

# Improving business performance while managing challenges

## Part 1: How Port Architecture can make a difference

**Martin Sharp**, Business Development Manager, BMT Hi-Q Sigma Ltd., London, UK

### The business context:

Ports and terminals are complex businesses and a key link within the overall logistics supply chain. However, some might argue that they are indeed the weakest and least transparent link in the chain. Examples of these complexities include:

- Operating in different ways, for example Gateways, Transshipment, Free Trade Zones, to name a few
- The structure of ports in terms of land, terminal infrastructure, terminal superstructure, quayside operations, landside operations and the ownership of these, which vary considerably
- The volumes of cargo expected to be handled by a port are ever increasing, and the need for flexibility is creating a new set of challenges
- Ports will soon need to consider the berthing of nuclear-powered vessels, and when this is combined with unrest and terrorism around the world security quickly becomes an added pressure
- Technology – be it automated handling systems, port community systems, planning systems, security systems and so on – and the need to ensure the safety of workers in a dangerous environment
- A growing need to reduce the adverse effects on the environment.

It is clear from this list that running a port is growing in complexity and with no sign of this easing, certainly not in the near future, the question is how do we improve business performance whilst dealing with continuing pressures?

### Business planning

Into this complex environment we have to add the customers. Professor Robert Cochrane recently spoke at the FACT 2011 Seminar in London and suggested that “The Terminal Manager’s objective is: to satisfy the shareholders by making a profit through providing terminal facilities which attract and serve customers



Ports present complex challenges when it comes to improving efficiency while keeping costs down.

including shipping lines and agents, hauliers, financiers and insurance companies – the most important of which are the shipping lines.”

Ports exist to move cargo and passengers between sea and land (not forgetting dry ports and transshipment hubs) as quickly as possible; therefore the amount of cargo that customers wish to move through a port is critical to the success of the businesses involved in a port. BMT is frequently asked to provide terminal operators, port owners, financial investors and others with traffic forecasts that provide vital input into business plans looking forward for the next 10 to 30 years. Our multi-faceted approach to port traffic forecasting incorporates a wide variety of variables that directly relate to the port sector, and recognize the importance of relationships between:

- Cargo volumes and developments in both sectors of the economy and industry, as well as with the economies of partner countries.
- Past and future interactions and how these have, or are likely to, shift over time as economic relationships change; whether on a temporary or permanent basis. This is achieved through econometric and other statistical analysis, as well as market research to ascertain structural changes in the industries that import and export.

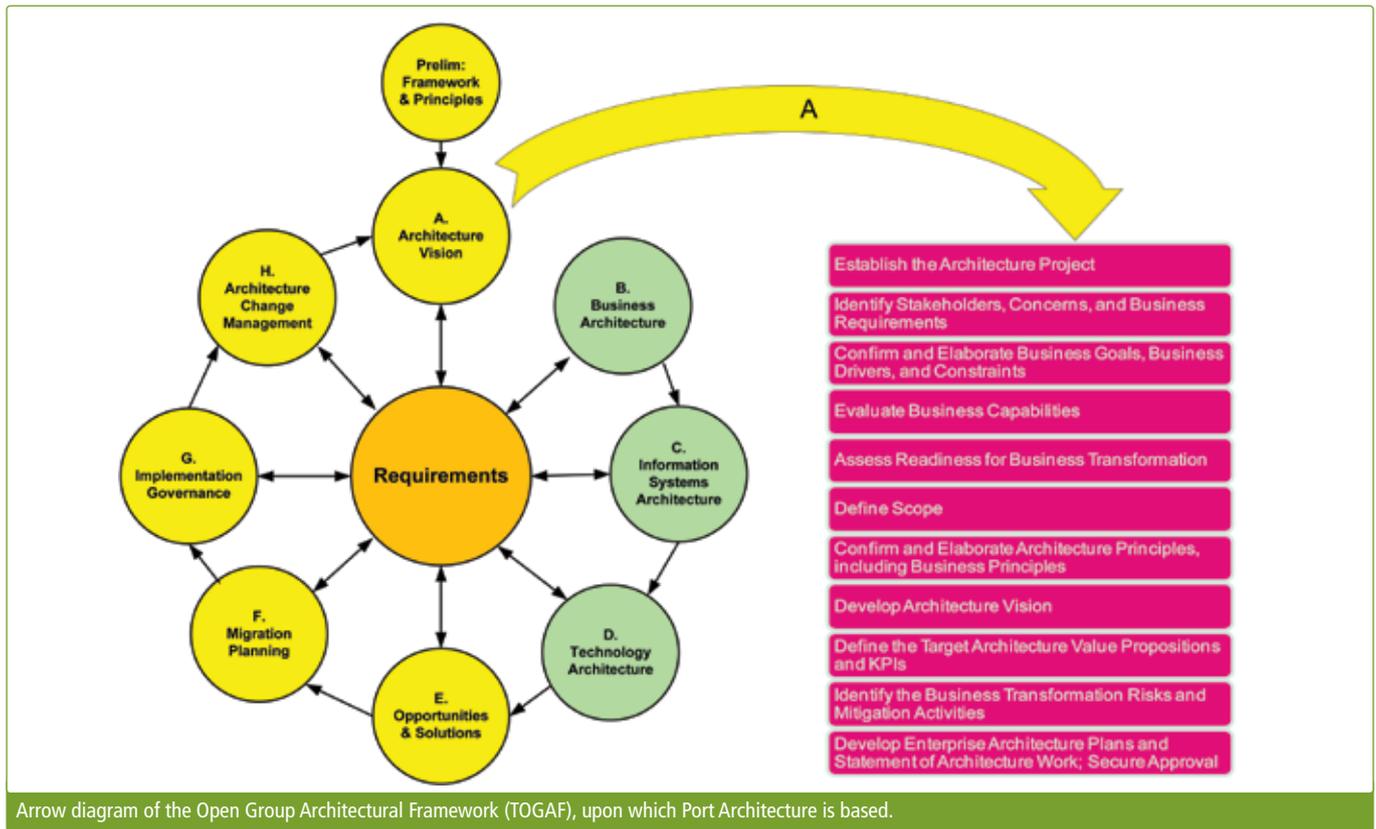
In addition, and most importantly, the impact of changes in the infrastructure, technology and the commercial state of the transport sector are factored in by a process of specialized desk and field research. What everybody is trying to achieve is the highest level of confidence in the volume of goods, passengers and so on through a port, and therefore have a better understanding of the potential for ongoing business in a changing environment. With this ever-changing market, how can we keep on improving the business performance?

