

TRAINING THE FUTURE MARINER

Integration of AI and the Human Element

Navigating the Transition

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Like it or not, the future is coming



Navigating the Transition



The name of my presentation is Navigating the Transition, because we are in the middle of a once in a generation change in how people and ships work together.

People who lack historical context often think the first time they experience something is the first time it ever happened.

As a student of maritime history, when I am faced with situation I haven't encountered before, I often look back to see if other people have had to deal with similar situations in the past. Very often it has. There may be differences in the details, but the underlying situations are often the same.



Launched in 1807, Robert Fulton's Steamboat *Clermont* was the first steamboat in public service.



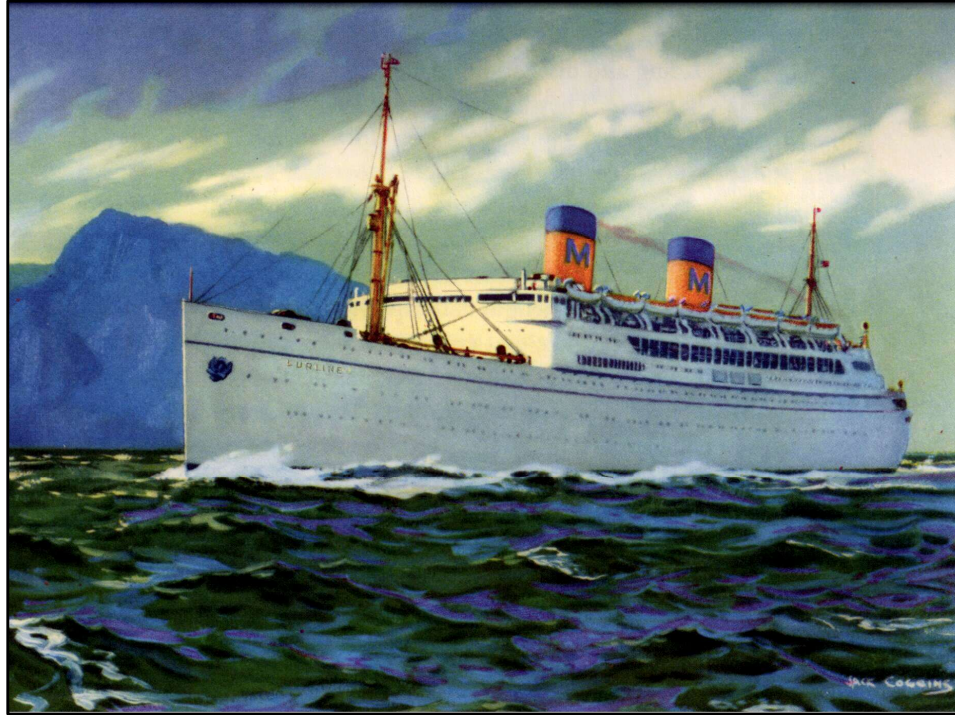
The Steamship *Savannah* made her maiden voyage on May 24, 1819, and went on to become the first steamship ship to cross the Atlantic – even though most of the voyage was mostly under sail.

By then stenciling was on the bulkhead

- Sail was going to be replaced by steam.
- Many mariners and their skills would become redundant

