

Deloitte.



Deloitte Port Services

Center of Expertise

The Netherlands, 2017

Introduction

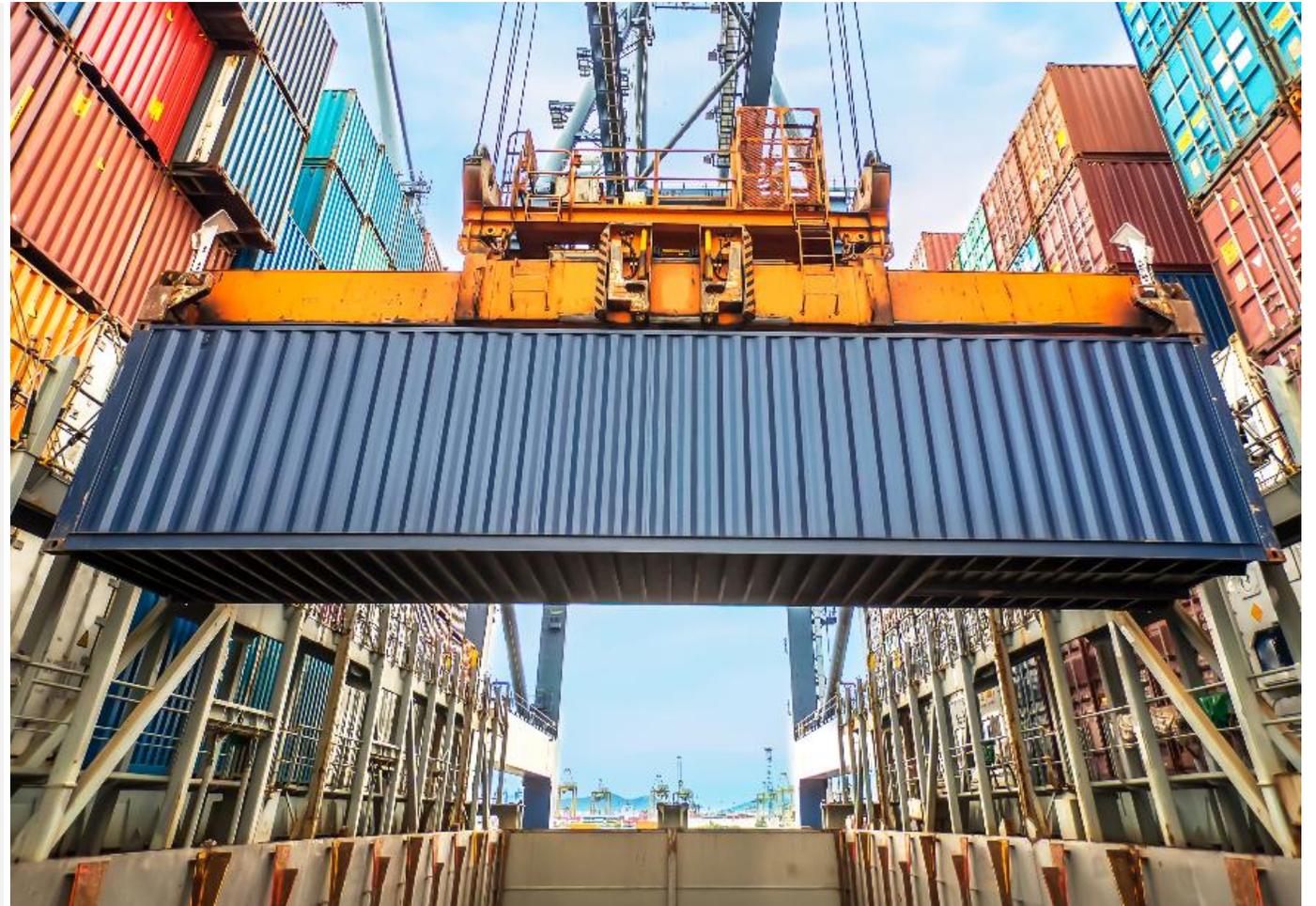
A shifting landscape



Globalization has led to an explosion of world trade over the last few decades. As people continue to enter middle income status, consumption patterns increasingly drive demand for traded goods. Shipping volumes will continue to grow.

But, just as it had during the last decade, global trade routes will continue to migrate towards the Asian continent. In addition, cargo flows (of raw materials) from Africa are also on the rise. In both Asia and Africa there is a strong demand for increased port efficiency and additional capacity. In the Middle East, economies are in a process of diversification, moving away from reliance on fossil resources exports and developing a market position as central hubs of maritime (and air) transport. Meanwhile, port authorities in Europe and North America are working hard on fully automated container terminals, 'greenification' of ports and port related economic activities in the port areas.

The increasing size of vessels, dedicated terminal operations and supply chain rationalization requires older inner city port areas to be transformed to urban functions.



Introduction

A taste of things to come



Port authorities around the world face a different set of challenges. In light of the ever-increasing competition between ports, driven by the shipping industry and global terminal operators, it is safe to say port authorities are increasingly focused on utilizing the possibilities presented by technological innovations. From high speed transportation of containers via Hyperloop to the use of drones and robots, data analytics and additive manufacturing. This comes down to becoming a smart port.

Increased competition often leads to stronger commercial awareness. This has caused a continuing trend of privatization of ports around the world.

Despite this privatization, we discern the need for strengthening the relationship between ports and the city - creating synergies that benefit both. This requires strong partnerships with local entrepreneurs, regional governments and knowledge institutions.



Introduction

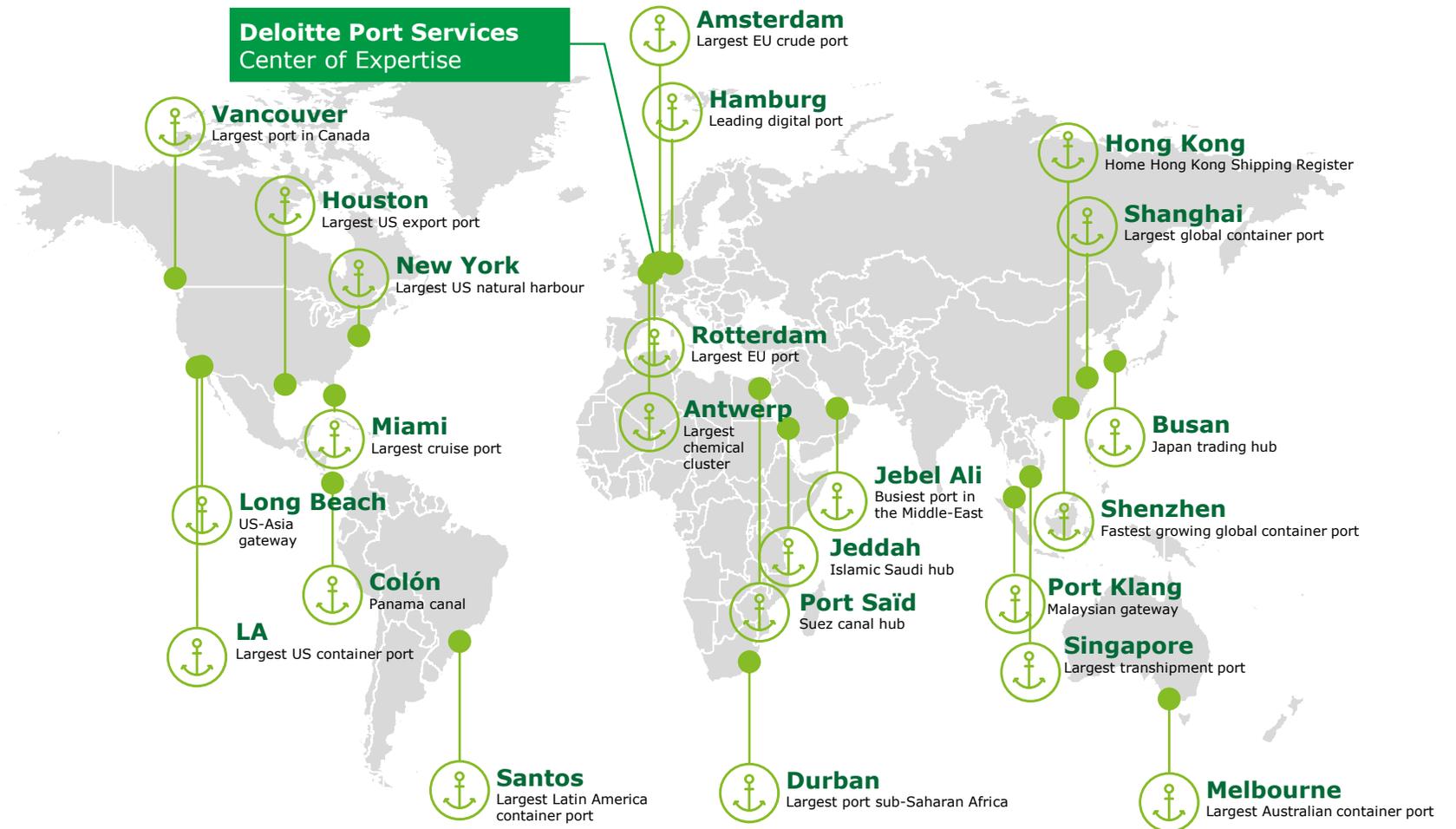
Our experience



Deloitte Port Services has significant experience working in the ports industry across the globe. We support a range of clients including port authorities, terminal operators, investors and policy makers. With our extensive experience in the ports industry, and our local expertise we are uniquely placed to understand the challenges and opportunities across the evolving ports ecosystem. Our wide range of service offerings are tailored specifically for our clients active in the ports industry.

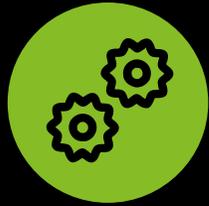
As a firm, we have invested in our ports people, tools and thoughtware to build an international community of passionate port & terminal professionals across all Deloitte functions.

We have shaped a number of customized services for the port industry to address its specific needs and requirements.





Challenges & opportunities



Capabilities & client cases



Expertise



Collaboration

Challenges & opportunities



Challenges & opportunities

Six prominent challenges that inherently create opportunities, are on top of the global port authority boards' agenda



Greenification / circular economy

The continuous push for greener and more sustainable solutions forces ports and port companies to consider new approaches.

