



Royal Netherlands Navy



Projection of *offensive* power

Smart cars, smart TVs,
smart phones...

When will
they start
making
smart people?

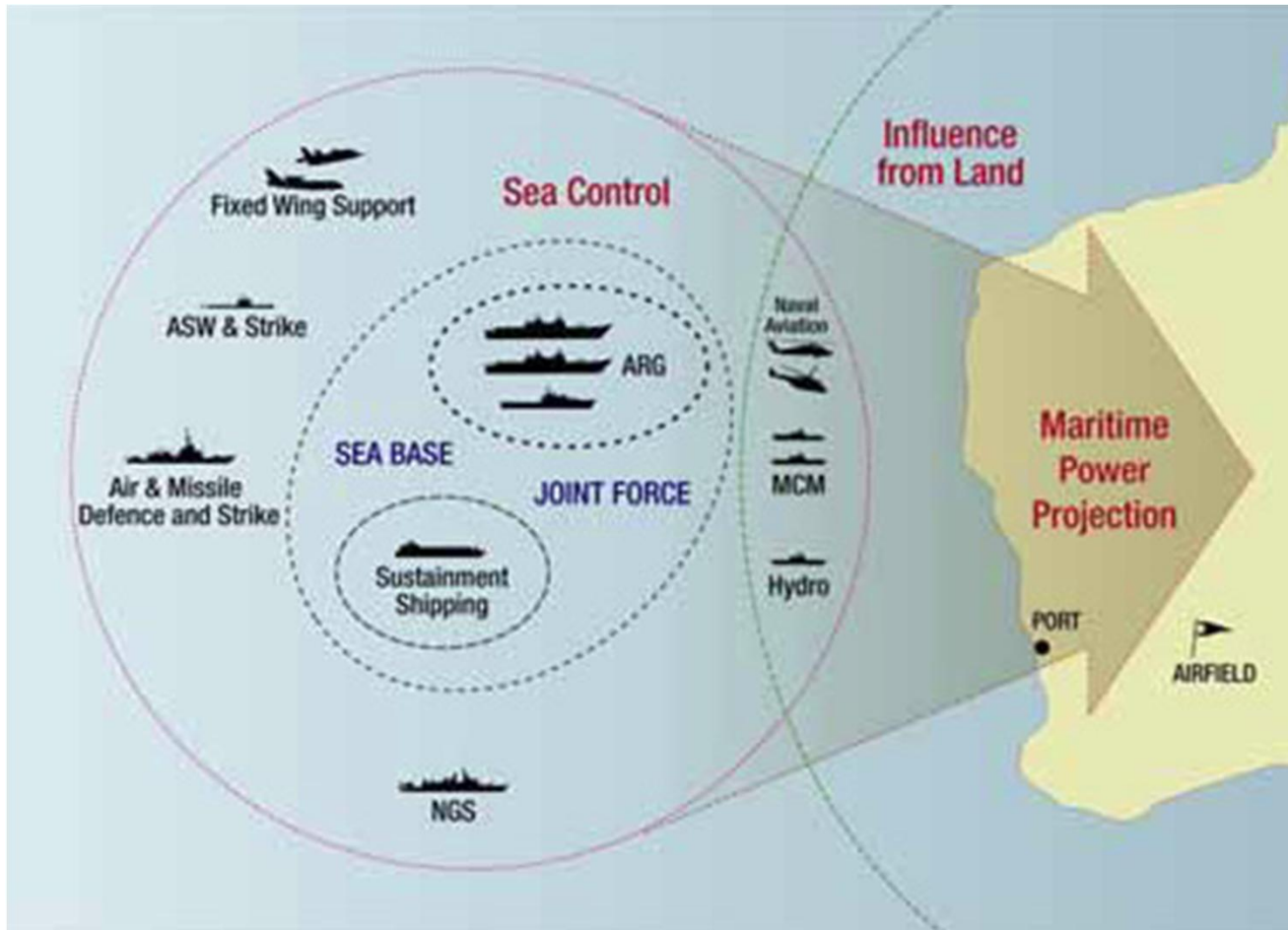


Maritime Warfare Center
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4 December 2015



OFFENSIVE POWER??





PROJECTION OF OFFENSIVE POWER?

maritime power projection

Power projection **in** and **from** the maritime environment, including a broad spectrum of offensive military operations to **destroy** enemy forces or logistic support or to **prevent** enemy forces from approaching within enemy weapons' range of friendly forces. Maritime power projection **may be** accomplished by amphibious assault operations, attack of targets ashore, or support of sea control operations.

Dictionary of military and associated terms.



PROJECTING OFFENSIVE POWER???



- USE OF SATELLITES
- CYBERWARFARE
-

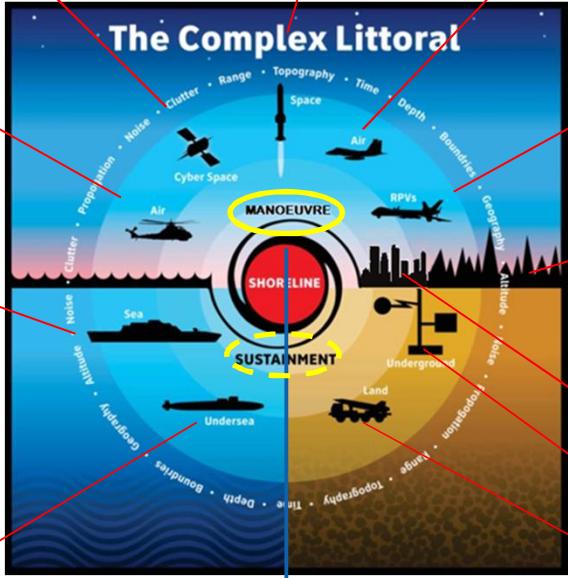
- OFFENSIVE USE OF MISSILES
- BMD
- ...

- BASED UPON 6FMC**
- **MOL/sustainment**
 - **ENVIRONMENTAL**
 - **ISR**
 - **C2**
 - **EW**
 - **Mobility**
 -

- AIR WARFARE
- COUNTER AIROPS
- ...