### Investment in technology

Technology adds another dimension to the problem of improving business performance. At the recent conference on Automation organized by PORTeC in London, speakers acknowledged the importance of automation and its supporting technology, but suggested that there are only minor improvements that are left to be made. The infrastructure for an automated yard requires a high investment and is fixed for its economic life of 20 to 30 years. Some ports have decided that they have gone far enough with automation, and rely upon highly skilled and motivated operators to achieve the efficiencies they require.

Security is another area where significant investments in technology are being planned and implemented. Those ports with deep pockets can install the very latest scanners, set up advanced security centers with hundreds of cameras and detectors, but it is important that it looks at what it actually needs and answer pertinent questions such as how are ports assessing the risks, and what are the financial implications of implementing controls aimed at reducing those risks?

The EU SUPPORT (Security Upgrades for Ports) project, managed by BMT, is developing a financial model to assist in this



Arrow diagram of the Open Group Architectural Framework (TOGAF), upon which Port Architecture is based.

area. What must be avoided is the temptation to solve problems by ‘throwing IT’ at them without a clear assessment of the cost effectiveness of the proposed systems.

The same applies to Terminal Operating Systems and other IT systems, such as those used for invoicing, planning, payroll and so on. Port Community Systems have been around for many years and are designed to provide the right information to the right people at the right time and therefore reduce costs, but they are a capital outlay and carry an ongoing operational cost – so it is important the right system is chosen.

Being able to integrate with existing and planned systems is vital, as well as fully understanding the benefits of implementing such a system. Technology is critical, but there is an increasing need to ensure the investment delivers the promised benefits from the many vendors of such systems. How do you determine which systems to invest in, and when the system will deliver the promised improved business performance?

## Performance

It is appropriate to discuss how we measure performance before answering the question about how to improve performance.

The word on the ports conference circuit in 2011 has been ‘Performance’ – not just the performance of part of a port, but performance across the whole supply chain. Ports are publishing various Key Performance Indicators (KPIs) as a marketing aid to attract more business. The Container Terminal Quality Indicator standard (CTQI) offers a benchmarking system to adjudicate the efficiency and quality of Global Port Terminal Operators, combining financial, operational and organizational indicators, and the Hamburg Committee of the Global Institute of Logistics decided to distribute the IPR of CTQI recently [1]. Whilst some of the measures are internal and business-related, there are limited measures that can be used to assess the profitability of a port as a whole. The CTQI measures are designed for container terminals, but this isn’t the only type of terminal. How do we measure the performance of dry bulk, LNG, general cargo, RoPax or cruise terminals? The fact that a port or terminal is an integral link in

the overall chain means that any measures must relate to and take into account the whole end-to-end supply chain.

## Problem summary

A port, therefore, is clearly a complex business operating as a key link in an international supply chain. There is increasing pressure to improve profitability, whilst delivering improved services at lower costs in a secure environment with due consideration to sustainability and safety.

