



DIGITAL TRANSFORMATION PRACTICE OF NINGBO ZHOUSHAN PORT

宁波舟山港数字化转型实践之路

Ren Xiaobo Deputy General Manager Ningbo Zhoushan Port Co., Ltd.

任小波 宁波舟山港股份有限公司副总经理

November 10, 2025

Insights on Port Digital Transformation

关于港口数字化转型的几个体会

01

Port Digital Transformation must clearly define development plans and implementation pathways
港口数字化转型必须明确发展规划和实践路径

02

Port Digital Transformation must not be confined to isolated smart solutions; it is imperative to build a comprehensive digital and intelligent ecosystem for ports
港口数字化转型不能局限于“单点智能”必须打造港口数智生态圈

03

Port digital transformation should adhere to green and low-carbon principles
港口数字化转型应该坚持绿色低碳

04

Port workers are the leaders of port digital transformation; we need not only technological innovation but also win-win cooperation
港口人是港口数字化转型的主导者，我们需要技术创新更需要合作共赢

01. Port Digital Transformation must clearly define development plans and implementation pathways
港口数字化转型必须明确发展规划和实践路径

Development Overview of NZP

宁波舟山港发展概况



Ningbo Zhoushan Port has become a key container ocean trunk port in the Chinese Mainland, the largest iron ore transshipment base and the largest crude oil transfer base in China, with a total of more than 300 routes, serving over 600 ports in 200 countries and regions around the world.