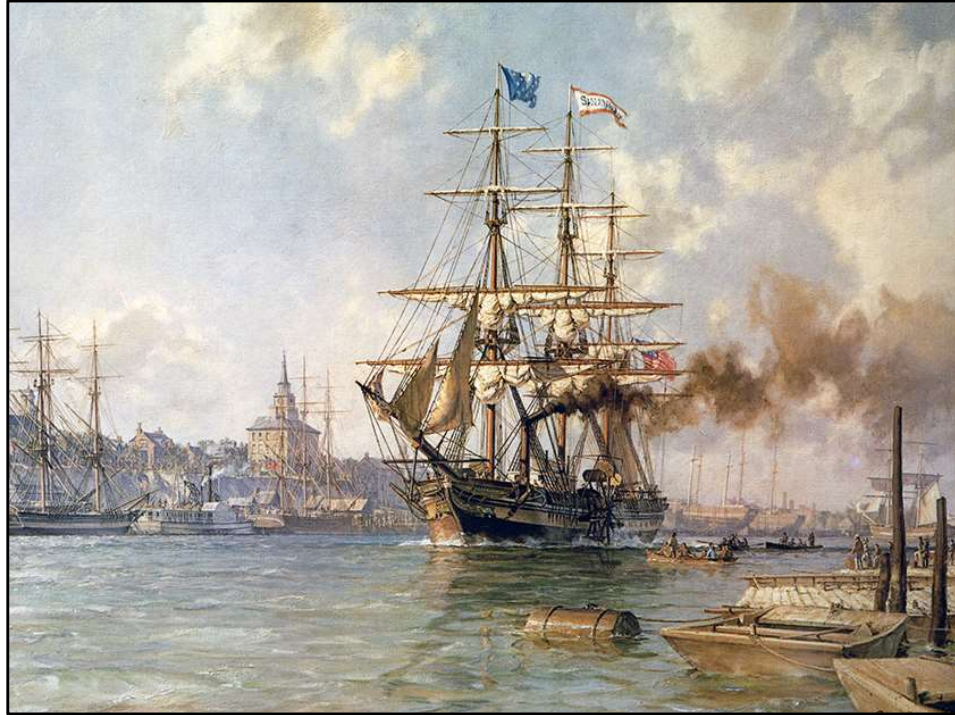


The Steamship *Savannah* was the death knell for ship like this.



But the Steamship *Savannah* paved the way for ships like this.

It took a hundred years, but the course was set.



So what did the mariner just starting his career contemplate when he saw the *Savannah*?

What skills was he going to need?



Now we are looking at the next major transition

- Crewed vessels to Autonomous ships and boats
- Many mariners and their skills will become redundant

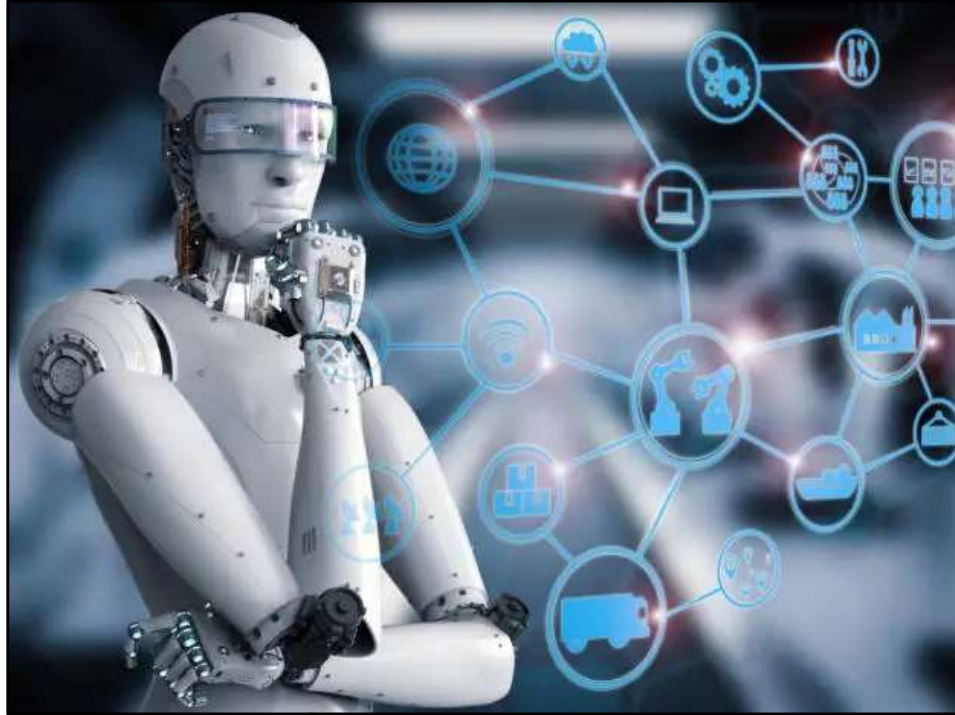
It wont happen overnight. But it is happening.



Last month the first autonomous zero-emission container ship *Yara Birkeland* completed its maiden voyage in the Oslo Fjord.

It was a short voyage, under very closely observed circumstances, but it made it to its destination without running aground or hitting anything.

So autonomous ships are coming, but there will be a transitional period.