- HELICOPTER OPERATIONS ON AND FROM THE SEA AND ON LAND

- UxV's symbolic for:
 - on- and under water
 - through the air
 - on land



- MOX:
 - JUNGLE
 - MOUNTAIN
 - ARCTIC
 - DESERT

URBAN WARFARE

UNDERGROUND WARFARE

LAND WARFARE

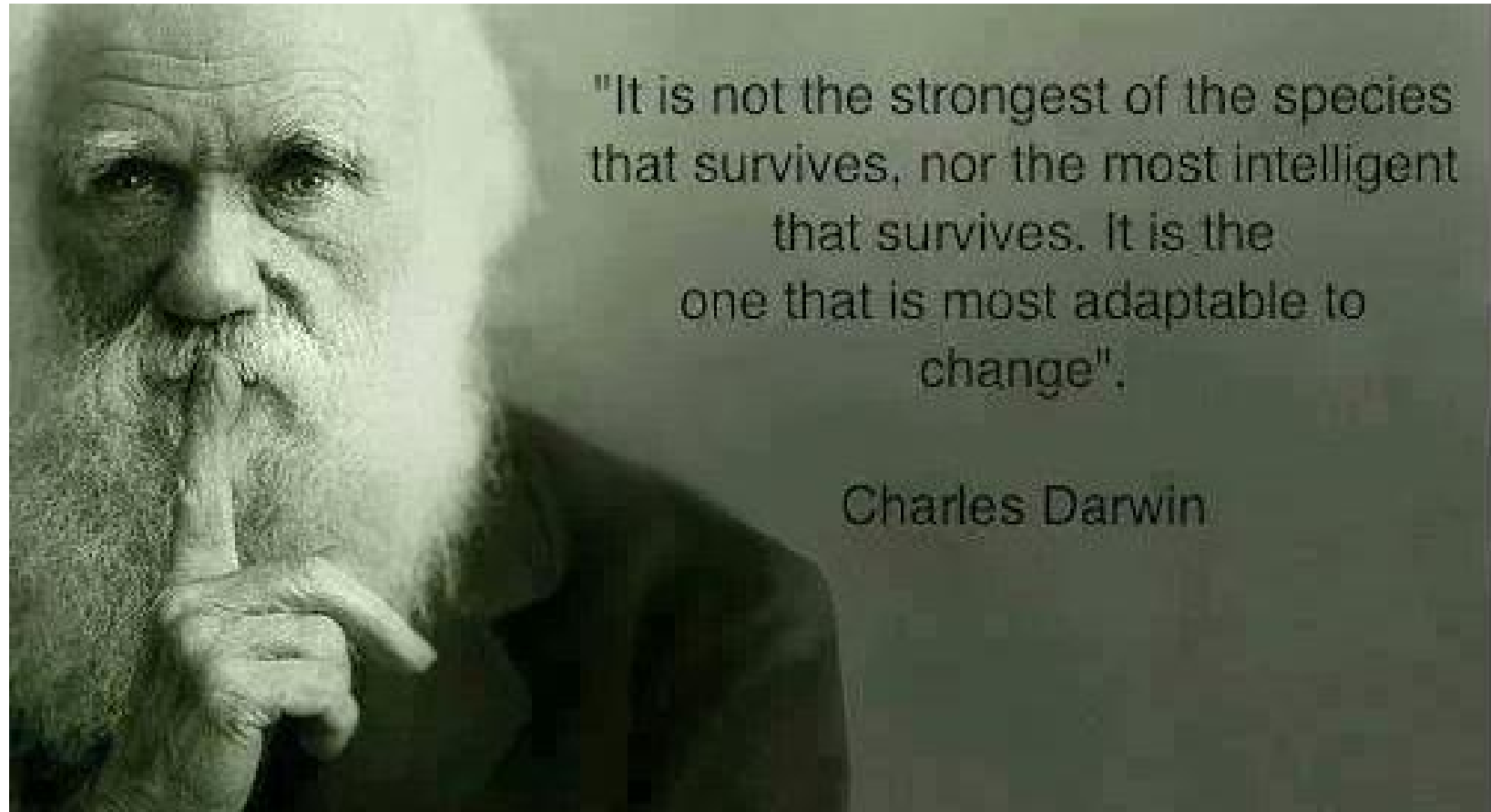
- IAMD (AAW+BMD)
- AWW (AAW-ASuW)
- ASW
- STRIKEOPS
- NMW
- MSO
- MA
- AMPHIBOPS
- RIVOPS
- MARSPECOPS
-

- UWW (OFF - DEF)
- MARSPECOPS
- ...

- MANOEUVRE WARFARE!!**
- OMFTS:
 - STOM
 - DISTOPS
 - SEABASING



INNOVATION: WHAT, HOW WHY?