It must also be duly noted that nobody would ever consider committing the necessary millions in construction and fitting-out costs without a very detailed design. Therefore, a significant amount of thought and planning goes into the design of the physical aspects of a port such as channel depth, quay length, cargo handling, customs facilities, transport with many expert consultants providing the necessary support. Michael Richter from Moffatt & Nichol recently suggested that the traditional bottom-up development process – Infrastructure, Equipment, Logistics, Operations, and then Business case – must be reversed if we want to improve business performance. He also suggested that we must now design for change and continual improvement.

But, how do you design the business itself?

How do you design the business in such a way that the current and future changes in both volume and type of cargo is taken into account?

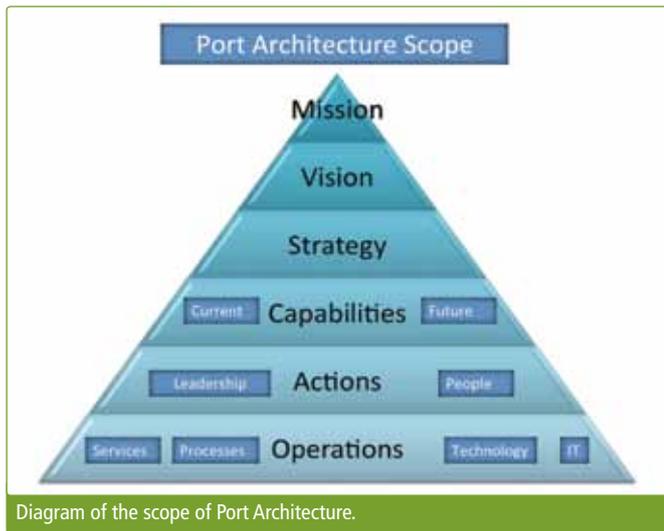
How do you design the organizational structure and the processes in order to operate the business and achieve the stated returns on the investments?

How do you ensure you specify the appropriate IT systems to support the business?

The approach we at BMT have termed ‘Port Architecture’ will enable the Port Operator to design the most effective business, whilst taking into account the complexities outlined above.

## ‘Port Architecture’ – what is it?

The first thing to state is that Port Architecture should not be seen as the silver bullet to solving all your issues; it is an aid to



help you understand the complex environment and enable you to make better and more informed decisions. It will enable you to have greater confidence in the investment decisions you make both now and in the future, and provide you with the means to continually assess what to do as the market evolves.

Port Architecture is new to ports, but it is based upon many years of experience in other industries including manufacturing, pharmaceuticals, financial services, defense, aerospace, rail and government. Port Architecture is Enterprise Architecture for Ports. It is firmly based upon industry standards, including IEEE Standard 1471-2000, TOGAF (The Open Group Architectural Framework), MoDAF (Ministry of Defense Architectural Framework) and elements of the Zachman Framework.

Port Architecture can be defined as a coherent number of principles, methods, and models that are used in the design and realization of a port's strategic objectives, organizational structure, business processes, information systems and infrastructure. If a port has a Port Architecture it is able to better understand its business, and how the people, processes and technology need to be balanced to deliver the business objectives and satisfy the end customer's demands. With the help of a Port Architecture, a port is able to ask strategic questions to help it determine what changes it should make, and the investments needed to meet the current and projected market requirements. Also, the Port Architecture would enable a port to quickly understand the tactical, in-depth implications of a chosen strategy route, enabling it to take better calculated risks through a fuller understanding of the impact of specific objectives.

*Part 2 of this paper will describe how to implement Port Architecture and provide examples of the benefits it brings, and will be published in the next edition of 'Port Technology International'.*

#### REFERENCES

[1] 'GIL & GL to Release CTQI Benchmarking Data', Hamburg Global Logistics Institute: <http://bit.ly/PT50hgil>

#### ABOUT THE AUTHOR

**Martin Sharp** has spent over 20 years working across a broad range of industry sectors delivering business improvements through the implementation of Enterprise Architecture. He is a Naval Architect and Chartered Engineer and combines his marine expertise with that of Enterprise Architecture to deliver this capability in the ports sector. He is proud to be part of the BMT Group of companies and to be regarded as the world's first Port Architect.

#### ENQUIRIES

Email: [martin.sharp@hiqsigma.com](mailto:martin.sharp@hiqsigma.com)

Web: [www.hiqsigma.com/ports-and-shipping](http://www.hiqsigma.com/ports-and-shipping)

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\*Actual radar images shown.

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Tel: +1.709.576.6666  
 Email: [sales@rutter.ca](mailto:sales@rutter.ca)  
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