LEVIATAD CHALLENGES

Challenges

1. Autonomous Ships and Drones

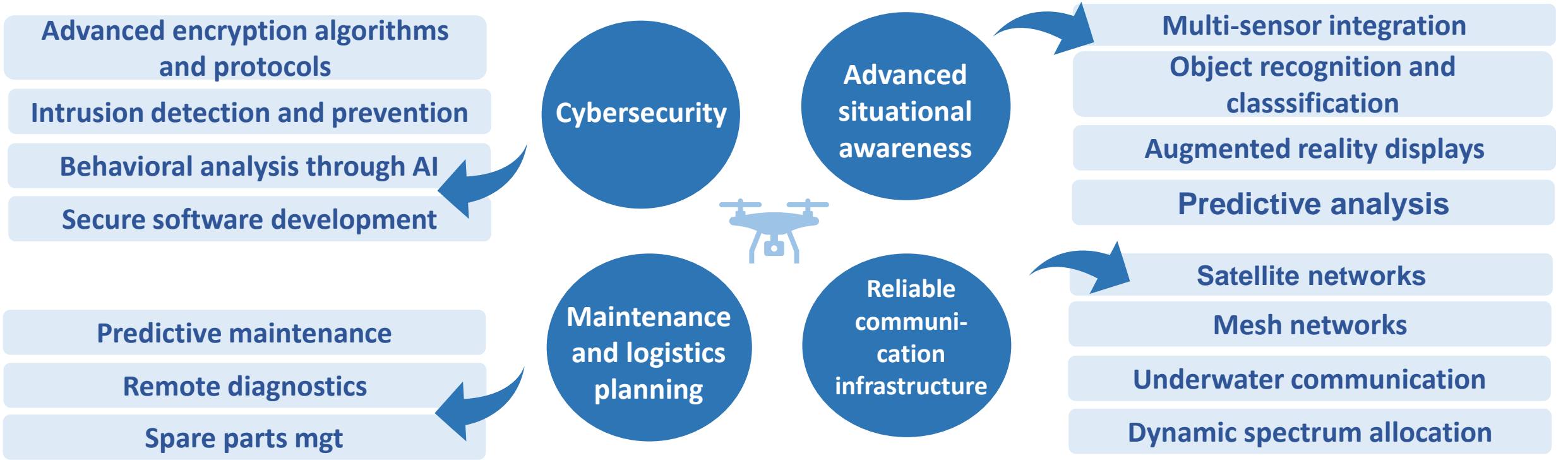2. Communication, Cyber Security

3. On-board Equipment

4. Predictive maintenance
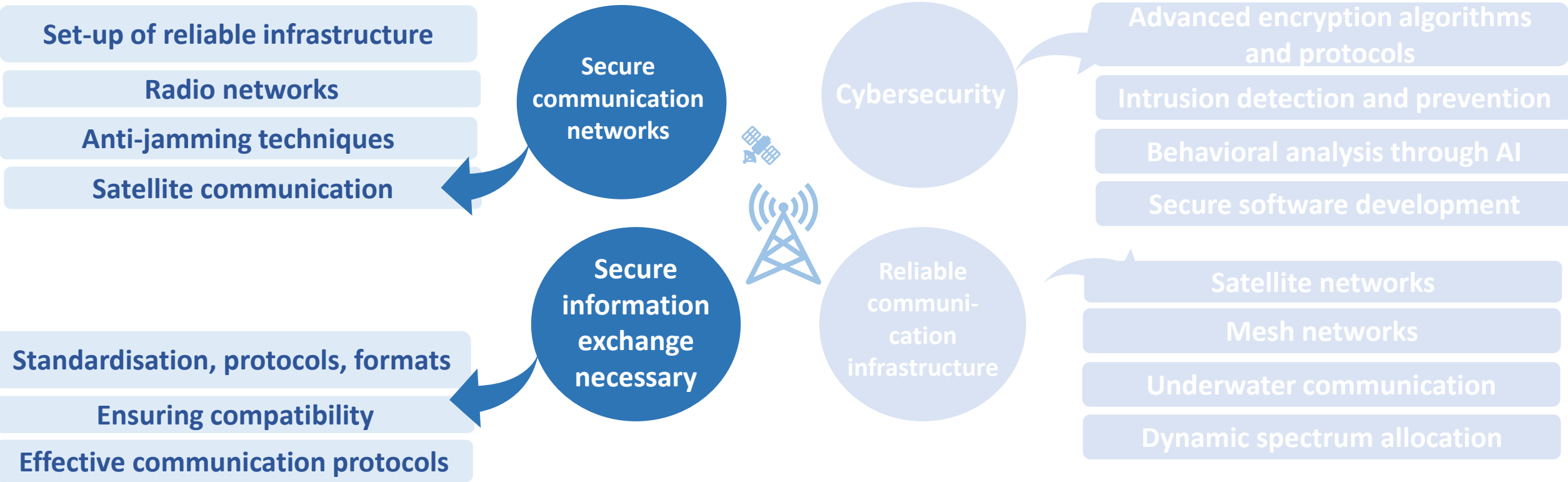
5. Weapon Systems

6. Decarbonisation of Ships

1 Autonomous ships and drones

+ **Increased efficiency, reduced costs, improved safety, …**

Advanced encryption algorithms and protocols

Intrusion detection and prevention

Behavioral analysis through AI

Secure software development

Cybersecurity

Advanced situational awareness