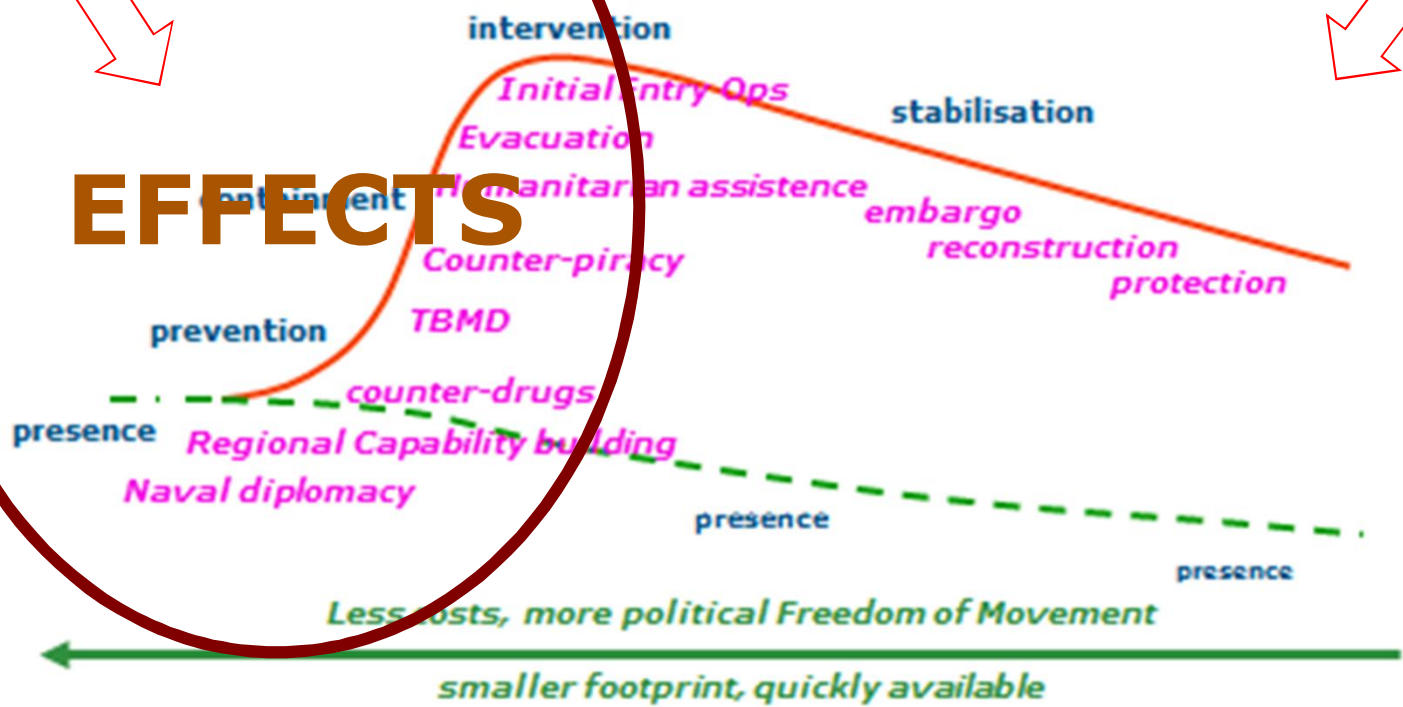
CONFLICT

PRE-CONFLICT

POST-CONFLICT

Maritime forces: deployable, flexible and responsive

EFFECTS





Piracy



Seamines & UXO's



Drugs- and weaponsmuggle



Terrorism



Political instabile regions



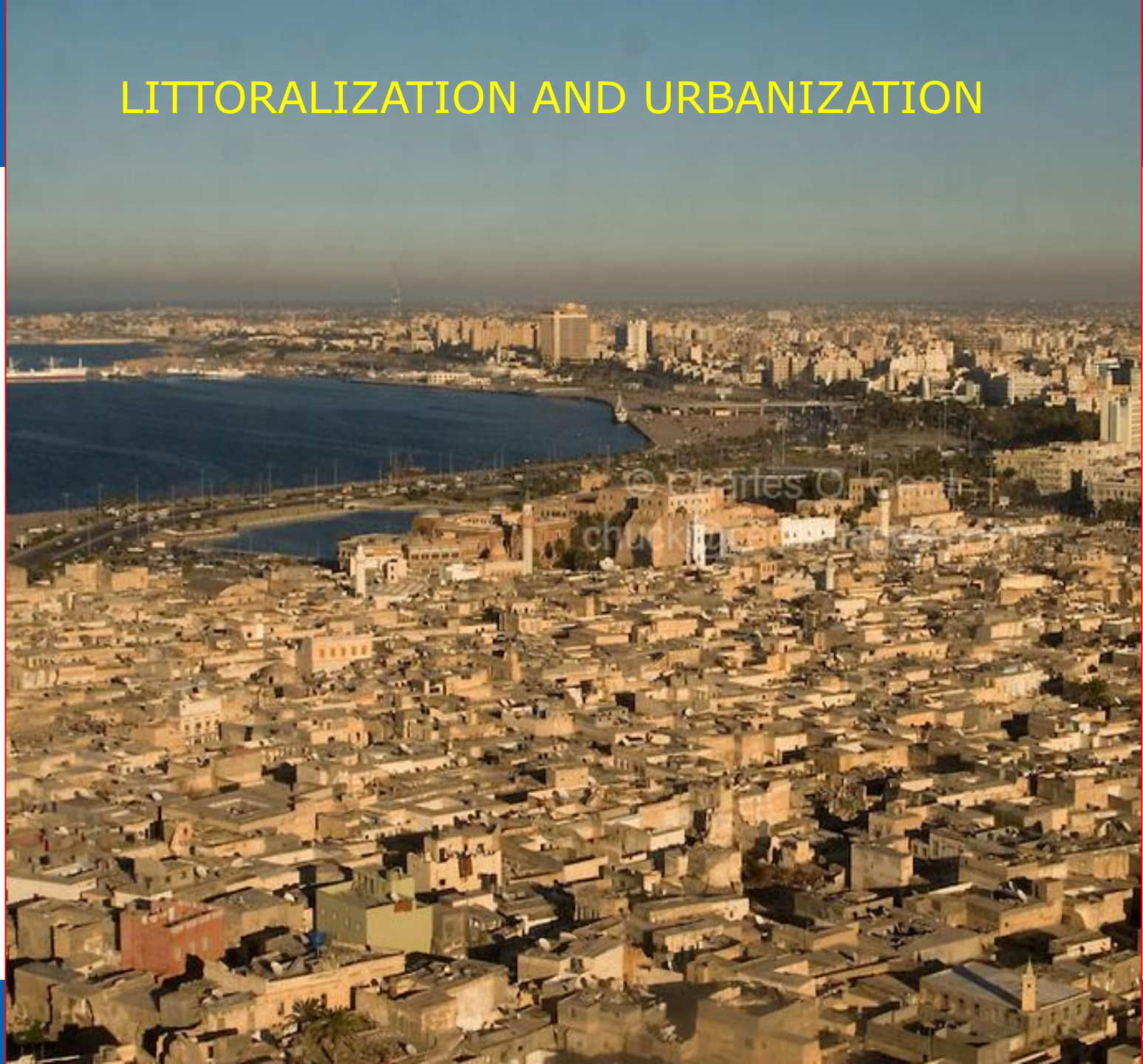
Illegal immigration/refugees / human smuggle

