



Rijkswaterstaat
Ministerie van Infrastructuur en Waterstaat



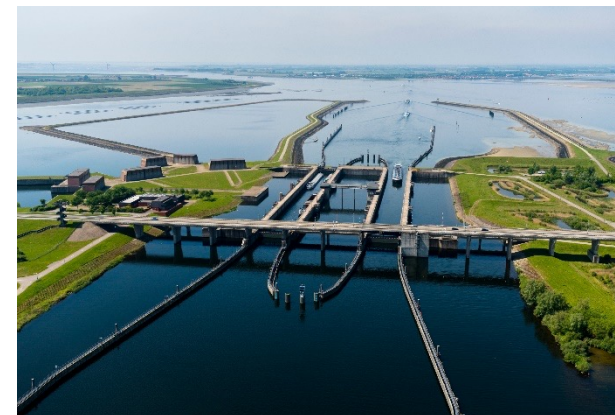
Digitale ontwikkelingen in het Europese scheepvaartdomein

Martijn Hage
1 november 2023



Wie ben ik?

- Watersporter
- Begonnen op sluis als inhuur daarna RWS
- Verkeerspost Wemeldinge
- (simulator) Instructeur/examinator bij NNVO
- Teamleider/districtshoofd/afdelingshoofd
- Bestuurslid NNVO namens RWS
- Adviseur scheepvaart en Activity-manager DIWA



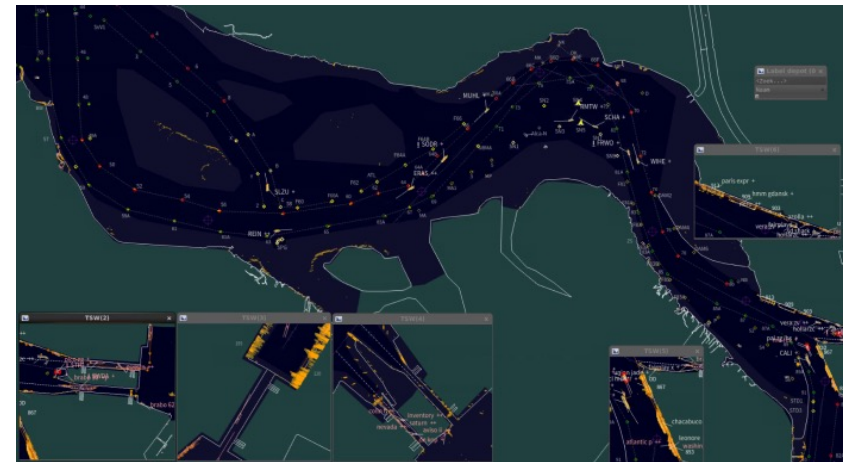
NATIONALE NAUTISCHE VERKEERSDIENST OPLEIDING





Wat heb ik zien veranderen?

- Van IVS 90 naar IVS Next naar sluisplanner
- Van fysieke agenda naar digitaal journaal naar Operationeel portaal Scheepvaart voor gebeurtenissen registratie
- Van rollerbal en meeschrijven naar gelabelde schepen en CPA
- Vaarmelder/BOA app en Euris
- Van meelopen met ervaren sluismeester naar digitale leeromgeving/brug/sluis simulator
- Van klassikaal lesgeven naar online etc



MASTERPLAN DIGITALISATION INLAND WATERWAYS NAVIGATING THE FUTURE



Traffic management center

Clean energy hub

Terminal

Lock

Secure communication

Digital twin

Connected information services

Smart shipping

Synchro modality

Data

Modalities

Infrastructure



masterplandiwa.eu



Co-funded by
the European Union

Activity 2 Business Developments

2.1 Smart
shipping

2.2 Synchro
modality

2.3 Port & terminal
information service

2.4 RIS enabled
corridor
management

2.5 ITS, ERTMS, e-
navigation

Published
on
masterplan
diwa.eu

Activity 3 Technological Developments

3.1 New
technologies

3.2 IWT connectivity
platform

3.3 Smart
sensing & PNT

3.4 Information model
& data registry

3.5 Tech in other
transport domains

Published
in June
2023 for
feedback

Recommendations,
actions,
alternatives,
Challenges,
opportunities

Activity 4 Facilitation topics

4.1
Standardization

4.2 Legal &
regulatory

4.3 Cybersecurity
& privacy

4.4 Data quality

Activity 5 Masterplan

 High level
vision

5.1 Vision on digital
transition in IWT

5.2 Roadmap on
digitalization

5.3 Definition of
consequences



DIWA Vision on Digitalisation



Safety of people/WT
Economical transport/navigation
Mitigate and adapt to climate change
Reliability of supply/resilient supply chains
Adapt to staff shortage/human resource challenges



