

# EADS Defence and Security

## New requirements on embedded systems and sensors



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R&T director

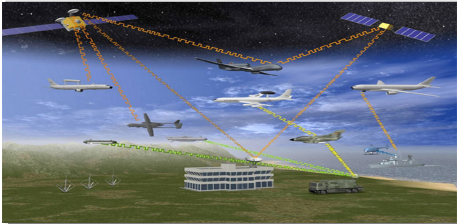
# Agenda



EADS Technologies and Innovation



Defence and security activities



Euripides Success Story

# EADS Technologies and Innovation

# EADS at a Glance: A Global Leader

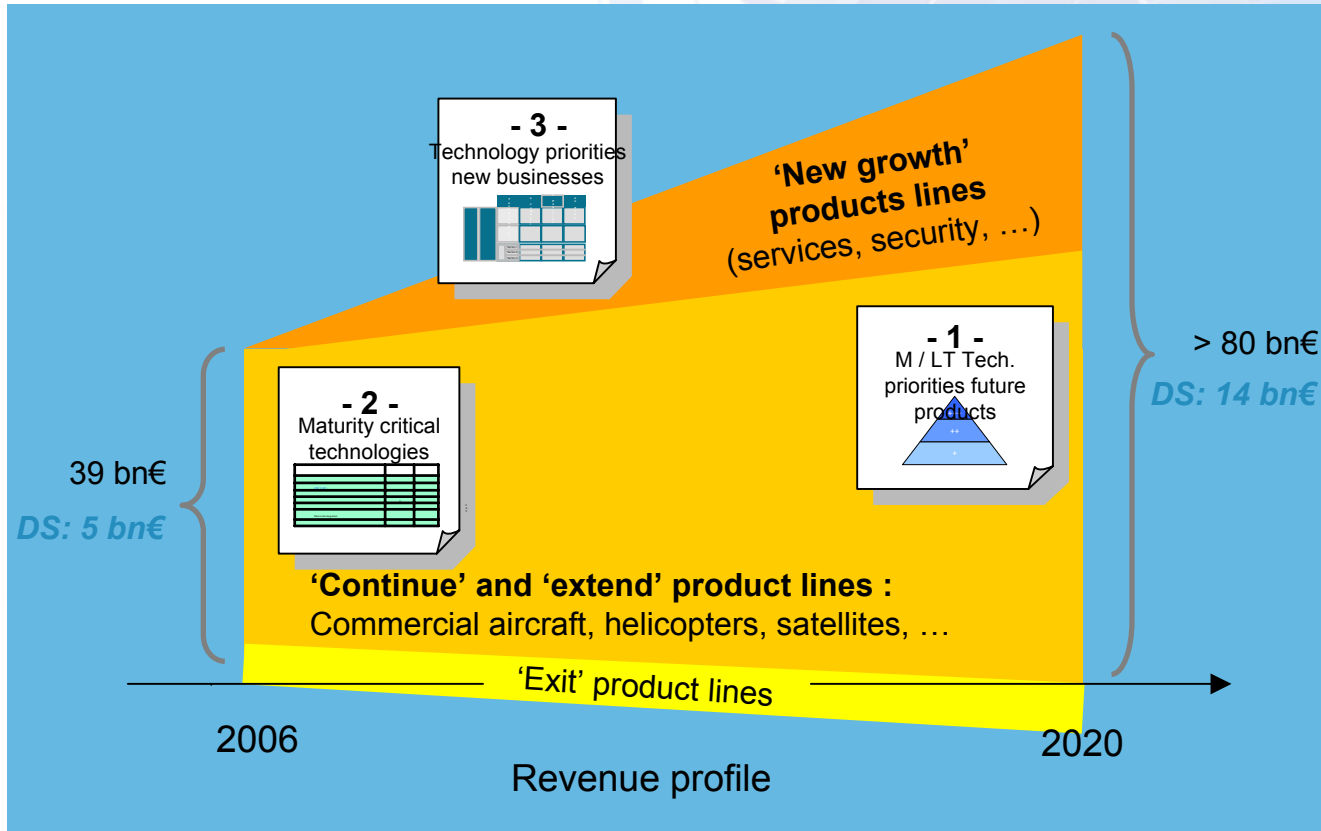
Commercial Aircraft		No. 1
Helicopters		No. 1
Commercial Launch Vehicles		No. 1
Missile Systems		No. 2
Satellites		No. 3
Military Transport		No. 3
Military Air Systems		No. 4