The Future

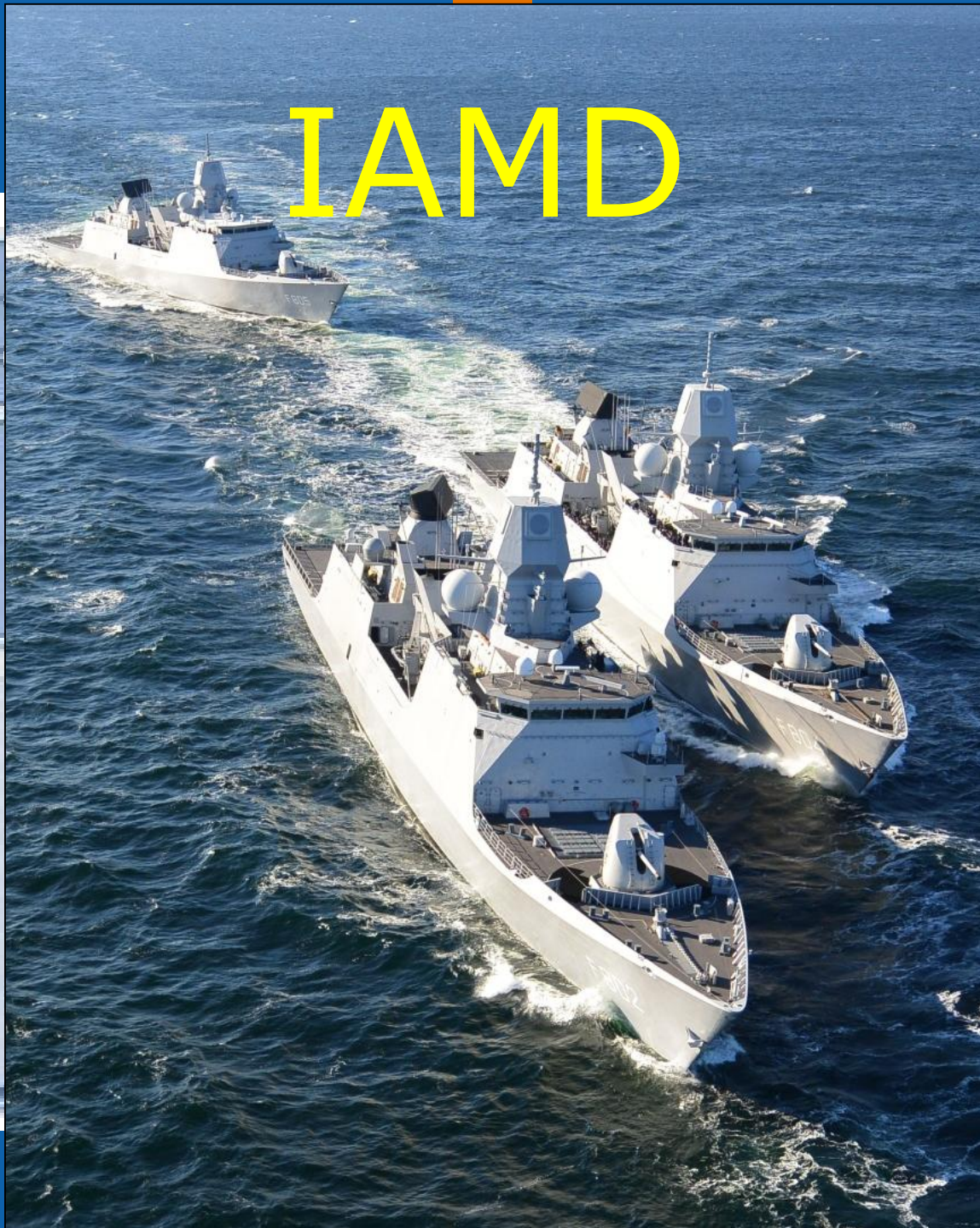
NEXT EXIT 



LITTORALIZATION AND URBANIZATION

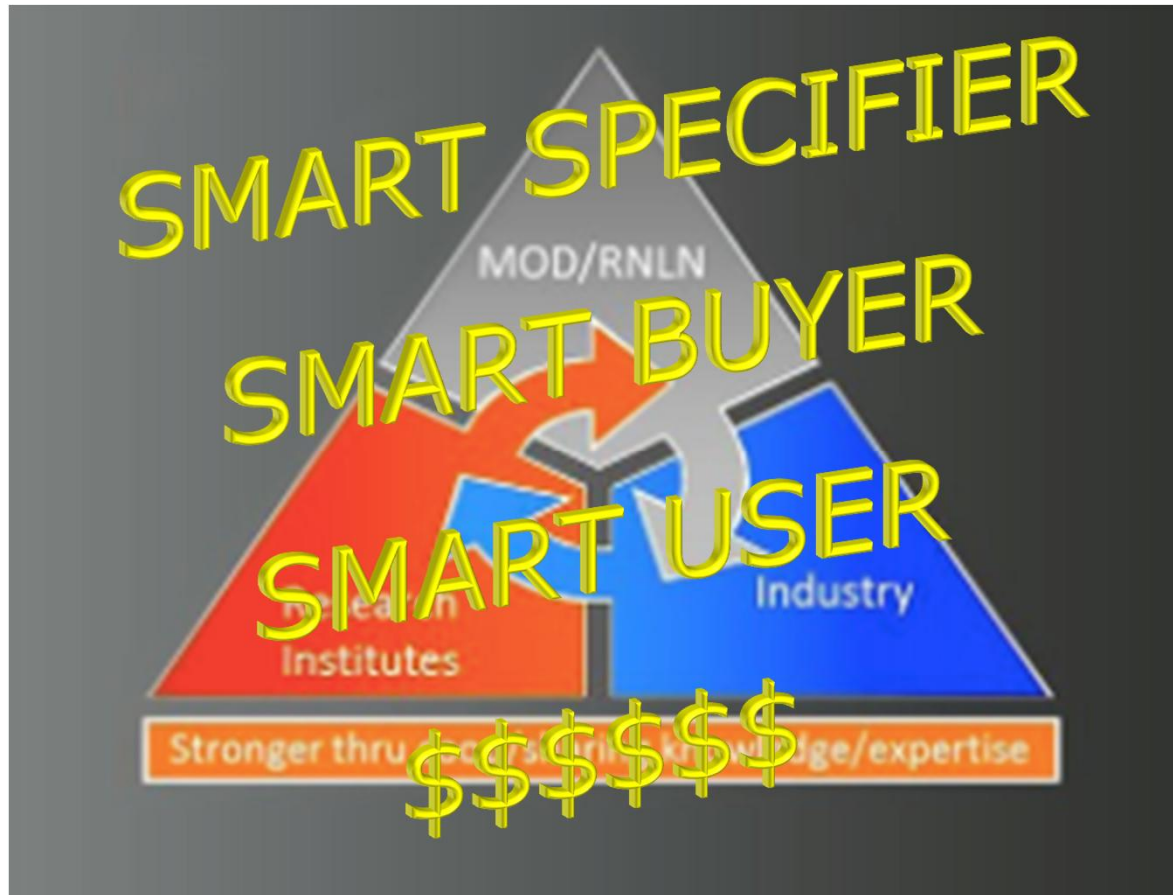


IAMD



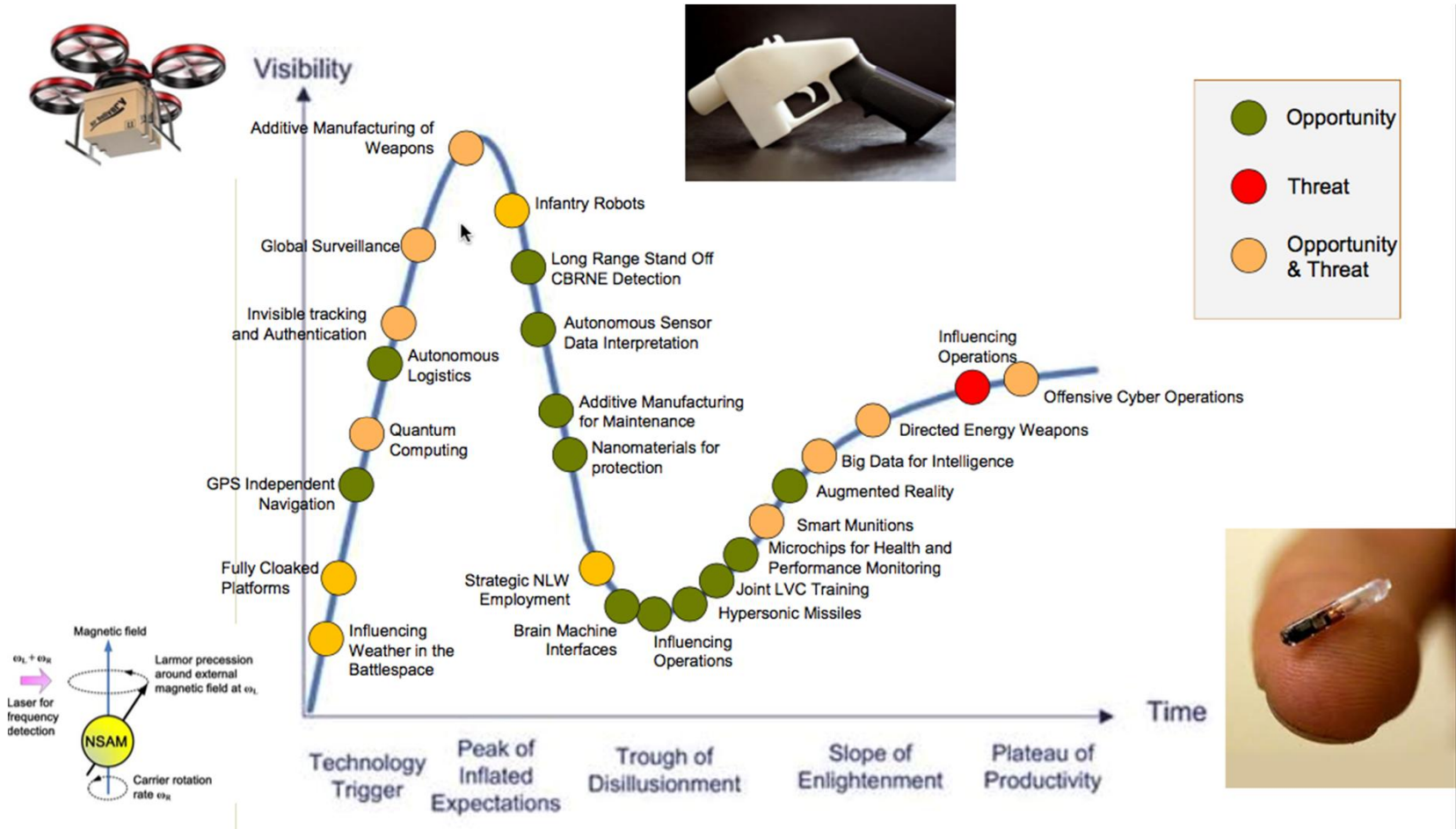


RESEARCH MODEL





Examples Hype Cycle





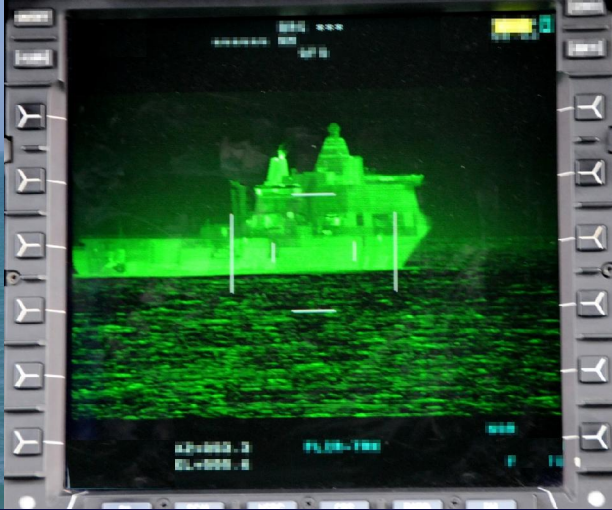
Relevant for maritime operations

- Onbemande systemen (UXV: SA, counter-mine, logistiek, zelfverdediging, bewapend?)
- Big data (Autonome sensorverwerking, dataintegratie, datapresentatie, video)
- Cyber operations (Sewaco beveiliging, offensief)
- Optimale inzet van personeel (Simulatie, optimale bemensing, automatisering, HMI verbetering)
- Precisiewapens (Laser, DEW)
- Internet of people and things (Damage/crew assessment, onderhoud)
- Materialen en 3D printing (Composieten, metamaterialen, 3D printing)
- Gebruik van de ruimte (Navigatie, global SA)
- Energievoorziening en milieu (Voortstuwing, energy harvesting)
- Biotechnologie (Medisch: weefselkweek, therapie met nanodeeltjes)