Connected
Information
Services



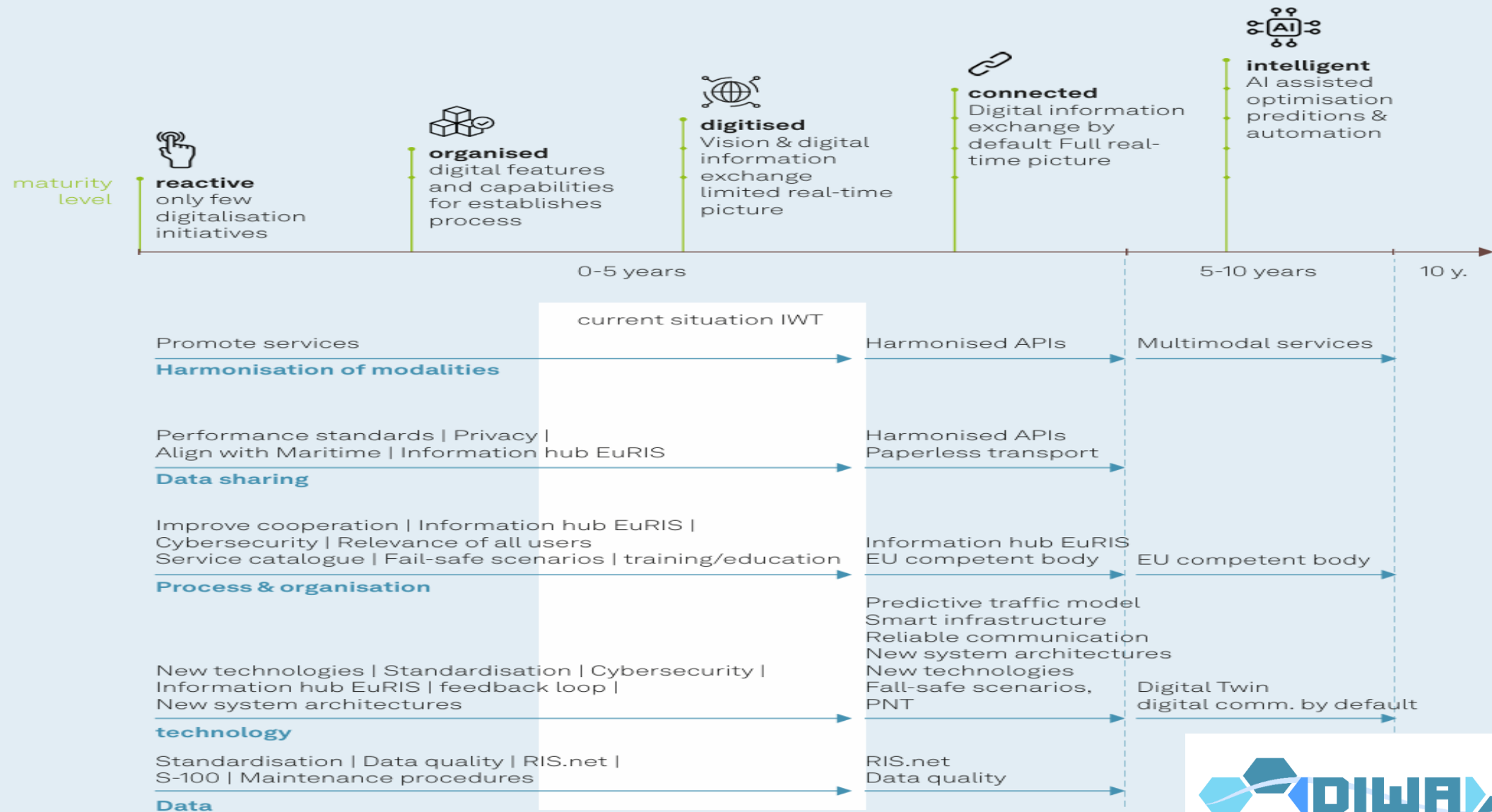
Synchro-
modality



Smart
Shipping

standardisation, cyber security, IWT promotion and visibility, legal, governance,
data quality, technological developments (AI sensors, ...)

Voorbeeld van Roadmap:





