



ADVENTURE: Computer modelling to assist aquaculture production monitoring, prediction & optimisation

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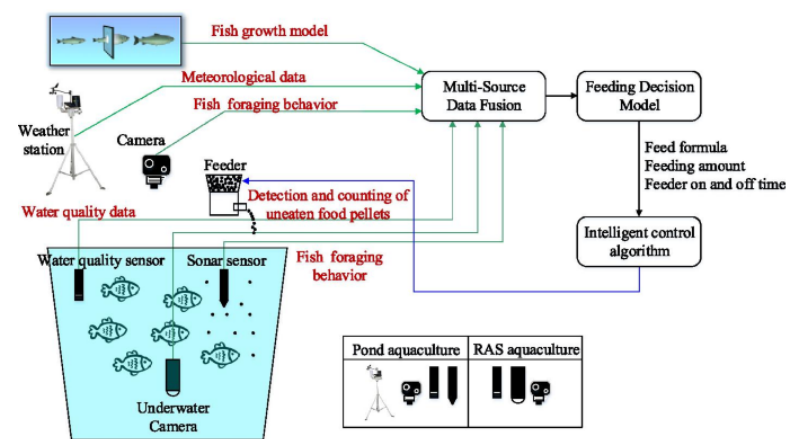
KNOWLEDGE NEED

- From open-pond to RAS (recirculating aquaculture systems)
- From labour intensive to digitalisation & automation



Infrastructure is being modernised,
how about **decision making**?

- How to turn data to actionable information?
- How to make optimal decisions?



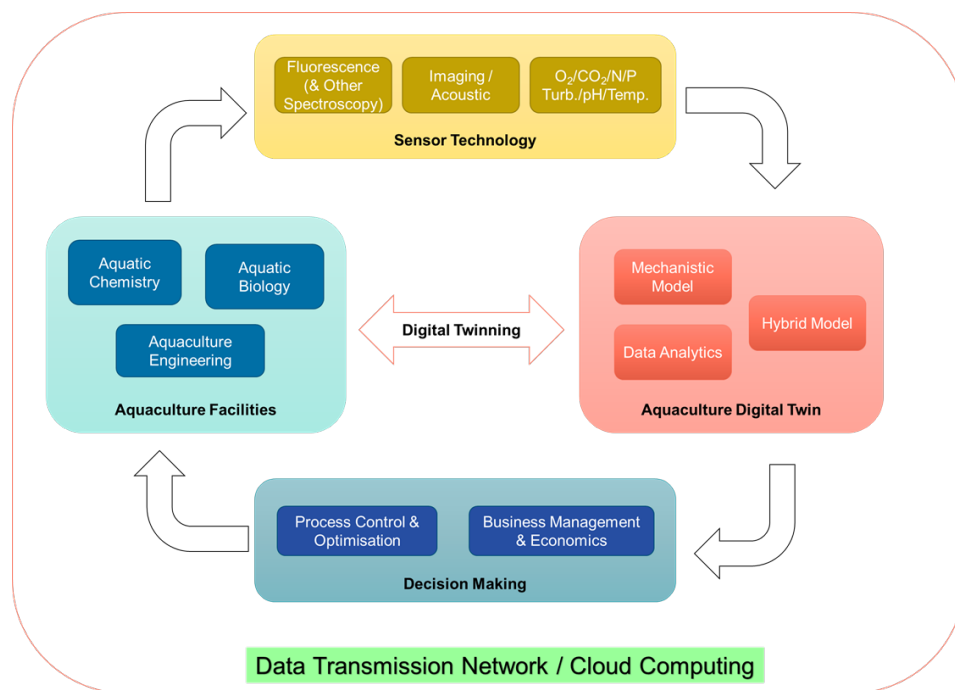
SOLUTION

Centred on a **digital twin**, i.e. computer model of the aquaculture production process based on

