

# The Yacht Charter's Guide to Smart Boat Technology



**BRNKL**



## INTRODUCTION

Managing a fleet of boats is a challenging task, especially when it comes to crew and passenger safety, maintenance costs, and the need to deliver excellent customer service. When a vessel is returned to the charter's home port two things can be immediately confirmed: the crew and passengers are safe and the boat is still floating. However, the overall health of the boat is still unknown. The follow-on inspection may take a few minutes or a few hours in order to validate the claims of the captain and crew as to whether vessel was involved in an incident. However, truly understanding what happened during the charter requires a lot of guess-work. Helping charter companies reduce this guess-work through evolving technology and the rise of "smart boats" provides new opportunities to enhance safety, reduce operating costs, and minimize down-time on charter boats after they are returned.

Operating and managing a charter fleet requires knowledge of each individual boat's health before and after the vessel is deployed for a trip. In an effort to make this easier, advanced on-board management systems include features like GPS tracking, sensors, communications, and surveillance. What makes these systems powerful is their ability to distill complex data into simple, user-friendly dashboards, enabling both technical and non-technical users to understand the data and make educated decisions.



## SENSORS

The sensors and systems being installed on vessels can provide immediate alerts to charter managers regarding a multitude of parameters, such as when boats have entered a restricted zone, suffered an impact or show signs of degraded health via batteries, bilges, and other critical components. This information is collected by the vessel's onboard hardware and is transmitted to the cloud. The data in the cloud is automatically analyzed to produce valuable insights to be displayed on the charter company's dashboard. For example, Barnacle Systems provides a hardware package that allows users to monitor GPS, impact, motion, temperature, humidity, barometric pressure, doors/windows, battery banks, bilges, high water floats, and even an optional surveillance camera. The system can be expanded with wireless sensors throughout the boat to monitor multiple cabins and simplify installs.



## DATA MANAGEMENT

A buzz-word in today's technology sector is "Big Data", which is essentially a very large data set that is analyzed computationally to identify trends or problems. Leveraging the massive infrastructure developed for Big Data (such as Google Cloud), charter operators can move away from maintaining fleet data manually in binders and spreadsheets and have all their data safely and securely stored in the cloud. Both the raw and processed data can be quickly retrieved and viewed through a charter management dashboard on computers, tablets and smartphones. This accessibility to data allows maintenance managers to continually make educated decisions for every single boat in their fleet.



## COMMUNICATION

Getting data from a boat to a dashboard can be a complex exercise. Managing hardware, data plans, and ensuring connectivity can be a daunting task when developing a custom solution. What happens when the communication link goes down? Top performing systems today collect real-time sensor data onboard the vessel, confirm there is a secure cloud connection and then transmit data. If the communication link is broken they continue to store the data locally and push all of the data out as soon as the link is re-established. Going further, when the hardware transmits the data to the cloud the cloud platform responds to indicate that the data was successfully received, eliminating the risk of losing data. For example, BRNKL by Barnacle Systems uses cellular-based communication – cellular connections may not always be available, but as soon as a cellular link is re-established all the data is pushed to the cloud. This ensures that there are no gaps in data without having to rely on expensive satellite-based communications.



## PHYSICAL SECURITY

During after-hours or between charters, vessels require some form of monitoring, whether it's a visual inspection from a watchperson or a surveillance system setup at a marina. The advantage of the latest Smart Boat technology is that fleet managers can receive alerts from their individual vessels if there has been an intrusion. Providing this granular surveillance for each vessel provides peace of mind to both those responsible for the vessel and for those who own the vessel. Typical vessel surveillance includes motion sensors, pressure mats, and door/window sensors. An advantage of these smart systems includes silencing alarms when a known individual is on-board, reducing false alarms.



## SAFETY

Ensuring the safety of crew and passengers is paramount for any operation. While technology cannot replace a properly trained crew, it can add a layer of safety on a vessel that enables external resources to participate in ensuring safe passage. For example, knowing when a vessel has suffered an impact the moment it happens can greatly reduce the risk of loss of life and vessel. In this example, charter managers can respond accordingly when a vessel has indicated a heavy impact by attempting to contact the captain and confirming whether everyone is safe. Another example is understanding whether a vessel has accidentally entered a restricted zone (i.e. shallow waters) or crossed a country's border. Both the charter managers and those on-board can be alerted as soon as this has happened, allowing them to respond accordingly. By using impact sensors and GPS positioning data with geo-fences charters can provide this extra level of safety to their customers throughout their journey.



## CHARTER USERS

The crew and passengers using a charter vessel can also benefit from a fleet management system. By downloading a mobile app on their phones, users can be granted access to the single vessel that they've chartered. This provides access to all the vessel health data and safety features.

For example, a concern of most charter users (and boaters alike) is dragging anchor at night or when they're exploring a remote destination. The latest smart systems allow crew and passengers to set anchor alerts and receive notification in the event that anything happens. The users can also monitor the boat's batteries, confirm that shore-power remains hooked-up while at dock, and receive alerts if any of the boat's critical components are faulty. A fleet management system provides peace of mind to not only the charter managers, but also to the charter users.



## CASE STUDY

During the 2017 Annapolis Boat Show, the team at Barnacle Systems visited nearly 70 charter companies to learn more about how they're implementing technology in their business. To the team's surprise, all but one of the charter companies is still relying on the word of the operator when a vessel is returned. The renter's best interest is to get their deposit back, which ranged from \$3,000USD to \$12,000USD, meaning that their opinion may be swayed when asked to describe if anything has happened to the vessel. If charter companies employed the latest Smart Boat technology on their fleet they would be able to identify (to the millisecond) when an event occurred on a vessel and use this as evidence to withhold any and all of a deposit until a proper assessment is completed. This results in peace of mind for the company along with a better maintained and more reliable fleet of boats.



## FUTURE PLANS AND CONCLUSION

The BRNKL by Barnacle Systems fleet management software was developed to help accelerate innovation in fleet management. The immediate future plan is to align with other charter and fleet management software platforms and allow the data to be ingested into existing systems, allowing charter and fleet companies to maintain their existing infrastructure. As a result, fleet operators and systems integrators can take advantage of these new systems without having to retrain an entire staff. The BRNKL solution is adding cloud analytics support so data collected from vessels can be used to generate useful insights and value for fleet operators and consumers.

With connectivity, sensing, security, and scalability being addressed by Barnacle Systems, it is expected that charter companies will be able to spend less time worrying about each charter vessel and more time growing their charter business.



## ABOUT THE AUTHOR



### ***Brandon Wright, P.Eng.***

Brandon is the Founder & CEO of Barnacle Systems. Mr. Wright grew up on Vancouver Island in Canada and has been around boats all of his life. He received his Bachelor of Electrical Engineering from the University of Victoria and is Pragmatic Marketing Certified (PMC) level 5. Mr. Wright has over a decade of experience developing remote monitoring systems for both environmental monitoring and military surveillance as a Product Manager and Professional Engineer. He has designed and developed award-winning surveillance solutions that have been successfully installed throughout North America, the Middle East and Europe. He has also had the honour of presenting remote monitoring solutions to the retired US Secretary of Defense, the Assistant Chief of Staff of Qatar, and various four-star generals from the US, Israel, and Mexico.