The energy transition could go much faster than anticipated requiring strategic preparation from ports.



Smart ports

Data-driven technologies and Internet of Things, combined with advanced robotics and analytics and additive manufacturing will redefine the future of ports.

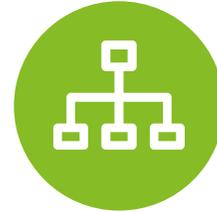
Technological advancements offer ports new business model opportunities and the potential to transform into smart ports.



Integration of supply chains

The further integration of traffic flows on both the seaside and the landside requires strategic coordination.

Integration of supply chains is driving increased port efficiency, port authorities could act as system orchestrators.



Organizational efficiency

The internal organization of port authorities needs to be flexible to adapt to the increasingly dynamic environment.

Increased competition between ports provides ports with the opportunity to focus on organizational efficiency and performance management.



Safety & security

Technology has a dark side and the digitalization of transport and logistics combined with the strategic importance of ports emphasizes the importance of cyber security.

Being at the heart of global supply chains, ports need to be at the forefront of safety and (cyber)security.



Port / city duality

With ever increasing cities, more and more ports are enveloped requesting new strategies towards port / city ecosystem development.

Ports should focus on creating regional added value and employment, benefiting both city and port, this requires thinking in ecosystems combining social and economic aspects.

Challenges & opportunities – Greenification / circular economy

The energy transition could go much faster than anticipated requiring strategic preparation from ports



- **The share of renewable energy is increasing** - Following up on international climate targets, the world is increasingly transforming the energy-mix towards renewable sources. The share of renewable energy is increasing rapidly. Efficiency is going up while costs are going down fast. With the transshipment of fossil fuels at the core of many of the world's largest ports in connection to the chemical industry, this will have a major impact on port operations and its industrial clusters.
- **The energy transition is happening** - Port authorities and businesses that operate in the port area need to strategically prepare for the energy transition. With the ongoing electrification of transport in the most developed countries, total demand for fuels is decreasing in these countries. Developing economies in Asia and Africa are expected to fully make up for this downward trend.
- **Middle distillates and gas are the new fuels** - Fuel consumption and carbon emission are high on the agenda's of port authorities and shipping companies, both from a sustainability and operational efficiency point of view. The importance of middle distillates and gas in fuelling ocean and inland shipping (LNG) is increasing sharply. This requires strategic action via investment in dedicated port infrastructure.
- **Biofuels are on the rise** - Biofuels are on the rise and biobased chemical products are becoming more mainstream. Strategic action is required to facilitate the development of local biobased (chemical) clusters in the port area, for instance through public private partnerships.
- **Environmental planning is required to lead the energy transition** - Port authorities are increasingly aware that ports are a significant source of emissions and could facilitate the energy transition. To instigate this, Port Authorities need to pursue targeted clean air programs with the goal of eliminating harmful emissions from port-related sources and companies in the port must incorporate environmental planning into their development plans. Renewable energies, green charging where environmental friendly modes are rewarded, waste management, cyclical economies and biofuels are some of the actions undertaken by ports to spare the environment.

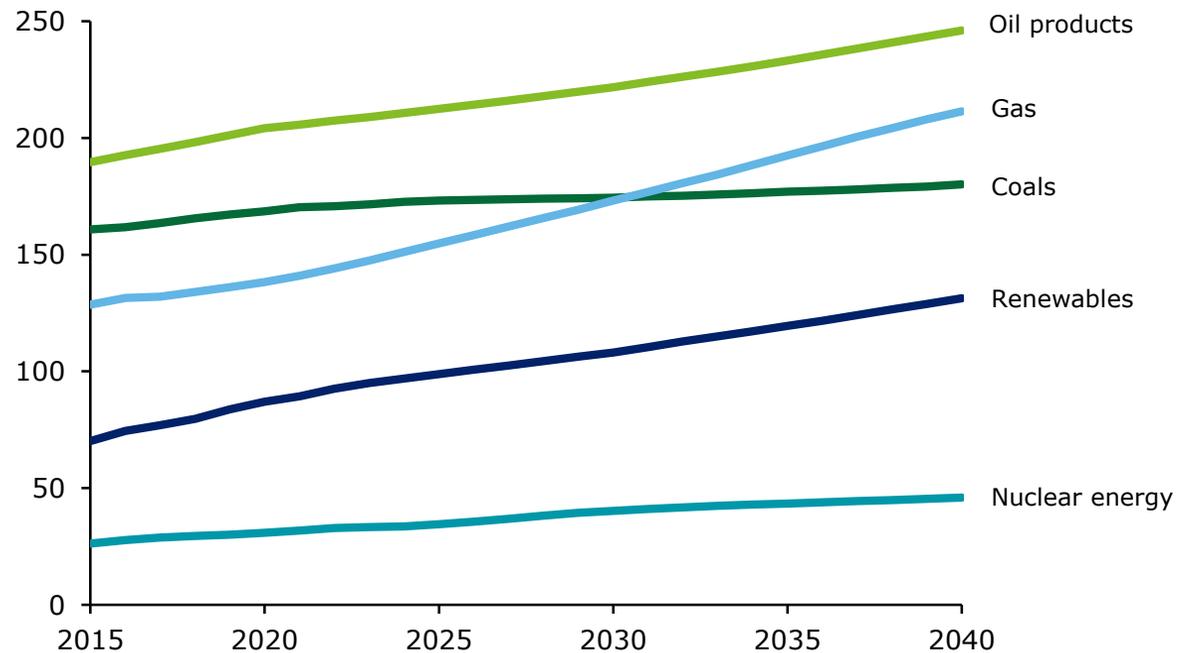


Challenges & opportunities – Greenification / circular economy

The energy transition could go much faster than anticipated requiring strategic preparation from ports



The global energy mix towards 2040



Source: International Energy Outlook 2017, Deloitte analysis

Waste2Chemicals (W2C) partnership highlighted

- State of the art innovative technology is available to produce methanol from mixed waste streams, through the gasification to syngas.
- A consortium set up a W2C-initiative in the Netherlands; creating an unprecedented value chain. Although operations are cash-positive, they are not yet sufficient for a commercial return on investment.
- Deloitte connected the dots and facilitated the partnership of the consortium with port authority and local governments for co-investments to realise the first W2C-plant in Europe; a perfect example of a public private partnership to realise the transition towards a biobased and circular chemical industry.



Challenges & opportunities – Smart Ports

Technological advancements offer ports the opportunity to transform into smart ports



- **Becoming a smart port to remain relevant** - Smart ports are capitalizing on the ever-expanding universe of connected 'things'; the Internet of Things. Technology already has a strong impact on ports around the world today, but that impact will further increase. Our message is to be disruptive or get disrupted. Being disrupted simply translates to not being prepared and to become redundant over time. Preparing implies becoming data-minded; new approaches to data management, new platforms, innovative delivery models and novel governance tactics.
- **Data is key** - Data analytics and data exchange are becoming a new comparative advantage for port players. Capacity sensing, route optimization, energy management, fault detection & resolution can be done much more (cost) efficiency. Advanced data analytics allows for streamlining and optimizing existing infrastructure usage and operations by eliminating unnecessary / empty transport.
- **Additive manufacturing will change global shipment** - The next step is additive manufacturing or 3D printing, allowing manufacturers to 'next shore'. It is going to transform the way that ships are supplied in the future – cargo streams will most likely differ. It is driving manufacturers towards the goal of zero-inventory and remove the need for shipping finished goods at all but it also implies more shipment of raw materials. New opportunities will also emerge as a result of the growing focus on circular economy initiatives both by governments and companies. This requires the shipment of used materials for recycling and refurbishment.
- **Robots and sensors will continue to replace people** - Increased efficiency of robotics and analytics will drive automatization even further and the usage of drones for inspection will increase efficiency. Self-steering ships will become the standard and the usage of sensors will replace the need for towing.
- **Technology has a dark side** - These fast-evolving technologies represent unprecedented opportunities as well as existential threats for ports. More on this is found under 'Safety and security'.



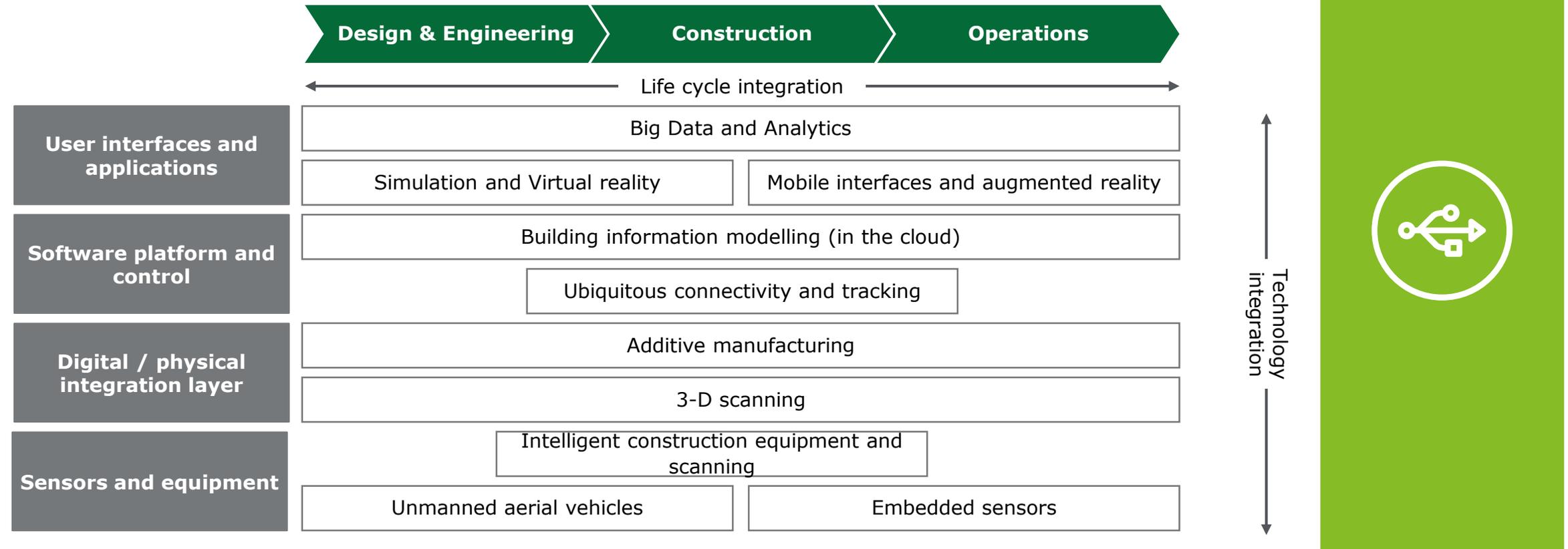
Challenges & opportunities – Smart Ports

