

# Multi-annual plan '24 - '27

AND ANNUAL PLAN 2024

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# Our core activities

In the previous cooperation period (2020-2023) we have jointly developed DigiShape into an impact-full cooperation platform that strives towards the joint development of innovative datascience solutions for challenges in the Dutch water sector. In line with our partner base, our focus was on challenges in water management, water & logistics (i.e., inland shipping and harbour related) and spatial planning of the North Sea.

For the next cooperation period (2024-2027) we will further strengthen our focus on the development of practical solutions. Over the past few years sharing ideas and ambition lead to the development of concrete projects. For the next DigiShape cooperation period, the development of projects will be our starting point. Still working on the key thematic areas (water management, water&logistics, North Sea spatial planning), activities withing DigiShape will focus on the joint development of (precompetitive!) propositions, which allows us to acquire the funding that is necessary to achieve our ambitions.

Key in the cooperation is the sharing of models and data. It became evident that there is great value in the availability of data and models that can be used in the community to speed up the development of data science solutions. We will therefore develop open, virtual experimentation environments consisting of data spaces and model catalogues. This allows us to bring the projects to the data, instead of the other way around, which usually consumes more than half of the available time (and thus budget).

Another important aspects in the DigiShape cooperation is the active sharing of knowledge amongst the partners, but also by interacting with the ever growing DigiShape community. We will continue building the capacity withing the water sector for this important field of work. For example, by organising (and sharing) courses and training events, as well as by distributing white papers on the key issues in our thematic areas.

Although it is not an objective on itself to expand the DigiShape network, we feel that it is necessary to identify and involve strategic partners in our activities. The active involvement of key stakeholders or experts in various fields of work will accelerate the development of our solutions as well as improve its quality. We will therefore continue connecting relevant networks, either through our partnerbase or through our already extensive community.

## Precompetitive proposition (s)

Many problems are so complex that most stakeholders only see (and solve) a small piece of the puzzle. DigiShape strives for a collaborative and integrated approach, leading to more reliable, objective and well-founded solutions. If required, we will acquire the necessary funding for these propositions.

## Sharing of models and data

We develop open virtual experimentation environments for our key thematic areas (Water & Logistics, North Sea, Water Management), consisting of continuously growing open data (lakes) and model catalogues.

## Capacity building

DigiShape partners share their knowledge with other partners as well as with the sector through shared training and collaborative white papers.

## Strategic network expansion

We actively involve the key stakeholders or strategic partners in order to accelerate the development and implementation of our solutions, as well as to accelerate the value of our virtual experimentation environments.



# Our way of working

## Partner network

DigiShape is in its essence a partner network. This effectively means that the partners define the focus and the activities. Partners aim to harness the great potential of digitization for the water sector in the Netherlands through broad, sector-transcending and pre-competitive collaboration. In order to stimulate this collaboration, regular meetings are held and the results of the collaborations are disseminated both online and offline through DigiShape. Parties have created a website for this purpose. Partners pledge their willingness to carry out separate projects (in different compositions) under the DigiShape partnership, with our without external funding. The results of these Projects will be made public.

In principle, anyone can become a Partner of DigiShape. And by signing up as a partner, organisations intend to proactively contribute to it. DigiShape's working method focuses on (pre-competitive) collaboration between governments, business (corporate, SMEs, startups) and knowledge and educational institutions.

## Precompetitive collaboration

We focus on broad, cross-sector collaboration at different levels (management, data science/labs). Projects are developed and implemented as part of a coherent program. In addition, much attention is paid to linking ongoing initiatives and promoting the exchange of knowledge. Results are shared publicly to the extent they are developed within DigiShape. We have an explicit focus on implementation in the organizations and to this end we will also pay more attention to training (potential) employees. Because of the cross-border nature of water issues, the international perspective will be included from the outset.

## Community

As it is the purpose of DigiShape to strengthen the development and implementation of data science innovations in the Dutch Watersector, the partners cooperate with the wider community. This effectively means that the community is actively invited to participate in DigiShape events, bring their ideas and suggestions at the table and even participate in projects if partners consider their knowledge of added value to the projects.