Multi-sensor integration

Object recognition and classsification

Augmented reality displays

Predictive analysis

Predictive maintenance

Remote diagnostics

Spare parts mgt

Maintenance and logistics planning

Reliable communi-cation infrastructure

Satellite networks

Mesh networks

Underwater communication
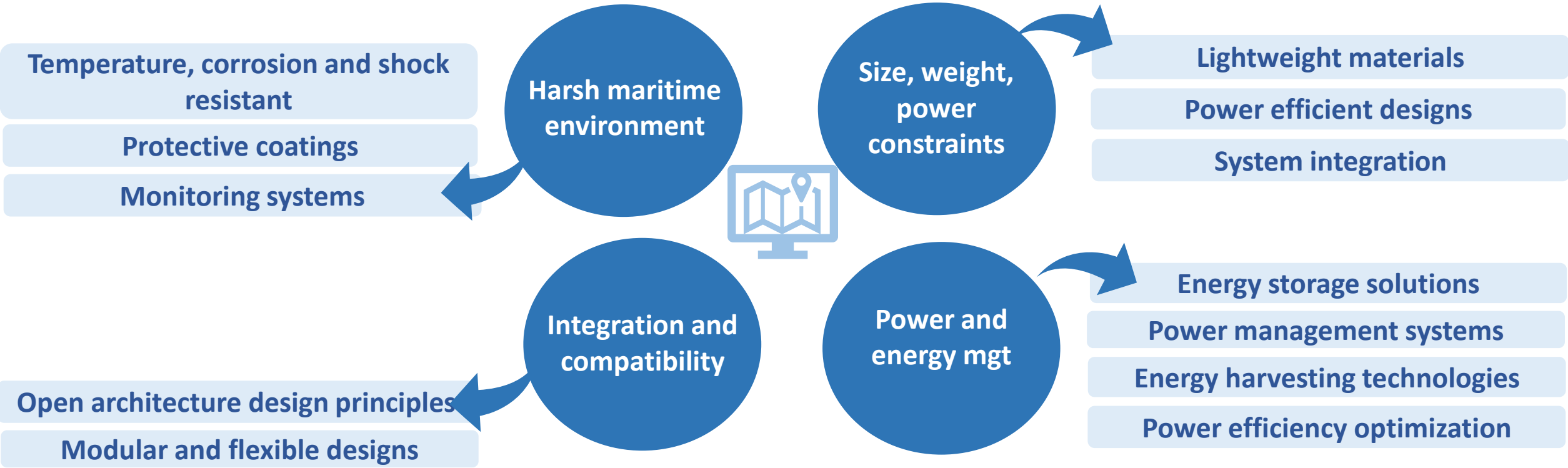
Dynamic spectrum allocation

② Communication and cybersecurity

+ Enable secure operational coordination, situational awareness, facilitates command and control, protect against threats, …