# EADS Management Structure



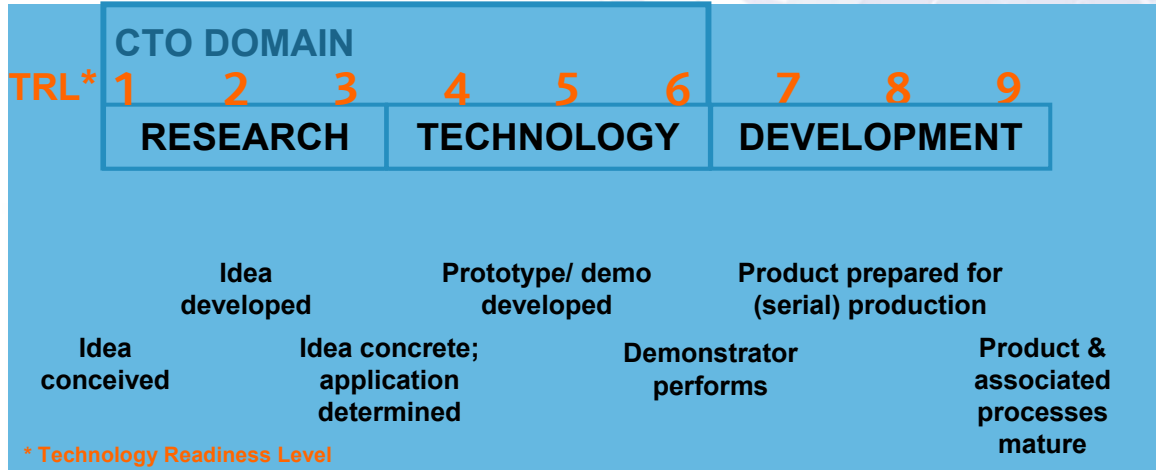
# EADS R&T Strategy

## Revenue Profile & Technology Categories

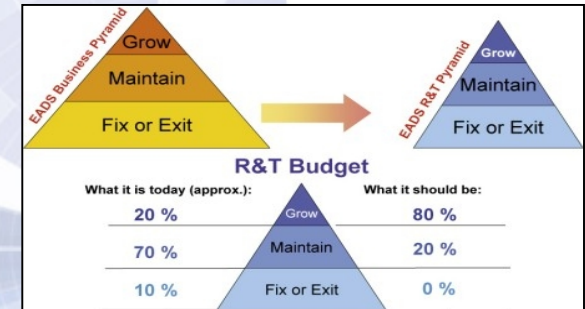


- EADS business strategy addresses the need for R&T to generate significant growth
- Maturation of critical technologies and identification of technologies for new businesses are key targets.