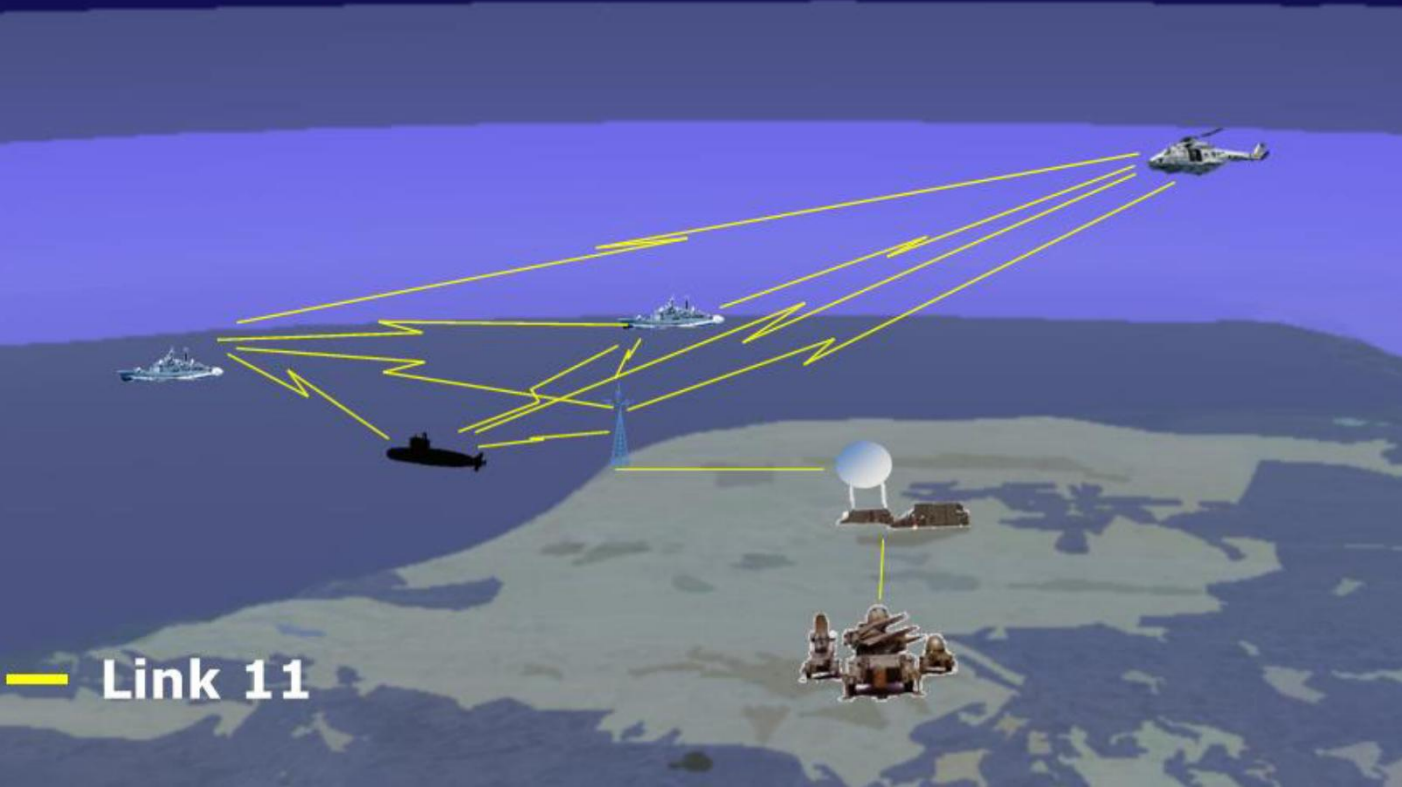


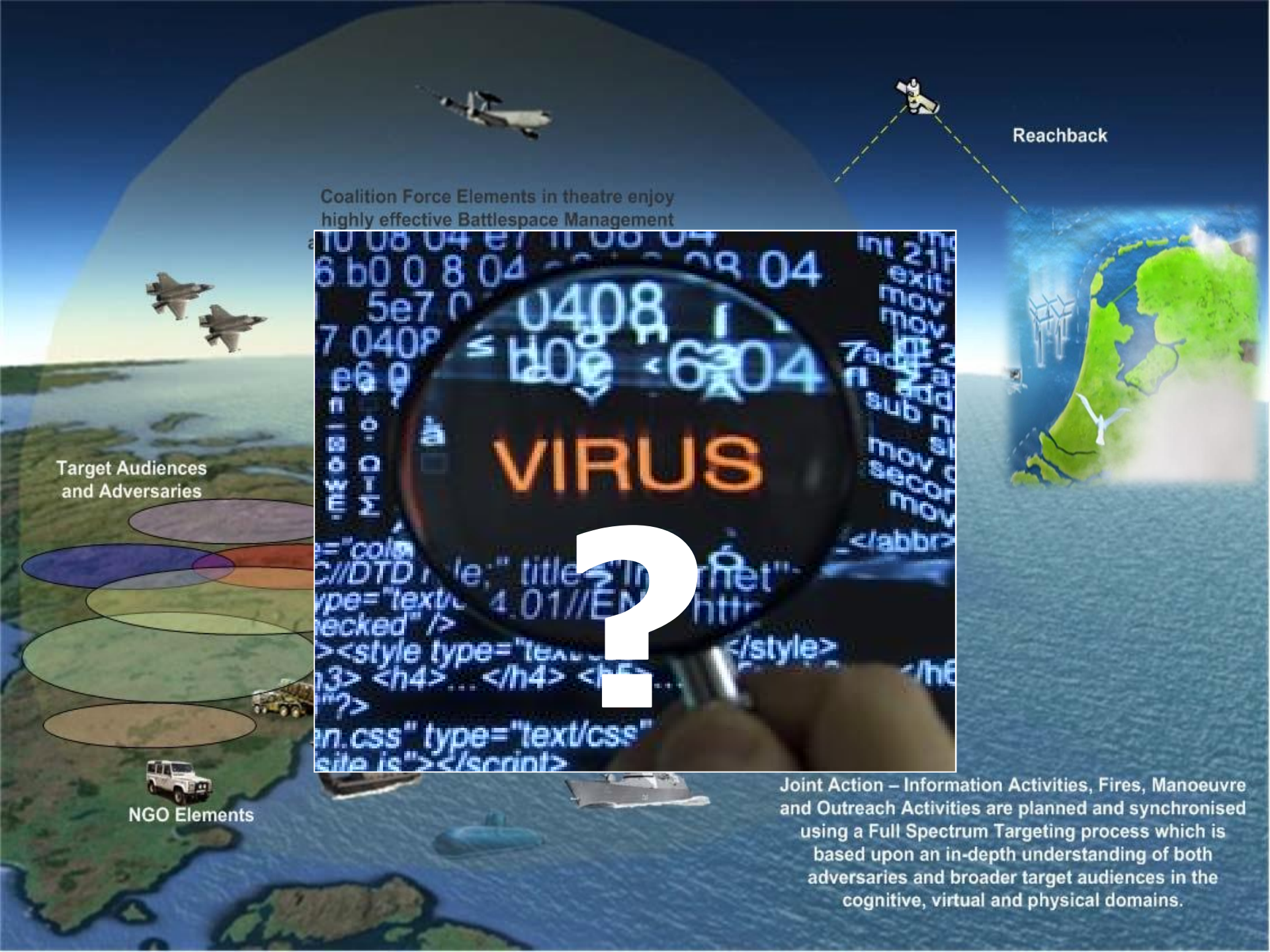
EXAMPLES TECHNOLOGICAL INNOVATIONPROJECTS

- SHIPCONSTRUCT.
 - Improve slipway construction IOT be able to launch and dock FRISC's during higher seastates on board of Patrol Vessels;
- SUBMARINES.
 - Dockingstations for equipment SOF.
- SENSOR - WEAPONSUITE.
 - Radar, optic and ESM sensors, optimized for operating in coastal waters.
 - Oto Melara with sensor on the gunsystem IOT engage fast manoeuvring targets in the air and on the water.
 - Digitalized weaponfilters for the gun IOT be able to engage rapidly several targets.
 - Smart algoritmes for multiple sensor – weapon combinations IOT optimize the engagement of several and different targets.
- SIGNATURES.
 - Dynamic measuring of signatures other vessels.
 - Dynamic optimilization and reduction of the own shipsignature.



