



PRACTICAL VIEWS ON SHIPS AND SHIPPING BY TWO NAVAL ARCHITECT'S

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AGENDA

- GENERAL VIEWS ON VESSELS AND SHIPPING
 - WHAT SHIPS ARE?
 - MARINE TRANSPORTATION AS PART OF GLOBAL ECONOMY
 - WORLD FLEET
 - TRENDS
- LIFECYCLE OF SHIPS (UP TO CONTRACT)
 - LIFECYCLE AND DIFFERENT PARTICIPANTS
 - WHAT SHIP NEEDS?
 - DIFFERENT STAGES UP TO CONTRACT



WORLD OF SHIPPING

WHAT ARE KEY DRIVERS?



WHAT A SHIP REALLY IS?..



Transporting



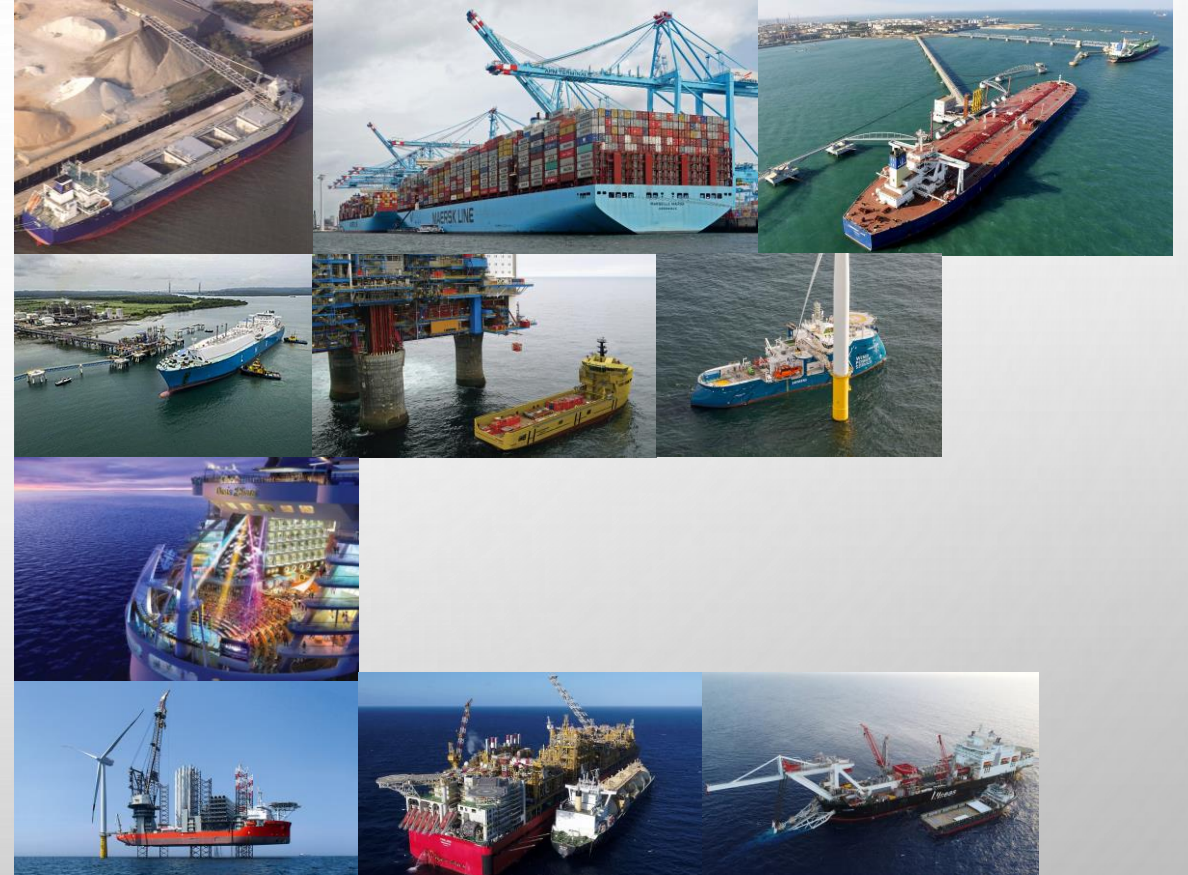
Servicing



Entertainment platform



Production or construction platform



...OR FREEDOM?

- YACHTS AND BOATS

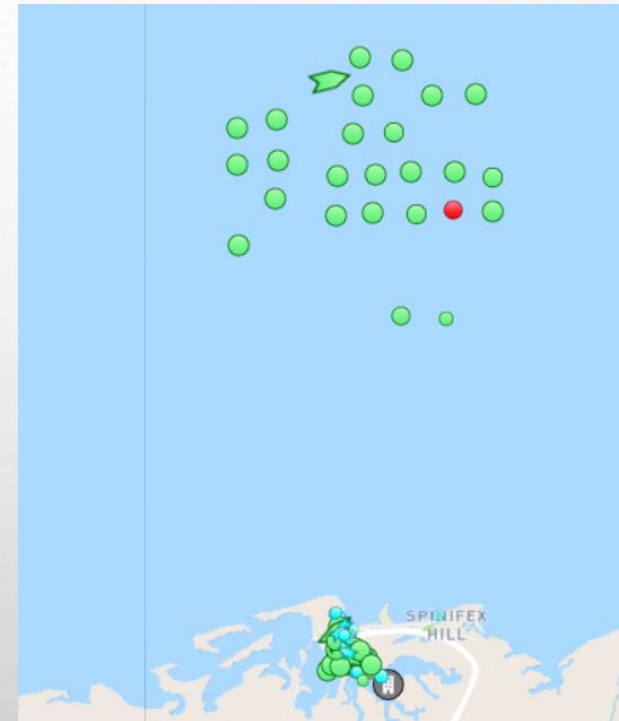
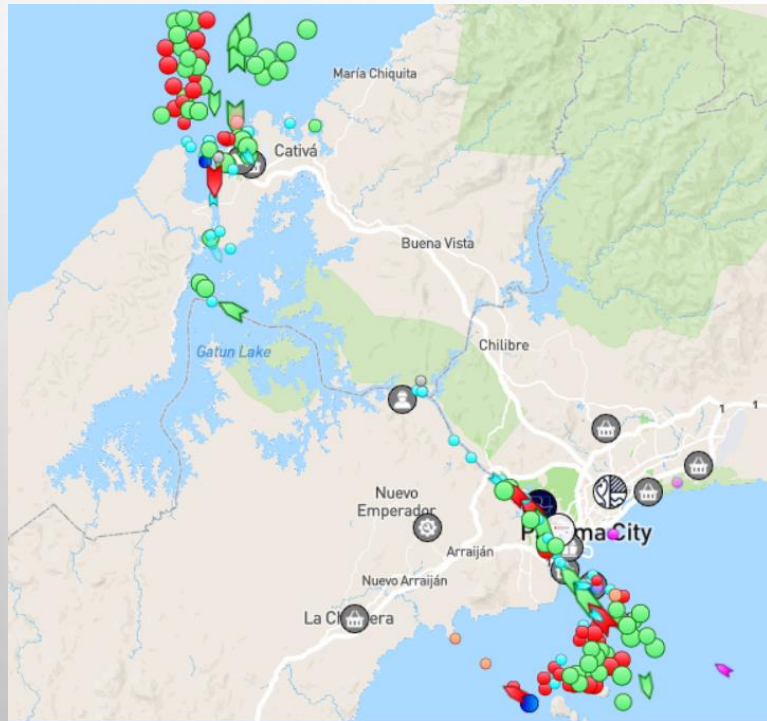


