Process Overview

We started by understanding the current uses and state-of-the-art technology around boats and then explored enablers likely to affect what we can do with boats in the near future. Likely enablers were curated and synthesized for this presentation.

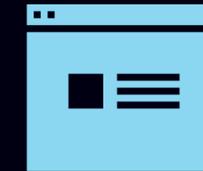| **6**	**12**	**72**	**47**
Stakeholders Interviewed	Experts Interviewed	White Papers Read	Technologies Researched

Summary of Findings

PRESENT

Augmented and Virtual Reality

Augmented reality provides users with information overlaid on reality. Augmentation can be visual or can apply to the other senses. Virtual reality provides users with low-cost, low-risk experiences via sight, sound, and spatial awareness.

Relevant Applications

• Wayfinding

• Professional interfaces

• Virtual tourism

Related Technologies

• Ubiquitous Sensing

• Holographic displays

• Remote-controlled drones

NEAR FUTURE

Machine Learning

Machine learning analyzes data to provide optimal results. More advanced machine learning seeks relevance by combing through data sets unprompted.

Relevant Applications

• Traffic management

• Pollution management

Related Technologies

• Ubiquitous sensing

• Aggregated data platforms

NEAR FUTURE

Ubiquitous Sensing

With the proliferation of connected objects and smart things with sensors, everything that can be measured is, usually on a hyperlocal scale.

Relevant Applications

• Data collection

• Safety reports

Related Technologies

• Aggregated data platforms

• Connectivity infrastructure

Summary of Findings

NEAR FUTURE

Aggregated Data Platforms

Platforms aggregate hundreds of data types from thousands of connected products. Eventually data sets from different sources will be collated and anomalies reconciled.

Relevant Applications

- Research projects
- Informing machine learning algorithms

Related Technologies

- Ubiquitous sensing
- Machine learning

NEAR FUTURE

Connectivity Infrastructure (LoRaWAN, NB-IOT)

Low power networking technology provides constant connectedness city-wide for smart objects.

Relevant Applications

- Data reporting
- Police surveillance

Related Technologies

- Ubiquitous sensing

NEAR FUTURE

Swarm Robotics

Small swarms of autonomous boats share a single brain and work together to achieve specific goals.

Relevant Applications

- Bridges and barriers
- Low-impact cleanup

Related Technologies

- Autonomous navigation
- Machine learning

Summary of Findings

NEAR FUTURE

Autonomous Navigation

Vehicles of all types go driverless, transporting humans and things with minimal human effort. With time and widespread adoption, routes are optimized and significant efficiency is achieved.

Relevant Applications

- Self-parking boats
- Water drones
- Autonomous tugboats

Related Technologies

- Machine learning
- Swarm robotics
- Self-docking

NEAR FUTURE

High-Efficiency Solar Energy

High-efficiency solar requires little space and time to create significant energy. Energy is quiet and pollutionless.

Relevant Applications

- House and business boats
- Boat charging stations

Related Technologies

- Better batteries
- Self-docking

FUTURE

Better Battery Technology

Better batteries ensure vehicles can go longer and do more before needing to recharge. Batteries on boats could be used to provide temporary or mobile energy for nonboat purposes.

Relevant Applications

- Charging Stations
- Drone Boats

Related Technologies

- High-efficiency solar
- Plug-and-go infrastructure

Summary of Findings

NEAR FUTURE

Advanced Filtering Technology

From acoustic to biofiltration, new methods of filtering water allow for portable, low-energy solutions to remove pollutants from the water.

NEAR FUTURE

Widespread Plug-and-Go Infrastructure

Standard ports make electricity, water, and sewage easily accessible for temporary structures.

Relevant Applications

- Recreation (swimming)
- Drinking water

Relevant Applications

- Houseboats
- Mobile businesses
- Docking drones

Related Technologies

- Ubiquitous sensing
- Nanotechnology water filtration

Related Technologies

- Grid management
- New sanitation

Appendix

All Technologies Researched

3-D printing	Electric-charging infrastructure	New sanitation
Air-pollution sensors	Grid management	NB-IoT
Aquatic plants	Groundwater mapping	Quantum computing
Augmented reality	Solar energy	Rainwater harvesting
Autonomous navigation	Holographic displays	Reverse-osmosis filtering
Batteries	Hybrid boat engine	Robotics
Biometric materials	Hydroponic gardening	Self-docking
Biological filtration	Hydroelectric engine	Sewage infrastructure
Biorefinement	Hyperloop	Swarming drones
Blockchain	Inboard performance system	Traffic sensors
Carbon-dioxide batteries	Infrared water filters	Trash-skimming boats
Carbon filters	Light sensors	Underwater cameras
Data platforms	LoRaWAN	UV water filters
Desalinization	Machine learning	Water-pollution sensors
Drones	Membrane filtration	Virtual reality
Dynamic positioning functionality	Nanotechnology water filtration	