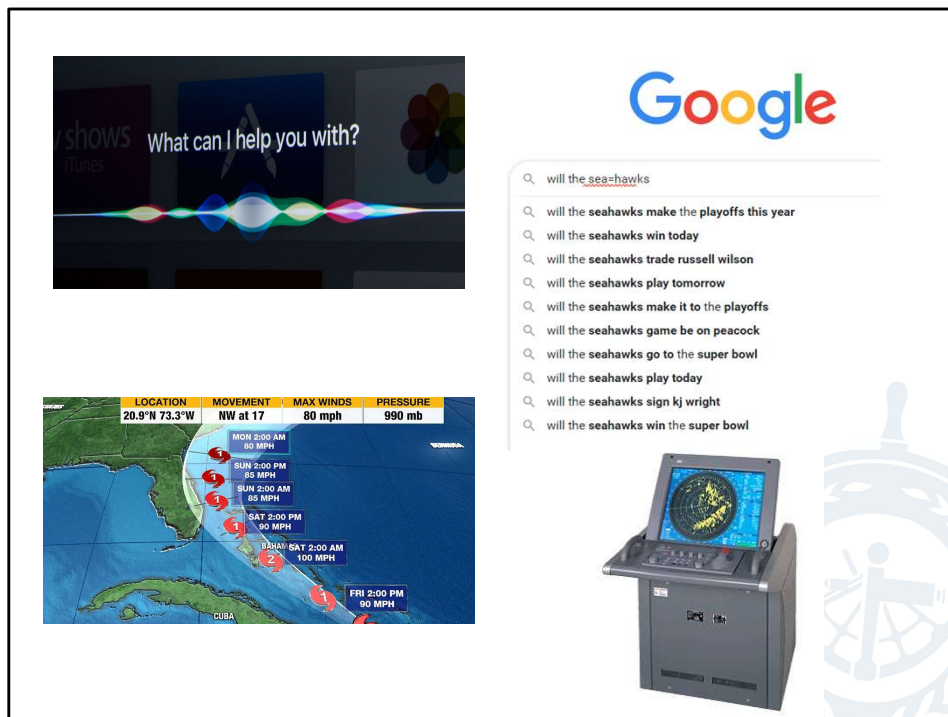


In the meantime, we should expect AI to play a larger role in ship operation, and increasingly take over duties currently performed by people.

Is Artificial Intelligence Synonymous with Autonomous Ships?



Labor-saving technology aboard ships is not new – witness the autopilot



AI is already here and mariners already use it –both at home and at work.

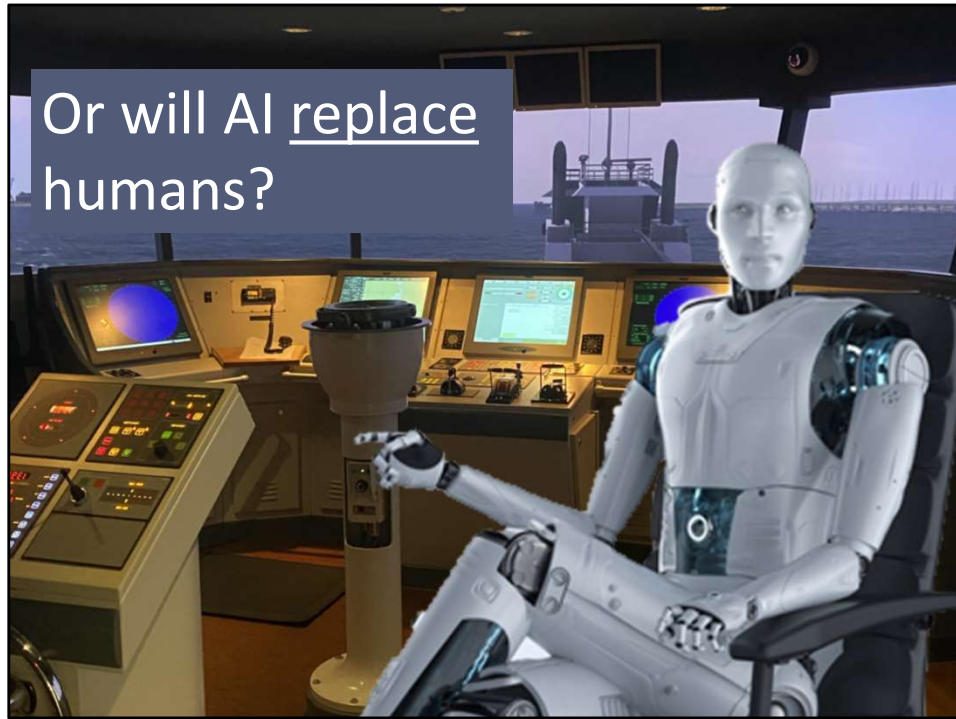
- Autocorrect
- ARPA
- Cargo Handling
- Search Engines
- Social Media
- Weather forecasting
- Voyage Planning
- Engine Management software



What does the future of AI look like?



Will AI be a helper?



Or will AI replace humans?

Or will it be a Master



The answer to both questions is yes.

We are entering a transition period where people and AI tools will share the same space, with the eventual turnover of most, if not all duties to machines.

The transition may not take a hundred years, but it will probably take more than 20.