WORLD OF MARINE TRANSPORTATION



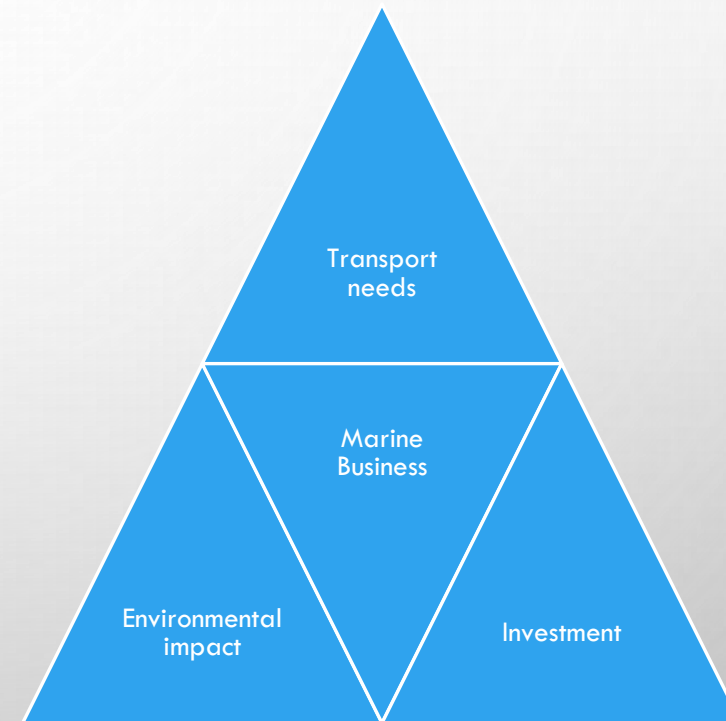


SHIPPING AND EFFICIENCY

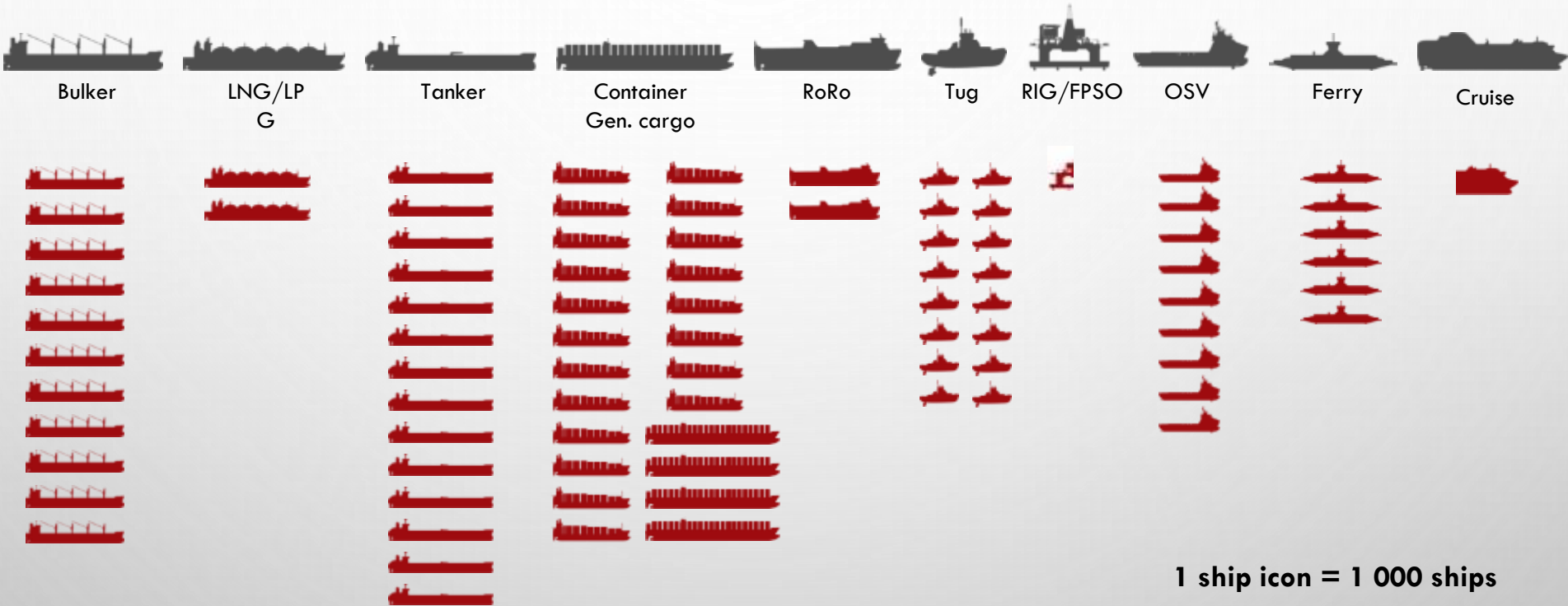


RESOURCE ALLOCATION IN SHIPPING - ECONOMICS

- TRANSPORTING GOODS TO BENEFIT OF SOCIETY (I.E. MINIMAL COST FOR SHIPMENTS)
- INVESTORS IN SHIPPING EXPECTS REASONABLE RETURN ON INVESTMENT
- ENVIRONMENTAL IMPACT SHOULD BE MINIMISED
- MARINE BUSINESS NEEDS TO FIT ALL THESE REQUIREMENTS IN EFFICIENT WAY

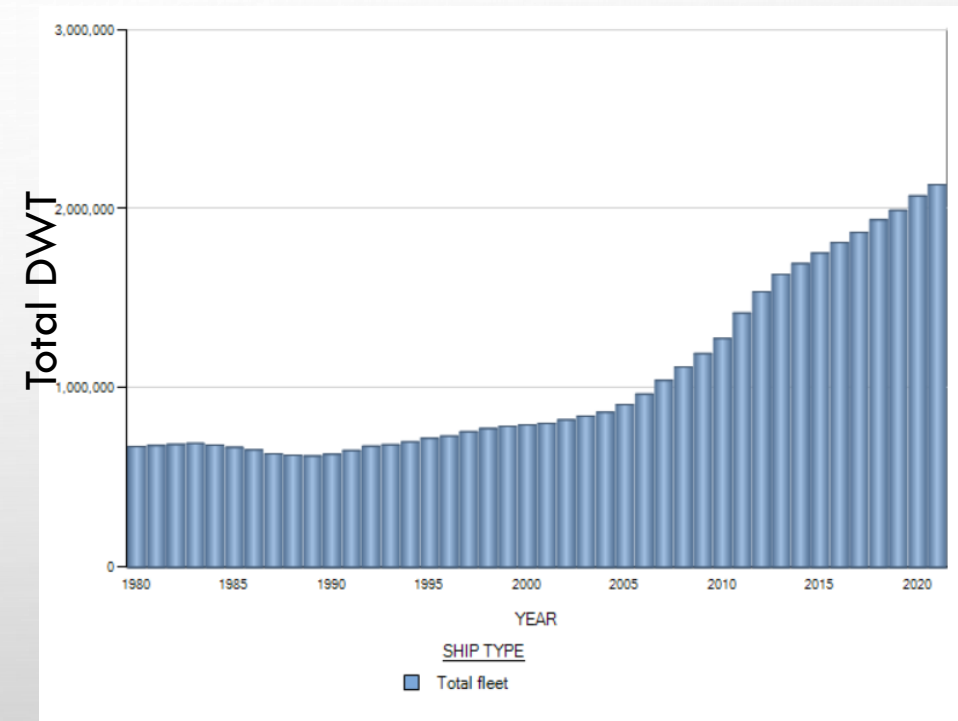


WORLD COMMERCIAL FLEET VIEW

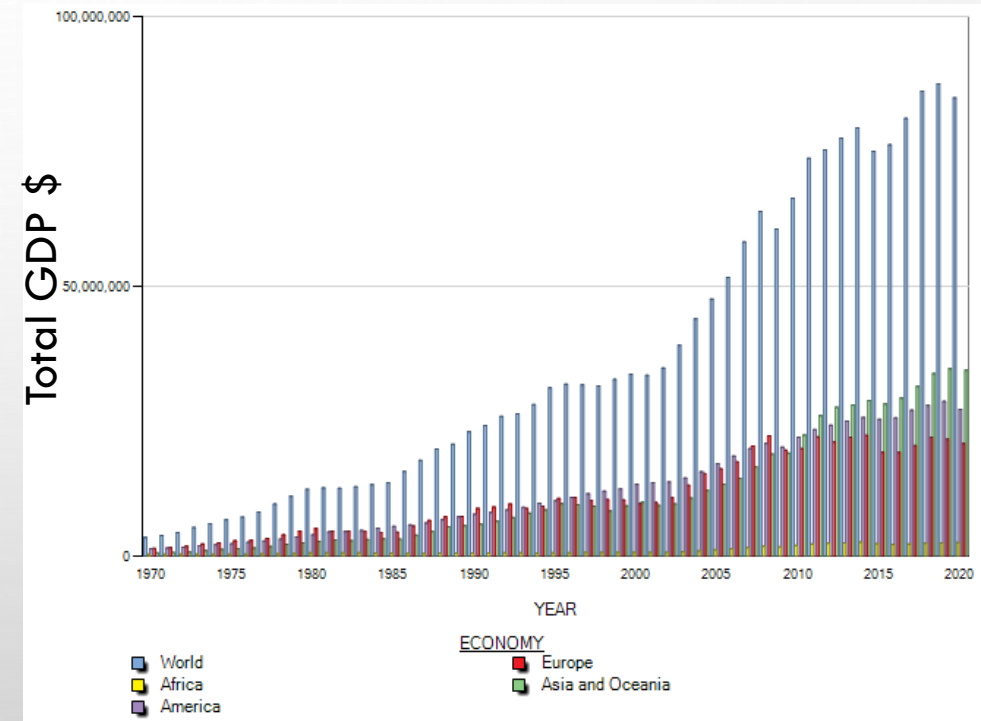
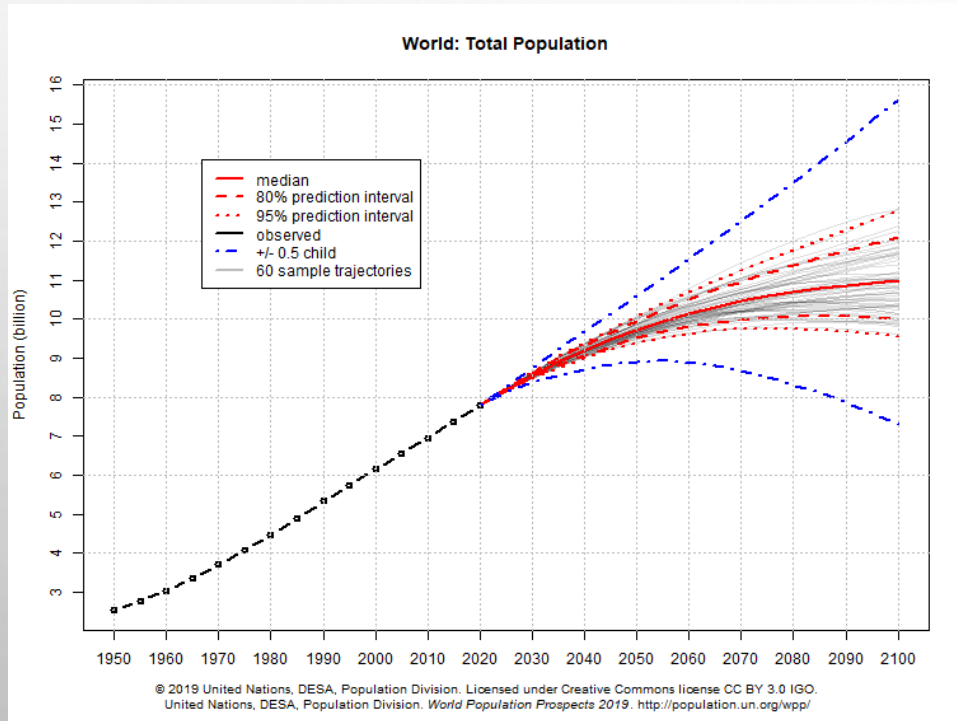


DO WE NEED NEW SHIPS?