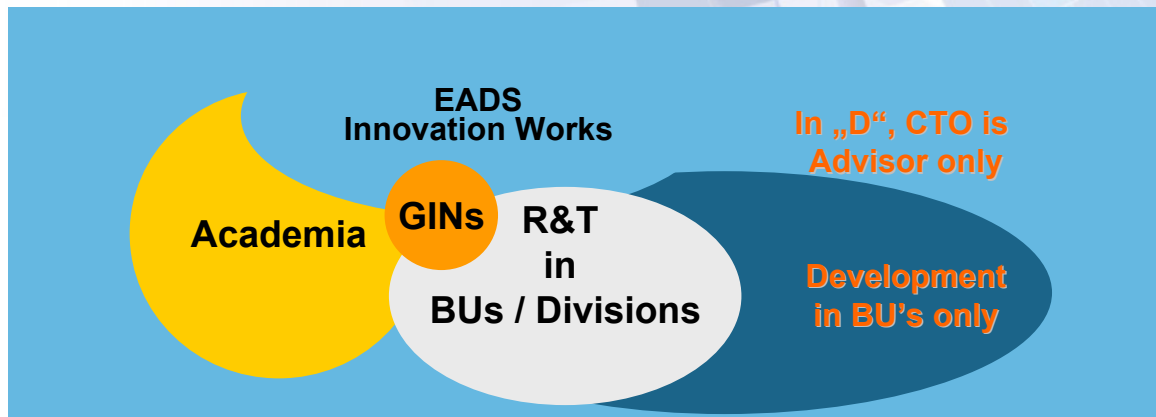
# EADS R&T Strategy



## EADS business pyramid



## Industrial Products



- Focus: R&T needs orientation to safeguard our future
- Speed: Accelerate the process to get key technologies ready
- Performance: Implement TRL process to continuous control

# Some figures

- R&D expenses 2,608 B€ (2007)
  - (1,399 B€ en 2000)
- 6,7% of the turn over
  - (5,8% in 2000)
- 950 patents in 2007
- Total patent portfolio :
  - 300 in 2000
  - 6 350 in 2007

