

## AI IS MORE THAN A BUZZWORD AND BEING DEPLOYED NOW ON SHIPS AND GOLF CARTS

More than ever, organizations are adopting artificial intelligence (AI) to bring efficiency, productivity gains, and a return on investment. In these uncertain times, AI is a powerful differentiator for companies of all sizes to transform digitally.

In recent years, the cloud has become integral in advancing AI as vendors offering years of research and tools to developers tasked with creating AI solutions.

Technological infrastructure (IaaS - Infrastructure as a Service), as well as the supply and maintenance of software (SaaS - Software as a Service), is now being applied to AI by hyper-scalers and service providers like Infosys through their Cobalt offerings.

IaaS avoids upfront capital costs required for increased computing capacity and provides pay as you use for experimentation. SaaS allows companies to utilize off-the-shelf AI solutions instead of building teams and infrastructure from scratch, albeit limited to standard solutions (standardization instead of innovation).

Platform as a service (PaaS) solutions, accessed via an application programming interface (API), allow the inclusion of AI and Machine Learning (ML) into applications, websites. PaaS solutions allow for higher-level programming with dramatically reduced complexity; the application's overall development can be more efficient.

The demand to make mission-critical and time-sensitive decisions at the Edge is fueling a growing need to bring powerful compute enabled by AI. Fortunately, this is being made increasingly possible by the availability of high-performance networking and edge computing hardware.

When real-time insights are critical, the latency caused as data travels to data centers or the cloud and then back to the device can be especially problematic. Things such as self-driving cars cannot wait for the roundtrip of data to know when to brake or how fast to travel.

The growing need for real-time decision making will drive intelligence to the Edge to complement the cloud for less time-sensitive compute.

Below are two compelling examples showing how a PaaS solution developed in the cloud was transferred to the Edge – involving a naval vessel and a golf cart!

## PREDICTIVE MAINTENANCE AT GOA SHIPYARD LIMITED

The [Goa Shipyard](#) says it is the largest exporter of ships from the Indian sub-continent and prides itself in saying that it is the only shipyard recognized by the DSIR, Ministry of Science and Technology of India. This AI example takes predictive maintenance to the extreme. The Goa Shipyard developed a Condition Monitoring System (CMS) for shipboard equipment with Infosys for the Ships it makes.

Regular maintenance in the maritime industry involves overhauling or replacing shipboard equipment at fixed intervals based on estimates and empirical values. Crews will replace components that are still fully functional with unnecessary docking times. Additionally, operators will not be aware of a part about to fail because it has not exceeded the estimated lifetime.

The CMS system will continuously monitor the equipment enabling the decision-making of maintenance based on the equipment's actual condition rather than a periodic maintenance strategy.



Goa Shipyards

For example, time-based maintenance might require a technician to replace the filter every 90 days. This process has two primary issues. First, the filter could fail in less than 90 days, causing damage to the equipment. Second, the filter may not need to be changed after 90-days, in which case the technician has wasted an hour. With CMS, a remote sensor could be placed behind the filter to detect the flow rate. This sensor could feed the flow rate data into a central repository, aggregated with other sensor data, and routed through a machine learning algorithm. The algorithm could determine a) filter replacement and b) if the combination of the flow rate data and other sensor data indicates a more significant issue with the equipment as a whole. Over time, as the algorithm digests more substantial amounts of data, it can create more accurate predictions.

CMS predicts system failure or fatigue at least 72 hours in advance, which is time to set a course of action, whether onboard repair or obtain new parts via helicopter or return to port. Machine learning algorithms are the building blocks of AI. Machine learning can detect anomalies based on analyzing differences in data outputs – for example, discrepancies in readings from engine pressure sensors. The next step is for experts to investigate the irregularities and diagnose the impending fault. Using the raw, number-crunching power of AI in this way means that abnormalities are detected much faster than with more traditional, rule-based condition monitoring, which uses a list of engineering principles that quickly becomes unmanageable with more complex systems.

