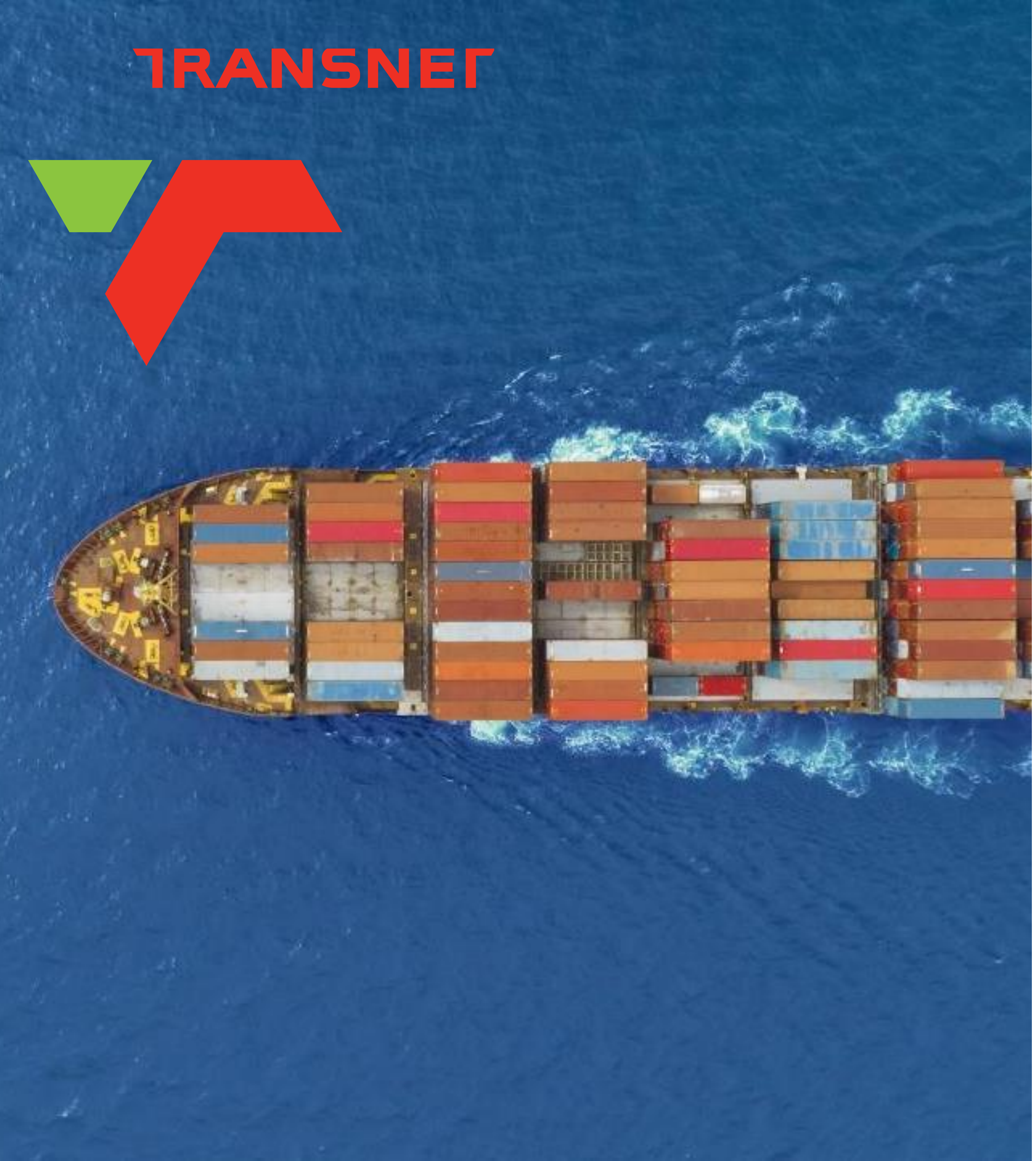

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Doing good while doing business