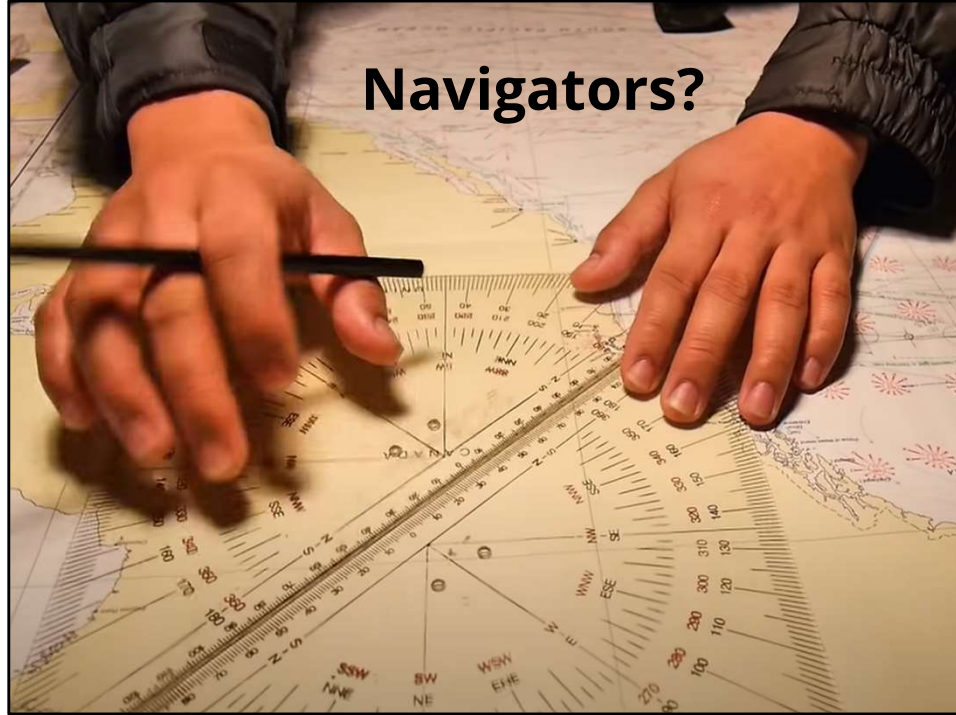
Are we there yet? No, but we are on that road. We have begun the new transition.

Training the Future Mariner

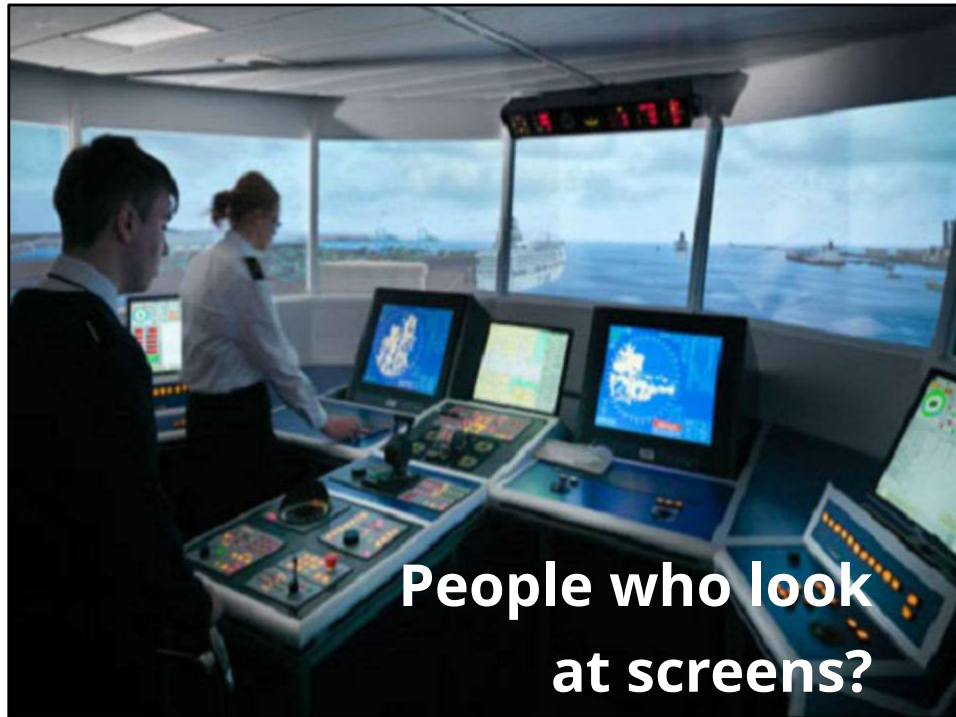
Integration of AI and the Human Element



So during this time of transition, we are still going to need mariners. But what skills are these transitional mariners going to need?

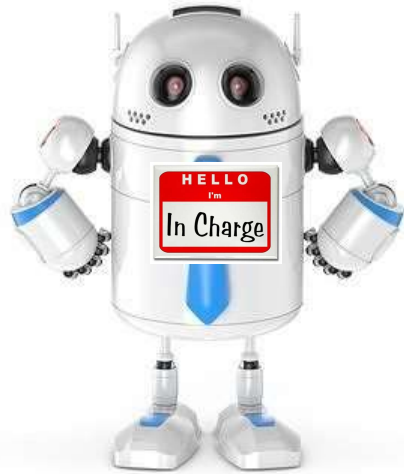


Are we going to teach them to be Navigators and Seafarers?



