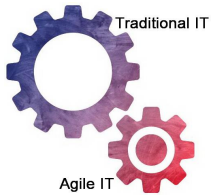



Geen simkaart
16:27
82%
131.31.32.157
DFMS Office
TSHD 1
GRAPHS
REPORTS
SETTINGS
LOGIN
TSHD 1
WGS84 Position:
29° 52' 15.8" S 31° 03' 24.5" E
Live data:
Production 1.02 m3/h
TDS 1200.00 ton
Historical data:
Production
Fuel consumption
Reporting:
Last trip
Day report
Fl.G
Fl.R
Fl.G
Fl.R
Fl.G
100 m


Traditional IT
Agile IT

IHC SYSTEMS > APP

- Each dredger will get his App
- Acces for all stakeholders?



Q & A?