宁波舟山港已成为我国大陆重要的集装箱远洋干线港、国内最大的铁矿石中转基地和原油转运基地，航线总数超300条，辐射全球200多个国家和地区600多个港口。

20 港区
Port Districts

216 万吨级泊位
Berths for ships over 10K dwt

63 十万吨级泊位
Berths for ships over 100K dwt

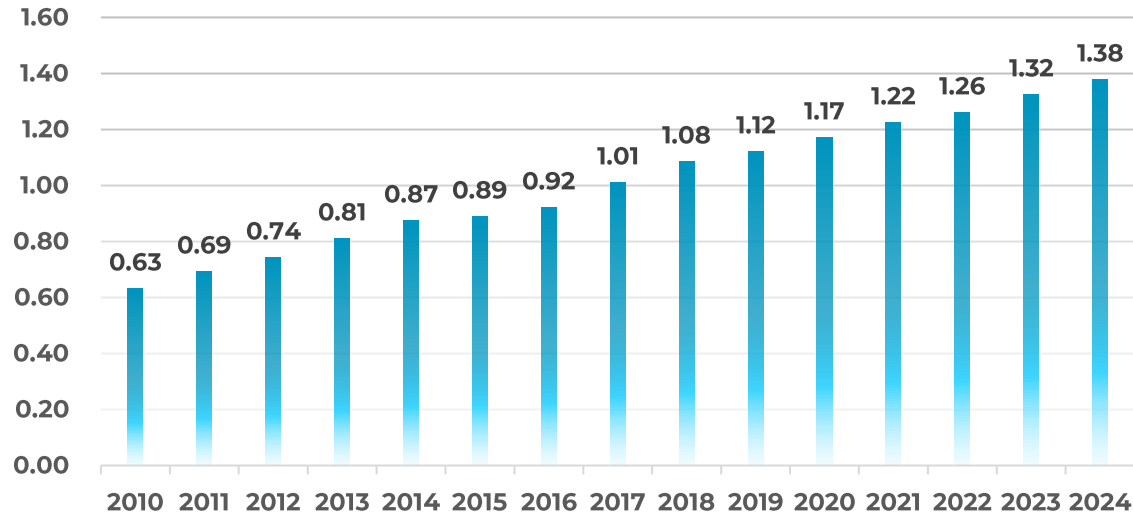
Development Overview of NZP

宁波舟山港发展概况

Annual Cargo Throughput of NZP

宁波舟山港年货物吞吐量

unit: billion tons



Annual cargo throughput for NZP of Y2024 was **1.38 billion** tons

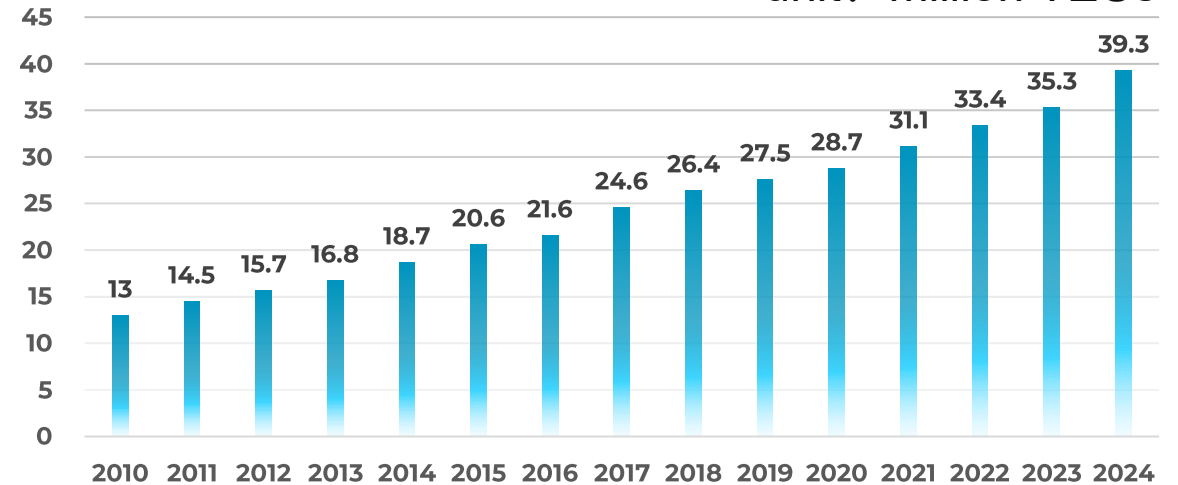
2024年宁波舟山港货物年吞吐量为**13.8亿吨**

Top 1
in Global Cargo Throughput

Annual Container Throughput of NZP

宁波舟山港年集装箱吞吐量

unit: million TEUs



Annual container throughput for NZP of Y2024 was **39.3 million** TEUs with a growth at **11.3%**

2024年宁波舟山港集装箱年吞吐量为**3930万标准箱**，同比增长**11.3%**

TOP 2 in China
TOP 3 in the WORLD

The Digital Transformation Development of NZP

宁波舟山港数字化转型发展历程

Exploring the "NingboZhoushan Port Approach" to Upgrading Traditional Terminals into Smart Terminals



In 2016, Ningbo Zhoushan Port began exploring the application of new intelligent technologies such as remote control of bridge cranes and gantry cranes, as well as intelligent cargo handling.

2016年，宁波舟山港开始探索应用桥吊、龙门吊远程控制、智能理货等新型智能技术

In 2020, the development direction was clearly defined: leveraging the "2+1" smart terminal demonstration project, conducting trials of cutting-edge smart technologies tailored to terminals with distinct characteristics, and striving to achieve differentiated breakthroughs in smart terminal construction.

2020年,明确智慧化港口建设的发展目标和实践路径:以“2+1”智慧化码头示范工程为依托,针对不同特点码头进行智慧化前沿技术试验,致力于实现智慧码头建设的差异化突破

The Digital Transformation Development of N郑

宁波舟山港数字化转型发展历程



Meishan Port Area has completed construction of a single-body, multi-million TEU-capacity automated container terminal capable of mixed-line operations
梅山港区建成单体超千万混线作业自动化集装箱码头



The Dapukou Container Terminal in Jintang port area has been completed as a fully automated terminal featuring port-wide mixed-line operations
金塘港区大浦口集装箱码头建成全域混线作业自动化码头



Product and operate on main island & Command and decision-making on secondary island
主岛生产作业 副岛指挥决策

The Intelligent Control Center of the Shulanghu iron ore terminal has been fully commissioned and is now in full operation
鼠浪湖矿石中转码头离岛智控中心全面投入运行

Digital Transformation Framework

数字化转型整体框架

● 一脑统领

One Brain Lead All

n-TOS

自主研发支撑千万级
码头运营的操作系统

Independently developed system supporting
tens of millions class ports' operation