Or simply people who interact with screens?

Who is in charge?



Defining the skills these new transitional mariners need, it is important to determine who is running the ship.



In other words, who takes the fall when things go wrong?

Who pays the price for failure?



Can you imagine any scenario where the ARPA goes to jail when it makes a mistake?

Who pays the price for failure?



As long as people staff ships, people will be ultimately responsible for the safe operation and navigation of the vessel.



With the *Savannah* came the need for a Chief Engineer to run the steam engine, but the Captain was still ultimately in charge.

Who is in charge?



And that is how it is going to work in this new transition. Until vessels are completely autonomous, there will be people aboard and the ultimate responsibility will lie with the Master.

Capt. Belinda Bennett – Windstar Cruises

Who is on your team?



We will still have cadets and junior officers.

Who is on your team?



And navigators

Who is on your team?

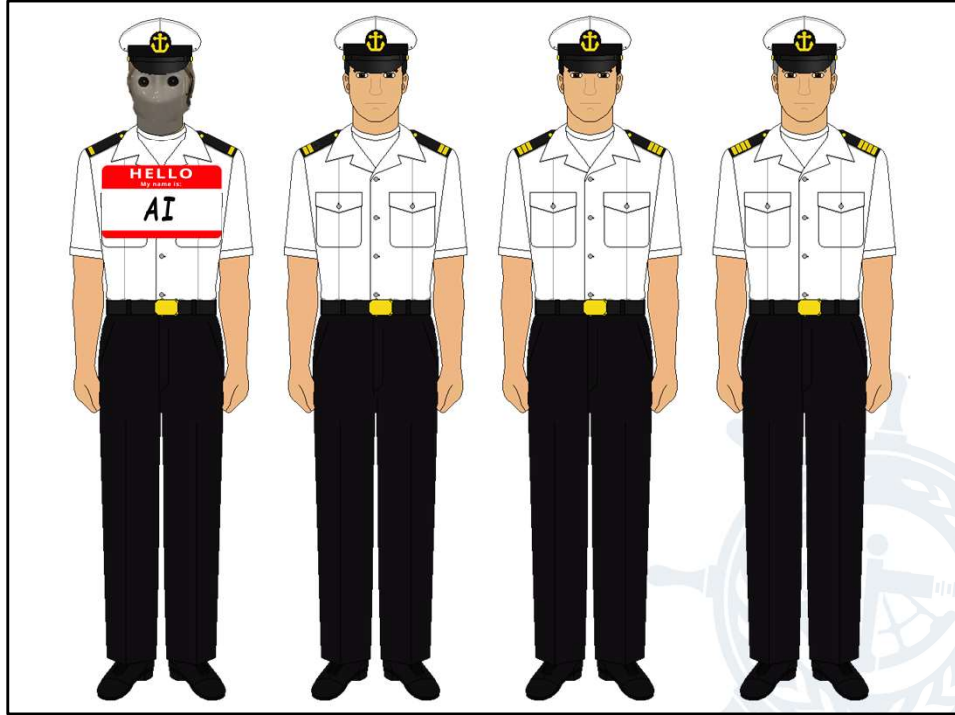


And senior officers

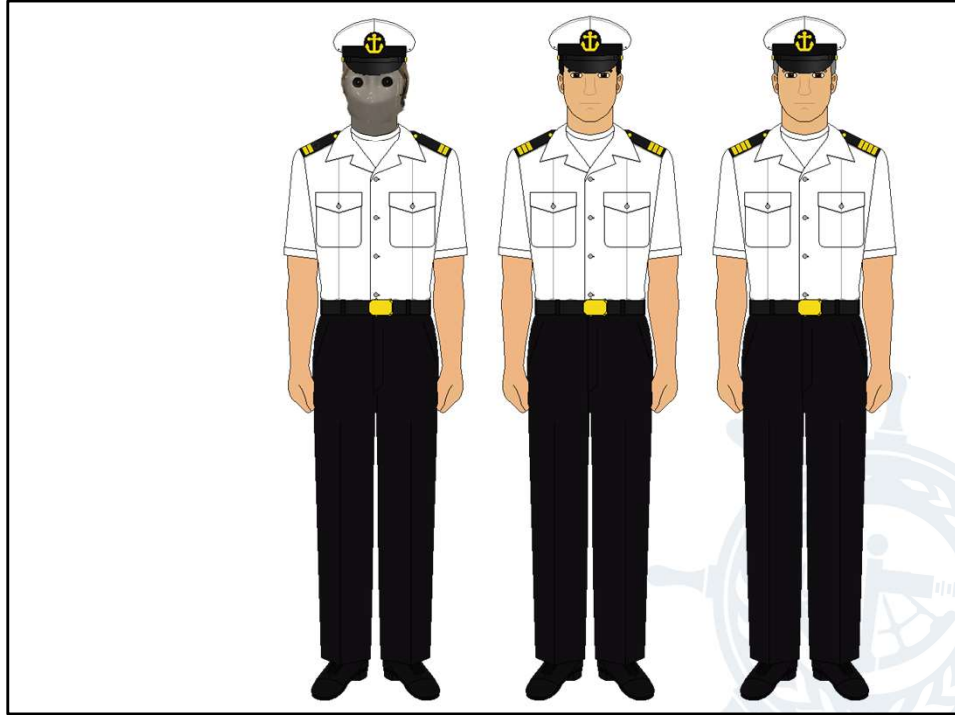
Who is on your team?