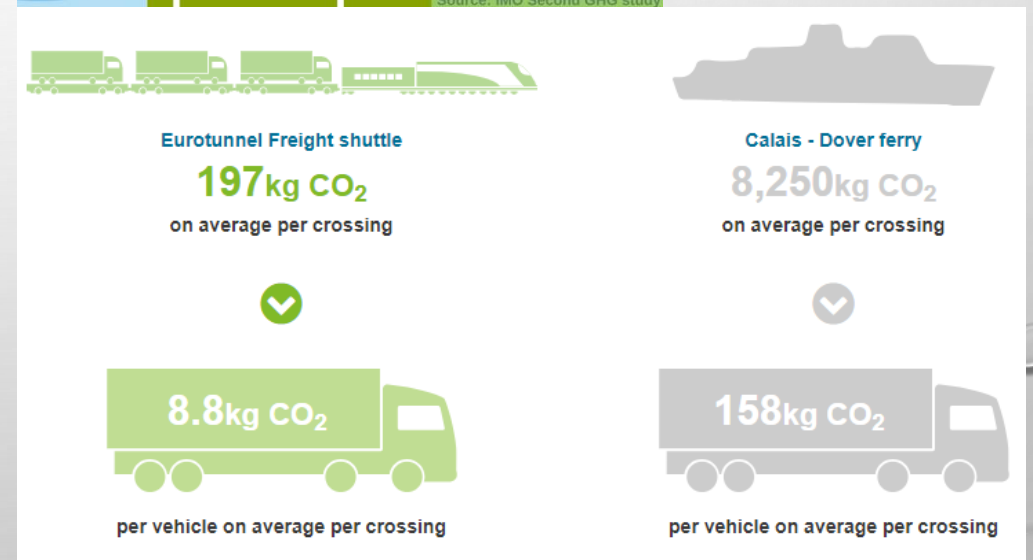
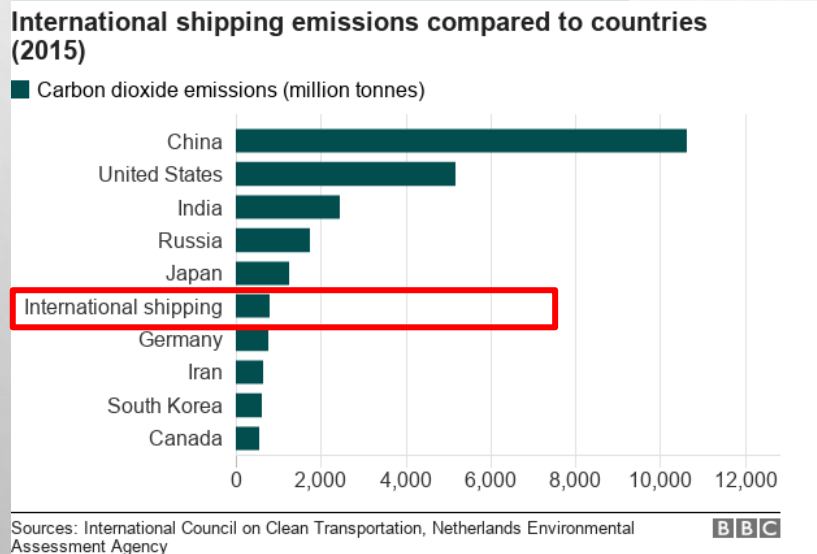
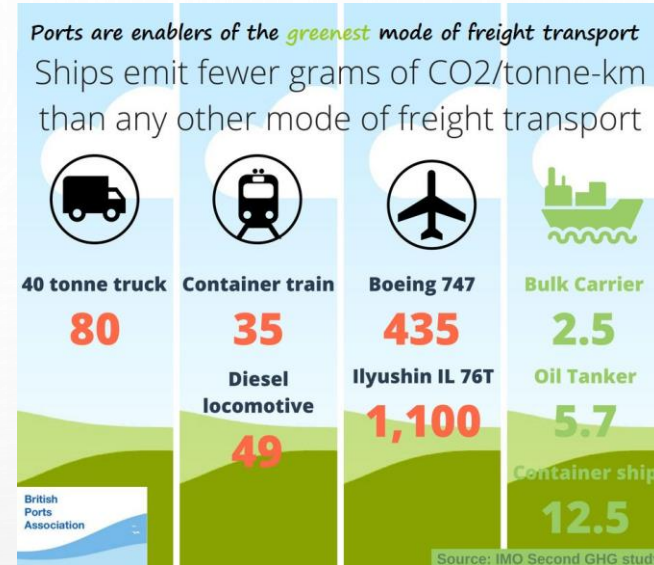
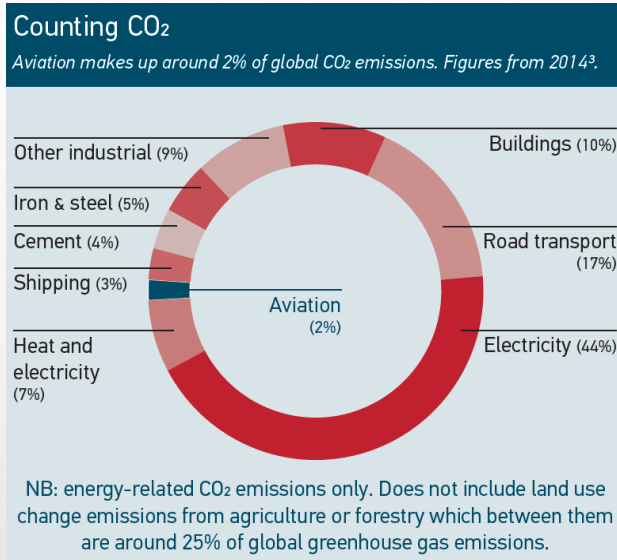
- SHIPS HAVE “DESIGN LIFE” OF 25 YEARS
- BUT FLEET WILL ALSO CONTINUE TO GROW
– WHY?



WE NEED MORE SHIPS



..BUT WE ALSO NEED SUSTAINABLE SHIPS



DIGITALISATION OF SHIPPING

- THIS IS AN ONGOING MAJOR TRANSFORMATION
- DESIGN AND BUILDING:
 - DATA SHARING/TRANSPARENCY
 - USE OF OPERATIONAL DATA AND INSIGHTS
 - PREDICTABILITY
- OPERATIONS
 - DATA SHARING/TRANSPARENCY
 - DIGITAL TWINS AND OTHER WAYS TO REDUCE MAINTENANCE COSTS AND RISKS
 - EFFICIENT OPERATION
 - PREDICTABILITY



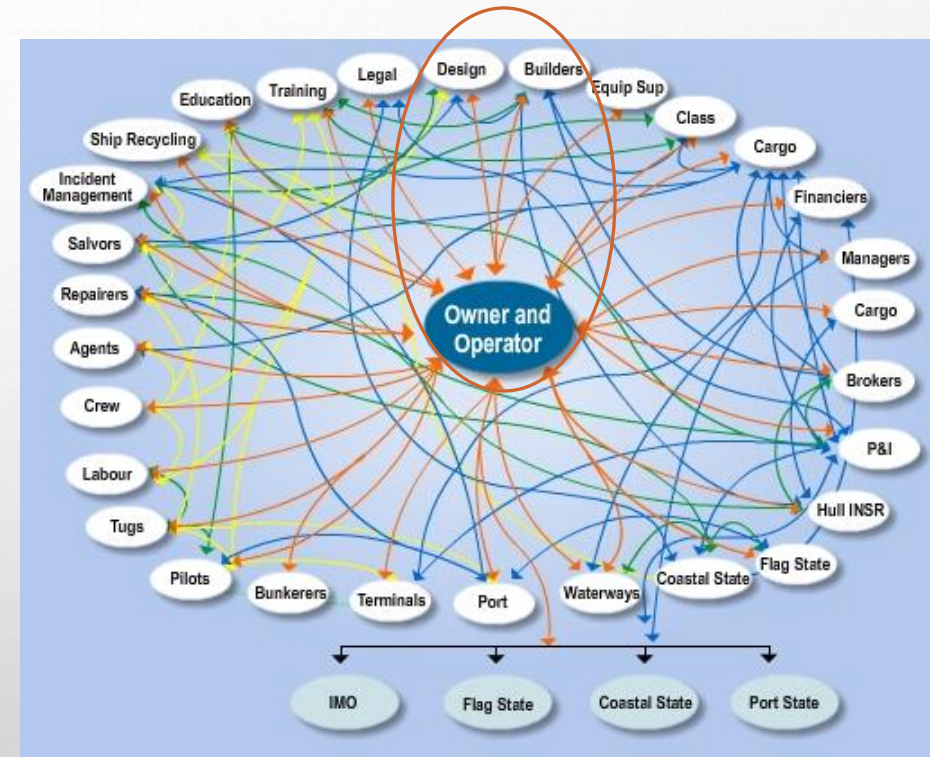
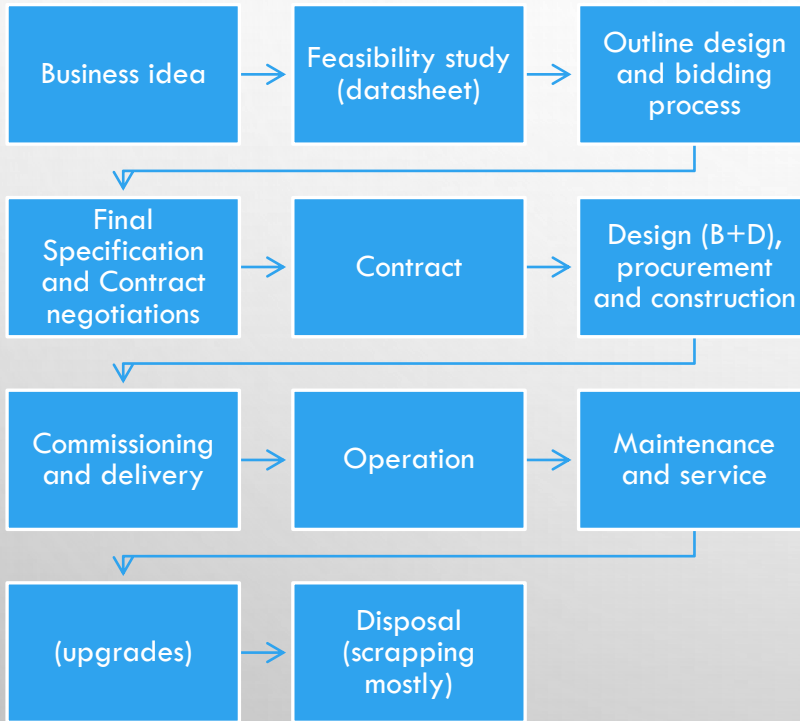