- Mechanisms of fish growth & water chemistry
- Data

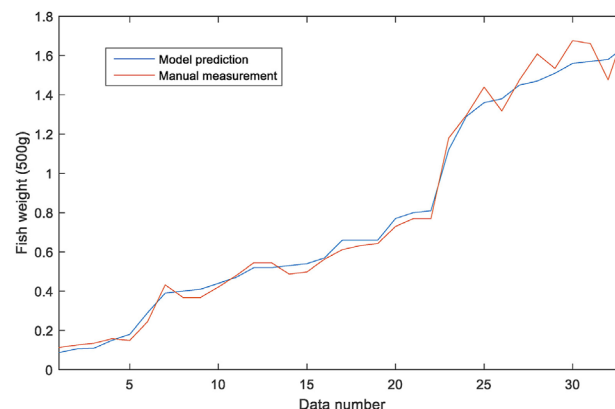
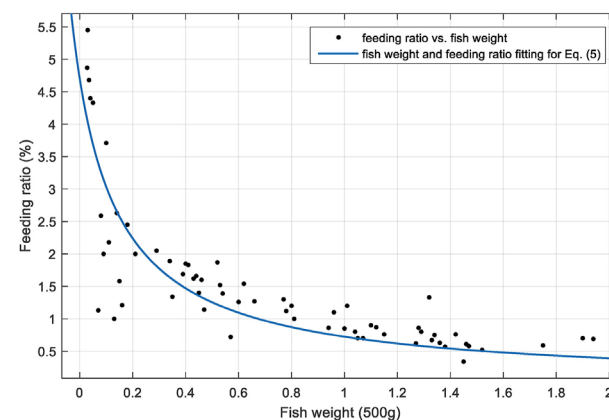
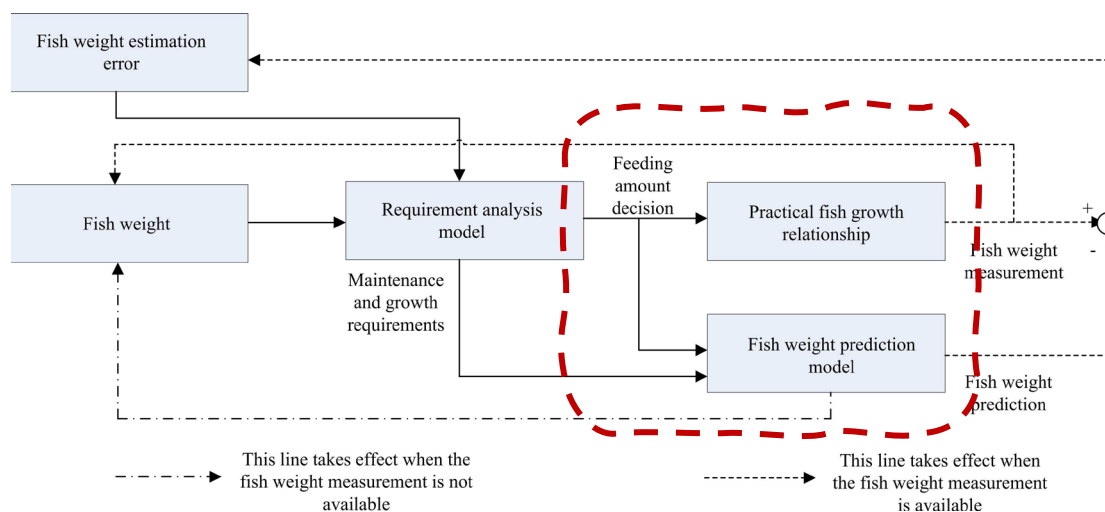
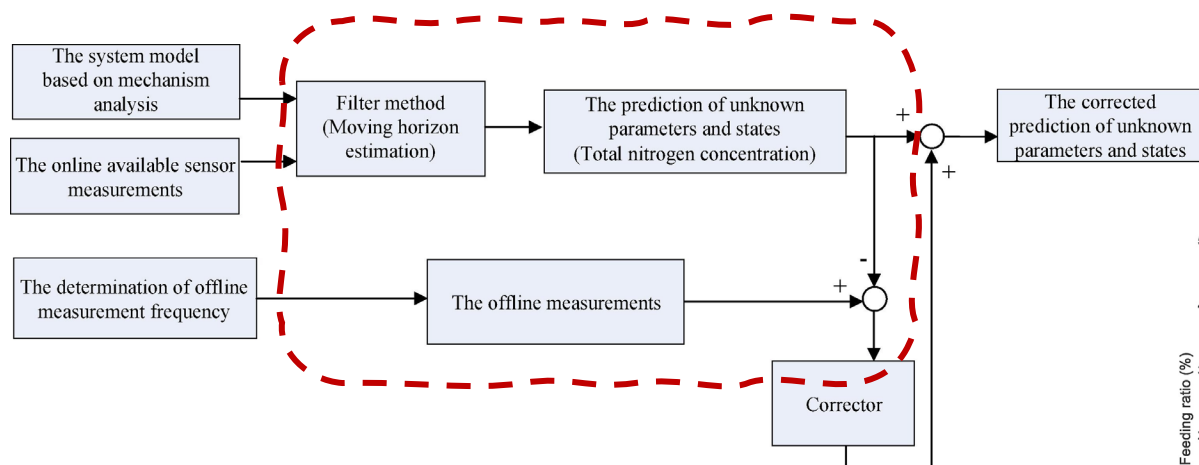
Using the digital twin to