Voorbeelden van maatregelen

	Measure	Description	Stakeholders	Effort	Consequences	Contribution to	Ambition/ Time (years)	Pillar
cybersecurity	M52 Adopt PKI to encrypt data exchange	Public-key infrastructure will result in the possibility to sign and / or encrypt almost all information flows - thus providing protection against tampering.	FA, SWS	M- L	Technical: Implement an authentication and encryption mechanisms in the software Operational: benefit: secure data exchange and communication consequence: incorporate periodic renewal of certificates into process Financial: €€ Organisational: Project	Safety, Economical transport, Reliability of supply	interim 5-10	CIS, Smart Shipping
cybersecurity	M53 Implement (basic) cyber security and data protection measures	Any IT/smart sensor systems/networks need cybersecurity measures to mitigate new risks. It is very important to comply with GDPR rules when generating new data. The GDPR requires organisations to implement appropriate technical and organisational measures to protect personal data against unauthorised access, alteration, and destruction. This includes implementing robust cybersecurity measures.	FA, oA, SWS, Ports, VTM, VOw, VOp, Sk	S- M	Technical: Implementation of state-of-the-art cyber security measures. Perform regular software updates and hardening of devices & software. Segregation/segmentation of the network. Decommissioning of (legacy) equipment Operational: benefit: sensors or sensor networks are secure against cyberattacks consequence: make cyber security experts available to implement the measures Financial: €€ Organisational: Project-Programme	Safety, Reliability of supply	basic 0-5, 5-10	CIS, Smart Shipping
cybersecurity	M65 Define cybersecurity minimum requirements for autonomous/ remotely operated vessels & centres	Cyber vulnerability of autonomous/remotely operated vessels constitutes safety risks for fairway authorities	FA, oA, Vow, EP	M	Technical: specify cybersecurity minimum requirements for operation of autonomous/remotely operated vessels & centres Operational: benefit: lower cyber risk when operating AV/ROV on the fairways consequence: Make regulatory, cyber and subject matter experts available Financial: € Organisational: SuAc	Safety, Reliability of supply	basic 0-5	Smart Shipping
cybersecurity	M66 Reduce AIS cyber vulnerability	The integrity, confidentiality and availability of data exchange should be guaranteed. Secure all communication data links between vessels and between vessels and shore stations/infrastructure and guarantee the validity of the originator and recipient. Should be a part of the certification of vessels and ROC's procedure.	FA, SWS, ES	M- L	Technical: assessment of AIS cyber vulnerabilities. consider new communication systems or implement authentication and encryption mechanism Operational: (more) secure AIS communication, Will require long term actions on different organisational levels to mitigate the AIS cyber vulnerability. requires also alignment with Maritime Financial: €€ Organisational: Ac-Project	Safety, Economical transport, Reliability of supply	basic 0-5, 5-10, 10+	CIS, Smart Shipping



Digitalisering en AI aan boord

- Intention sharing/trackpilot
- Minder verbale communicatie (gebruik Euris/apps)
- 10 jaar en verder: Autonome scheepvaart (nog mensen aan remote of geheel autonoom?!) 
- Erkenning door operator en autoriteiten dienen eisen/standaarden etc te bepalen

TRESCO
THE INLAND NAVIGATION SOLUTION

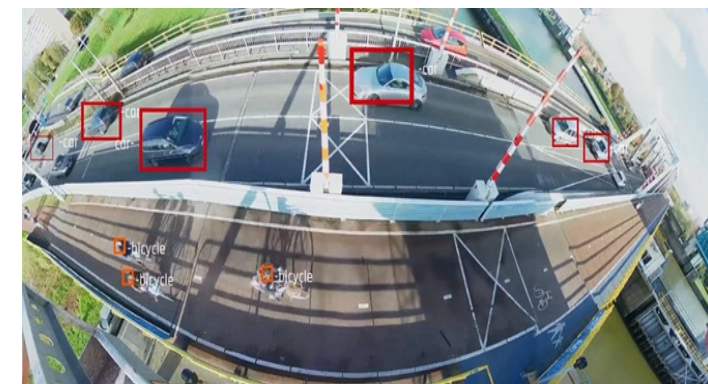
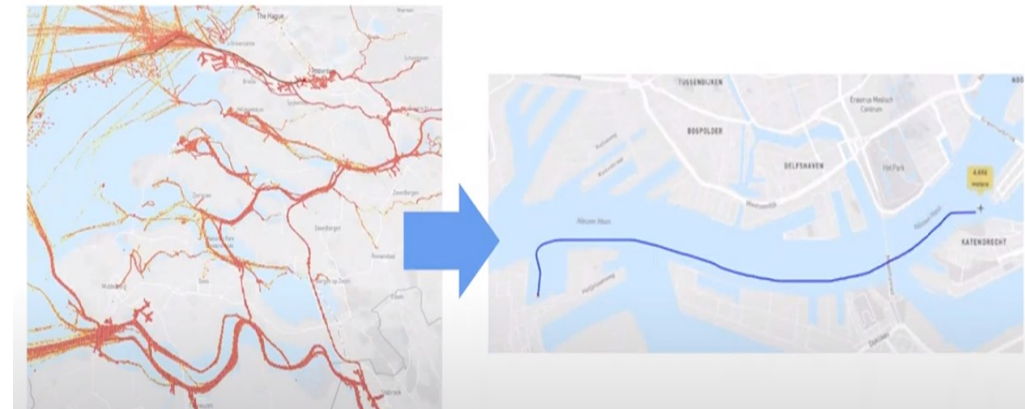
NAVIGATIE FLEET MANAGEMENT





Ontwikkelingen die (VTS) operator werk (kunnen) gaan raken

- Artificial intelligence (AI)
- Data delen: Euris platform,
- Elektronisch melden
- "Choke Points" prognose obv data-analyse
- Slimme camera's/sensoren en drones
- Simulators tbv opleiden trainen oefenen/games
- Cyber security awareness





Vragen?

<https://www.masterplandiwa.eu>

[Waterways, Locks & Bridges - SMASH!](https://www.masterplandiwa.eu)
(smashroadmap.com)



SMASH!



Of stuur mij een mail: martijn.hage@rws.nl