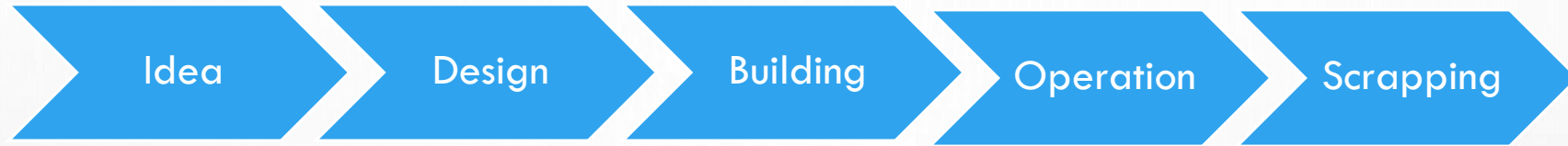
LIFE OF SHIP

LIFECYCLE OF SHIPS AND DIFFERENT PLAYERS



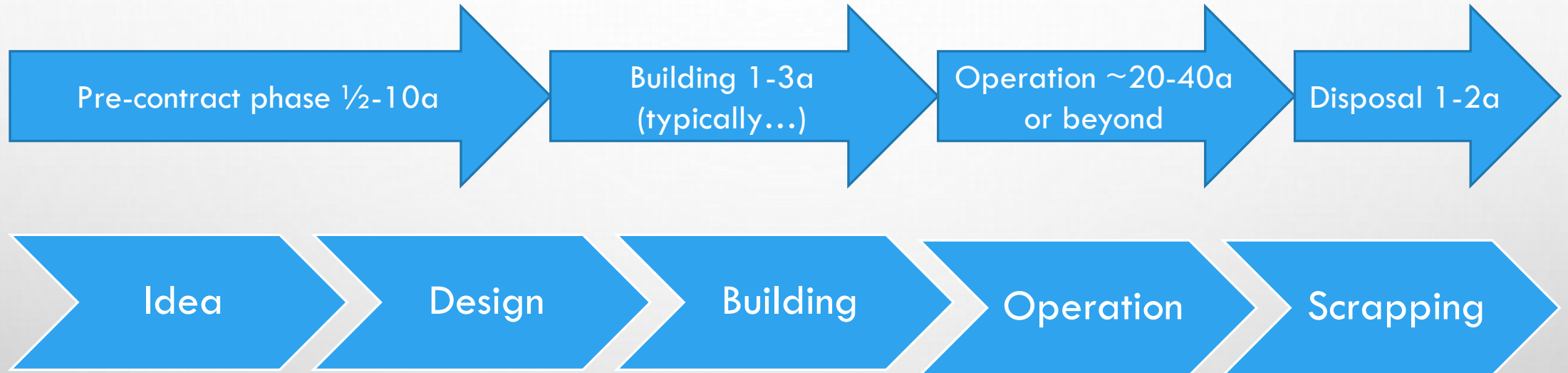
SHIPS LIFECYCLE – OVERALL VIEW





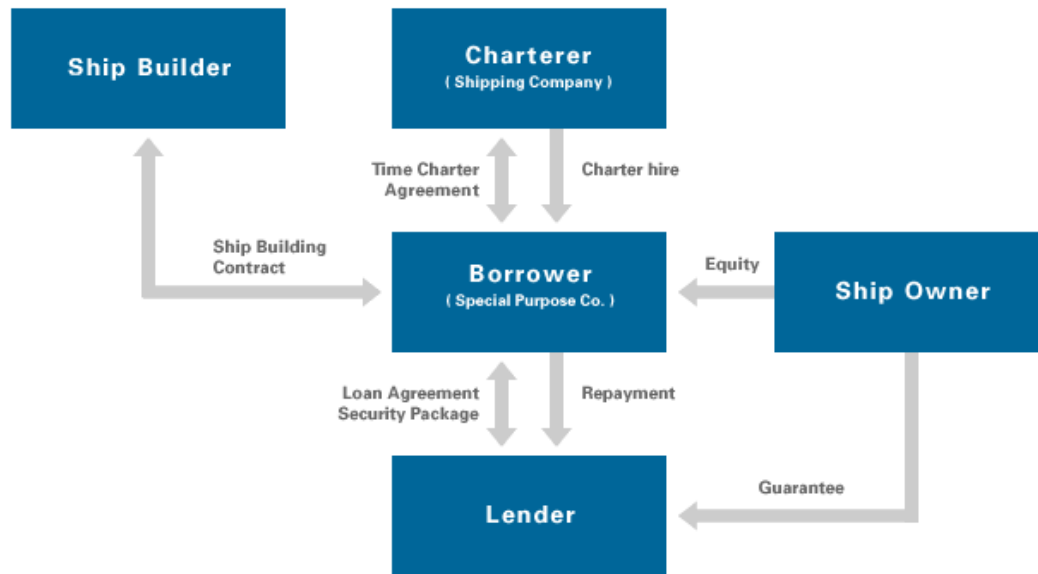
SHIPS LIFECYCLE

PRACTICAL EXAMPLES OF SHIP LIFECYCLE

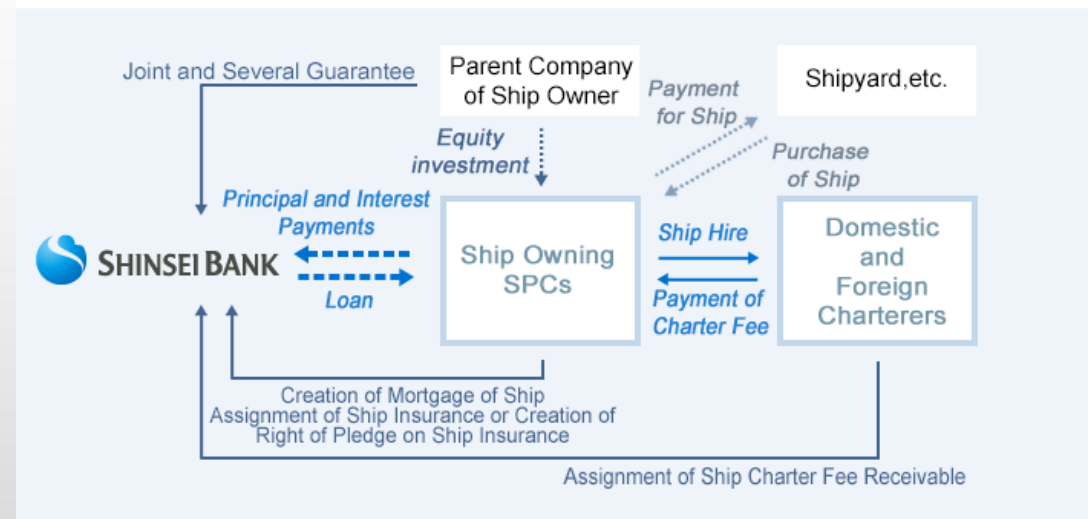


FINANCING OF SHIP

An example of transaction structure (Time Charter)

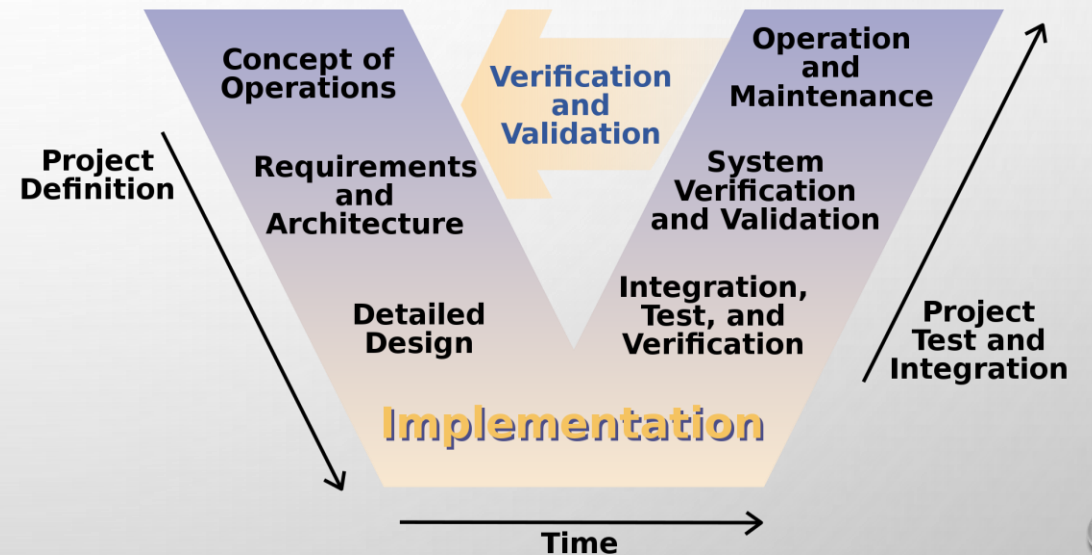


Structure Example



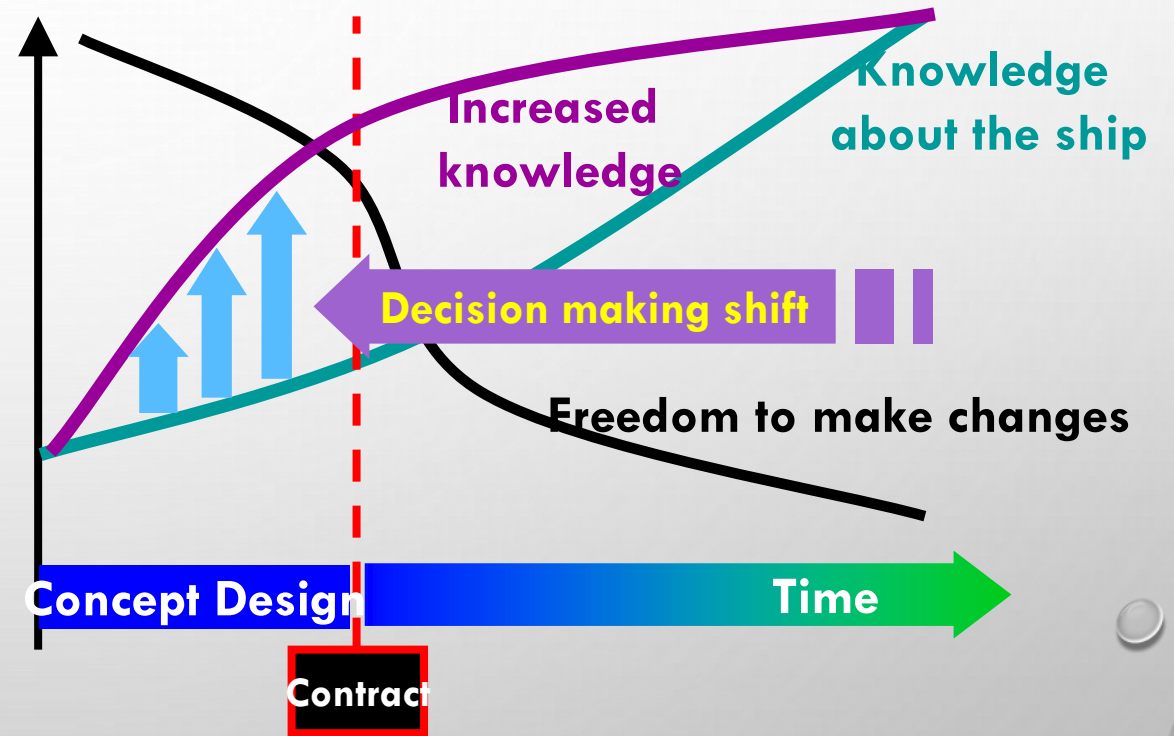
WHAT SHIP NEEDS?