## DigiShape events

In order to create active networking opportunity as well as the exchange of knowledge (capacity building), DigiShape organizes at least 4 physical meetings each year. During these meetings, the state of the art developments are shared by the partners, as well as by the network with the aim of feeding discussions that lead to the joint development of new propositions or the further strengthening & progressing of existing propositions. Besides these DigiShape Day events, multiple webinars will be organised, either for partners only or for the wider community.

## Virtual organisation

DigiShape does not have an own office or central location. We strive at using offices and meeting rooms of the partners for live meetings and further meet online in smaller or larger groups.

## Seedmoney projects

Depending on the yearly budget, we strive at organizing at least one call for seedmoney projects each year. Typically, selected projects are awarded with 50% of their project budget, to a maximum of 10 kEuro. Seedmoney projects are expected be carried out by at least 2 DigiShape partners, be innovative and executed by young employees of the partner organisations. Specific topics may be selected each year as focus for the seedmoney call.



# Our governance

## Small core team

As DigiShape works mainly through its partners, there is not a central bureau staffed with personnel. However, in order to facilitate the cooperation as well as the external outreach, the partners jointly hire a catalyst (currently: Chris Karman) and a communications advisor (currently: Rianne Croes).

The role of the catalyser is, like a chemical catalyser, to ensure that processes are initiated (often upon request of one or more partners) and making progress over time so that results are delivered. The catalyser is further the first point of contact, both for partners as well as for external organisations. He also manages the external outreach, supported by the communications advisor. Focus in the external outreach is through events, website, newsletters and social media (LinkedIn).

The catalyser works with the core team, a small group of representatives of the partners. Together they act as the “operational management team” of DigiShape.

## Decision making

Day to day decision making is done by the DigiShape core-team, consisting of the catalyser and 3-5 representatives of the partners. The core-team is responsible for the tactical and operational management of DigiShape. The partner representatives in the core-team are appointed by the PartnerMeeting (PartnerBeraad).

The PartnerMeeting consists of all DigiShape partners, represented at executive level. The PartnerMeeting is the highest decision-making unit in DigiShape and meets typically twice each year. The agenda of the PartnerMeeting is prepared by the core-team and contains at least once a year the financial budget to approve.

One of the partners is acting as treasurer and is always represented in the core team and primarily responsible for drawing up the budget, in cooperation with the catalyser and the core team.

## Legal status

DigiShape is a cooperative network without a legal status. This means that none of the partners, nor the core-team or treasurer, can enter into a contract for other partners than its own organisation.

As in some cases it is considered relevant for DigiShape to act as an independent entity (e.g., to be visible as a partner in larger projects or to acquire funding for realising the DigiShape ambitions) it was suggested that a legal status might be helpful. As such, during this program period research will be done in the possibilities and limitations to establish a DigiShape legal entity. Before commencing in the actual realisation of this entity, the Partner Meeting has to agree.

## Partner contribution

Each partner is expected to contribute to the operational costs of DigiShape according to the graduated scale included in the annex of the cooperation agreement. In the previous cooperation period, a minimum of 25% of this contribution was to be paid in cash, the remaining 75% could be paid as an in-kind contribution.

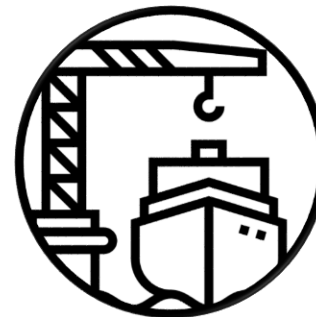
As it proved difficult to effectuate the promised in-kind contribution, the PartnerMeeting decided that in the current cooperation period each partner will in principle be charged the full partner contribution according to the graduated scale as currently used. The invoice will be prepared mid-year, where each partner can receive a discount on the partner contribution based on performed (Jan-Jun) and yet to be performed (Jul-Dec) activities.