Making Simulation a Sustainable Business Function

AnyLogic Conference 2024

In partnership with

CONSULTLINK

Solutions Through Innovation

Benjamin Schumann Consulting

Simulation for Innovation

Presenters

Sonwabo Nkosana

- Senior Manager: Infrastructure Planning and Development
- TNPA

Christian de Charmoy

- Associate: Transportation Engineer
- Bigen

Renier Pretorius

- CEO
- ConsultLink

Neile Steenkamp

- Director: Southern Africa
- ConsultLink

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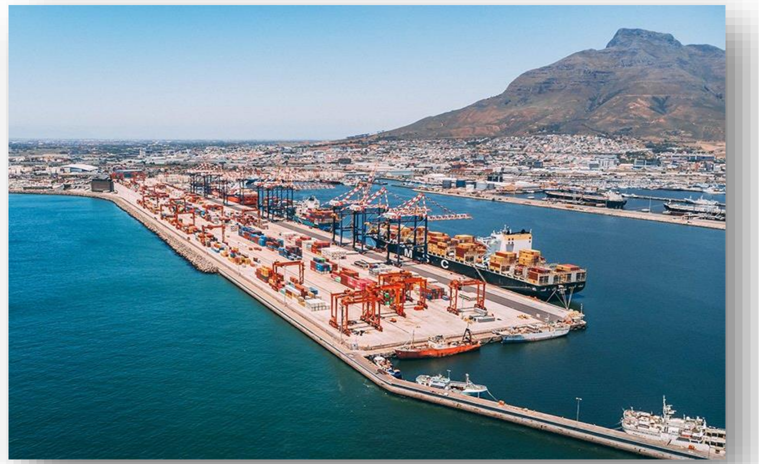
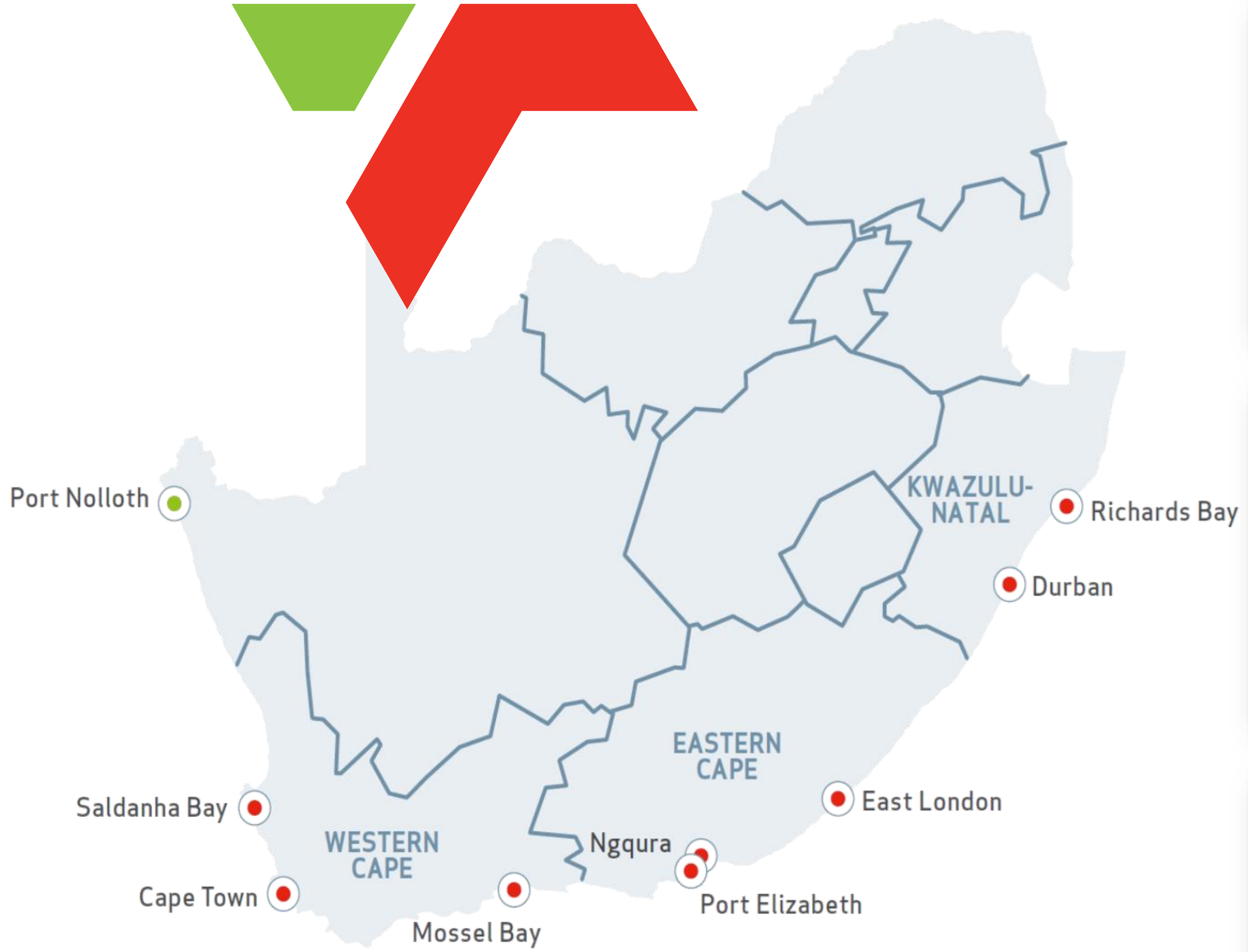
Our **Client**