Technological advancements offer ports the opportunity to transform into smart ports



Impact of digitalisation

Much stronger life cycle integration, new entrants



Challenges & opportunities - Integration of supply chains

Integration of supply chains is driving increased port efficiency and requires port authorities to act as system orchestrators



- **Consolidation in terminals and shipping** - Globalisation, and the subsequent increase in shipping volumes, have driven the requirement for increased transport efficiency and additional port capacity. In the last decades, the market has seen a consolidation in terminals and shipping. Shipping companies, logistics providers and terminal operators have become global and a few players gained market power implying a strong bargaining position, giving rise to the supply chain rationalization.
- **Further evolving hub and spoke network** - Determined by economies of scale and efficiency, a hub and spoke-network of ports is evolving and competition between ports is increasing. The largest vessels, such as the 22,000-TEU ships which are at the design stage, can only call at a limited number of ports as they require more depth, wider docks, stronger quays and larger cranes. The trend of increasing the size of ships, trains and trucks is expected to continue in the years to come and consequently we foresee a more limited number of ports that have a global status.
- **Hinterland connections are critical** - The appropriate player to improve the competitive position of the port is the port authority. Aside from favourable pricing, efficiency of operations and automation it can create competitive advantages. As supply chains integrate, hinterland connections are becoming the ports' most important assets. The port authority should focus on improving hinterland connections, taking the lead in putting together a common investment agenda for required infrastructural improvements. Its role changes from landlord to active participant in (and potentially coordinator of) the supply chain.
- **Port authorities can facilitate the implementation of technology** - Better insights into transport flows will help companies active in the port to further optimise their supply chains and make them more flexible. The port authority of the future is assisting companies through port community systems. Technologies like blockchain drive this transformation, cutting the middle man (broker) out of the transaction increasing visibility.



Challenges & opportunities - Integration of supply chains

Integration of supply chains is driving increased port efficiency and requires port authorities to act as system orchestrators



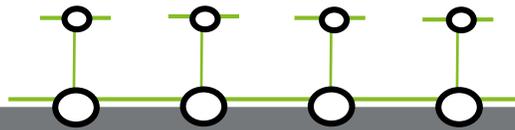
Supply chain rationalization

Shifted focus from port performance to integrated supply chain performance

Phase 1: Scattered ports



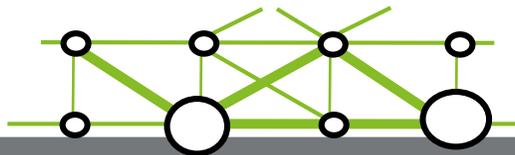
Phase 2: Hinterland capture



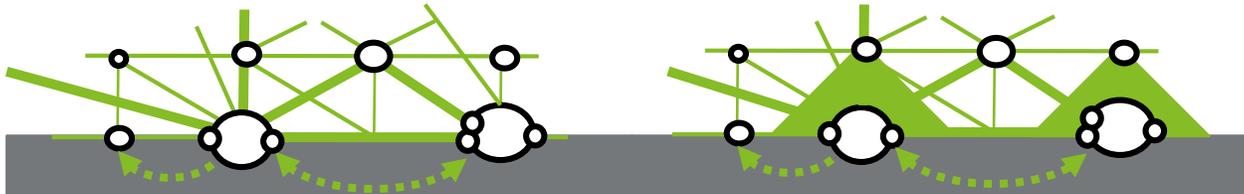
Phase 3: Interconnection



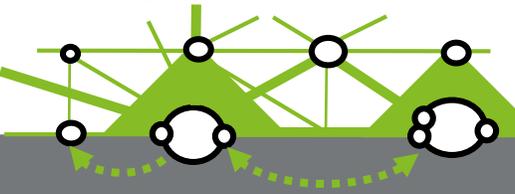
Phase 4: Centralization



Phase 5: Transshipment hub



Phase 6: Regionalization



Source: Notteboom t., and Rodrigue, JP (2010, Deloitte analysis)

Stress tests for leading European port

- Port authorities are at the core of global supply chains, and need to be prepared for external shocks and shifts in global supply chains. Port users are asking for port resilience.
- Deloitte Port Services simulated the economic impact on the port of shutting down all coal-fired power plants, resulting in a decrease of coal shipments to near-zero.
- The analysis resulted in deep insight into the impact this energy transition would have on the port and how the port could increase its resilience and prevent becoming obsolete.

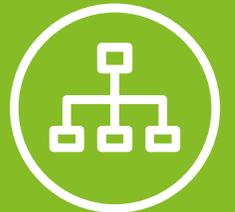


Challenges & opportunities - Organizational efficiency

Increased competition between ports requires ports to focus on organizational efficiency and performance management



- **Private sector interest in the port industry** - Port privatisation and liberalisation is a result of the increased competition between ports and the changed function of ports in the supply chain. Private sector participation in the port industry can improve port operation efficiency and increase adaptability to customers' demand. This in turn increases port competitiveness. However, the competitive environment of ports favours considerable local autonomy.
- **Increased cooperation between ports** - In Western Europe ports are clustered closely together often offering similar services. We see a growing tendency of port cooperation in this market driven by the increased competition and shifting market forces. A recent example is the merger between Dutch Zeeland Seaports and Flemish Port of Ghent.
- **Ports focusing on traditional operations are at risk** - Shifting market forces put traditional key players within ports at risk of delocalization or even of becoming obsolete. For example traditional chemical or fuel-based industries. The search for new industries or the guidance of traditional players through transformation into a new strategic focus will be a major challenge.
- **Port authorities need to focus on efficiency and performance management** - This challenge requires ports to focus on organizational efficiency and performance management. Ports can optimize internal processes by real-time data processing and predictive information management. This enables them to improve efficiency, save costs and add value to its customers' service proposition. Ports need to evaluate their talent base as the shift from a landlord port to a cluster authority with facilitating / coordinating function requires a new skillset. Also, the ongoing push for fully integrated supply chain solutions and internet of things, requires a high level of IT knowledge.



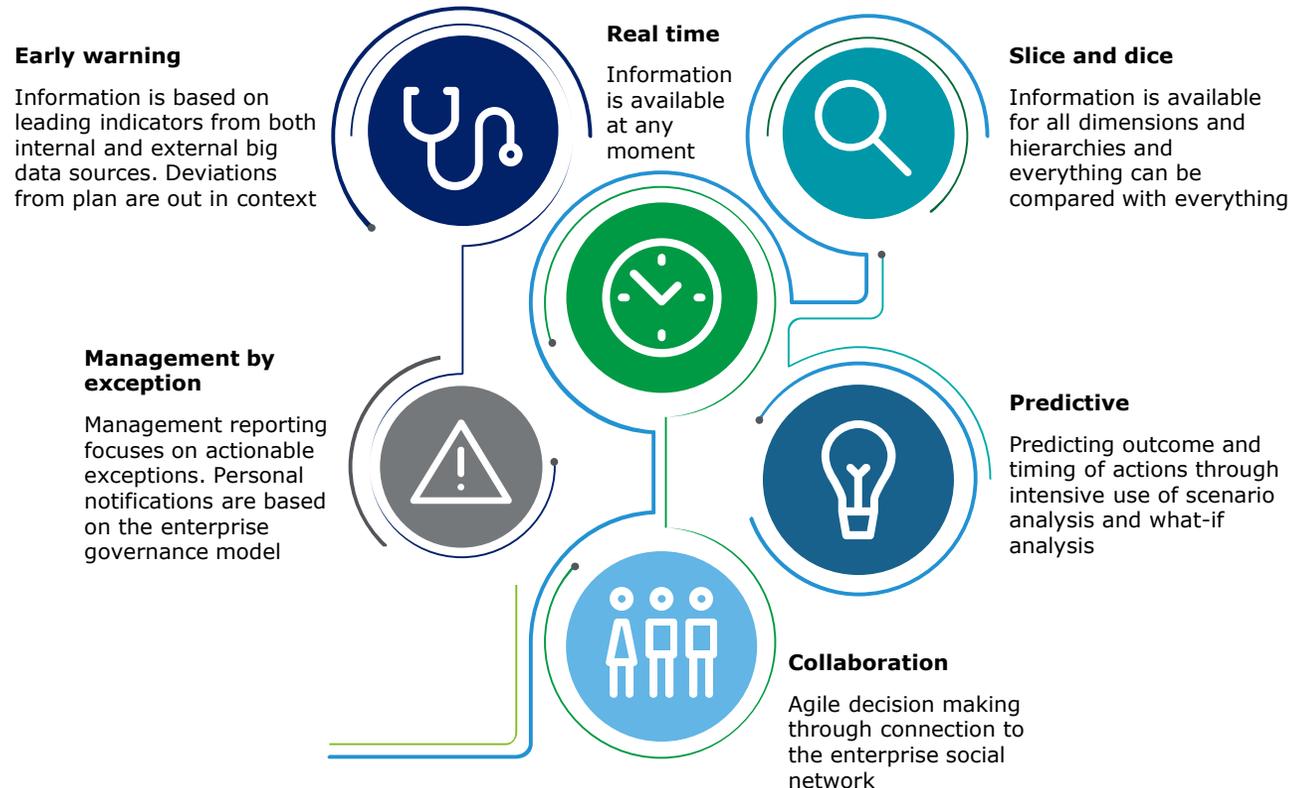
Challenges & opportunities - Organizational efficiency

Increased competition between ports requires ports to focus on organizational efficiency and performance management



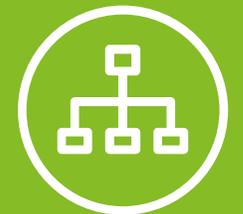
Performance management

The performance management system of the future is exception-based, real-time and predictive



Performance management for leading African port

- Port authorities face new challenges and need to think of alternative business models and a new set of capabilities to address these challenges.
- Deloitte Port Services facilitated the port leadership around their thinking of how emerging trends and developments could disrupt the port and how the port could respond to this new reality.
- A business model with corresponding set of required capabilities was drafted and presented to the board.

