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The Digital Transformation of Shipping Opportunities and Challenges for Norwegian and Greek Companies

Survey of decision makers at Norwegian and Greek shipping companies on their views on the outlook for the future

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Foreword

Over the last few years, discussion on the shipping industry has primarily revolved around the fallout from the economic crisis. In addition to general economic challenges such as fleet utilisation, shipping companies in Norway and Greece are increasingly facing the impact of the digital transformation and a changing competitive environment.

Over the last few years, changed value chains have caused shipping companies to evolve into service providers for the logistics industry. For this reason, it is necessary to take a look forward.

Google and other global players are pervading more and more areas of our day-to-day lives. Norwegian and greek shipping companies expect them to become providers of technical services for transport companies but do not think that they are likely to operate ships of their own.

Shipping companies will require more IT experts on land in the future. They will be facing a growth in technical challenges.

Crewless shipping seem still far away, but both norwegian and greek shipping companies are becoming open to an idea of ships controlled from land.

Finally, I would like to thank shipping companies for taking time out for the interviews and for providing insights into their companies.

I trust that you will find this study interesting and illuminating reading.

Fredrik Gabrielsen Partner at PwC | Head of shipping & offshore

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PwC project group members:

Rachell Lau, Survey results analysis Kristoffer Mikkelsen, Survey results analysis Tatiana Tkachenko, Survey results analysis Anniken L'orange, Project leader Malin Brubak, Graphic design

Summary

The digital transformation of the shipping industry is making progress

The effects of the digital transformation can be noticed more and more clearly in many areas of life. If Google and other technology companies have their way, we will, for example, be seeing self-driving cars on our roads before too long. Solely the reserve of science fiction not all that long ago, carmakers and motorists are gradually growing accustomed to the idea of allowing a computer to drive a car from A to B.

Likewise, the digital transformation is set to play a key role in shipping and for shipping companies in the future. The maritime industry is now anticipating extensive digitisation processes with a great degree of certainty. Today, Norwegian and Greek shipping companies are also taking a different approach to the idea of crewless ships than previously. For a long time, crewless ships controlled from land were at most considered to be pure science fiction. Now at least two out of ten decision-makers in the Norwegian and Greek shipping companies think that it is certain or at least probable that ships will be controlled from land in the foreseeable future. To be sure, the times in which the prospect of crewless ships was dismissed as a seaman's yarn now seem to be over once and for all.

Crewless shipping: doubts currently still prevailing

Even so, most decision-makers in Norwegian and Greek shipping companies currently still have doubts as to the viability of this new technology. In their view, the main arguments against crewless shipping include the vulnerability of the ships and entire value chains to cybercrime (eg, attacks by hackers), the longer (expensive) berth times because the absence of any crew means that maintenance and repairs can no longer be carried out immediately, and high development costs for the necessary hardware and software on board the ships and on land that will be beared by the company in order to adapt the new system. Nine out of ten decision-makers polled see a further serious drawback in the fact that if there is no crew on board the ship there is no way for any direct action to be taken in the event of an emergency such as a fire or leak. On the other hand, the main advantages of autonomous shipping is seen in being able to continuously monitor the temperature and condition of cargos, particularly in the case of hazardous substances, from land and the potential for reducing staff costs. Over half of the decision-makers polled consider this to be important arguments in favour of crewless shipping.

Changed value chains – from transporters to service providers

Today, the digital transformation of logistics not only entails technological change, greater energy efficiency or enhanced IT systems. In addition, entire value chains are being reorganised. In what way will the digital transformation change the role played by Norwegian and Greek shipping companies in the logistics process?

Only 7 % of the decision-makers polled believe that shipping companies will still tend to form the end of the transport chain in five to ten years' time and make use of other technical and logistic service providers. On the other hand, around two out of ten decision-makers assumes that shipping companies are more likely to be supplying other logistics companies with shipping services and nautical expertise. Over 43% of the polled population think that both scenarios will emerge to equal extents. Accordingly, a substantial number of decision-makers polled assume that shipping companies will largely evolve into shipping service providers, providing other logistics companies with nautical expertise. At the same time, three out of ten decision-makers polled assumes that their company will have to provide more services along the transport chains in the future. Shipping companies will have to extend the breadth and depth of their range of logistic services in order to retain their future viability. In this connection, in the coming five years, nearly half of the decision-makers polled think that their companies will provide more services within the current part of the transport chain and will use larger ships carrying larger loads.