TRANSNET

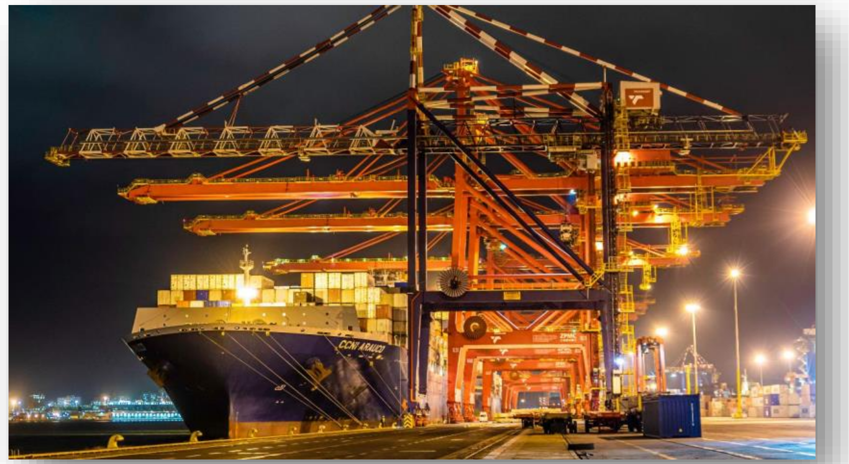


TNPA in Numbers [2023]:

Total Cargo Move
210,697,413 t

Total TEUs Handled
4,113,821

Total Vessel Arrivals
8,965

Our **Team**

Development Advisory and Impact	Energy	Infrastructure Management Services	Real Estate	Transportation	Water

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CONSULTLINK
Solutions Through Innovation

- Analytics
- Modeling
- Simulation
- Scheduling
- Solutions

Benjamin Schumann Consulting
Simulation for Innovation

Problem **Statement**

- **Static calculation** of individual component's capacity such as a single berth capacity
- **No integrated capacity assessment**
  - Marine
  - Waterside
  - Landside
  - Gate
- **External service** providers typically performed capacity simulations and provided limited scenario analysis
- **Varying operations** across numerous ports:
  - Containers
  - Break Bulk
  - Dry Bulk
  - Liquid Bulk