- MISSION (ROUTE, CAPACITY, SPEED, RESTRICTIONS ETC.)
- “FUNCTIONS”
 - PAYLOAD RELATED (CARGO/MISSION RELATED)
 - SAFETY
 - MACHINERY
 - TANKS
 - WEIGHT (LWT AND DWT) AND COST (MATERIAL, LABOUR AND OTHER)
 - FORM (WHERE DIFFERENT FUNCTIONS ARE ASSIGNED)



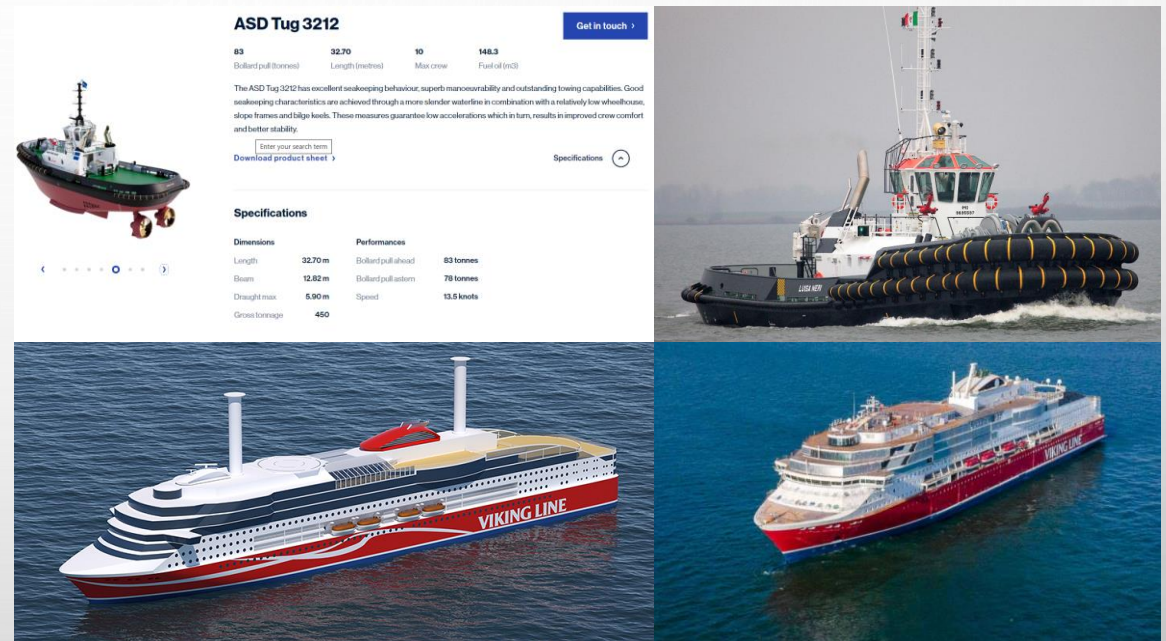
COST AND DESIGN DECISIONS

- DILEMMA: MOST OF COSTS ARE LOCKED AT CONTRACT SIGNING, BUT DESIGN IS YET AT VERY ROUGH
- USE OF SIMULATIONS AND FIRST PRINCIPLE TOOLS HELP TO INCREASE KNOWLEDGE BEFORE CONTRACT
- ..BUT NEED TO BE AWARE OF ADDED VALUE



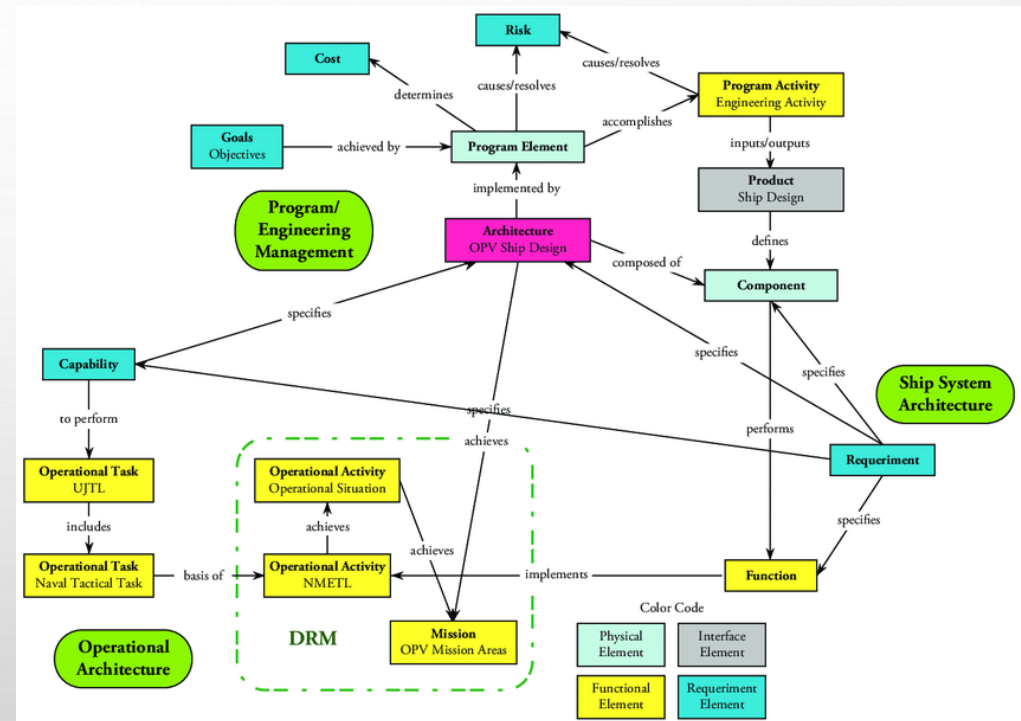
PRODUCT OR PROJECT?

- IS SHIP A PRODUCT?
- WHAT IS DIFFERENCE BETWEEN PRODUCT AND PROJECT?



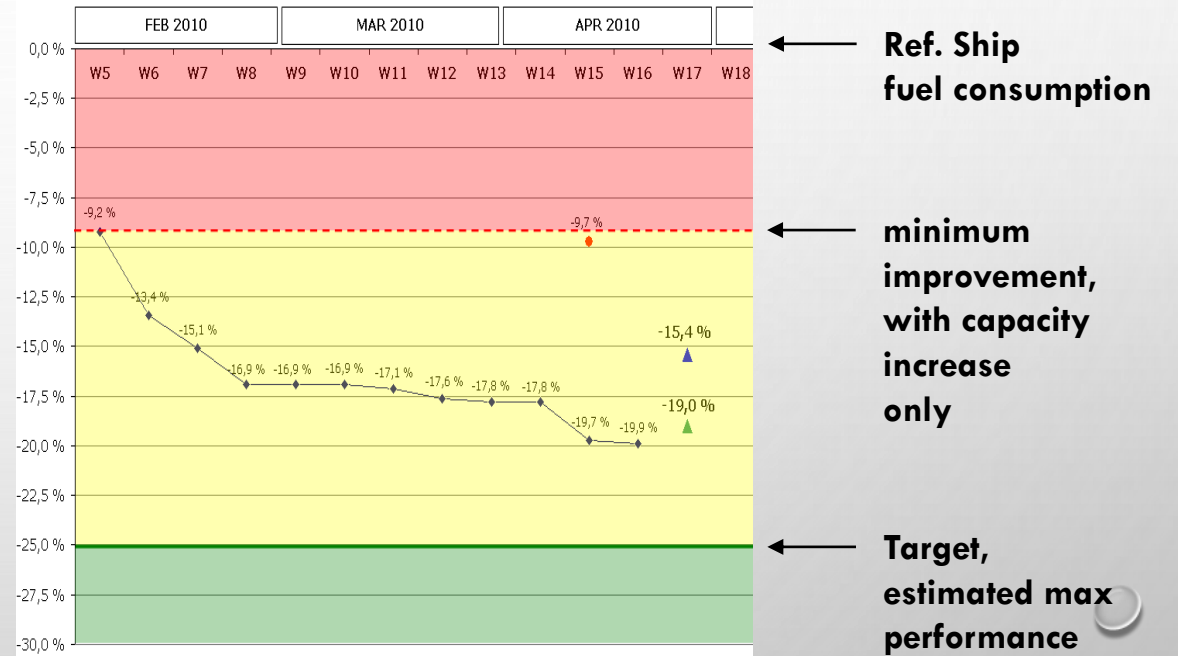
DESIGN SPIRAL OR SOMETHING ELSE?

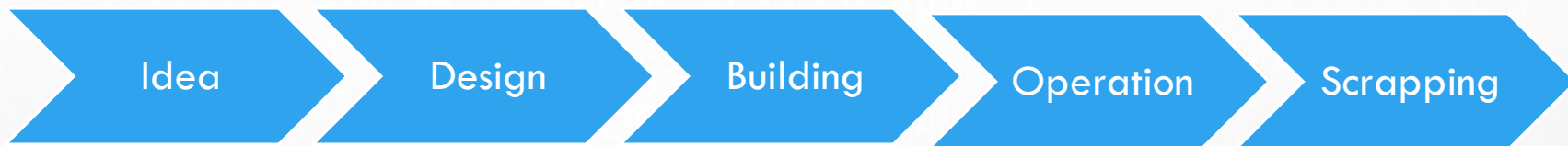
- DESIGN SPIRAL GIVES BASIC IDEA OF DESIGN THAT IS REFINED AS DESIGN EVOLVES
- HOW THINGS WORK IN PRACTICE IS SLIGHTLY DIFFERENT STORY
 - REFERENCE VESSELS
 - EXPERIENCE
 - DESIGN STUDIES
 - SYSTEM THINKING

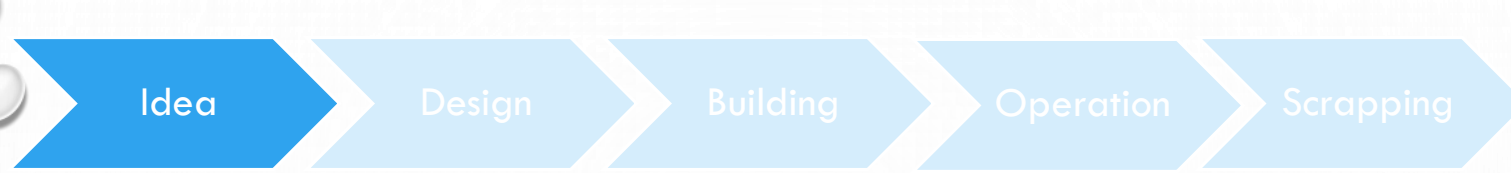


“MOST” IMPORTANT THINGS IN DESIGN&CONSTRUCTION

- WEIGHT AND COG (STABILITY)
- COST
- CAPACITY
- SPEED-POWER PERFORMANCE
- COMPLIANCE WITH RULES AND REGS
- + LOADS OF DETAILS THAT CAN GO WRONG AND CAUSE ISSUES TO ABOVE