# Defence and security activities

# Defense and security activities

## Defense & Communication Systems

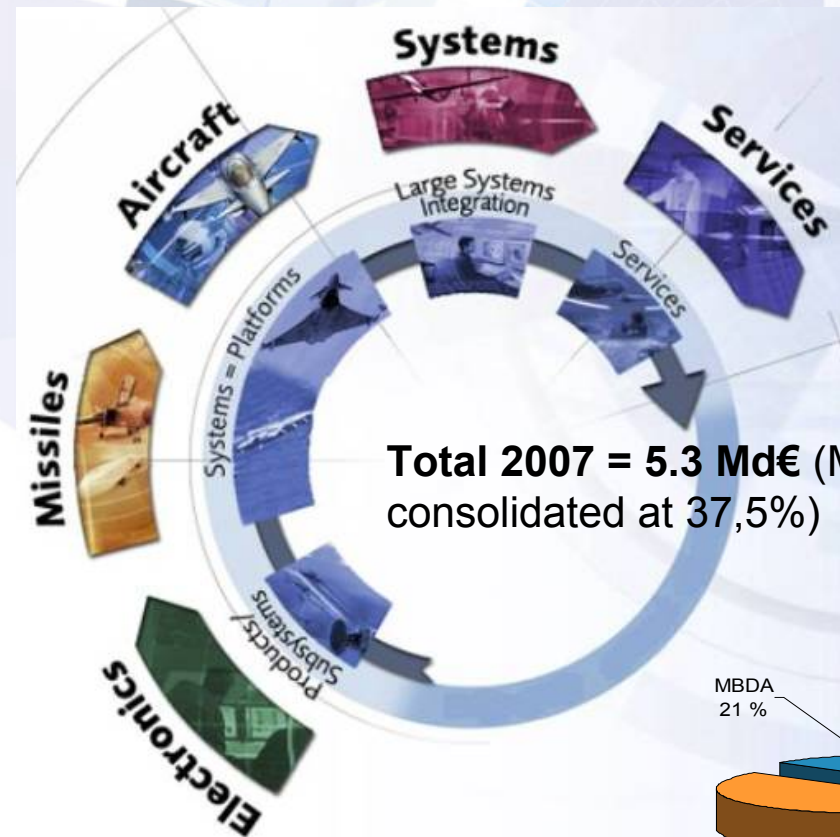
### Military Air Systems



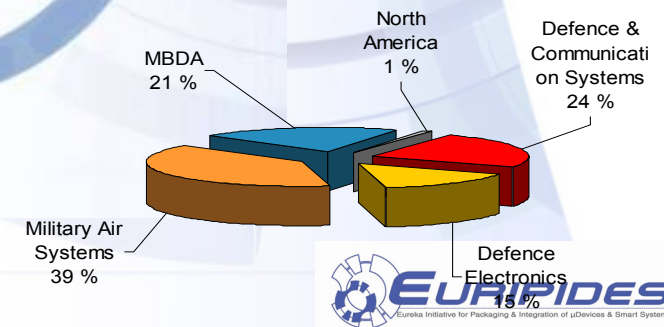
### Services



### MBDA



### Defense Electronics



**Population protection**

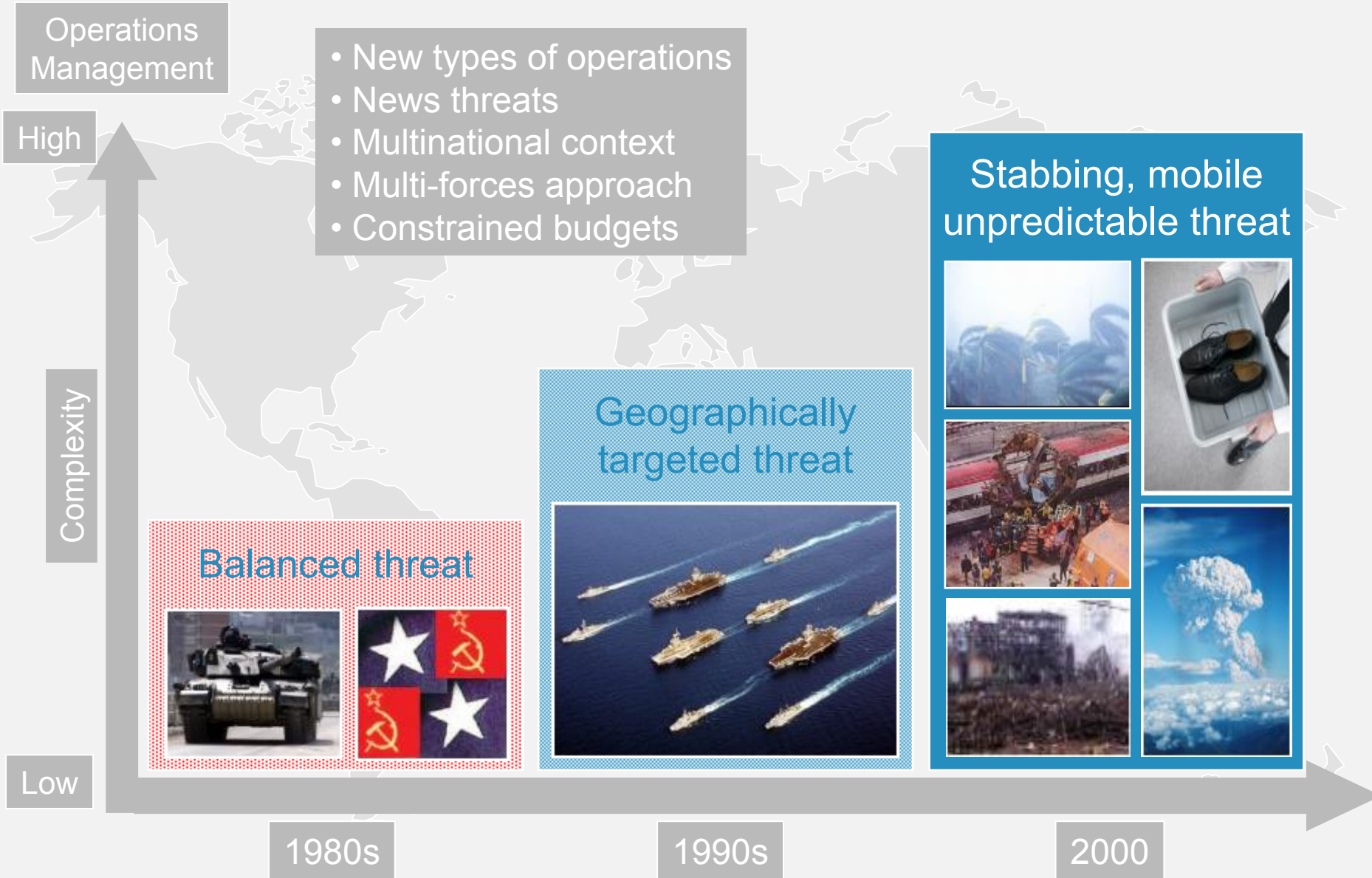
**Crisis management**

**Critical infrastructure protection**

**Maritime security**

**Border security**

# Threats evolution



# Evolution of capacities needs in Europe

Future customer capability needs
<b>Joint &amp; coalition operations</b>
• Interoperability (standardisation, data links a.o.)
• Effects based operations
• Contribution capability (to multi-national operations not covered by US)
• Civil and military collaboration
<b>Economies of scale</b>
• Common infrastructures (e.g. IT, COMMS, facilities)
• Dual use between security and defence
• Higher level of integration
• Modularity
<b>Improved Situational Awareness throughout the whole value chain</b>
• Localisation (blue force tracking)
• Intelligence
• Surveillance
• Reconnaissance
• Self-synchronisation (e.g. decision support, „plug & fight features“)
<b>Information security</b>
<b>Increased tempo of operation</b>
• Fast and reliable decision making and dissemination
• Time-critical targeting
<b>Reaction to asymmetric threats</b>
<b>Operation in an urban environment</b>

Future customer capability needs
<b>Protection &amp; Survivability</b>
• Self protection (e.g. platforms, vehicles, soldiers)
• Equipment protection (e.g. hardening)
• Perimeter protection (borders, power plant, IT systems)
• (Extended) Air defence
• Protection of space assets
• Access control
<b>Improve D3 (Dull, Dirty, Dangerous) missions</b>
• Unmanned operations
• Stand-off capability
• Overcome human limitations
<b>Effects control</b>
• Precision targeting
• Adaptable effects
• Non-lethal effects
• Information operations (e.g. deliver media)
• All weather capability
• Cyber warfare
<b>High operational readiness</b>
• Training
• System readiness (e.g. availability, reliability, certification..)
• Support (e.g. test, logistics, ...)
• Support of increased out-of-area operations

- Coherence of operational capability needs, but differences at next levels
- Future customer needs demand more integrated system solutions