Simulation Tool **Objectives**

- **Provide a** futuristic view of port plans, to analyse future demand
- **Enable TNPA teams** to predict operational impacts across port precincts
- **Simulate port processes** to identify bottlenecks and improve efficiency
- **Calculate and validate capacity** for all commercial ports, ensuring optimal use of facilities
- **Support TNPA's oversight** by setting meaningful targets for Terminal Operators in line with TOPS

Our **Approach**

More than simulation

- **Full system solution** required to address the project requirements

- **Standardized approach** required to develop cohesive port models:
  - Port Library
  - Data Input Structure
  - Model Development & Maintainability
  - Model Execution

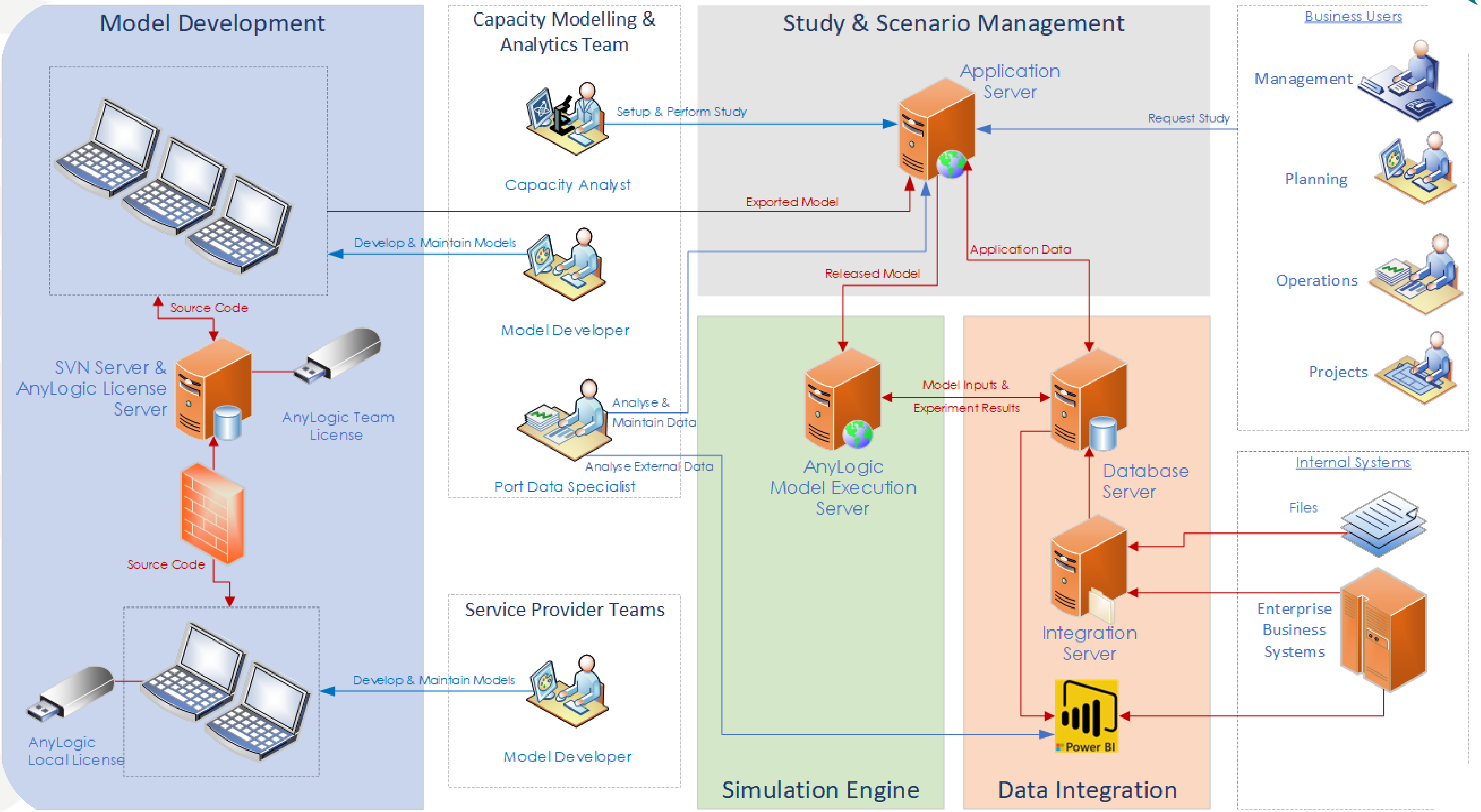
- **Organizational Need**
  - People and Skills Transfer at the Core of the Solution
  - Knowledge Transfer