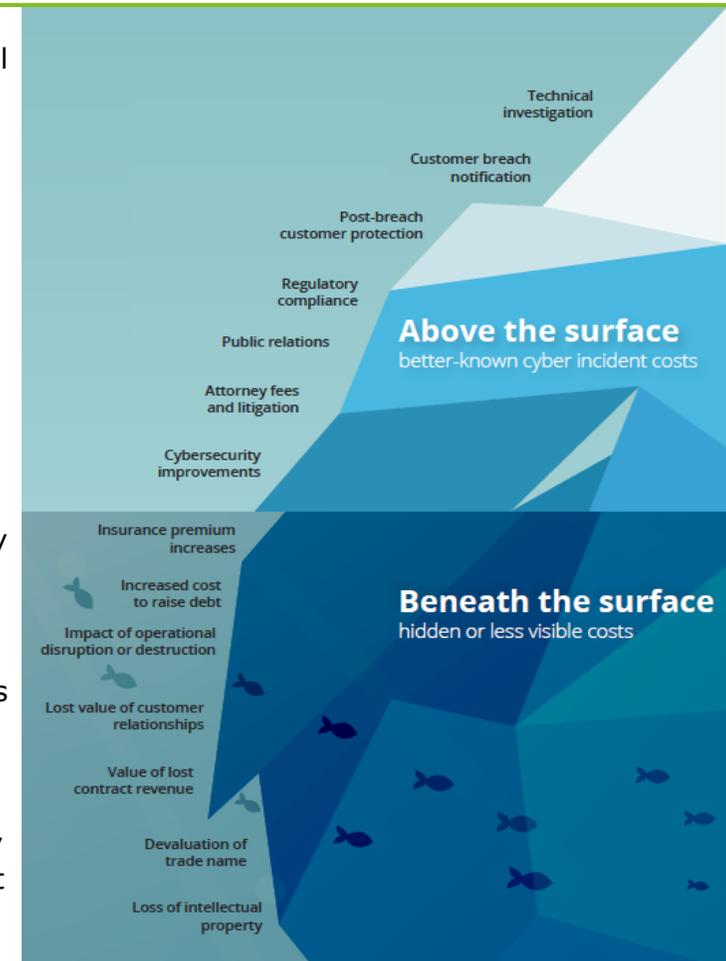


Challenges & opportunities – Safety and Security

Being at the heart of global supply chains, ports need to be at the forefront of safety and (cyber)security



- **The dark side of technology** - Technological advancements also have a dark side: cybersecurity and cyber-resilience are becoming more important as a parallel to physical security. Port security has become a top priority for ports worldwide, also because port security (ISPS) is becoming a critical location factor for international shipping / transportation companies.
- **Ports are vulnerable to cyber crime** - Ports should be prepared to deal with existing and emerging cyber threats from criminals, terrorists and enemy nation states that could shut down large pieces of the country's critical maritime transportation system. A prominent example is the Port of Antwerp where drug traffickers recruited hackers to breach IT systems that controlled the movement and location of containers.
- **Active risk management is required** - Ports and port facilities are required to implement risk management activities and take numerous precautions, such as drafting security plans, engaging security officers and deploying security equipment. These safety and security precautions now significantly influence many ports' day-to-day business activities.
- **Security software technology increases reliability** - When developing new ports or port areas, security procedures and processes can be optimised with the implementation of state of the art security software technology. The use of various control systems and increasing automation in general in the port will reduce the risk of human errors and automation increases reliability of the system. The same applies to integrating RFID-technology to increase transparency and detectability.
- **A secure port requires a risk-aware culture** - The importance of cybersecurity will only increase when the internet of things takes a more prominent place in port operations. But the solution to a safe and secure port is not just technological – it requires building a risk-aware culture.



Challenges & opportunities - port / city duality

With ever increasing cities, more and more ports are enveloped requesting new strategies towards port / city development



- **Port and city are disconnected** - The relationship between ports and cities is said to be disappearing. Port and city have institutionally been disconnected in many cases as port authorities have been privatized in many countries with limited governmental control over port activities. The new footloose character of ports and the strong international outlook would theoretically allow it to function almost anywhere. It should no longer be bound to the urban environment.
- **Urban ports remain dominant** - However, most of the world's leading ports are located in and are closely connected to their hosting urban environment. The urban ports keep their dominance over better located competitive non-urban ports. Most interesting is that the urban-port connection is receiving more attention.
- **Ports can contribute to urban economic development** - The increased attention of policy makers towards the development of the port is focused on ports being a key factor in the economic development of local economies. Port activities and typical urban business activities such as maritime services, insurance, banking, (commodity) trading are increasingly considered to be synergetic.
- **Waterfront (re)development is an opportunity** - Combined with increasing migration towards cities, waterfront redevelopment of port areas is more topical than ever. Due to the fact that urban centres have historically evolved around transport hubs, ports are often located in or near the city centre, an undesired location for 'environmental unfriendly' port activities. With migration to cities and high land values as important drivers, inner city ports are being relocated to sites with less impact on the city and the people that live in it, whilst former port areas are redeveloped into lively working and living areas.



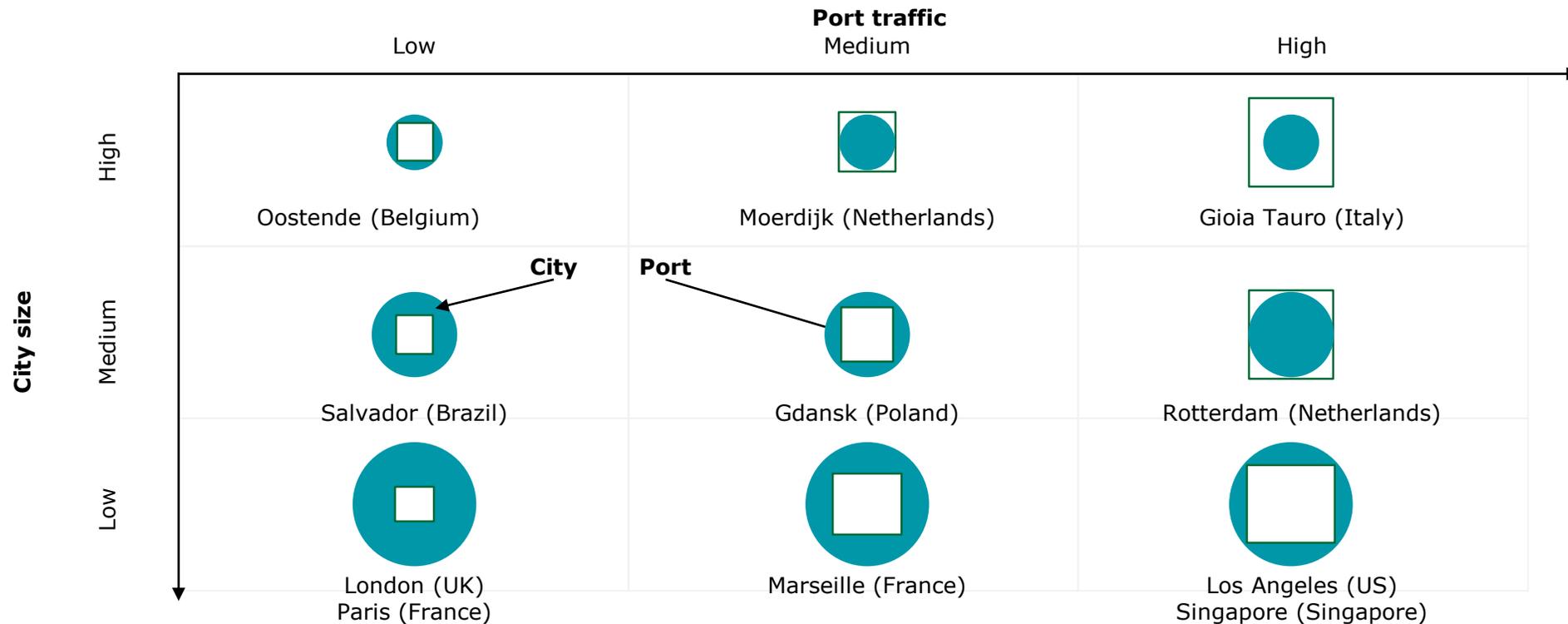
Challenges & opportunities - port / city duality

With ever increasing cities, more and more ports are enveloped requesting new strategies towards port / city development



Typologies for port cities

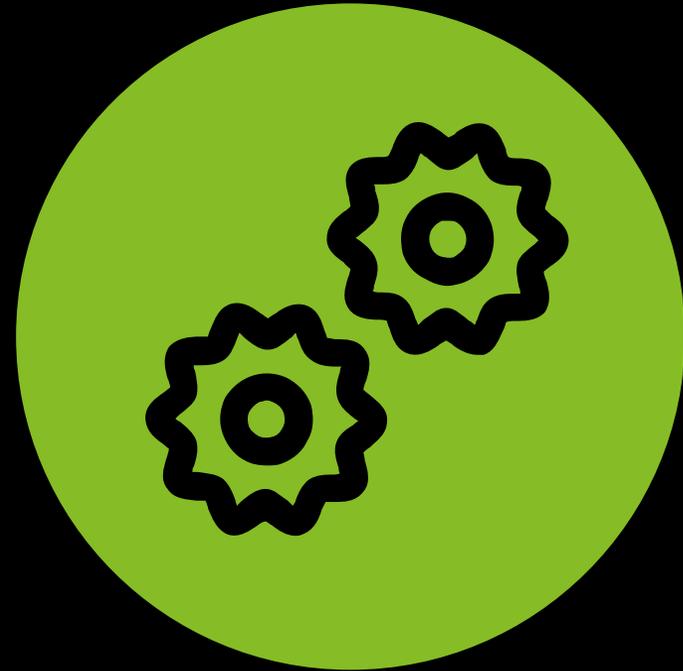
Ports have a complex relationship with the hosting city