# A Moving environment (1)

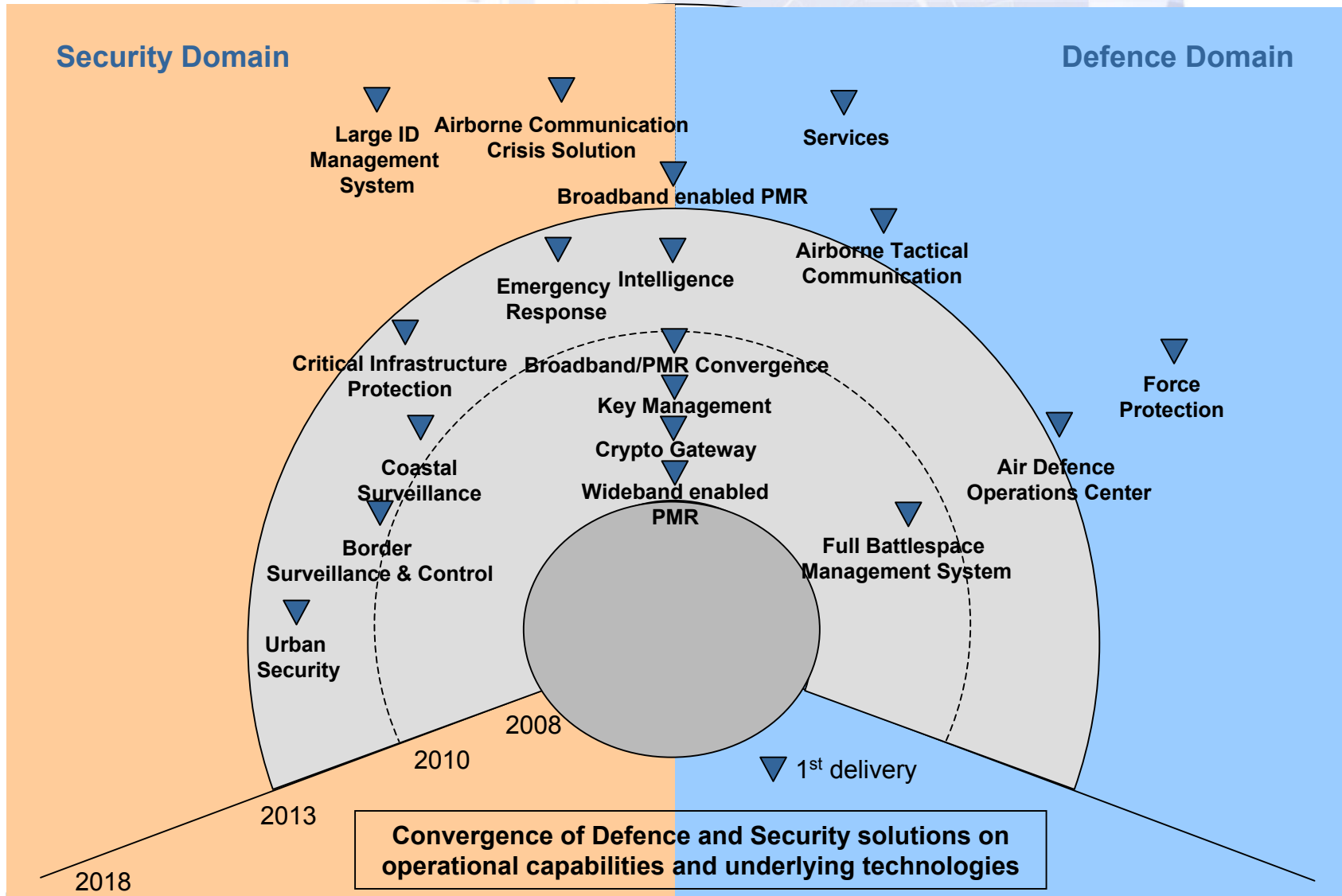
## Technological evolution : Some examples :

- Technological evolutions in communications and are IT are pulled by commercial market and standardisation
- IT and Communication are merging on all over IP world
- SOA (services oriented architectures) is a must in term of reusability and interoperability with a tremendous gap in development life cycles.
- COTS is not covering all needs in many cases adaptation of commercial components or modules is required for example in PMR (Professional mobile radio).
- There is a strong requirement to integrate on the field a lot of sensors with stringent environment :
  - Location, attitude
  - Bio sensors
  - Chemical detection, temperature, moisture
  - Low power, energy harvesting capabilities, long autonomy