- Estimate critical variables not always/easily measured
- Decide feeding & water quality control



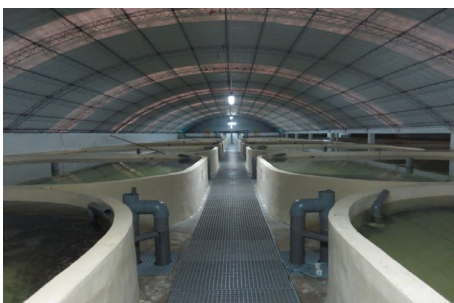
- Biosystems Engineering 2021, doi: 10.1016/j.biosystemseng.2021.11.012
- Computers & Electronics in Agriculture 2021, doi: 10.1016/j.compag.2021.106175
- Aquacultural Engineering 2022, doi: 10.1016/j.aquaeng.2022.102245

UNDERLYING MAGIC



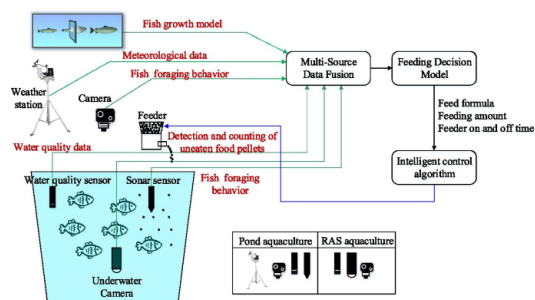
TARGET MARKET

Aquaculture producers



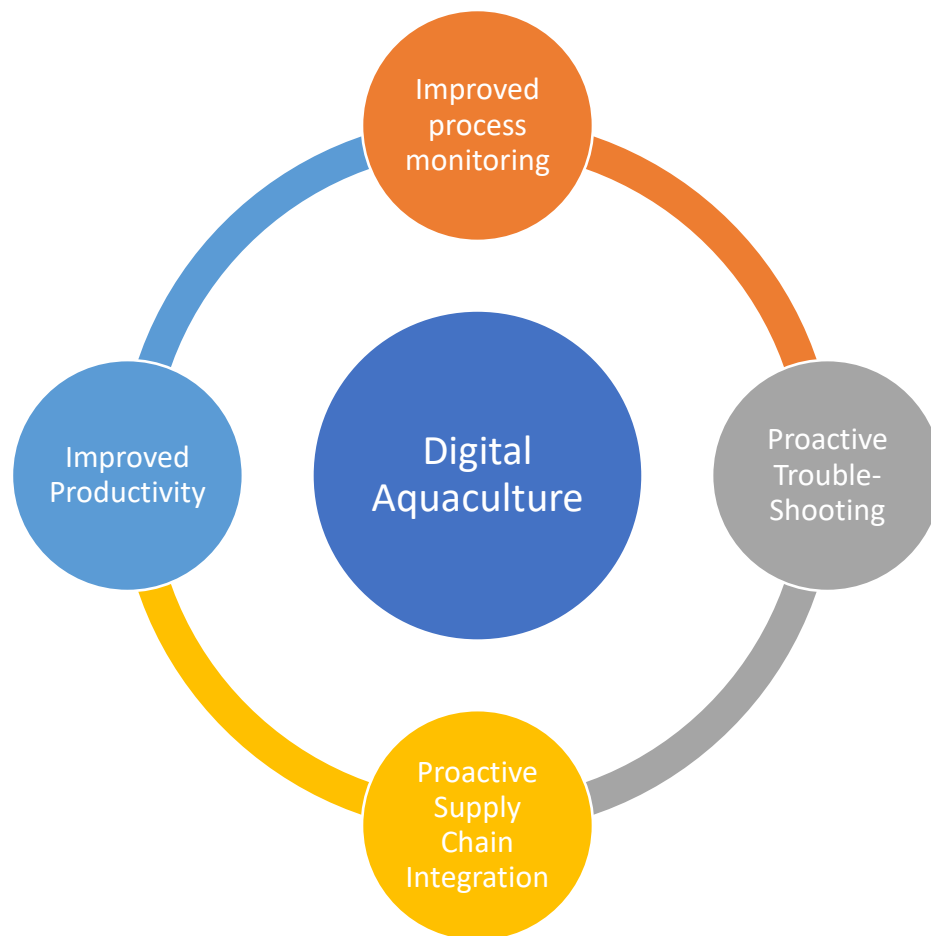
- Continuous monitoring of process parameters (N, DO, etc)
- Optimal decision making (feeding, water quality control, etc)