Source: Ducruet and Lee (2006), Deloitte analysis



Capabilities & client cases



Capabilities & client cases

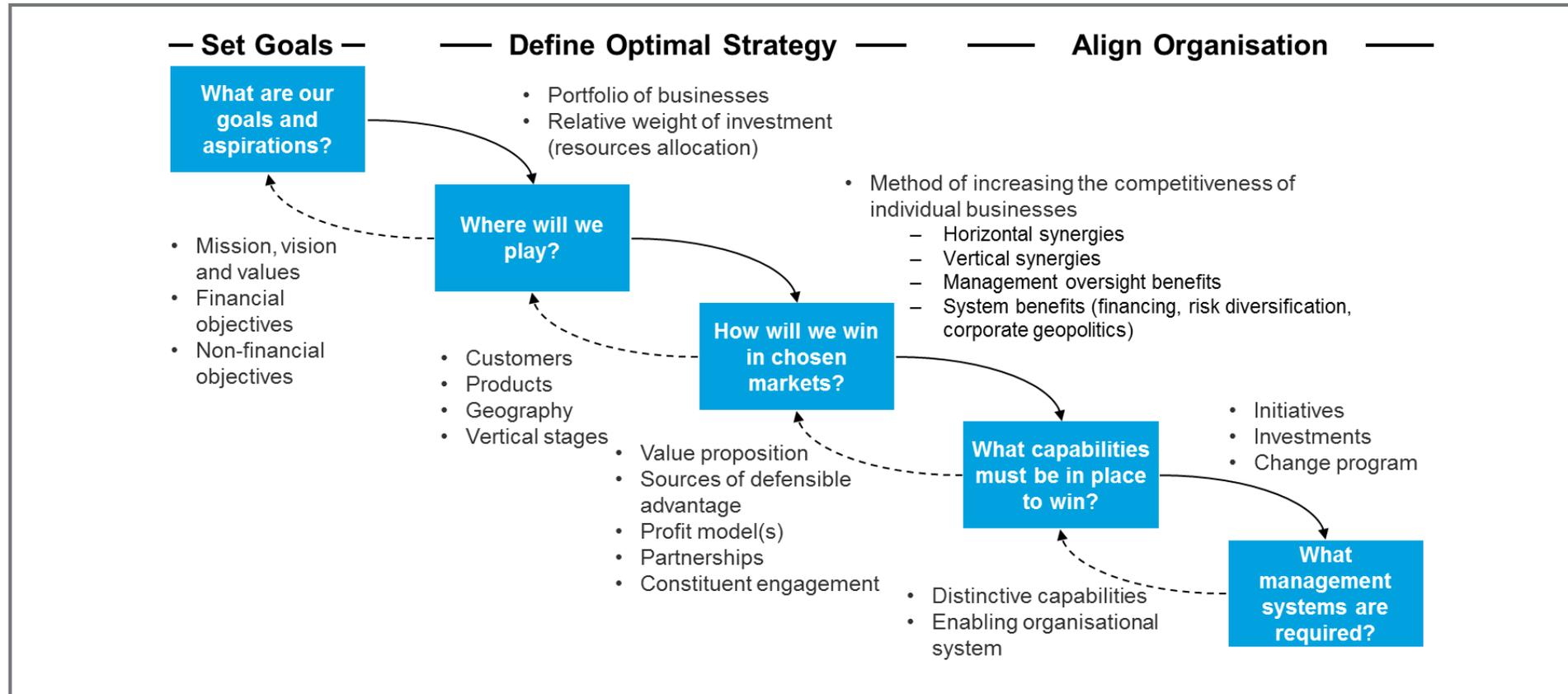
Port strategy – Fit for the future



- **Ports are entering a new paradigm** with disruptive innovations and exponential developments in technology, demography, economy and society. Global trends and challenges have a significant impact on the port and its operations ask for reflection and agility. Given the ongoing industrial restructuring towards renewable energy and circularity to fight against greenhouse gases, ports need to adapt in order to survive and hold on to the thousands of jobs and the added value that is created in the port area. This requires well informed strategic decision making.
- Deloitte Port Services has a strong track record and proven methodologies to assist port authorities in an industry that is on the move. We provide guidance for **strategy development and deep industry insights** for new or existing ports to assess development options and identify expected results, potential risks and funding needs based on the review of traffic evolution and forecasts, market situation, the competitive positioning of the port and its operational characteristics.
- Deloitte provides port executives with insights required for setting the strategic direction. Present and future external and internal driving forces and the **evaluation of the value and risk of future scenarios influence the strategic direction** of a port. Deloitte combines strategic thinking with practical experience of the maritime and transport industry. Our approach for strategy development starts with an assessment of the current situation, followed by an analysis of macro drivers, market assessment, traffic demand forecasting and competitor analysis in order to identify the strategic options. These options will be assessed by identifying investment options and a risk / reward analysis; ultimately leading to strategic recommendations for the future strategy.

Capabilities & client cases

Port strategy – Fit for the future



Leading port in Europe

Deloitte Port Services advised on the Port's vision and growth strategy to 2030, resulting in a clear definition of five key value areas and the qualitative and quantitative substantiation of these five areas and a plan / approach for innovation business transformation

Leading port in Europe

Deloitte advised on the Port's strategy and the way that they approach innovation in order to become more successful in launching and realising the innovation potential in the organisation

Capabilities & client cases

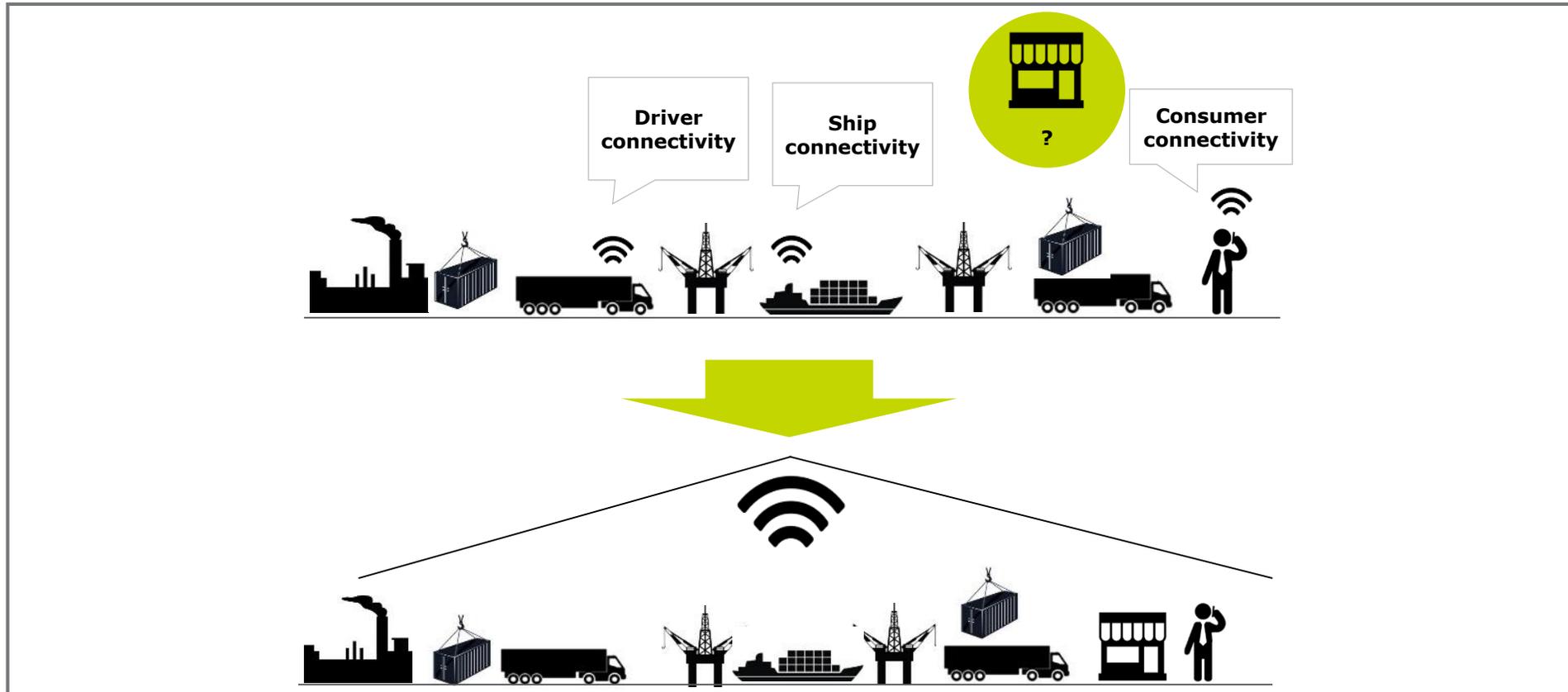
Smart ports – guiding new partnerships and waves of innovation



- Logistics are becoming more complex, **increasing the need to digitalize information streams** which allows for optimisation of existing infrastructure. This optimisation allows an elimination unnecessary transport. The digitalisation is performed through data analytics and exchange combined with new technologies (self steering ships, navigation sensors, inspection drones). Technologies like blockchain will allow for a true peer-to-peer exchange of value, cutting out the middle man. This trend also increases visibility, for instance an online portal allowing customers to obtain quotes and place orders within seconds without pre-registration.
- We observe an increased awareness at ports around the **importance of smart solutions**. Relevant stakeholders, including port authorities, knowledge institutes, universities and (maritime) businesses, are teaming up to map the innovation ecosystem and generate ideas for smart port solutions. This is supported through the development of Internet of Things (IoT) networks in ports, unlocking opportunities to connect all kinds of machines to the internet and spurring innovative potential.
- Deloitte is actively guiding ports and stakeholders in how to embrace new technologies and apply them for the better of the port users and to create an innovation port ecosystem. We understand that being a smart port is not only about providing solutions for port users, but teaming with stakeholders to **add value to the ecosystem**. This asks from port authorities to review their business model and start thinking in non-standard partnerships and alliances with a-typical partners. New partners may need to be attracted to the port. Deloitte has the tools and methodologies to create and develop these partnerships.