# A Moving environment (2)

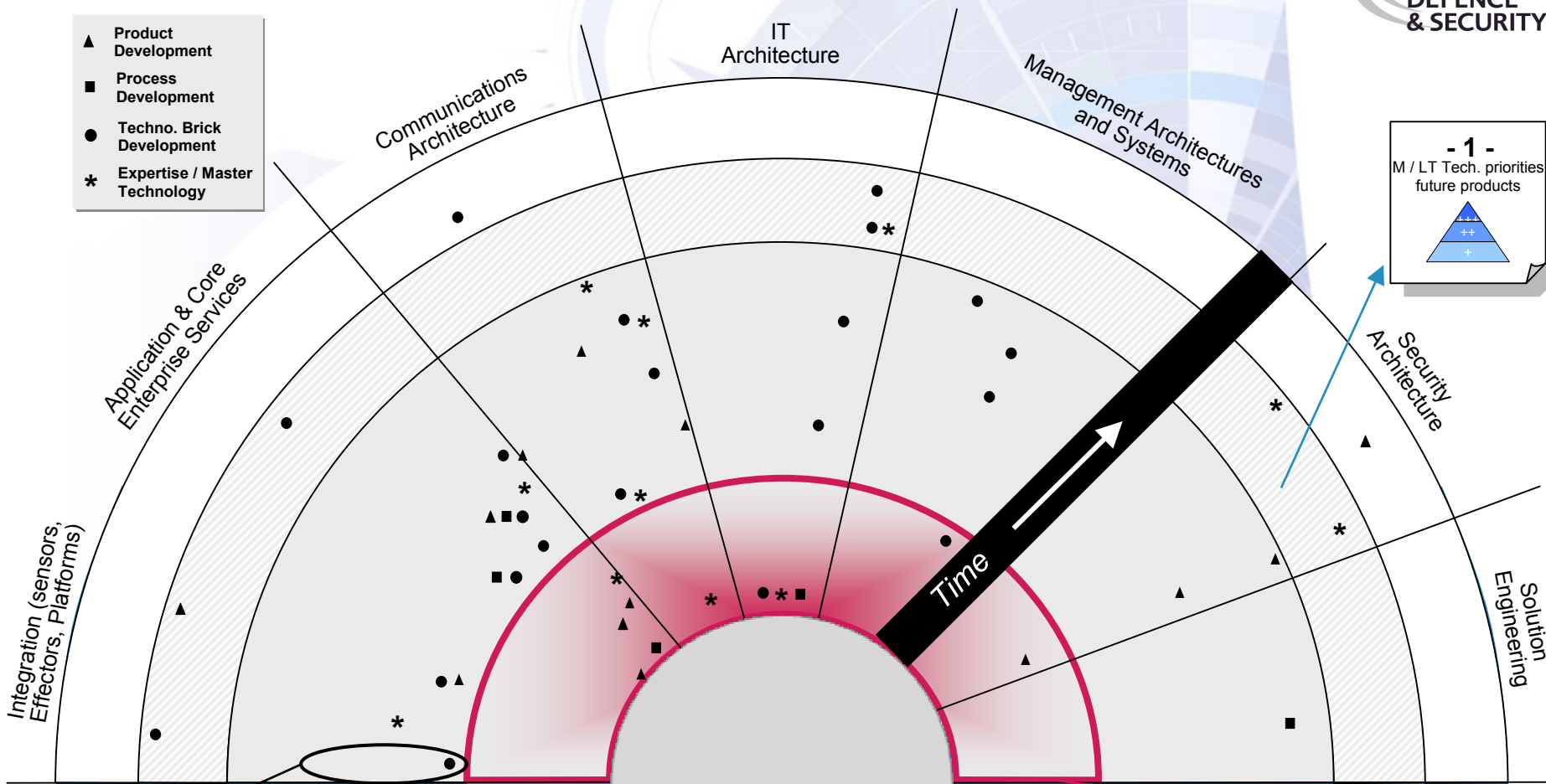
- This implies Secured broad band capacities and therefore authorised real transfer of high bandwidth elaborated data to command and control centres
- Sensors will be integrated in 3D package offering :
  - Communications capabilities
  - High performance CPU including signal processing
  - Flexible interconnection
- The infrastructure will be shared amongst users and then will require :
  - High security features (authentication, Integrity, confidentiality)
  - Certified crypto modules
  - Decentralised key management
  - But also multi level security to let the network being used by different types of users to share the investment in Broad band backbone.