> Only **7%** of the decision makers polled believe that shipping companies will still tend to form the end of the transport chain in five to ten years' time and make use of other technical and logistic service providers.

For majority of decision-makers it is certain that Google and comparable global players will increasingly (also) evolve into technical service providers for transport companies. By the same token, only a minority think that Google, Amazon and Co. will lengthen their value chains to include ship transportation. Less than one in five of the polled decision-makers expect these global behemoths to operate ships of their own in the future.

New role for corporate IT and shortage of trained staff – programmers instead of sailors

The digital transformation is featuring so heavily in shipping companies' scenarios for the future that many companies have started or already recruited a management role to adjust to this transformation. In Norway and Greece, more than half of the decision-makers in our poll saw a strong need to invest IT in the shipping industry and believe that shipping companies will require more IT experts on land in the future.

In light of this, the shortage of trained IT employees poses a serious underlying problems. Around one in three decisions makers in the Norwegian shipping industry assumes that it will become more difficult to find well-trained nautical and technical staff. This number is much higher amongst the Greek decision-makers polled, where eight out of ten share this view.



The Digital Transformation as an opportunity

The digital transformation has reached the shipping industry

Looking forward, the digital transformation is set to play a key role in shipping and for shipping companies. Over nine in ten decision-makers questioned acknowledged that in only a few years smart shipping tracking of cargo at sea will be the general standard.

Figure 1. Views on the future of ships and shipping companies

Share of "definitely" and "probably" results, score of 1 and 2 on a 6-point scale.

Smart shipping tracking of cargo at sea will be the general standard in a few years' time

Maintenance processes will be digitised on a broad basis over the next few years

There will be an extremely swift increase in the automation and digitisation of shipping over the next few years

Shipping companies will require substantially more IT experts on land in the near future

Ships will be controlled from land in the foreseeable future



Nearly all the decision-makers polled in the Norwegian and Greek maritime industries assumed that smart shipping tracking would soon become the general standard (see Figure 2).

Figure 2. Views on smart shipping tracking

Smart shipping tracking of cargo at sea will be the general standard in a few years' time.



Similarly, most decision-makers participating in the poll expect to see broad-based digitisation of maintenance processes over the coming years. Majority of the decision-makers in the maritime industry polled assume that before too long data on the condition of machinery and components on board ships will be automatically transmitted electronically to shipping companies (see Figure 3).

Figure 3. Views on the digital transformation of maintenance processes

Maintenance processes will be digitised on a broad basis in the coming years, allowing data on the condition of machinery and components on board ships to be automatically transmitted electronically to shipping companies.



The vast majority of shipping companies are convinced that automation and digitisation in shipping will grow at an extremely swift rate over the next few years. Nine out of ten decision-makers in the Norwegian companies and six out of ten decision-makers in the Greek companies considered this to be definite or probable (see Figure 4).

Figure 4. Views on the increase in automation in shipping

There will be an extremely swift increase in the automation and digitisation of shipping over the next few years.





Crewless shipping

It is not only digitisation processes which are considered to be likely in the foreseeable future. In addition, Norwegian and Greek shipping companies are now becoming open to an idea of "crewless shipping" (see Figure 5).

Figure 5. Views on controlling ships from land

Ships will be controlled from land in the foreseeable future.

For a long time, crewless ships controlled from land were at most considered to be pure science fiction. Now one of three decision-makers in the Norwegian shipping companies and two out of ten in the Greek shipping companies think that ships will definitely or probably be controlled from land in the foreseeable future.



Arguments in favour of crewless shipping

A more detailed analysis of crewless ships and the digital transformation of shipping indicates that the experts see a number of advantages. The main advantage is seen as being able to continuously monitor the temperature and condition of cargos, particularly in the case of hazardous substances, from land.

Seven out of ten decision-makers in the Norwegian and Greek maritime industries consider this to be an important argument in favour of crewless shipping. Even so, there are clear signs that the doubts are currently seen as outweighing the advantages (see Figures 6 and 7).

Figure 6. Importance of arguments in favour of crewless shipping

Share of "extremely important" and "very important" responses to the pro arguments, score of 1 and 2 on a 6-point scale.