NOWHERE TO RUN, NOWHERE TO HIDE





Reachback

Coalition Force Elements in theatre enjoy highly effective Battlespace Management

VIRUS

?

Target Audiences and Adversaries

NGO Elements

Joint Action – Information Activities, Fires, Manoeuvre and Outreach Activities are planned and synchronised using a Full Spectrum Targeting process which is based upon an in-depth understanding of both adversaries and broader target audiences in the cognitive, virtual and physical domains.





Provision of information as an operational capacity



Federated digital cooperation

Match optimal quality supply and demand of information

Time critical and (near) real time information

Quick!, UAV, TDL, Video, integration of information

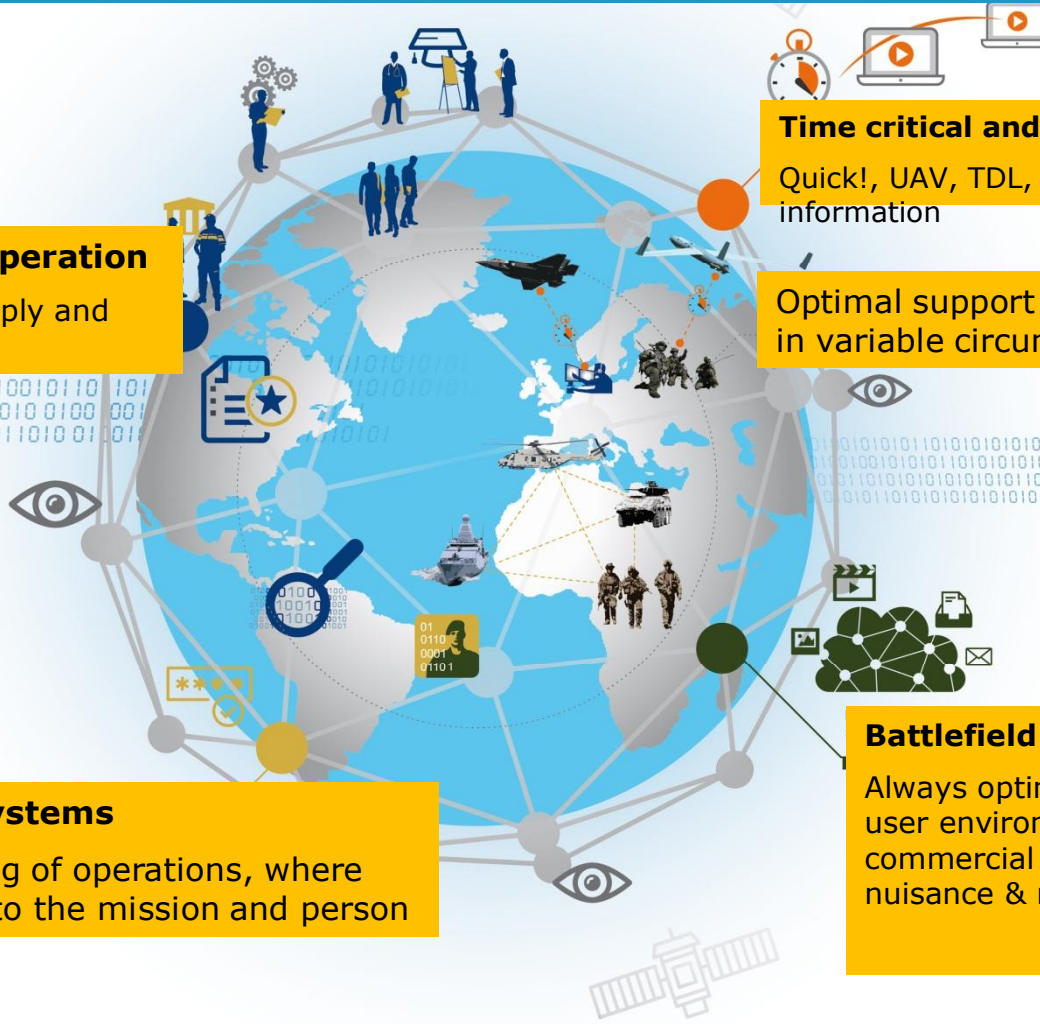
Optimal support of operational management in variable circumstances

Battlefield Internet

Always optimal connected, in a tactical user environment, attention for commercial developments, without nuisance & ready for the future

Future C2-support systems

Controlling & monitoring of operations, where technology is adapted to the mission and person





BATTLEFIELD INTERNET

Always optimal connected, in a tactical user environment, attention for commercial developments, without nuisance & ready for the future

Mobile operations can profit from ICT technology and concepts from the world of internet (such as IP-, LTE and cloud)

Tactical distributed solutions

Orchestration of networks
(e.g. SDN, NFV)

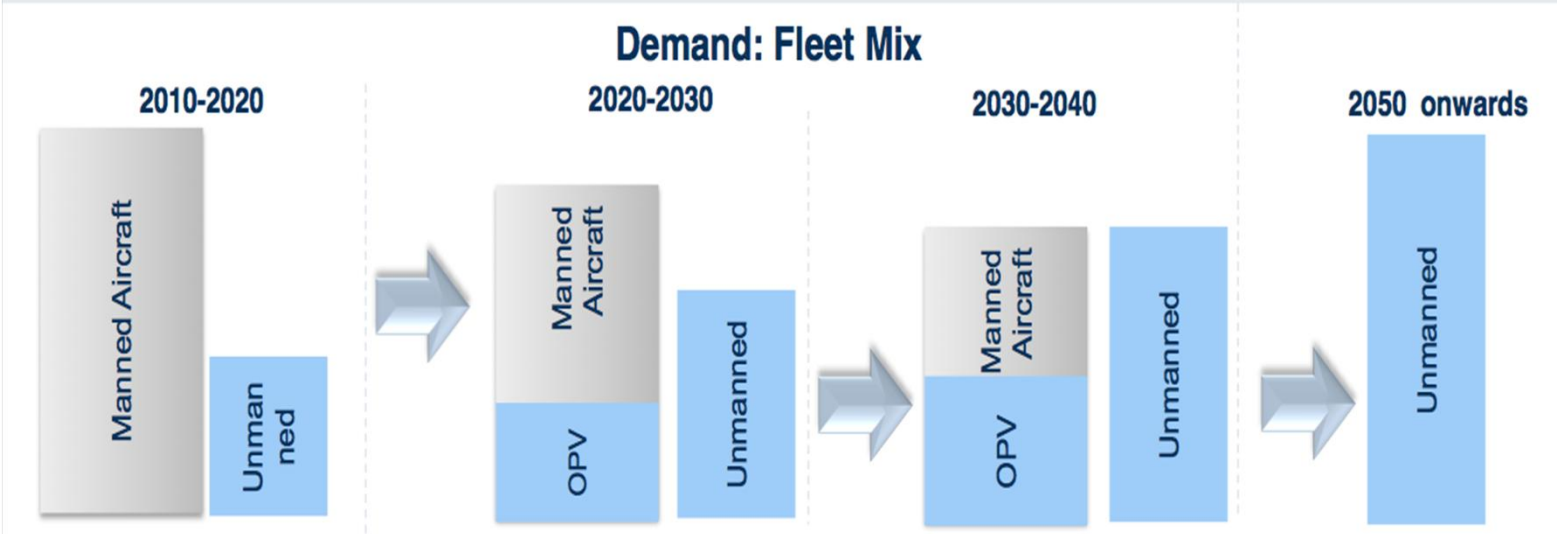
User-friendly, without effort of end-user and a minimum of management