BUSINESS IDEA

Mission:

- Develop new business idea
- Define competitive edge
- Secure internal funding for further development

Factors for success:

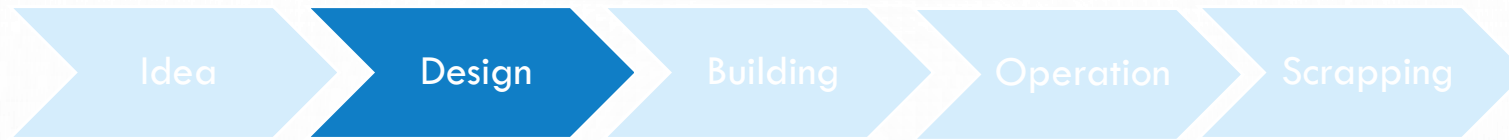
- Does vessel respond to demand?
- Potential against competition
- Realistic budget
- Sufficient research on critical factors

Key decisions:

- How vessel creates revenue?
- Rough idea of capacity/capability
- Rough idea of business potential (GM)

Risks (failures):

- Not realistic budget (project stops at later stage)
- Too Innovative (too big risk to take forward)
- Not enough studies on other options



OUTLINE

Mission:

- Develop Outline specification for Yard bidding
- Obtain sufficient certainty that design works technically
- Yards are capable to provide price&schedule

Factors for success:

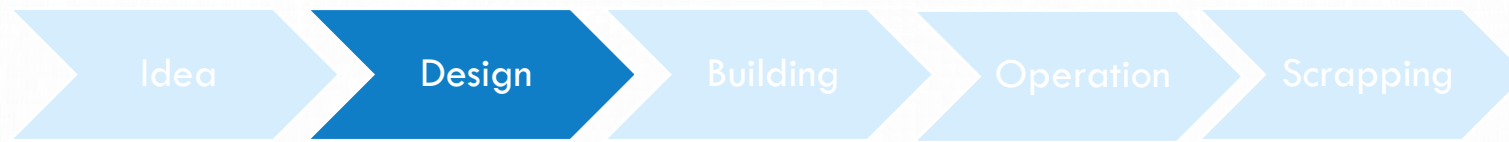
- Use of experienced designer (reference designs)
- Not too much complexity
- Technically correct
- Right team to develop design

Key decisions:

- Vessel main dimensions
- Performance requirements
- Machinery concept
- Preliminary arrangement

Risks (failures):

- Design not according to Rules&Regulations
- Too high cost
- Yards bidding not experienced
- Timing



CONTRACT

Mission:

- Develop Outline specification for Yard bidding
- Obtain sufficient certainty that design works technically
- Yards are capable to provide price&schedule

Factors for success:

- Use of experienced designer (reference designs)
- Not too much complexity
- Technically correct
- Right team to develop design

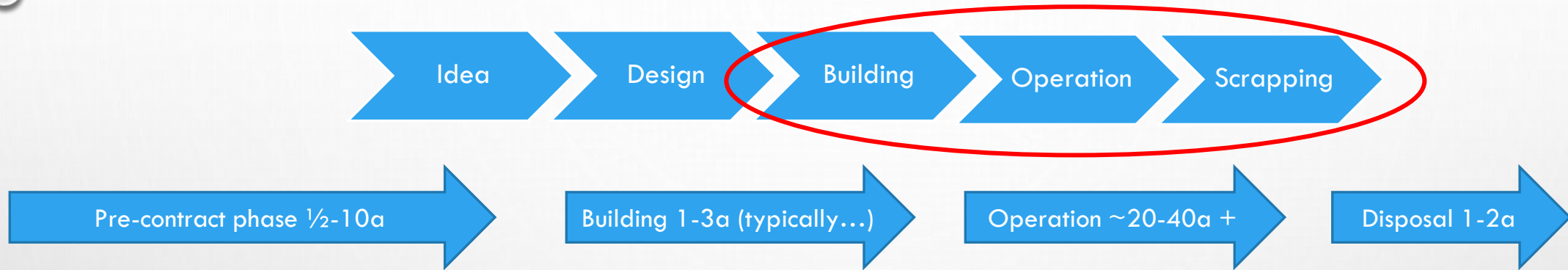
Key decisions:

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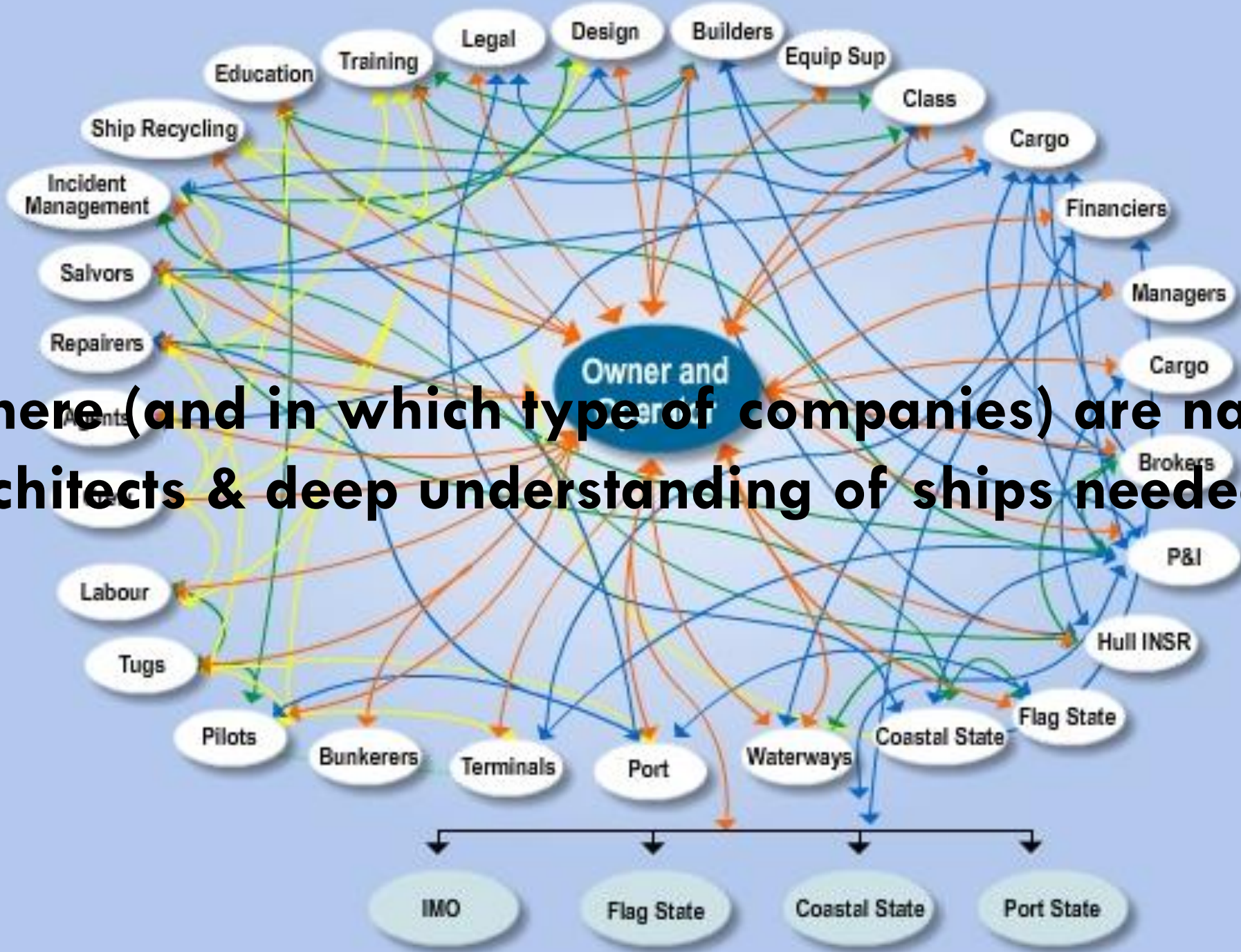
Risks (failures):

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- Timing

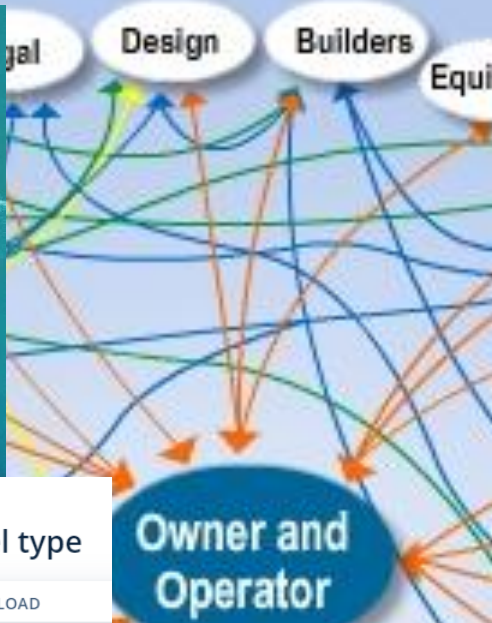
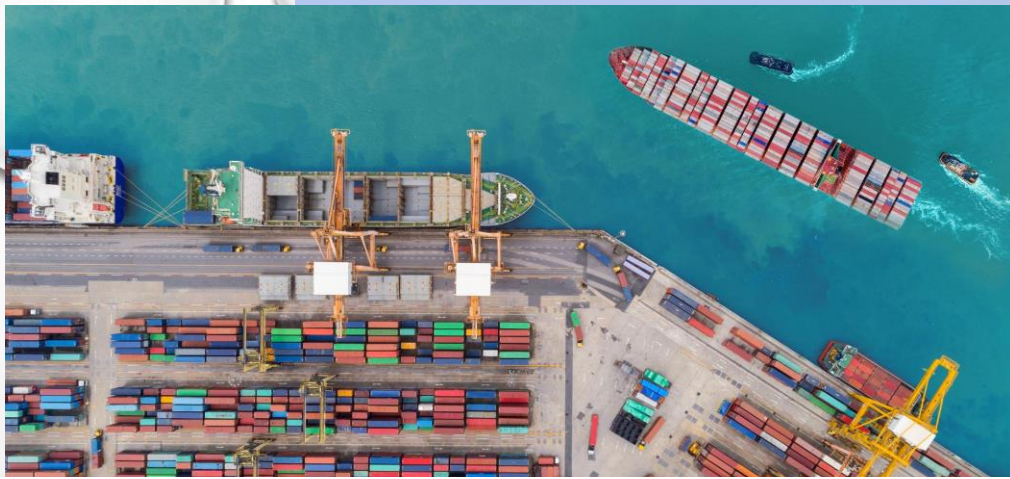
SESSION 2