Our **Approach**

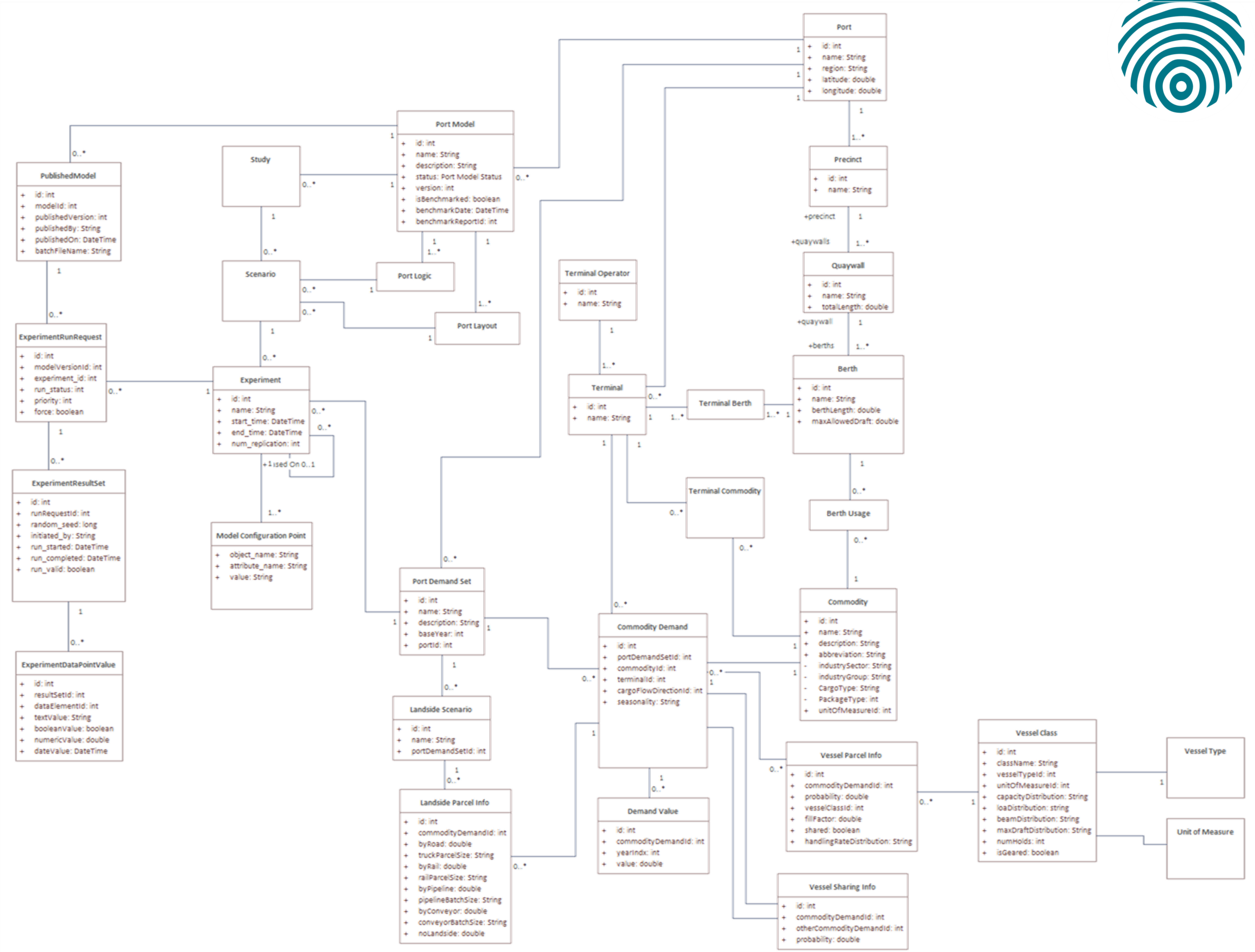
anylogic

- Can run simulation models
- Library requirement to enable model standardization
- Java export to run scenarios with our Execution Engine
- Extensive talent pool, reference material , training and skills available
- Scalable solutions ideal for large organizations with licensing flexibility and through Git and SVN model management