# Current thematic areas

In the following pages we will further elaborate on the long term objectives in each of the thematic areas that we are currently working on. Therewith we further specify the objectives of the four core DigiShape activities as described on the first page of this multi-annual plan.

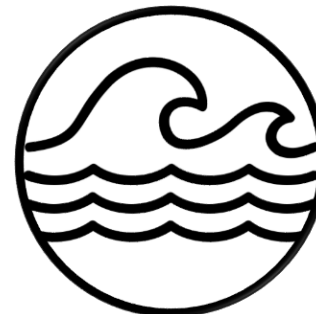
These long term objectives are derived from the strategic working sessions that were organised with the partners in 2023. It is envisaged, however, that these will be further refined (and prioritised) in Q2 of 2024 along the lines of the newly adopted strategy (core activities). In general, these objectives are to be considered as a guideline directing our activities without considering them as a strict framework.



Water & Logistics



Watermanagement



North Sea spatial planning





# Water and Logistics

The thematic area has its focus on waterborne logistics, using the harbour as a central point of activity. From the harbour, shipping movements may go either inland (towards Germany or Belgium) or to the North Sea. As such, nautical activities focussing on the harbour, inland shipping, harbour approach as well as coastal shipping are within the scope of this thematic area.

Because of the wide scope of this thematic area, there is a clear interaction with the other thematic areas. These include, for example, nautical safety at sea (e.g., around offshore windfarms) or sailing depths in the rivers during periods of drought.

Over the past year, the partners and community have been working from a shared set of tools and instruments. OpenCLSim and OpenTNSim are good examples of these instruments, which are currently under joint development by various partners through a GitHub library. This shared development and joint use of instruments from this library has led to large collaborative and precompetitive projects such as TRANS2, DigiPACT and Path2Zero.

It is the ambition of the partners to further develop the models catalogue related to Water & Logistics and, related to that, develop a dataspace in which the relevant datasets are made available to the partners and the community. Part of this process is the element of 'capacity building', in which we gain and share experience in the field of data delivery and data sharing.

## Precompetitive proposition (s)

- Coalition on nautical safety
- Digital Twin for smart & sustainable quay walls

## Sharing of models and data

- Community of shared tools and data (backend)
  - OpenCLSim, OpenTNSim
  - Assets business process mapping: standards & fast access / mass data storage and data sharing
- Data delivery
- Related projects: TRANS2, Clarion, Path2Zero, ...

## Strategic network expansion

- Include other harbors in DS: 3NL, Antwerp, Hamburg, EU dimension
- Extend to EU dimension

# Water Management

Activities within the thematic area of water management initially focussed around droughts and the safety of flood protection (dike monitoring). Especially the latter gained a lot of attention. On the one hand because of extremely high water levels, stretching the strength of our dikes, and on the other because of droughts which in some cases may lead to significantly impaired dike strength.

Innovative AI systems for dike monitoring, involving advanced and data intensive sensing techniques and novel machine learning methods, are being developed for and with the end users: Rijkswaterstaat and the waterboards.

It is generally recognised that we are just at the doorsteps of such developments, while extreme weather and climate conditions require better prediction and decision making in this field.

For this reason we successfully reached out to the NL AI Coalition so that we can team up with the best experts in the field of machine learning and AI. Together with the water managers, we envisage the realisation of an experimental environment containing relevant datalakes and model catalogues in which we can (jointly and precompetitive) accelerate the innovation for this thematic area.

## Precompetitive proposition (s)

- Experimental environment (living lab) with an open data for twinning tactical and operational models: a safe environment for developing novel solutions

## Sharing of models and data

- Datalake in which data from one or preferably multiple waterboards is brought together; open for experimentations. We bring the projects to the data.
- Related projects: ...

## Strategic network expansion

- Waterboards (and/or STOWA, Waterschapshuis, IHW)
- Active involvement of AI partners through NL-AIC



In the past program period, the focus of this program line was on the joint development of a Digital Twin for the North Sea. Three different tools using the same 'engine', therewith providing instruments for different targets groups while still using the same data.