Technology service providers



- Embedding the algorithms in software and/or software as a service
- Integrated hardware/software solutions for intelligent aquaculture operation

RESULTS and IMPACT

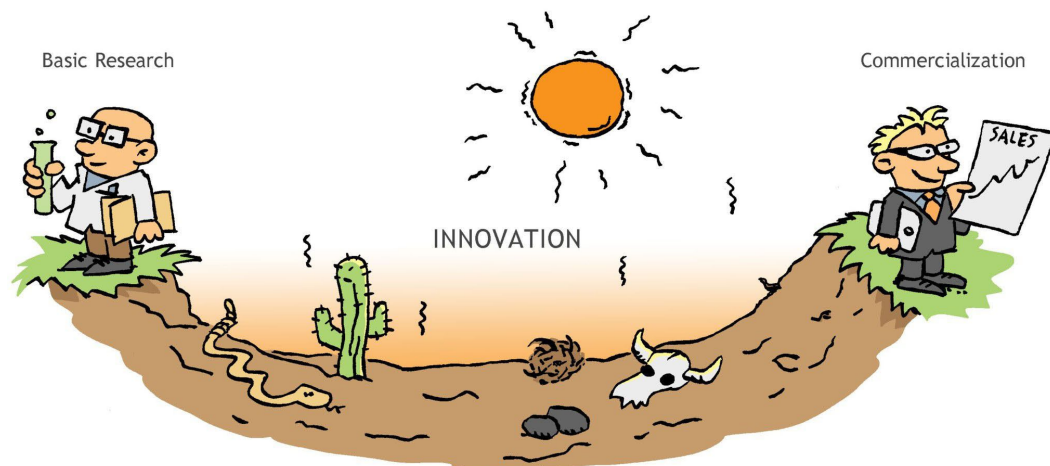


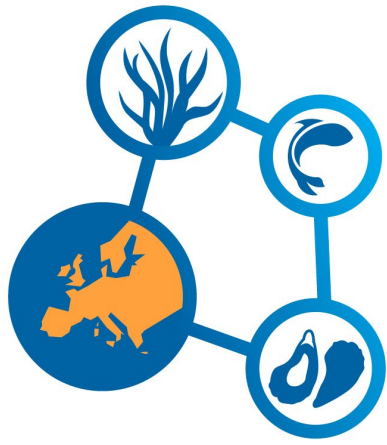
CURRENT STATUS

Low TRL (2~3) – most results based on simulation & retro data

Further development

- Applied research: lab-scale experimental tests to get to TRL 4~5 (EU funding?)
- Innovation: large-scale validation & demonstration with commercial partners (software/hardware vendors, end-users)





AQUA EXCEL



AQUAculture infrastructures
for EXCELlence in European
fish research 3.0

Thank you!



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