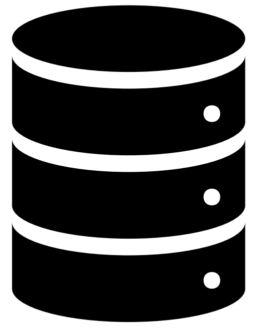
Solution **Architecture**



Domain Model

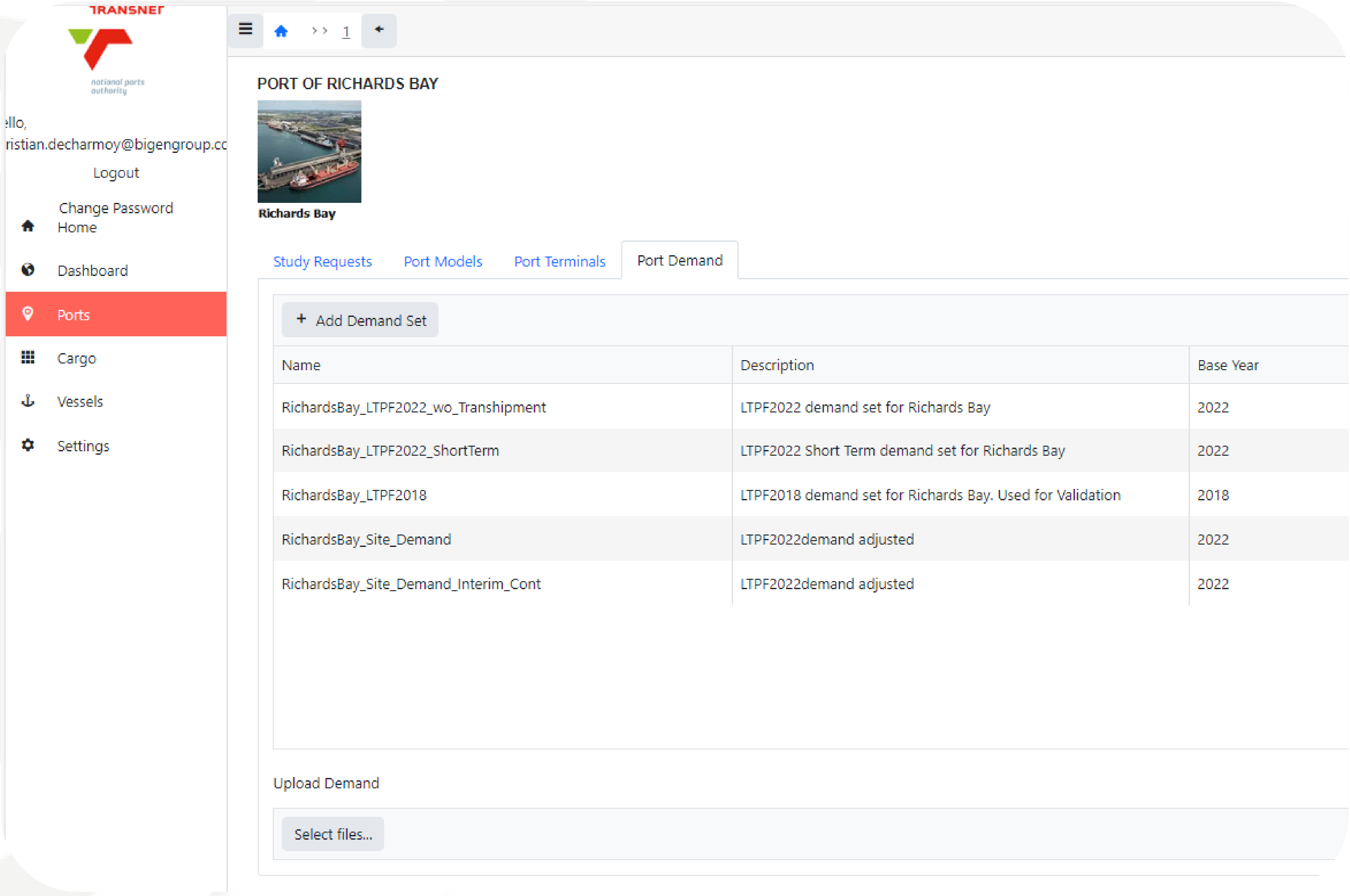


Web **Portal**



SQL Database

AnyLogic **Model**



Port **Library**

Setup

Marine Layout

Marine Logic

Marine Resource Fleets

Terminal Logic

Terminal Resource Fleets

Truck Layout

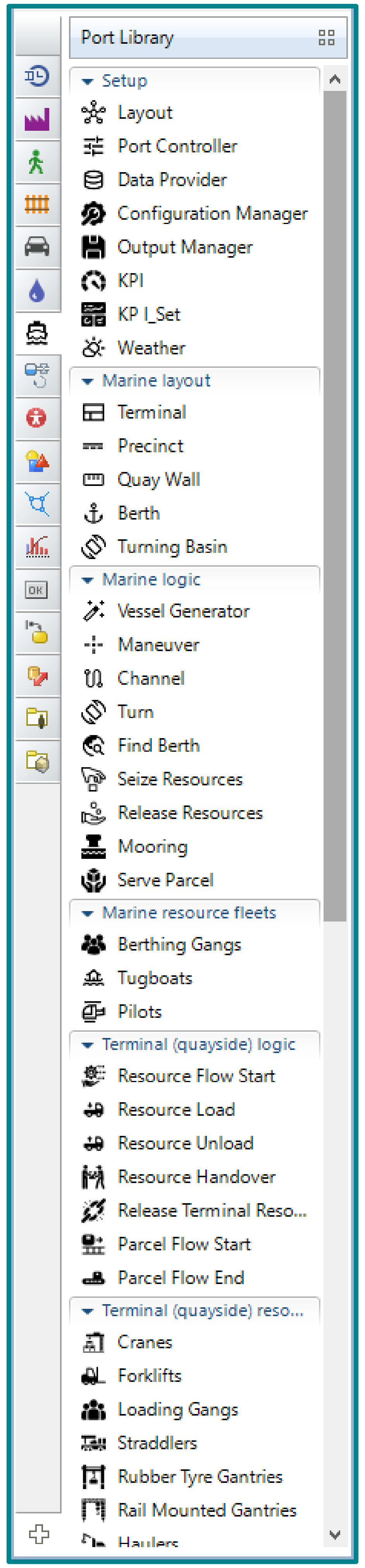
Truck Logic

Train Layout

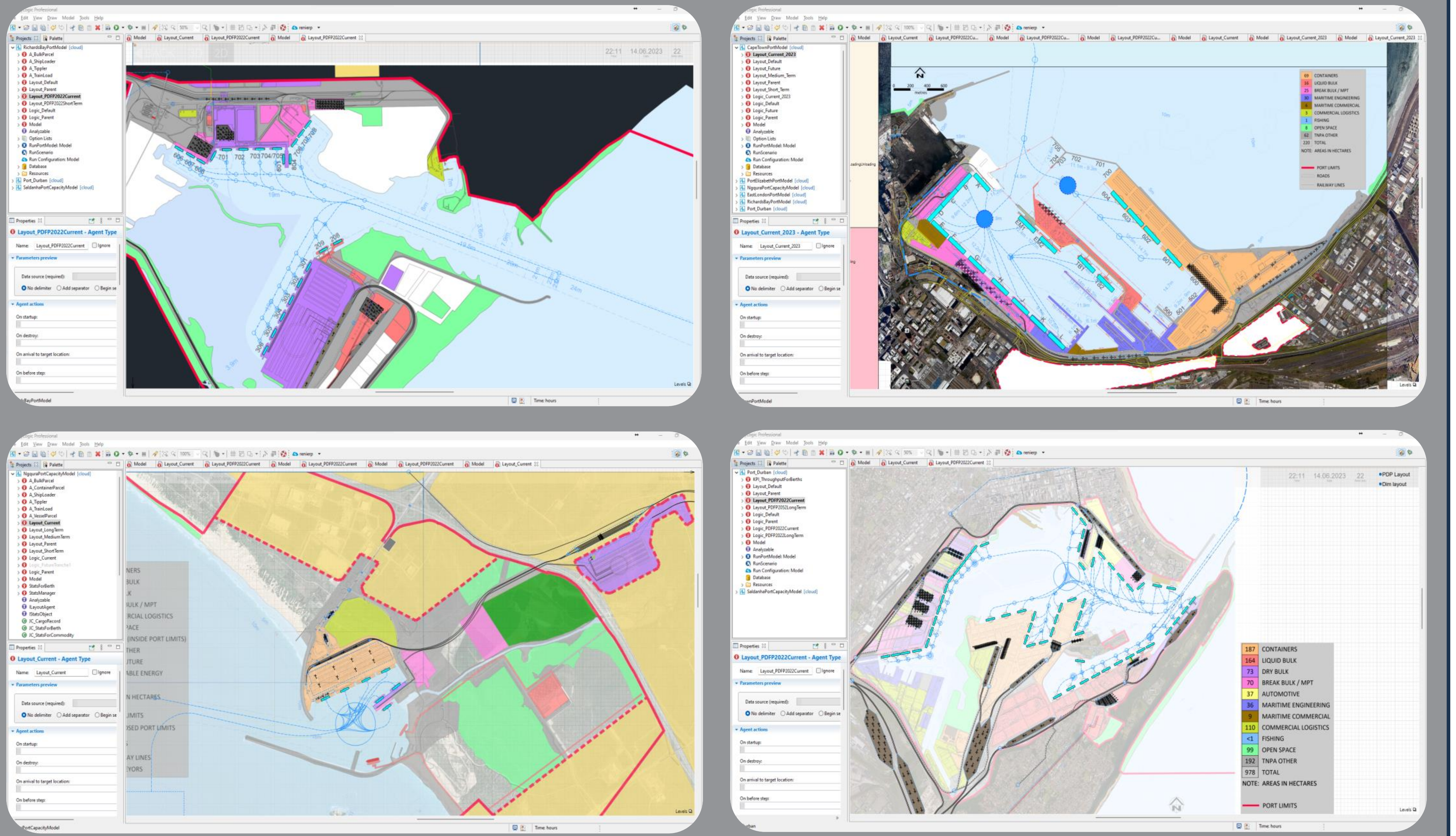
Train Logic

Bulk Material Flow

Fluid Material Flow



Standardised **Model Development**



Each model developed by someone else

Why this work is significant

Typical approach:
Single study to answer a specific question.

This Project:
We have equipped an Organisation to answer questions in future using simulation.

Examples to date:
Workshopping with models that they own such as in Saldanha where we could best single and dual loading of vessels.

The Organisation has a Simulation tool accessible by everyone to test scenarios in their port.

Organisation is independent and now has a standardized solution.

Anyone can use AnyLogic to run any port model.

Long term support and SLA in place to support the solution over the next 4 years.

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Thank you

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