Further, in the context of these developments, a lot of energy was laid in discussions about the future use of the North Sea whilst protecting biodiversity and nautical safety. The much hoped for project funding (National Growth Fund) for an overarching 'Digital North Sea' program was not granted. As such, the partners in Digishape – in cooperation have started discussing a joint proposition to bring the development of a Digital Twin for the North Sea to a next level.

Based on a number of clear scenarios for the future of the North Sea and taking into account limiting factors such as space, safety and biodiversity, we will focus on developing - with key stakeholders - a virtual experimentation environment with an appropriate data lake and models catalogue.

## Precompetitive proposition (s)

- There is a great need for a virtual experimentation environment with a corresponding 'data lake' and 'models catalogue'. This should focus on a number of clear scenarios for the future of the North Sea, taking into account limiting factors such as space, safety and biodiversity

## Sharing of models and data

- Datalake
- Models Catalogue
- Related projects: MOSWOZ, MONS, CFNS, UPDNS, ...

## Strategic network expansion

- International cooperation (DTO / EDITO) with at least neighbouring countries
- Key stakeholders (wind, shipping, government, multi-use, ...)



# Capacity building

The broad and diverse community has contributed significantly to the success of DigiShape in the past years. The partners have the initiative and decide about the focus and direction. As the objective of DigiShape is to strengthen the water sector in the field of developing and implementing Data Science, most activities are carried out in close cooperation with the community.

Together we are building the capacity of the sector in the field of data science. Teaching others and learning from others. As such, partners have decided to open a selection of in-house courses and training events for other DigiShape partners, so that we can learn together and avoid duplication.

Although different of character, the DigiShape community events (live or online) are also an important element in capacity building. Whereas training is focussing on hard- and soft skills; the community events are focussing on technical topics. Sharing new developments as well as ideas for future cooperation.

## Relevant courses (initial inventory)

- High performance marine data access using BEACON (1-1,5 hr, MARIS)
- Lecture: AI modelling maritime example (MARIN)
- Excel 2.0 (van oord)
- Open CLSim (van Oord)
- Working with AIS (TUDelft)
- OpenCLSim/OpenTNSim (TUDelft)
- Reproducible modelling (Deltares)
- Masterclass on immersive content, metaverse, VR/AR/XR, hardware, software, ICT (BUAS)
- ML for non programmers (TUD/Juan)
- Masterclass waterveiligheid & dijkmonitoring (BZIM)
- Stedelijk waterbeheer bij veranderend klimaat (BZIM)
- Masterclass Datagedreven werken bij de I&W beleidskern (Eric en Simon)
- Pizza sessie: Chat GPT, generative AI tools (Deltares)
- Asset management meerdere partijen (Arcadis)
- NLP communicatie meerdere stakeholders (Arcadis)

## Partner & Community activities

- CEO diner on key topics
- 4(+) DigiShape days
- 2(+) whitepapers on key topics
- Up to date Website
- Active Social Media presence

# Annual plan - objectives 2024

## General

- 4 DigiShape days
- CEO dinner
- Explore potential DigiShape foundation
- Programming in-kind contribution of partners



## Water & Logistics

- Set up active coalition on nautical safety
- Facilitate open community of tools and data
- Expand participation in Soil Constraining Constructions
- Active participation of additional harbours in DS: 1 NL, 1EU



## Water Management

- Active coalition to develop experimental environment
- First dataset available for use by DigiShape partners
- First twinning project running
- Active cooperation with AI partners through NL-AIC
- Waterboards involved as partner in DS



## North Sea

- Active coalition to develop experimental environment
- First datasets available for use by DigiShape partners (current DT datasets)
- First version of model catalogue available
- At least 1 session with key stakeholders to define key North Sea scenarios
- International cooperation through EU or other international project



## Capacity Building

- Training agenda online
- >4 Shared trainingcourses with multiple partners present
- 2 whitepapers
- Up-to-date website
- Active social media (LinkedIn)