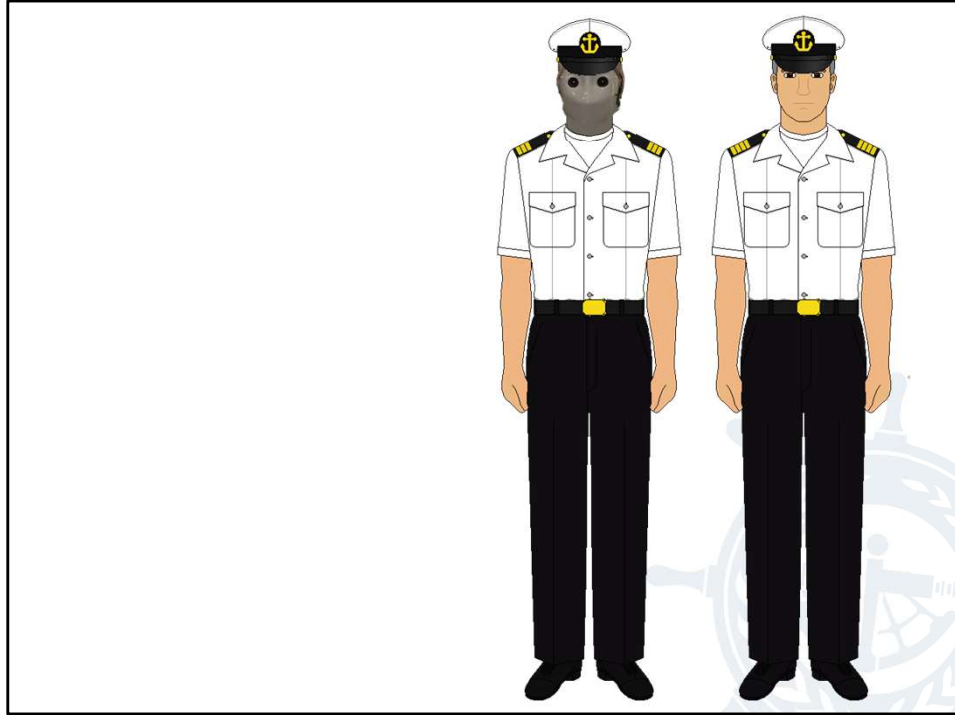
And the New Guy.



The new guy's name is AI. AI will be ambitious. AI will want to learn more and take on more responsibility.



And AI doesn't get tired, bored, or distracted. AI thrives on performing repetitive tasks. And AI isn't subject to minimum rest requirements and doesn't demand overtime. AI will strive for promotion.



AI will work hard to prove itself and become indispensable. AI will work to prove it is the only Mate the Captain will ever need.



At some point the Captain will let AI take the ship out on its own. Under strict supervision, of course.



Until one day.....

Training the Future Mariner

Integration of AI and the Human Element



So during this time of transition, as we increasingly depend on AI tools, we are still going to recruit and train human mariners. Probably for many years to come.

But what skills are these new mariners going to need?



The history of Seafaring is filled with people striving for better ways to cross the ocean and come back home safe. Mariners have always looked for better ways to cross the ocean and come home safe. Technology played a role, long before the invention of electricity or electronics.



M.I. *Mariners Intelligence*



A very good term for the knowledge you have acquired over the years, as coined by my friend Jeff Slessinger of Delphi Marine, is M.I. – or Mariner's Intelligence. When I was in the Navy, my Chief Engineer used to say that it takes 10 years to get 10 years experience, and longer for some people.

Mariner's Intelligence is a collection of ancient knowledge and skills, passed down from one generation to the next. But what really makes you experts in your field is not just your knowledge of the facts, but the way you can weave the facts into years of experience and intuition.