Set-up of reliable infrastructure

Radio networks

Anti-jamming techniques

Satellite communication

Secure communication networks

Cybersecurity

Advanced encryption algorithms and protocols

Intrusion detection and prevention

Behavioral analysis through AI

Secure software development

Standardisation, protocols, formats

Ensuring compatibility

Effective communication protocols

Secure information exchange necessary

Reliable communi-cation infrastructure

Satellite networks

Mesh networks

Underwater communication

Dynamic spectrum allocation

3 On-board equipment and performance improvement technologies

+ Enable secure operational coordination, situational awareness, facilitates command and control, protect against threats, …

Harsh maritime environment

Temperature, corrosion and shock resistant

Protective coatings

Monitoring systems

Size, weight, power constraints

Lightweight materials

Power efficient designs

System integration

Integration and compatibility

Open architecture design principles

Modular and flexible designs

Power and energy mgt

Energy storage solutions

Power management systems

Energy harvesting technologies
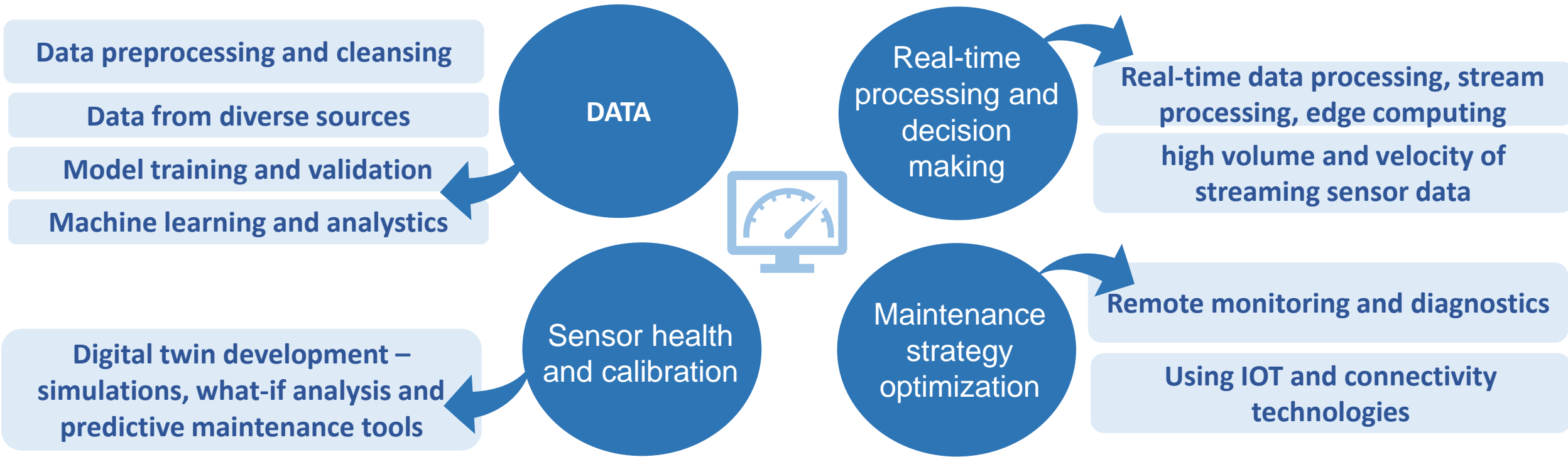
Power efficiency optimization

4 Predictive maintenance

Offers enhanced equipment reliability, increated operational availabitliy, cost savings, improved safety, optimal resource allocation, data-driven decision making

Data preprocessing and cleansing

Data from diverse sources

Model training and validation

Machine learning and analystics

DATA

Real-time processing and decision making

Real-time data processing, stream processing, edge computing

high volume and velocity of streaming sensor data

Sensor health and calibration

Digital twin development – simulations, what-if analysis and predictive maintenance tools

Maintenance strategy optimization

Remote monitoring and diagnostics

Using IOT and connectivity technologies

Decarbonisation of ships

+ Decarbonization is crucial for the marine defense sector to mitigate its environmental impact and to comply with regulations