On each ship, the platform operates autonomously but syncs to a central command center for the whole fleet. The AI-based system performs preventative maintenance for the vessel's engine, consisting of many systems and auxiliary subsystems.

Edge computing is key to the digital transformation in vessel maintenance, processing, and analyzing data closer to the point where it is created, providing real-time data analysis even without an internet connection.

## AN AUTONOMOUS ELECTRIC BUGGY FROM MAINI

The Maini Group has been in business for 40 years and develops and produces a whole fleet of electric vehicles for material and people handling. It is known as the “pioneer in India’s first mass-produced green electric car.” Infosys and [Maini](#) partnered to produce an autonomous electric buggy.

This commercially viable product, launched at India's Wings event, focused on the Civil Aviation sector in March 2020, targeting those airport buggies that rush travelers and luggage to the gate. The product has many other uses in transporting people, for example, across amusement parks and office campuses.



Maini Group launches India's first autonomous buggy. March 2020

The approach that Infosys took in developing this product is to compartmentalize the problem into two main areas. First, an autonomous mobility platform, a set of technologies that would not only enable self-driving cars but anything that needed to work autonomously. Virtually any mobility; wheels, rails, or freely moving around. One platform – many uses.

The second was the need for vision sensing resulting in a combination of visible camera images, 2D LIDAR, and 3D LiDAR images. The LiDAR acronym means Light Detection and Ranging. A LiDAR uses a laser beam for detection, analyzing, and tracking purposes. Additionally, GPS gives a sense of not just direction but layout and positioning.

Using the Autonomous mobility and the Vision sensing platform enables the buggy to detect objects, lanes, and curbs for navigation. Safety features include long-range obstacle detection, short-range peripheral obstacle detection, S/W & H/W health monitoring, and emergency stop procedures. Data is not sent to the cloud as decisions need to be real-time.

## INFOSYS AND AI

The two examples above demonstrate that AI is more than a buzzword and is delivering business benefits.

I believe that Infosys is a global leader in engineering, consulting, technology, outsourcing, and next-generation services. Infosys Nia is an artificial intelligence platform that enables a comprehensive set of industry and function-specific solutions and allows customers to build custom experiences specific to business needs.

Infosys provides a growing portfolio of ready-to-use Infosys AI solutions adapted quickly to specific business needs. It includes an AI store with pre-curated models and datasets, including a catalog of AI models, datasets for training models, and AI services codes. Also available are open-source software and services and products from a consortium of AI startups and established technology vendors.

Infosys Nia, coupled with expertise to educate and train in AI techniques, gives Infosys the platform, services, and skills to deliver business value.

## WRAPPING UP

AI is integral for companies looking to accelerate digital transformation. The combination of data, cloud, and AI provides a distinct competitive advantage by unearthing new possibilities resulting in tangible business benefits.

The first example shows how the maritime industry does business is changing based on the introduction of AI. With more technological advances, we will see a digital transformation in vessel maintenance through predictive maintenance.

As I've said many times before, I believe fully autonomous vehicles will be one of the most impactful technological innovations in our lifetimes. As the industry grows and autonomous vehicles become more advanced and ubiquitous, there will be an immense market opportunity for those involved in making these automobiles tick.

Infosys has demonstrated the ability to solve a wide variety of business problems. Imagination only limits the application of AI technologies.

Other business problems cited by Infosys demonstrates the possibilities:

- Improving the order-to-cash process by creating a real-time risk profile to customize the collection strategy, expedite resolving disputes, predicting anomalies, preventing conflicts, and enabling better visibility and forecasting of cash flow to reduce days sales outstanding (DSO).
- Predict variability in manufacturing and material cost while also reducing product development cycle times.
- Create knowledge models of multiple, complex labor contracts with an on-demand, self-service conversational interface to operationalize the knowledge.
- Create a customer profile based on internal and external data sources to help develop targeted messaging, accurately identify upselling and cross-selling opportunities, offer personalized solutions, and improve customer satisfaction.

And the list goes on. Stay tuned for more interesting examples.

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