Capabilities & client cases

Smart ports – guiding new partnerships and waves of innovation



Leading port in Europe

Deloitte Port Services advised on innovation in the port and the future business model of the port

Port in Africa

Deloitte Port Service facilitated a workshop around global trends and developments and the impact on ports and how ports could respond to these trends and developments

Capabilities & client cases

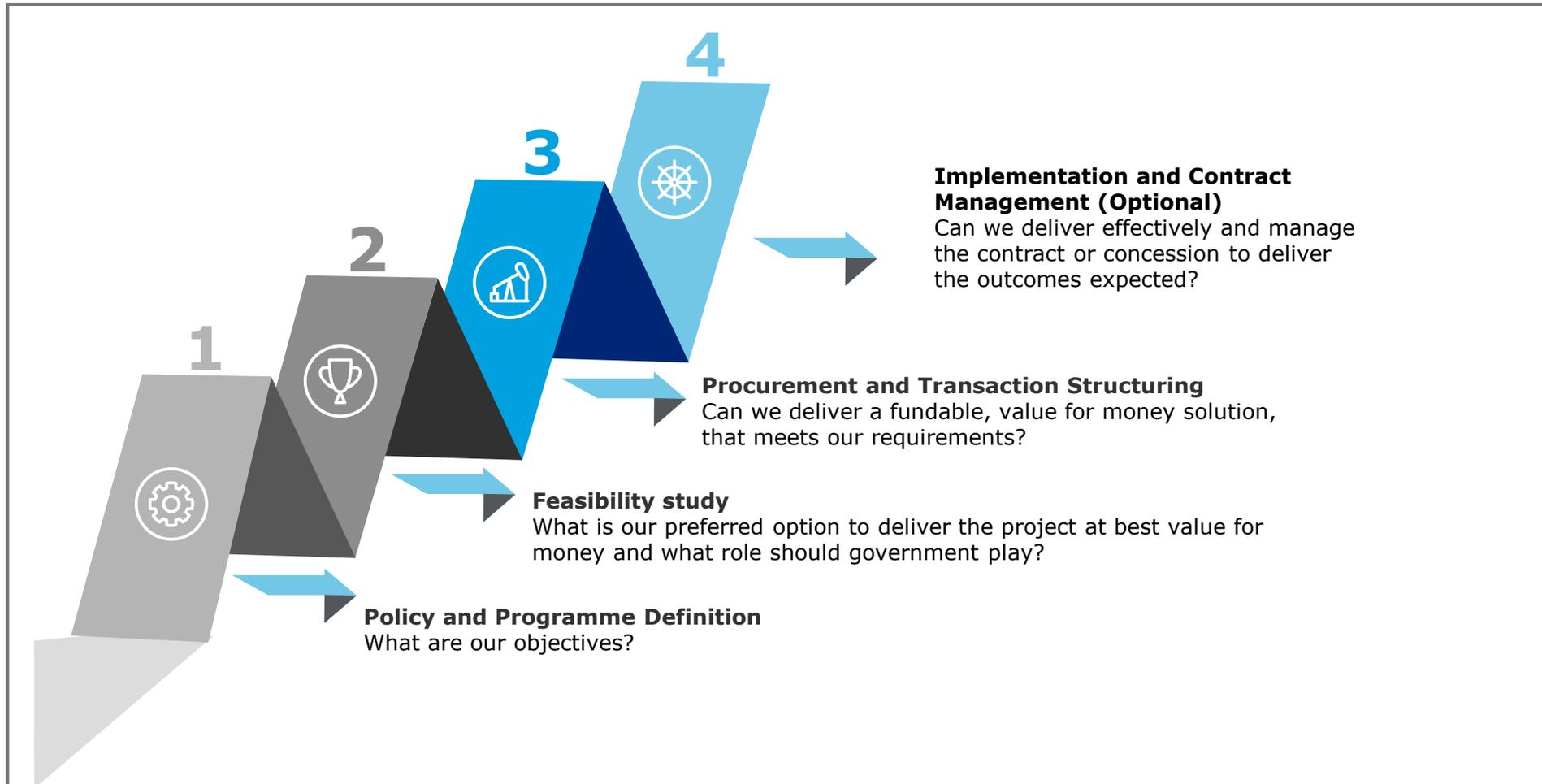
Port development – Realise new port infrastructure



- **Ports are in a continuous evolution, and port development is not the sole responsibility of port authorities.** Whilst port authorities are developing ports and industrial complexes in a most efficient, safe and flexible way, they are doing so in close cooperation with business in and around the port. Attracting and accommodating cargo and transport flows and businesses is of vital importance to the port, but due consideration should be given to the port surroundings and environment.
- **Deloitte Port Services advises ports and relevant authorities on the assessment of port and terminal development options and the appropriate bundling of uses and projects to attract investment capital.** We analyse potential partners / investors and support the structuring of relevant tenders / agreements up to contract signing. Key offerings in the various stages of port development include:
 - Market assessment
 - Cargo flow forecasting
 - Business cases and financial feasibility studies
 - Economic impact assessment
 - Financial modelling
 - Soft market testing
 - Public-private partnerships
 - Transaction and contract support
 - Real estate value enhancement options
- We understand the key drivers of a robust feasibility study – or business case and also understand the common short-comings that prevent effective decision-making. This contributes to efficient business cases for port development.
- Deloitte Port Services does not provide technical services for port development.

Capabilities & client cases

Port development – Realise new port infrastructure



Leading port in Europe

Deloitte Port Services advised the client on the feasibility of redeveloping inner city port areas into innovative and competitive port areas. We supported with the development strategy, drafted a business case including a financial model and advised on potential partnerships

Leading port in Europe

Deloitte Port Services advised on the development of new sea locks, the financing and funding structure, the business case and the overall feasibility of the project. Also, Deloitte Port Services advised on the economic value of the sea cruise for the port and the city and the impact of developing bridges over the approach channel

Capabilities & client cases

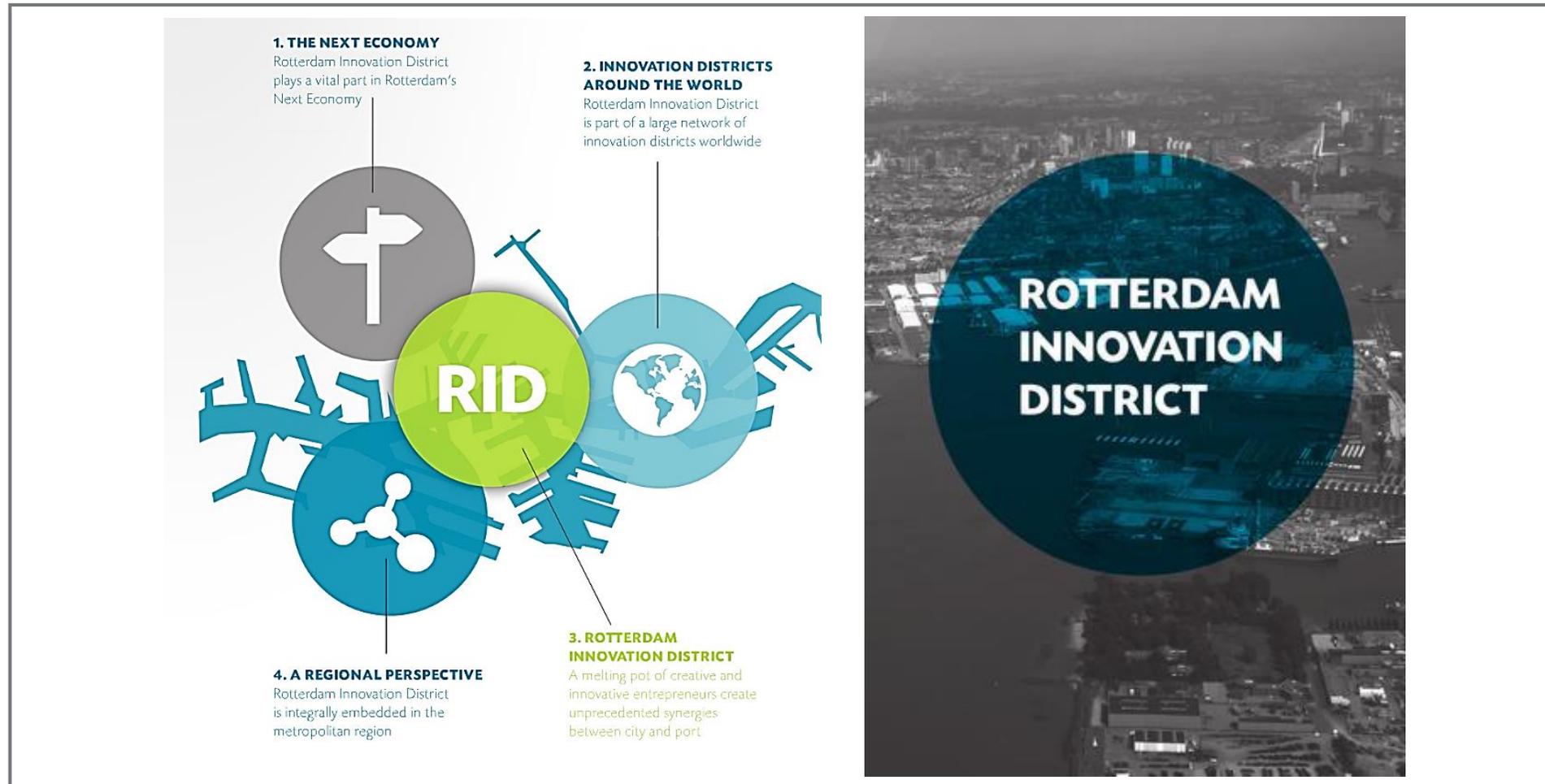
Waterfront (re)development – Transformation into vibrant living areas