Shipping companies can expect lower staff costs

It is now possible to continuously monitor the temperature and condition of cargos, particularly in the case of hazardous substances, from land

Human error can be prevented more effectively if there are no crews on board the ships

Space can be saved, allowing a greater volume of cargo to be carried

Crewless ships are less dependent on the weather; there is no risk to human life even in poor weather conditions





The following aspects can be considered when evaluating the arguments in favor of crewless shipping:

- Lower recruiting and staff costs
- · Lower personnel, crewing and organisational costs
- Generally lower costs due to standardisation and automation
- Improved availability of special expertise and more efficient deployment of resources
- Less exposed to the risk of conventional piracy
- Enthusiasm about what technology makes possible

Arguments against crewless shipping

The situation with respect to the arguments against crewless ships is different. Nine out of the decision-makers see a serious drawback in the fact that if there is no crew on board the ship, there is no way for any direct action to be taken in the event of an emergency such as a fire or leak. Shipping company decisionmakers cite a further three main arguments against crewless ships (in each case, over seven out of ten decision-makers consider these arguments to be important or very important):

- The heightened vulnerability of the ships and entire value chains to cybercrime as a result of the necessary digitisation (eg, hacker attacks)
- Protracted (expensive) berthing periods as there is no longer any crew to perform ongoing maintenance and repairs on board the ships
- Any damage to hazardous or refrigerated goods on board the ship can no longer be directly addressed as there is no crew capable of taking immediate action

Although most of the decision-makers consider the foreseeable high IT costs for the development of the necessary hardware and software as well as resource redundancy to be (very) important arguments against crewless ships, they play a subordinate role. These costs would presumably be accepted after the other problems had been addressed and corresponding solutions found.

Figure 7. Importance of arguments against crewless shipping

Share of "very important" and "extremely important" responses to the counterarguments, score of 1 and 2 on a 6-point scale.



A crew on board the ship can respond immediately to an emergency such as fire or leaks

A crew on board can perform maintenance work directly on board the ship and generally keep it in better condition, thus obviating the need for expensive berthing times

A computer-controlled ship is a potential target for hackers and pirates

Cargo, and particularly hazardous substances, can be monitored on a daily basis by the crew on board, ensuring that any damage can be immediately averted

There will be high IT costs for safety reasons as all important components must be configured redundantly (i.e., backup systems must be set up)

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The following aspects can be considered when evaluating the arguments against crewless shipping:

- The absence of any human presence the lack of any possibility for an overall assessment of the situation on board the ship and the ability to respond appropriately and without delay to unforeseen events
- Insufficient confidence in the technical systems, concerns over technical failures and collisions
- The risk of accidents, the legal uncertainty and the vulnerability of the systems to manipulation by hackers or the like
- General acceptance, loss of expertise, destruction of jobs
- This debate might be considered premature as the systems are not (yet) mature enough and the absence of any relevance

Changed value chains

These days, the digital transformation of logistics no longer only entails technological changes, energy efficiency or upgraded IT structures for specific logistic processes, eg, for shipment tracking or related security, maintenance and repair processes. Rather, it is calling entire value chains into question. Decision-makers from the Norwegian and Greek maritime industry have a remarkably similar and clear answer to the question as to the position that shipping companies in both countries will hold in five to ten years' time: only 7% of the polled decision-makers in Norway and Greece believe that shipping companies will still tend to form the end of the transport chain in the medium term and make use of other technical and logistic service providers. Two out of ten decisionmakers (21%) believe that shipping companies will tend to supply other logistics companies with shipping services and nautical expertise. A significant portion of the surveyed population (over 43%) expects both scenarios to apply ("depending on the circumstances"), while 29% of the Norwegian decision-makers and 7% of the Greek decisionmakers polled think that neither of these two scenarios will arise and that things will pretty much stay as they are.