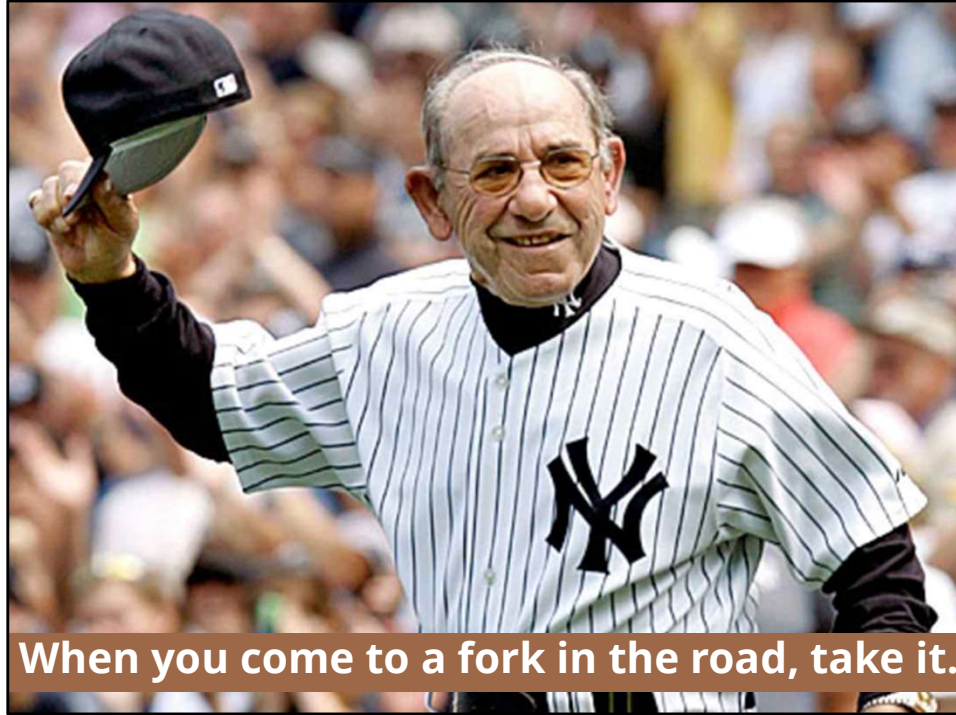
We need to be very careful not to let thousands of years of collective knowledge and expertise get “thrown out with the bathwater” just because a machine can now perform the same task.

- AI technology on the bridge is not an excuse to dumb down deck officer competency requirements.
- The Master of the Vessel must also be the Master of Technology.
- Smart vessels require smart operators.

AI technology on the bridge is not an excuse to dumb down deck officer competency requirements.

As the new AI Watch Officers move up in the chain of command, human officers must be able to stay one step, or one rank ahead. They must monitor AI's progress and be careful not to turn over too much responsibility too soon. Just because a person holds a Mate's license, it does not necessarily follow that they are ready to stand a Mate's watch. Technology starts with a promise, but not every new technology evolves as expected or advertised.

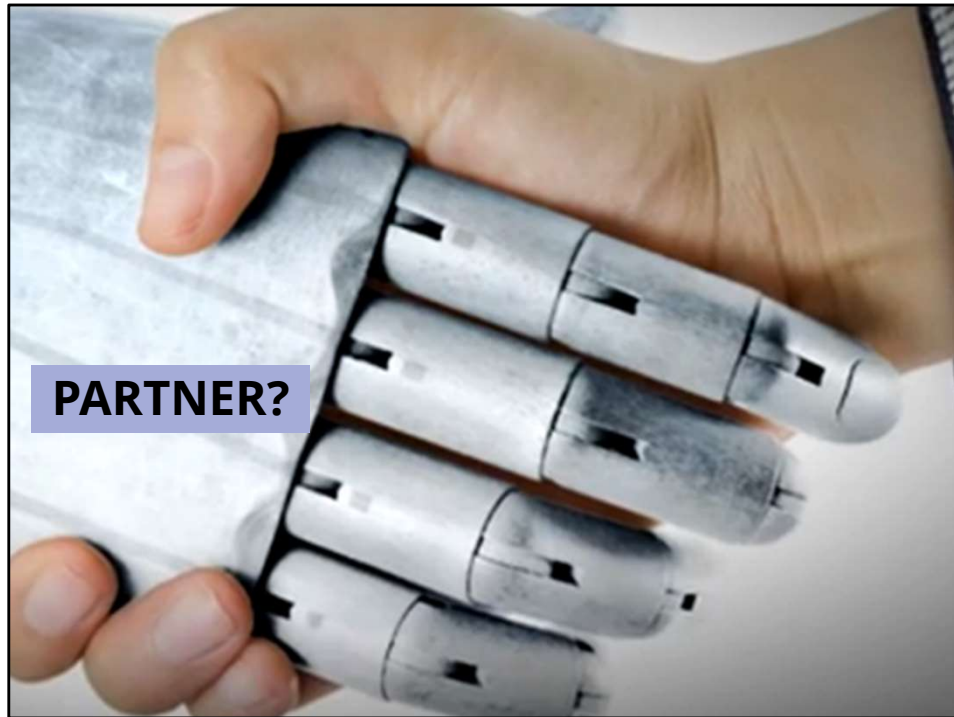
This means our future mariners cannot be glorified button pushers or screen watchers. For the next 30, 40 50 years or beyond, they must still learn to be experts in seamanship, ship handling and collision avoidance, because if they do not know these things themselves, how can we expect them to recognize when there their AI counterpart is heading down the wrong channel or standing into danger. There was a reason the Savannah, and most other early steamships also carried sails. New technology can be promising, but it takes years of development to reach its full potential.