- SHIP LIFECYCLE AFTER SHIPBUILDING CONTRACT
 - SHIPBUILDING
 - SHIP OPERATIONS
 - UPGRADES AND REFURBISHMENTS
 - SCRAPPING / DISPOSAL
- SUMMARY

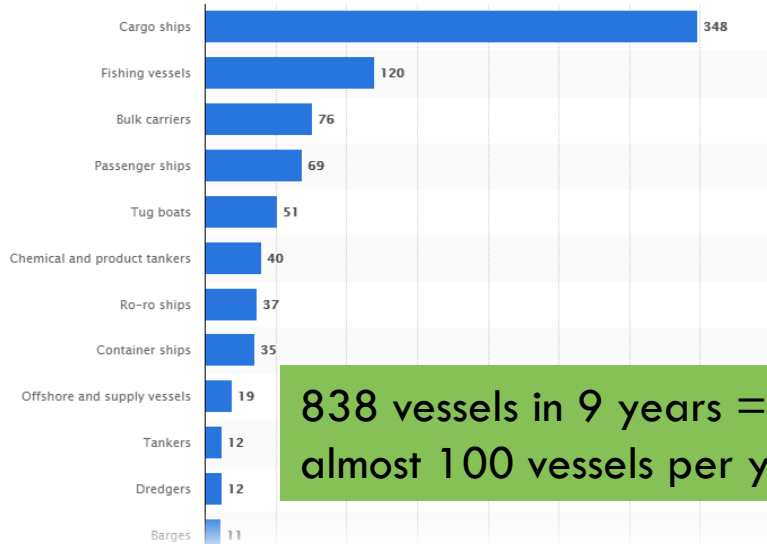


Where (and in which type of companies) are naval architects & deep understanding of ships needed?



Transportation & Logistics > Water Transport

Number of ship losses worldwide between 2011 and 2020, by vessel type



838 vessels in 9 years => almost 100 vessels per year!

[Expand statistic](#)

Details: Worldwide; Allianz; Lloyd's List Intelligence; 2011 to 2020

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Human errors led to ships collision in Corsica

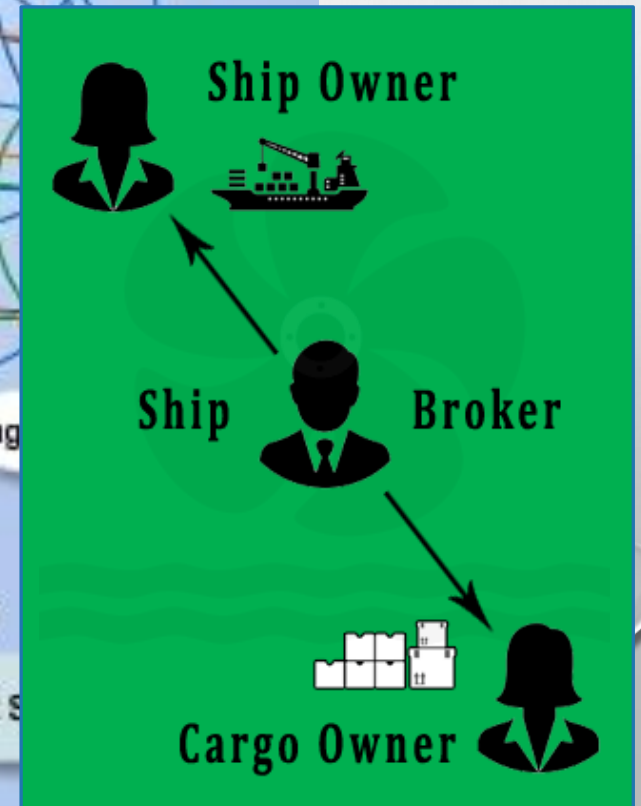
by The Editorial Team — January 8, 2019 in Accidents



The container ship 'CSL Virginia' collided with the ferry 'Ulysse' near Corsica on 7 October 2018



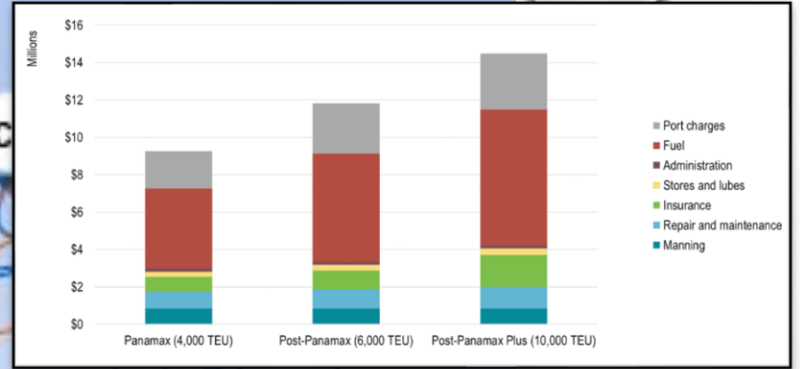
According to investigators the watch officer on board the Tunisian vessel Ulysse was talking on his phone, while the watch officer on the container ship Virginia did not attend to radar alarms. This caused the collision between the two ships in Corsica on October 7, which also led to an oil spill.



Educatio

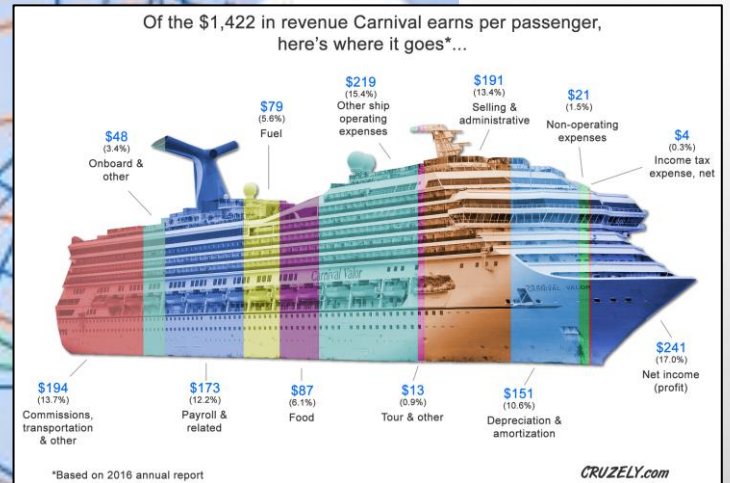


Builders Equip Sup



Owner and Operator

Crew



ZeeBORN Planned Maintenance

Component: Maintenance | Stock | Offloads/Transfers

Maintenance Schedules (calculated until 9/13/2010)

Pr. Int. No.	Job Code	Component	Job Name	Due Date
651.04.013.01	C200059	Turboscharger	Clearing the turbine (in HFO op...	9/5/2010
721.10.001	G212028	No.1 Aux. Cool. S.W. Pu...	100% Greasing	9/5/2010
501.02.001	D501004	Lifeboat 2	Lifeboat launching and trial trip (...)	9/5/2010
501.01	E500002	Lifeboat 1	Lifeboat launching and trial trip (...)	9/5/2010
602.13.01	8600052	M/E2 Connecting Rod ...	Check new/overhauled parts of ...	9/5/2010
501.02.007	E500002	Emergency Light	Confirmation of light up of light	9/5/2010
571.21.10	8730002	Electric Motor	48 months maintenance: doman...	9/6/2010
733.01.02	8730001	Electric Motor	3- months el. motor maintenance...	9/6/2010
731.05.021	8730001	Electric Motor	3- months el. motor maintenance...	9/6/2010
651.02.013	C600032	Turboscharger	Clean the compressor (in operati...	9/6/2010
651.04.005	C600001	Fuel Oil System	Clean fuel oil filter (depending o...	9/6/2010
780.01	C700053	Blow Water separator	Drain tank	9/6/2010
651.01.003	8600146	Cooling Water System	Check the corrosion protection ...	9/6/2010
363.82	Q363017	N2 Booster Compressor...	Recommended maintenance - s...	9/6/2010
363.82	1363015	N2 Booster Compressor...	After the first 100 hours	9/6/2010
571.22.05	8730001	Electric Motor	3- months el. motor maintenance...	9/7/2010
439.01.002.0...	8430208	Electric Motor	Electric Motor Bearing Greasing	9/7/2010
439.01.003.0...	8430208	Electric Motor	Electric Motor Bearing Greasing	9/7/2010
439.01.003.0...	8430208	Electric Motor	Electric Motor Bearing Greasing	9/7/2010
439.01.002.0...	8430208	Electric Motor	Electric Motor Bearing Greasing	9/7/2010
439.01.002.0...	8430208	Electric Motor	Electric Motor Bearing Greasing	9/7/2010
780.02.05	C760001	Sludge Burner	To be cleaned and inspected for...	9/7/2010
780.03.02	8760007	Mill Pump	Check of impeller and mechanica...	9/7/2010
651.04.004	8651003	Speed Governor	Check brushes and commutator ...	9/7/2010