Figure 8. Position that Norwegian and Greek shipping companies are expected to have in the transport chain in five to ten years

- Shipping companies will tend to form the head of transport chains and make use of other technical and logistic service providers
- Shipping companies will tend to supply other logistics companies with shipping services and nautical expertise
- Both scenarios are possible depending on the circumstances
- Neither of the two scenarios, things will remain pretty much as they are
- Don't know

Accordingly, a substantial number of Norwegian decisionmakers polled assume that shipping companies will largely evolve into shipping service providers, providing other logistics companies with nautical expertise. In this connection, around one out of three decision-makers in Norway believe that liner shipping companies will enlarge their transport chains in the medium term and offer further logistic services in addition to door-to-door transportation (see Figure 9). On the other hand, Greek decision-makers polled have a different view, where one out of five Greek decision-makers polled believe that shipping companies will not enlarge their transport chains in the medium term.

Figure 9. Elongation of the value chain for liner shipping companies

Liner shipping companies will elongate their transport chain and offer other logistic services alongside door-to-door transportation.



Every second manager in Norwegian shipping companies and three out of ten decision-makers at Greek shipping companies polled think that in the future their company will have to provide more services along the transport chains than before. Shipping companies will have to extend the breadth and depth of their range of logistic services in order to retain their future viability (see Figure 10).

Figure 10. Enlargement of range of services provided by shipping companies along transport chains

Looking forward, Norwegian and Greek shipping companies will need to provide more services along the transport chains than before.





Within the next five years, nearly every second decision maker polled expects that their companies will provide more services within the current part of the transport chain and will use larger ships carrying larger loads. Around one in six of the polled decision-makers will see load specialisation being implemented in their companies in the coming five years, while nearly one in ten decision-makers polled expect no adjustments in their business model in the coming five years.

Figure 11. Adjustments to the current business plan within the next five years



Majority of the total polled population also expect to see a scenario in which Google and comparable global players increasingly evolve into technical service providers for transport companies. More than half of the decision-makers polled consider this to be certain (see Figure 12).

Figure 12. Google and Co. as technical service providers

Google and comparable companies will increasingly provide technical services for transport companies.

By the same token, only a minority think that Google, Amazon and others will extend their value chains to include ship transportation. 17% of the total polled decision-makers expect these global behemoths to operate ships of their own in the future. While 39% of the total polled decision-makers in both Norway and Greece believe that Google, Amazon and comparable players will not operate their own ships.

Figure 13 Google and Co. as. ship operators

Google, Amazon and comparable global players will operate ships of their own in the future.





New role for corporate IT

Society faces enormous changes in view of technological progress. These days it is not so much a question of whether the digital transformation is believed to trigger fundamental changes. Rather, more than ever the focus is on finding the best way of responding flexibly to the changes coming in the wake of technological progress.

In Norway, more than half of the decision-makers polled see a strong need to invest in IT in the shipping industry, while in Greece, nine out of ten decision-makers polled share this view. The digital transformation is evidently featuring so heavily in shipping companies' scenarios for the future today that their IT systems are generally being upgraded. This is because more and more IT specialists must be recruited on land to ensure the necessary processes can be developed and implemented.

Figure 14. Estimated requirements for IT experts on land over time

Shipping companies will require substantially more IT experts on land in the near future.



Restructuring of workforces and shortage of trained staff

In this light, the shortage of trained employees poses a serious underlying problem. One out of three polled decision-makers in the Norwegian shipping industry assumes that it will become increasingly difficult to find well-trained nautical and technical staff. This figure is even higher amongst the Greek decisionmakers polled, where eight out of ten share this view (See figure 15).

Figure 15. Views on market trends: shortage of skilled labour

It will become increasingly difficult to find well-trained nautical and technical staff.



Procedure adopted and description of sample

In an electronic survey, 28 decision-makers in Norwegian and Greek shipping companies active in ocean shipping were asked for their views on the current economic situation and the outlook for the future as a basis for gaining a current view of the general sentiment at Norwegian and Greek ocean shipping companies. The survey was conducted by PwC Norway and PwC Greek guaranteeing data privacy and the anonymity of the interviewees. The data derived from survey with Managing Directors, board members and their representatives was used by PwC to summarise and present the results in this document. The survey was conducted from end of April to the end of June 2017.





Contact



Fredrik Gabrielsen Partner | Head of shipping and offshore +47 97 08 24 08 fredrik.gabrielsen@pwc.com



Socrates Leptos - Bourgi Partner | Global Shipping & Ports Leader +30 210 687 4630 socrates.leptos. .bourgi@gr.pwc.com











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Our clients range from some of the world's most complex organisations to small and medium sized local businesses.



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