- **In many of the world’s leading port cities, regeneration of old, inner city port areas is becoming increasingly profitable.** Many of the inner city port areas are faced with environmental restrictions which limits the port operations it can perform. Hence it loses its value as a port area and becomes profitable for regeneration / redevelopment.
- **Port areas surrounded by residential and office locations are being transformed** into working and living areas. Examples of extensive waterfront (re-) developments include Canary Wharf in London, Boston Innovation District in Boston, Stadshavens in Rotterdam and HafenCity in Hamburg.
- **Deloitte Port Services has a broad expertise** in waterfront development and supports port authorities, government administrations, corporates and partnerships in all phases of decision-making. Key offerings regarding waterfront development include:
 - Business cases and feasibility studies
 - Process management
 - Impact assessment
 - Financial modelling
 - Risk management
 - Public-private partnerships
 - Finance / funding structures
 - Tender support

Capabilities & client cases

Waterfront (re)development – Transformation into vibrant living areas



Leading port in Europe

Deloitte Port Services advised on the feasibility of redeveloping 1.600 hectares of inner city port areas into a lively new living and working environment. We supported with the development strategy, drafted a business case including a financial model and advised on potential partnerships

Leading port in Europe

Deloitte Port Services advised on the feasibility of the city-port duality and business case, the redevelopment strategy with the objective of transforming former inner city port areas into lively and vibrant new inner city living and working areas

Capabilities & client cases

Port resilience – Develop resilient and competitive maritime clusters



- **The port is a complex structure in which port authorities, port operators, shipping lines, terminals and nautical service providers cooperate.** Increased integration of supply chains results in increased interaction with other transport clusters, including aviation and logistics. These parties and their cooperation are being influenced by a number of factors which together determine the **resilience and competitiveness** of the port cluster.
- **Deloitte developed a the Port Analysis Model (PAM) to assess the current and future potential of a port** in terms of attractiveness or competitiveness by getting a broad, static picture of a port and assessing the port against key themes. The PAM has been developed in a partnership between the Port of Rotterdam and Deloitte and has also proved successful as a benchmarking tool for current and proposed ports and provides input for increasing port resilience. It has been applied to a large number of ports, including Amsterdam, Antwerp, Bintulu, Davao, Hamburg, Huelva, Port Kelang, Rotterdam, Saint Petersburg and Singapore.
- **Ports are faced with a rapidly changing external environment.** Long term sustainable strategies help ports to adapt and change together with the environment. Resilience on the other hand helps an organisation to prepare for and recuperate from shocks. These shocks can be natural or man made. Tools like **stress tests, vulnerability indexes and strategic action plans** are recommended for a successful resilience analysis. Our colleague Indra Vonck, PhD, completed his PhD on this specific challenge for ports.

Capabilities & client cases

Port resilience – Develop resilient and competitive maritime clusters



Port in Southeast Asia

Deloitte Port Services advised on pricing strategy / tariff structure and provided insights into the competitiveness of the port compared to ports in the region, based on the Deloitte Port Analysis Model

Government in Middle East

Deloitte Port Services advised on the competitiveness of the maritime cluster, in coherence with the logistics and aviation cluster, and developed a model to monitor the competitiveness

Capabilities & client cases

Cyber security – Manage cyber risks with confidence



- **Organizations in the wider supply chain industry are way ahead on grasping possibilities of data-driven technology, having widely distributed networks and relying on rapid information about those networks to make decisions.** But with ongoing digitalization cyber challenges are just around the corner. Critical infrastructure in the maritime sector sustains essential services and movement of vital goods. Maritime activities are so crucial that their unavailability or delays in their supply chain may adversely affect entire populations as became apparent by the West-Coast strikes.
- **Since maritime organizations can not afford to stop innovating, they need a cyber risk management approach that is grounded in their overall strategy and key objectives.** This approach is built on the premise that not everything can be secured all the time.
- **Deloitte’s Cyber Security team can help you address cyber challenges.** A grasp of our wide variety of cyber risk management services:
 - Our security strategy & transformation team allows organizations to create real business value through security.
 - We organize “red teaming” exercises in which we combine both the human, physical and technical elements in the simulation. This simulation provides a good overview of current information security maturity within your organization.
 - We provide support in setting up an effective crisis management organization, capable of mitigating the impact of an event during a crisis situation and minimizing the impact on people, the environment, assets, reputation and stakeholders.

Capabilities & client cases

Cyber security – Manage cyber risks with confidence



Port in Southeast Asia

Deloitte advised on the roadmap for a highly decentralized organization to improve the client's information security maturity, with a focus on its detect and response capabilities

Global Container Transport Company

Deloitte advised on terminal operating system compliance and created a standard operating procedures and control framework related to security policies including hardening and patch management, with a focus on Terminal Operating System, in order to demonstrate compliance to group requirements

Capabilities & client cases

Port transactions – Realise successful transactions



- **We believe that a proper transaction strategy is the basis for a successful tender process execution.** Each transaction is unique and therefore requires a tailored transaction strategy and execution.
- **We support sellers in their efforts to attract capital and appropriately structure / restructure agreements with investors and lenders.** This includes drafting the transaction strategy, preparing and executing tender processes and negotiating concession / contract terms and conditions.
- **We support investors in the strategic review of potential targets and throughout the transaction process providing financial, commercial and tax advisory services.** In-depth preparation for the tender process, a well-prepared bid strategy and balanced negotiation of terms and conditions contribute to achieving the strategic goals of investors.
- **Deloitte has a strong track record in supporting public (port) authorities and private investors in all of the stages of a transaction.** Our services include:
 1. Transaction / bid process strategy
 2. Drafting transaction documentation
 3. Review of legal documentation
 4. Transaction coordination and support
 5. Valuation
 6. Risk management
 7. Negotiation support

Global Operating Maritime & Logistics Service Provider

Deloitte advised on the sale of the company's port agencies activities, its business strategy and on subsequent acquisitions

Global Terminal Operator

Deloitte advised on the transaction process, the business case, the actual port sector market conditions, risks and transaction scenarios, leading to the valuation of the container terminal and the transaction advice to the GTO's Head Quarters

Capabilities & client cases

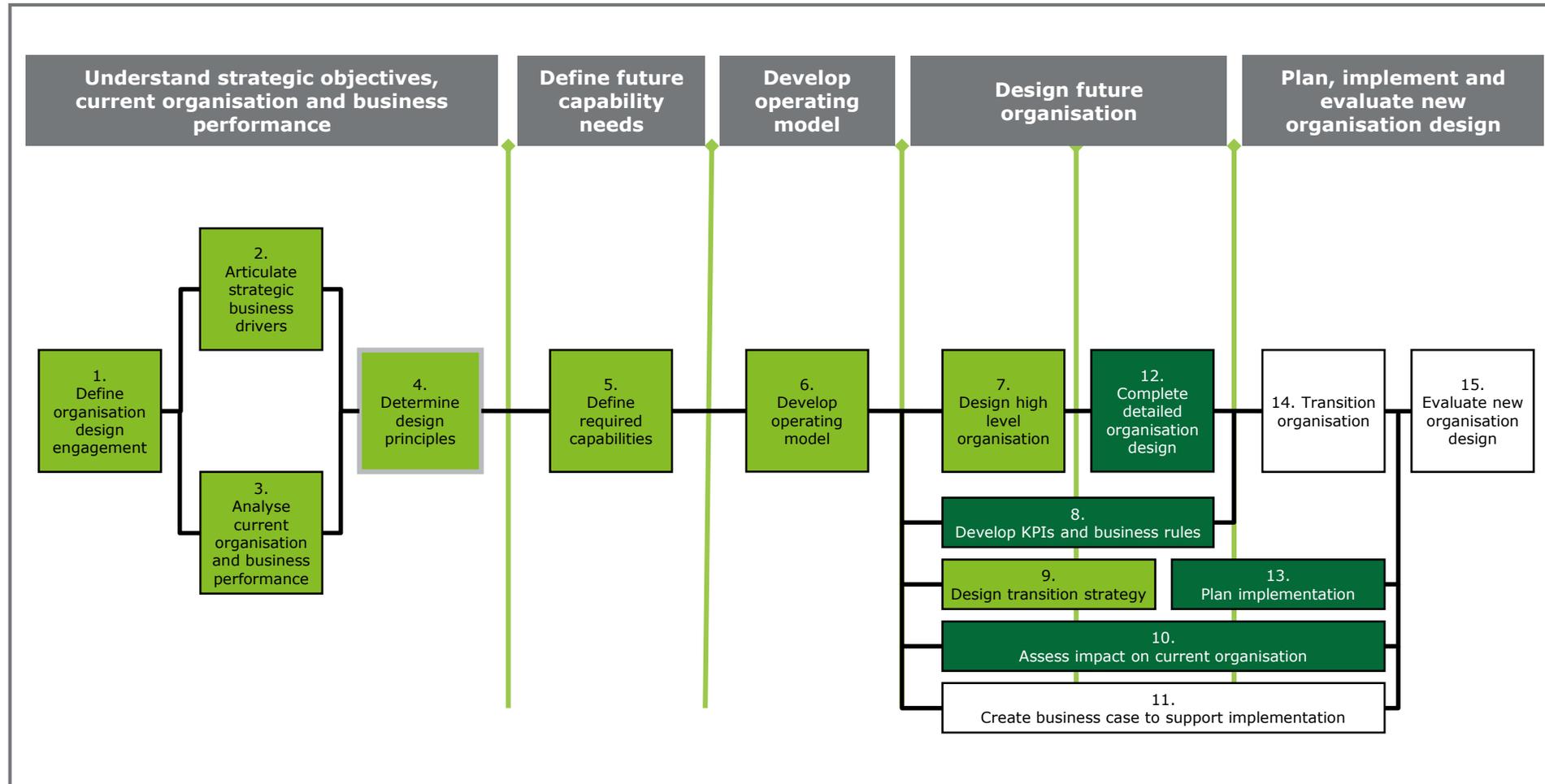
Port operating model – facilitating operational efficiency and growth



- **Ports are operating in a rapidly evolving environment and to remain relevant, ports require operating models that addresses tomorrows challenges.** Building on trends and developments for ports as described in the organizational efficiency section, **Deloitte's Port Operating Model** focuses on six interrelated operating model dimensions and example questions:
- **Processes**
 - What is the end-to-end design of our processes to drive standardisation and scale efficiency? How does process ownership and accountability for each capability need to be implemented? How will our core processes operate in the real world?
- **Information**
 - How to organise most efficiently to support the new model?
- **Technology**
 - What technology do we need to provide to support the design principles? What type of architecture, applications and systems are required?
- **Organisation**
 - What high-level governance constructs are required? How is the internal control framework set up?
- **People**
 - How many roles will be displaced and from where? Where will we need to retain / recruit? What training (knowledge / skills) is required? What other entities / people are impacted?
- **Physical location**
 - Which locations should be considered? Which locations should be strategic sites? What are the associated costs and establishment plan?