“双芯” 码头大脑



“Double Core” Port Brain

iECS

数字化全域智能设备
调度控制平台

Digital intelligent global equipment
scheduling control platform

● 一键作业

Click-once Operation



远控龙门吊

Remote control gantry crane

自动化作业链
Automatic
Operation Chain



无人驾驶集卡

Unmanned container truck

自动化作业链
Automatic
Operation Chain



远控岸桥

Remote control bridge crane

● 一网覆盖

One Network Coverage



5G网络

5G network



车路协同 云端决策 Vehicle-road coordination & Cloud decision



北斗高精定位

Beidou positioning

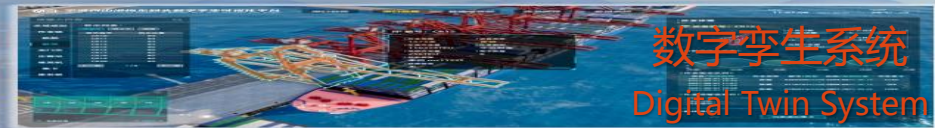
● 一区示范

One Zone Demonstration

科技+法治 Technology&Rule of law



数字孪生系统
Digital Twin System



港口生产作业 “看得到、听得着、能指挥、可预判”

Port production operation can be "seen, heard, commanded and predicted"

The background image is a composite. The top half shows a wide aerial view of a coastal area with a city, green hills, and a large body of water under a blue sky with white clouds. The bottom half shows a close-up aerial view of a large container ship, with the name 'COSCO' visible on its side, docked at a port. The ship is loaded with many colorful containers. A blue semi-transparent rectangular box is overlaid on the middle of the image, containing white text in English and Chinese.

02.Port Digital Transformation must not be confined to isolated smart solutions; it is imperative to build a comprehensive digital and intelligent ecosystem for ports
港口数字化转型不能局限于“单点智能”必须打造港口数智生态圈

A smart port is not just about "smarter equipment," but rather about "more collaborative systems and a more integrated ecosystem."

智慧港口不只是“设备更聪明”，而应是“系统更协同、生态更融合”



Establish a digital collaborative management platform to achieve comprehensive digital management of all elements—vessels, ports, cargo, and shipping.

打造数字化协同管理平台，实现“船、港、货、航”全要素数字化管理



Build a smart logistics cloud platform that integrates services across maritime ports, inland ports, airports, and information hubs, fostering a smart logistics ecosystem characterized by "sharing, service, intelligence, and connectivity."

打造服务“四港”联动发展的智慧物流云平台，形成“共享、服务、智能、连接”的智慧物流生态



Explore the direction of digital industrialization in the port and shipping sector, building a product portfolio centered on the "n-TOS+S-ECS" smart dual-core architecture.

探索港航领域数字产业化发展方向，打造能以“n-TOS+S-ECS”智慧双芯为核心的产品矩阵



03.Port digital transformation should adhere to green and low-carbon principles
港口数字化转型应该坚持绿色低碳

In the process of building smart ports, we are steadfastly advancing green and low-carbon development.

在智慧港口建设过程中，我们坚定不移推进绿色低碳发展

Greening Equipment 设备清洁化



put more than 1500 electric mobile machinery units into operation in the entire port.

在全港投运1500台以上的电动流动机械。

We have built China's first 740TEU green pure electric container ship for maritime transport.

我们建造了中国首艘740TEU绿色纯电动海上集装箱运输船舶



Scaling Clean Energy 清洁能源规模化



We are developing wind power and photovoltaic projects in port areas such as Chuanshan and Meishan. By the end of this year, wind power and distributed photovoltaic projects across these port areas will generate 100 million kilowatt-hours of green electricity annually.

到今年年底，在各港区风力发电、分布式光伏项目可年自发绿电**1亿千瓦时**



**04. Port workers are the leaders of port digital transformation;
we need not only technological innovation but also win-win cooperation
港口人是港口数字化转型的主导者，我们需要技术创新更需要合作共赢**

We look forward to mutually beneficial cooperation.
期待合作共赢

Port digital transformation is a highly complex project that requires technological support, institutional safeguards, and the collaboration of ecosystem partners.

We look forward to strengthening communication and deepening cooperation with all of you to jointly advance the digital transformation of ports.

港口数字化转型是一项高度复杂的工程，既需要技术的支撑，也离不开制度环境的保障，更需要生态伙伴的协同。

我们期待与各位加强交流、深化合作，共同促进港口数字化转型。



THANK YOU!

感谢您的观看