A fork in the road is coming. One fork is to sulk and complain about how the world is going to hell and how they just don't make sailors like they used to.



Smashing the machines that are perceived to be taking away our jobs might feel good, but as the Luddites discovered, it won't stop the inevitable progress.



The other fork is to accept the inevitability of change, and welcome AI as a new and talented member of the bridge team, one who can help us do our jobs safer, and make better decisions.

The Human Element



- A key element of the safety of life on board ships
- A contributing factor to most of the casualties in the shipping sector



According to the IMO, people (the Human Element) are both the problem and the solution. Mariners bring many intangible skills to the bridge that computers may never be able to learn.

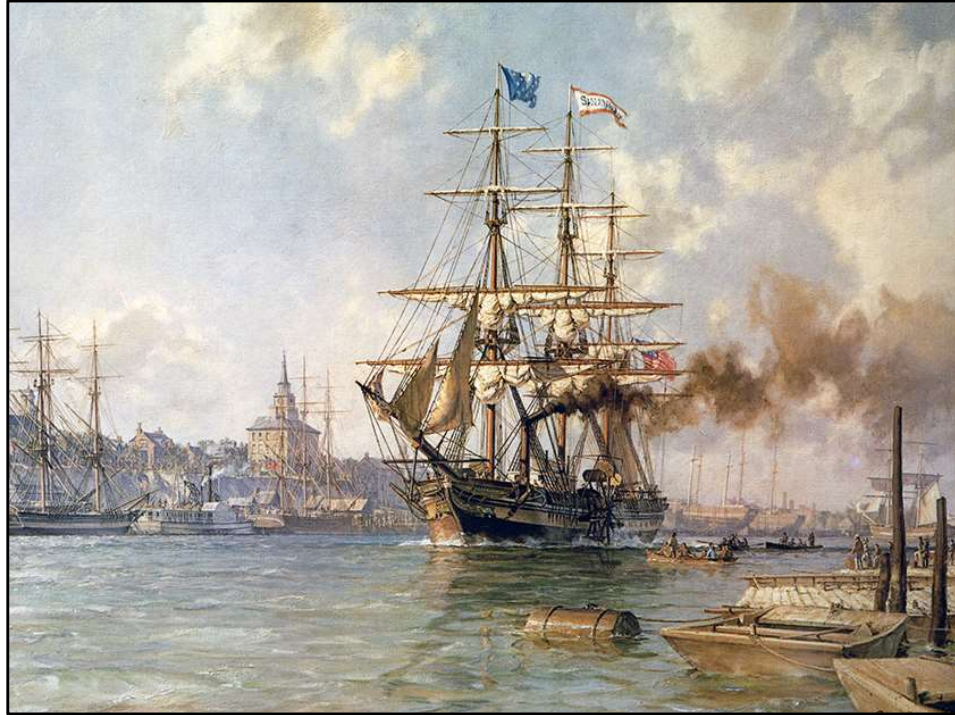
But mariners also get sick. We get bored. We get tired. We get distracted. We make mistakes.

If we learn to use them properly, and take advantage of the skills they have to offer, machines utilizing Artificial Intelligence can help alleviate many of the routine tasks mariners face everyday, and free them to exercise, develop and perfect their Mariner's Intelligence.



Most of us here today are not going to be replaced by robots or autonomous ships, but we will be replaced by mariners who will need to work with and understand AI technology.

Our obligation as mentors and instructors is to train the future mariners to the same high standards we expect of ourselves and our shipmates, while at the same time encouraging them to learn and master the new ways of sailing the seas.



Just like the people who saw the Savannah over 200 years ago, we are witnessing the beginning of a new era in seafaring. I don't know which course future ships will follow, but I know people will be involved, whether on the bridge or on the shore, or both.

Even though the ships and people will change, the voyage is never ending. For those coming after us, I hope we can pass on not only what we have learned, but the lessons I learned from those who came before us. The best thing we can do for future mariners is to teach them not only the essential skills, but to also keep an open mind about the future, and to never stop learning and never stop searching for ways to make seafaring better.

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Thank You

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