Capabilities & client cases

Port operating model – facilitating operational efficiency and growth



Port in Africa

Deloitte advised on the restructuring of a port authority and drafted a new organisation structure and a detailed organisation design

Leading port in Africa

Deloitte Port Services advised on the way ports around the world respond to disruptive trends, on how to align its organisation structure and operating model to this constantly changing environment and on the capabilities that must be in place to be competitive in the ports industry today and in the future

Capabilities & client cases

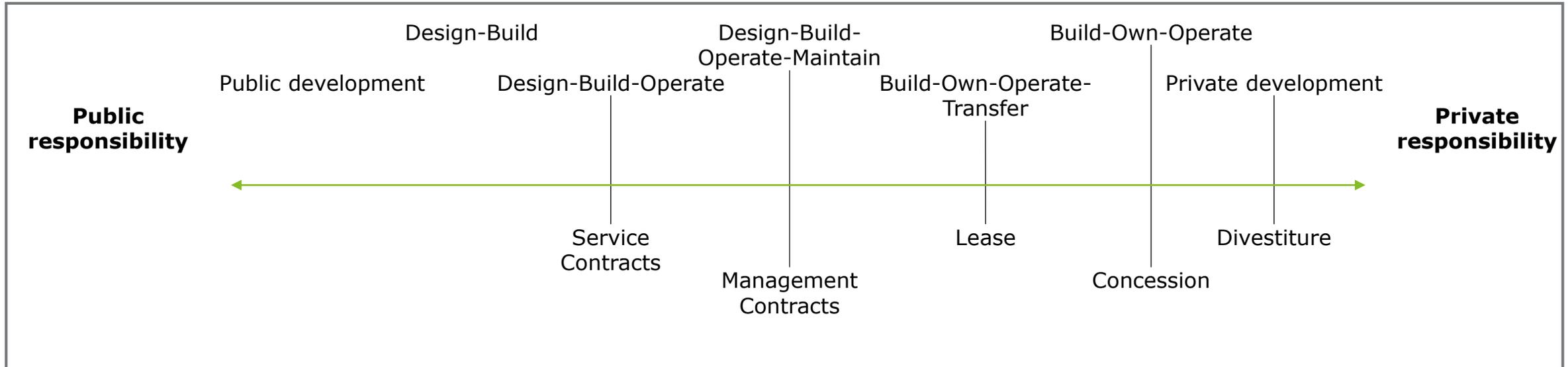
PPP & Concessions – allocate risks to where they belong



- **Public Private Partnerships (PPPs) or Public Private Initiatives (PPIs) are becoming increasingly more common, especially in areas such as port re-development and infrastructure.** For a successful PPP, a great deal of **preparation and planning is required**. Additionally, sufficient commitment, good communication and comprehensive contracts are essential factors for successful partnerships.
- **Allocating risks to parties with the best ability to manage these risks will produce true value for the public sector.** Organisations are more willing to retain or transfer identified risks if the PPP process is transparent and it follows a sound framework from initiation through to procurement.
- **Deloitte has extensive international experience with the design, implementation and process management of PPPs.** PPP process management involves communication between all partners, management of potential conflicts of interest, financial modelling, risk assessments (including pricing of), Public Private Comparator (PPC), Public Sector Comparator (PSC), bringing on the market, management of the bidding process, final negotiations and contract award and management. Through tested methodologies and practical guidelines we are able to add value to any PPP initiative.

Capabilities & client cases

PPP & Concessions – allocate risks to where they belong



Leading port in Europe

Deloitte Port Services advised on the Public Private Partnership contract and structure for the development of major port infrastructure

Port in Oceania

Deloitte advised on the creation of a Public Private Partnership for The development of a berth expansion, which included market sounding, business case, procurement and transaction design and management

Expertise



Expertise

Deloitte Port Services professionals work for leading global companies in the Port & Terminal Industry



Selected clients shown include clients of Deloitte member firms around the world

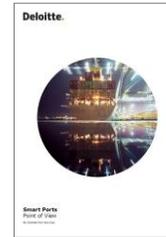
Expertise

Thoughtware by Deloitte Port Services and related publications



Global trends in the Ports industry

An overview of past and future trends in the global Ports Industry, developed and presented for a client workshop in South Africa.



Smart Ports

A tidal wave of technological innovation & integration is pushing industries and businesses to transform themselves in an effort to become more data, and insight-driven. The port industry is no exception. The Smart Ports document gives a Point of View on the port of the future.



Global ports organisation design

An overview of port organisation structure and the impact global trends have on port org design, developed and presented for a client workshop in South Africa.



Shipping smarter – IoT opportunities in transport and logistics

Deploying and expanding IoT capabilities requires more than just technological breakthroughs—making a system work requires not only an understanding of the industry dynamics but also a strategic approach to the Information Value Loop.



Port Analysis Model

The PAM is a strategic instrument for the broad analysis of ports, within their context. The PAM allows port professionals to assess the current and future potential of a port in terms of competitiveness through a broad, static picture of a port in its environment.



Ship shape and ready for business

An overview of Deloitte's Point of View and expertise in the shipping business, highlighting a selection of customized services offered to shipping clients to tackle the current challenges they face.



Resilience in seaports dealing with turbulent environments

A conceptual approach of resilience in seaports with a set of tools and policy recommendations for Port Authorities and port industries— published by Deloitte Port Services professional Indra Vonck, PhD, as PhD dissertation.



Panarchy within a port setting

The panarchy theorem provided a frame of mind for decision makers which links social and economic thinking to economic development – published by Deloitte Port Services professional Indra Vonck, PhD, in in the Journal of Transport Geography.

Collaboration



Collaboration

Deloitte Port Services is a global network of port and terminal professionals coordinated from the Netherlands



Collaboration

Deloitte Port Services is a global network of port and terminal professionals coordinated from the Netherlands



Sjors (George) Berns

Deloitte The Netherlands | Deloitte Port Services
Senior Manager, Ports Leader

Mobile: +31 6 2078 9894

sberns@deloitte.nl



Sjors Berns leads Deloitte's Port Services group, the Center of Expertise for the port industry. He is a senior manager in Deloitte Financial Advisory Services and works in the Real Estate & Partnerships practice. Sjors has, for over a decade, advised leadership at leading port authorities, terminal operators, investors and national, regional and local governments around port development, feasibility and port and cluster competitiveness.

Indra Vonck, PhD

Deloitte The Netherlands | Deloitte Port Services
Senior Consultant Ports

Mobile: +31 6 1335 6402

ivonck@deloitte.nl



Indra Vonck is a consultant at Deloitte Financial Advisory Services in the Netherlands and works in the service line Real Estate Advisory with a specific focus on seaport and maritime development. Before joining Deloitte he worked at the University of Antwerp in close cooperation with port stakeholders and authorities as researcher and project manager. During this time he also obtained a PhD in Seaport Resilience from the University of Antwerp and Solvay Business School.

Regional presence, expertise and networks

Deloitte's strong global presence, as well as regional strength in key markets, enables us to leverage our vast experience with ports and port industry development across geographies, to understand and address the critical challenges players face in the ports and shipping industry.

We deliver an integrated approach across geographies and bring a proven ability to provide world-class opportunity and delivery teams with the right sector and language skills rapidly anywhere the world. This has proven effective in our support of clients across the value chain.

Jochem Dragt

Deloitte The Netherlands | Deloitte Port Services
Port Director

Mobile: +31 6 8201 9148

jdragt@deloitte.nl



Jochem Dragt is a director at Monitor Deloitte Strategy Consulting in the Netherlands. He predominantly works in Energy & Resources industries and is part of the Deloitte Port Services group. Jochem brings over 20 years of working experience and he worked closely with port authorities, terminal operators and shipping companies on strategic commercial topics such as go-to-market strategies, portfolio strategies, innovation, segmentation and pricing.

Casper Ryborg

Deloitte Denmark | Deloitte Shipping & Ports
Partner Consulting, Global Shipping & Ports Lead

Mobile: +45 3093 5551

cryborg@deloitte.com



Casper Ryborg leads Deloitte's Global Shipping & Ports group with a prime focus on serving shipping clients. As leader of Deloitte's Shipping & Ports group, Casper works with a global network of over 500 shipping & ports professionals in Audit, Financial Advisory, Consulting and Tax to deliver value to clients. Casper's area of specialisation is delivery of complex business-critical transformation programmes and he is dedicated to making business more efficient and effective in delivering change.



Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee ("DTTL"), its network of member firms, and their related entities. DTTL and each of its member firms are legally separate and independent entities. DTTL (also referred to as "Deloitte Global") does not provide services to clients. Please see www.deloitte.nl/about for a more detailed description of DTTL and its member firms.

Deloitte provides audit, consulting, financial advisory, risk management, tax and related services to public and private clients spanning multiple industries. Deloitte serves four out of five Fortune Global 500® companies through a globally connected network of member firms in more than 150 countries bringing world-class capabilities, insights, and high-quality service to address clients' most complex business challenges. To learn more about how Deloitte's approximately 225,000 professionals make an impact that matters, please connect with us on Facebook, LinkedIn, or Twitter.

This communication contains general information only, and none of Deloitte Touche Tohmatsu Limited, its member firms, or their related entities (collectively, the "Deloitte Network") is, by means of this communication, rendering professional advice or services. Before making any decision or taking any action that may affect your finances or your business, you should consult a qualified professional adviser. No entity in the Deloitte Network shall be responsible for any loss whatsoever sustained by any person who relies on this communication.