Advanced propulsion systems

Use of alternative fuels

Designing and optimizing engines

Alternative fuels and propulsion systems

Efficient energy storage and management

Development of high capacity batteries, fuel cells electric motors

Integrating renewable energy sources

Hull and propeller optimization

Vessel design and efficiency

Optimize ship operations (EE)

Advanced control systems and automation technologies
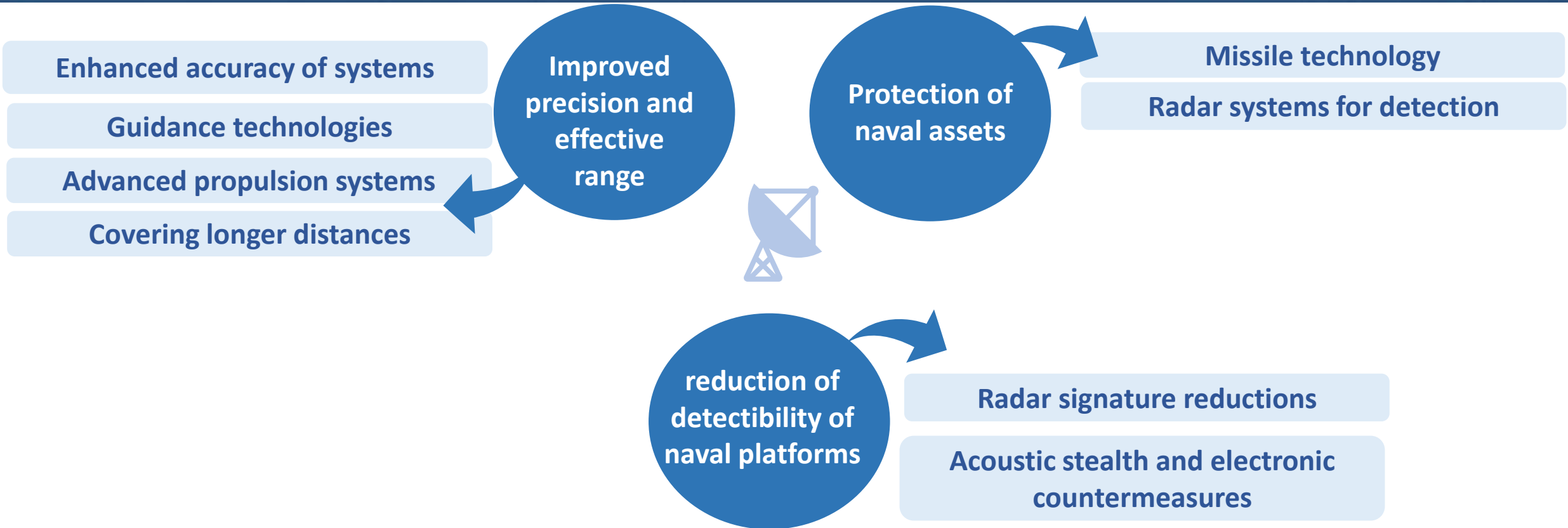
Intelligent routing and speed optimization

Adjustment of power systems

Predictive analytics

6 (weapon) systems improvement

+ Effectiveness of marine defense activies, increase operational capabilities of marine defense forces, ensure ability to protect and resond to maritime threats

Enhanced accuracy of systems

Guidance technologies

Advanced propulsion systems

Covering longer distances

Improved precision and effective range

Protection of naval assets

Missile technology

Radar systems for detection

reduction of detectibility of naval platforms

Radar signature reductions

Acoustic stealth and electronic countermeasures

Challenges

1. Autonomous Ships and Drones

2. Communication, Cyber Security

3. On-board Equipment

4. Predictive maintenance

5. Weapon Systems

6. Decarbonisation of Ships

SMEs

- Technology Providers

- Cybersecurity Companies

- Communication Network Providers

- AI and Analytics Companies, Remote

  Monitoring and Diagnostics Providers

- Maintenance and Logistics Providers

- System Integrators

- Energy Storage Solution Providers

- Equipment Manufacturers

- Marine Equipment Manufacturers

- Shipbuilding and Naval Engineering Companies

- Propulsion System Manufacturers