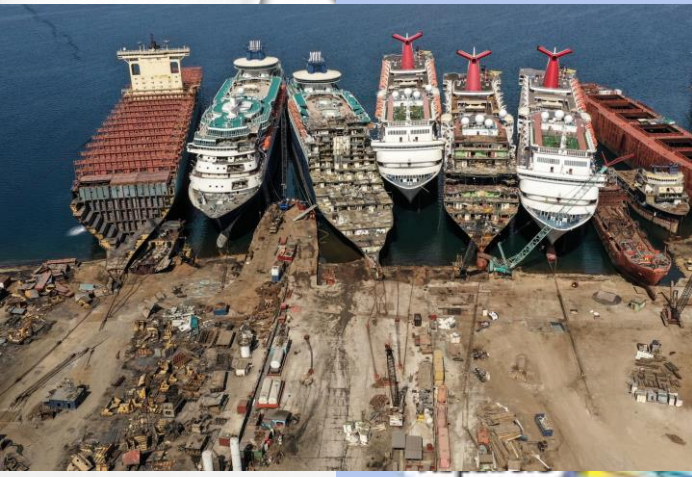


Bunkerers

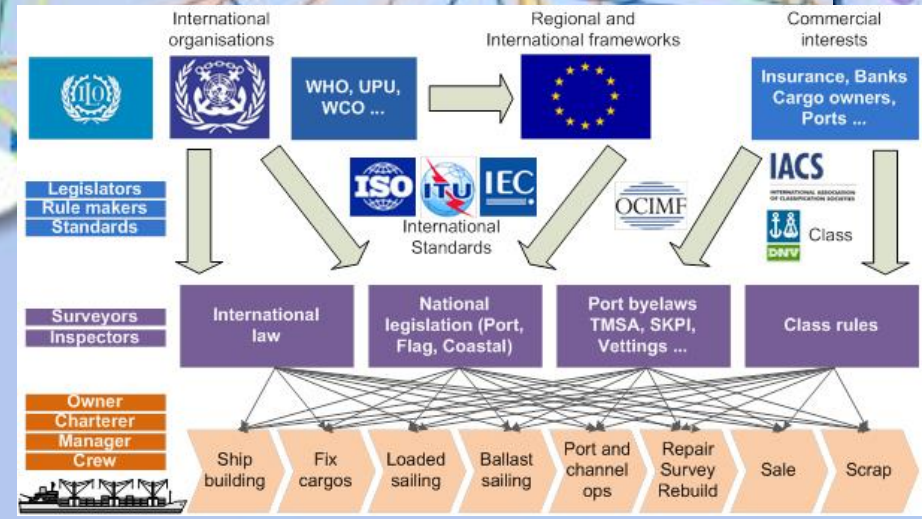
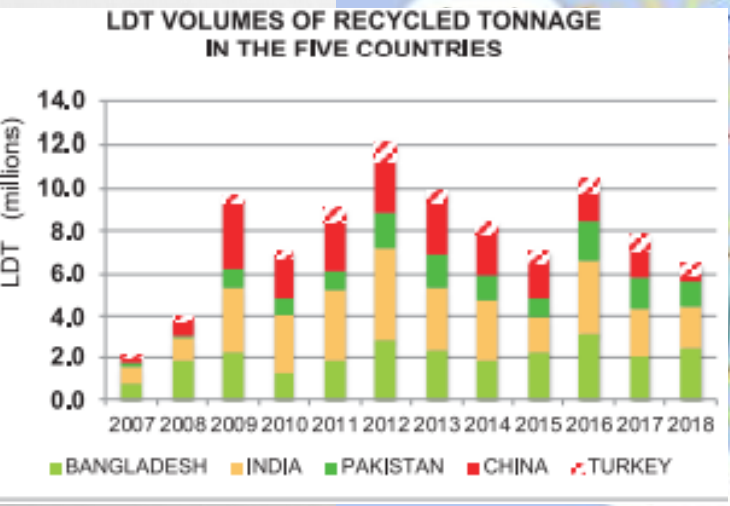
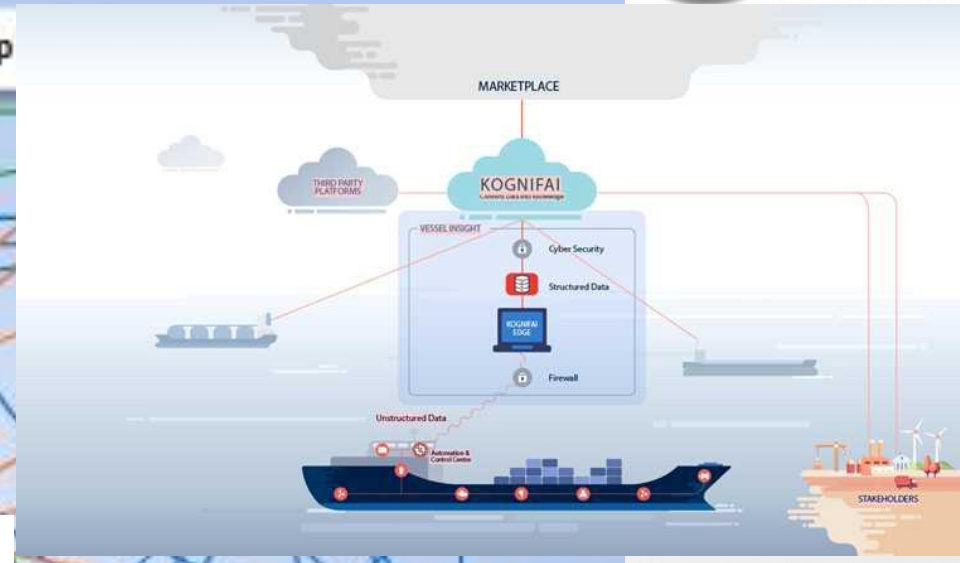
IMO



PMS = Planned Maintenance System



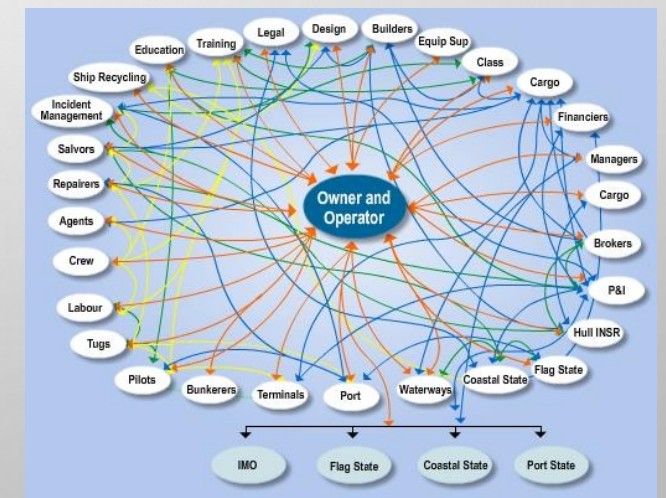
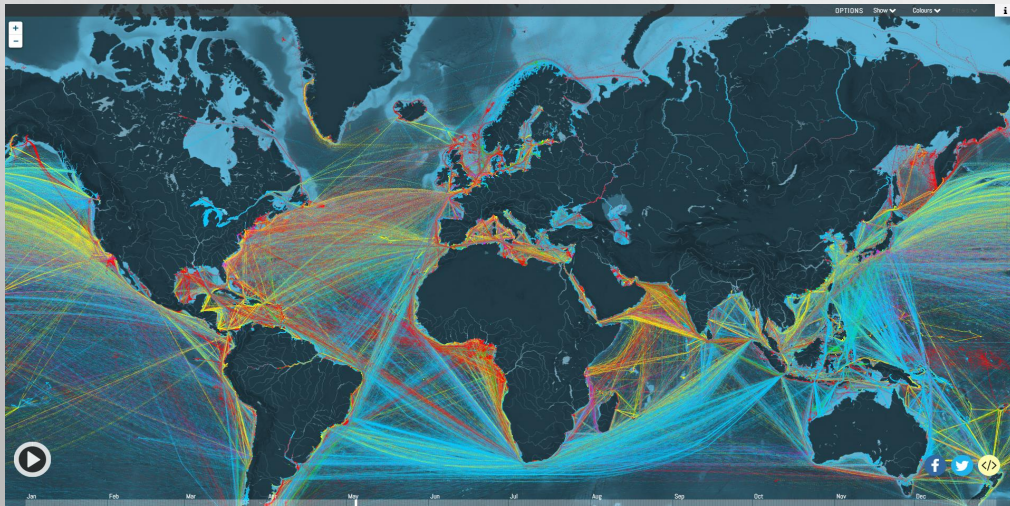
'Yard' in Bangladesh – workers carrying waste oil



SUMMARY

"PRACTICAL VIEWS ON SHIPS AND SHIPPING BY TWO NAVAL ARCHITECT'S"

- SHIPPING IS THE MOST INTERNATIONAL BUSINESS IN THE WORLD AND WILL CONTINUE GROWING HEAVILY FOR THE YEARS TO COME.
 - MAJORITY OF THE SHIPS ARE OPERATING "OUT OF SIGHT" FROM BIG PUBLIC
- IT IS ALL ABOUT TEAMWORK – NO (GOOD) SHIP IS DESIGNED, BUILT OR OPERATED BY A SINGLE PARTY!
- THERE ARE MULTITUDE OF INTERESTING CAREER OPPORTUNITIES AND TASKS / PROJECTS FOR A NAVAL ARCHITECT AT EVERY STEP OF SHIP'S LIFECYCLE – BE CURIOUS AND CHALLENGE YOURSELF!



FURTHER READING AND INFORMATION

BOOKS

- **“MARITIME ECONOMICS”** BY MARTIN STOPFORD (2009, 3RD EDITION).
- **“THE GEOGRAPHY OF TRANSPORT SYSTEMS”** BY JEAN-PAUL RODRIGUE (2017, 4TH EDITION).

MARKET REPORTS & ANALYSIS

- **“REVIEW OF MARITIME TRANSPORT”** BY UNCTAD: ANNUAL REPORT AND STATISTICS ON GLOBAL MARITIME TRADE, MARKET DEVELOPMENTS, TRENDS AND OUTLOOKS. AVAILABLE AT [HTTPS://UNCTAD.ORG/EN/PUBLICATIONSLIBRARY/RMT2019_EN.PDF](https://unctad.org/en/publicationslibrary/rmt2019_en.pdf)
- **“ANNUAL REVIEW 2019”** BY ICS. ANNUAL REPORT ON KEY INDUSTRY ISSUES. AVAILABLE AT: [HTTPS://WWW.ICS-SHIPPING.ORG/DOCS/DEFAULT-SOURCE/RESOURCES/ICS-ANNUAL-REVIEW-2019.PDF?SFVRSN=3](https://www.ics-shipping.org/docs/default-source/resources/ics-annual-review-2019.pdf?sfvrsn=3)

INDUSTRY NEWS & NEWSLETTERS:

- **WORLD MARITIME NEWS** - [HTTPS://WORLDMARITIMENEWS.COM/](https://worldmaritimenews.com/)
- **HELLENIC SHIPPING NEWS** - [HTTPS://WWW.HELLENICSHIPPINGNEWS.COM/](https://www.hellenicshippingnews.com/)

PODCASTS:

- **LLOYD'S LIST PODCAST:** WEEKLY PODCAST (15-20 MINUTES) ON DIFFERENT TOPICS, SUCH AS INDUSTRY TRENDS OR MARKET BACKGROUNDS [HTTPS://LLOYDSLIT.MARITIMEINTELLIGENCE.INFORMA.COM/](https://lloydslist.maritimeintelligence.informa.com/)
- **SHIPPING PODCAST:** DIFFERENT MARITIME EXECUTIVES EXPLAIN BACKGROUNDS OF THEIR BUSINESS AND DISCUSS INDUSTRY TOPICS [HTTPS://SHIPPINGPODCAST.COM/](https://shippingpodcast.com/)