Always optimal connected by quick sufficient coverage, connectivity and access to service during tactical operations



Projected Impact on the Helicopter Industry 2035: *Get Unmanned or Die Trying*

Who will be the Winners and the Laggards?





ADVANTAGES & DISADVANTAGES (unmanned)

Fixed wing:

Advantage: endurance, range, price, operational costs

Disadvantage: launch & recovery, bad weather

Rotary wing:

Advantage: flexibility, payload capacity, small footprint on deck, launch & recovery

Disadvantage: endurance, price, operational costs (maintenance)







Sensors and payloads for tactical UAVs maritime operations

Standard EO/IR camera payload

Synthetic Aperture Radar (SAR)

Inverse SAR

Hyper spectral imager

Communication ESM

Radar ESM

Acoustical sensor

AIS receiver

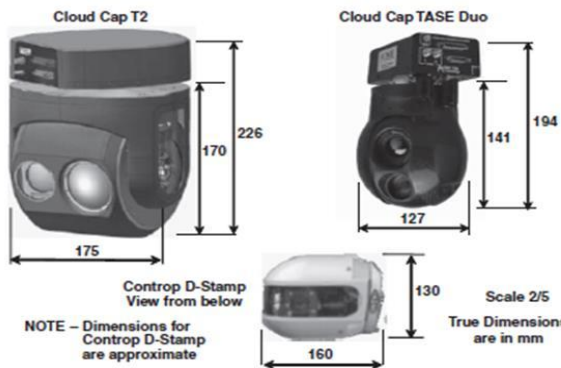
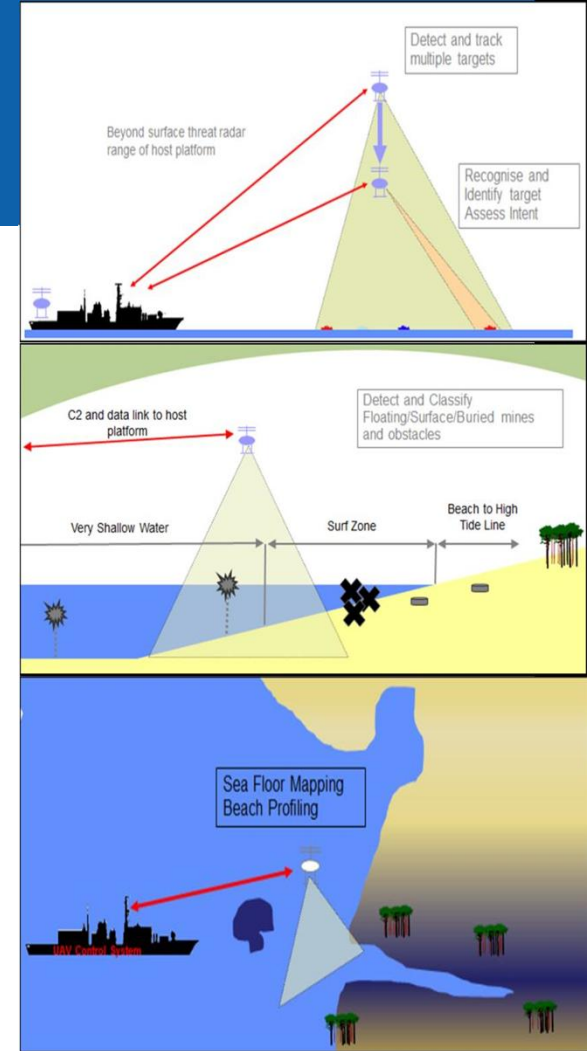


Figure 8.3 EO turrets for close- and medium-range UAV. (Reproduced by permission of Cloud Cap Technologies and Controp Precision Technologies Inc.)





1 Leadership 3 Support 14 pilots 14 Sensors
32 x Operations

1 Leadership - 4 Support - 5 MIC - 15 Analyst
25 x Intell

1 CDR - 2 Staff
3x Staff

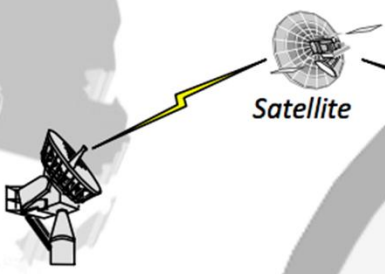
1 Leadership - 5 Crewchiefs - 5 Avionics - 4 Logistics - 10 Supp - 11 CIS
36 x Maintenance

Mission Control Element

GCS 1 GCS 2
 Ops Center & Data Analysis

Output
 AIR LAND SEA

Missions:
 Intelligence, Surveillance, Reconnaissance (ISR)
 Target Acquisition (TA)
 Battle Damage Assessment (BDA)



"Remote Split Operations"

4x MQ-9 Reaper; 24/7 for 6 months continuously (5500 Flight hours)
1 x CAP

GCS 3 GCS 4

Launch & recovery Element

SAR EO/IR
Sensors



WHY?

“If you can't explain it simply, you don't understand it well enough.”

-- Albert Einstein, 1947

WHAT?

“We’ve spent an awful lot of money, but we decided that the number one need was interoperability.”

-- CEO of International technical company

HOW?

“The whole is more than the sum of the isolated parts.”

-- Psychology, ‘Structuralism’

BUT?

“When you come to the end of your rope, tie a knot and hang on.”

-- Franklin D. Roosevelt, 1936



QUESTIONS?