# Defence and security Solution road map



# Key technology road map

- ▲ Product Development
- Process Development
- Techno. Brick Development
- \* Expertise / Master Technology



**- 1 -**  
M / LT Tech. priorities  
future products

**- 3 -**  
Technology priorities  
new businesses

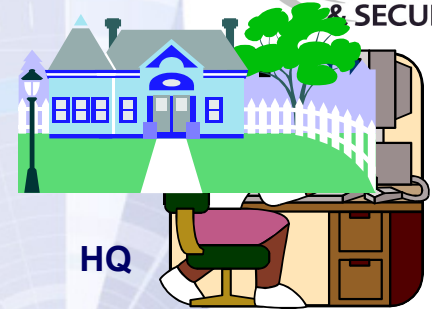
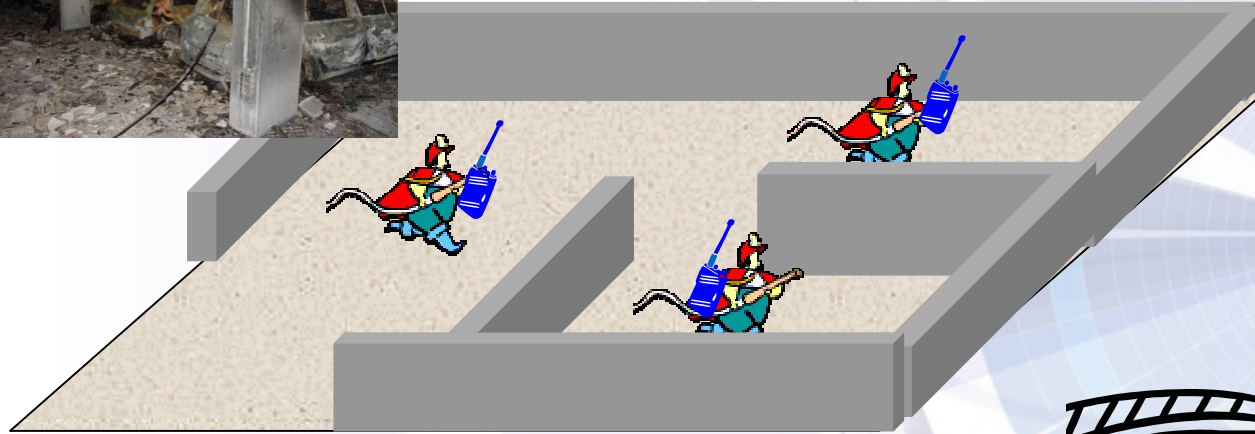
Belongs in part to DCS core business  
Partnership desired

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Partnership desired

**- 2 -**  
Maturity critical  
technologies

**Deployment of LSI solutions require combined integration of a wide range of technologies and know-how**

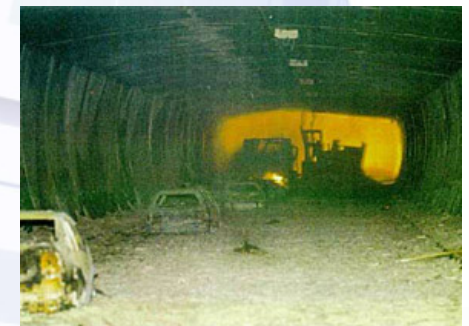
# Real Example : In door Location



HQ



- First responder (Firemen, civilian security, emergency services,.. location in complex environment
- No GPS location available
- High risks



# Real Example : In door Location Technologies used

- Indoor location
  - Inertial sensors worn by the users
  - Cartography management
  - Synthetic operational picture sent to the Command and Control Center to appreciate the global view
- Sensor Mini inertial platform : MEMS
  - Accelerometer,
  - Gyrometer ,
  - Magnetometer
  - High precision odometer to compute distance and bearing values
  - Position update with known values (stairs, walls, ...)
  - Provide real time position on the map

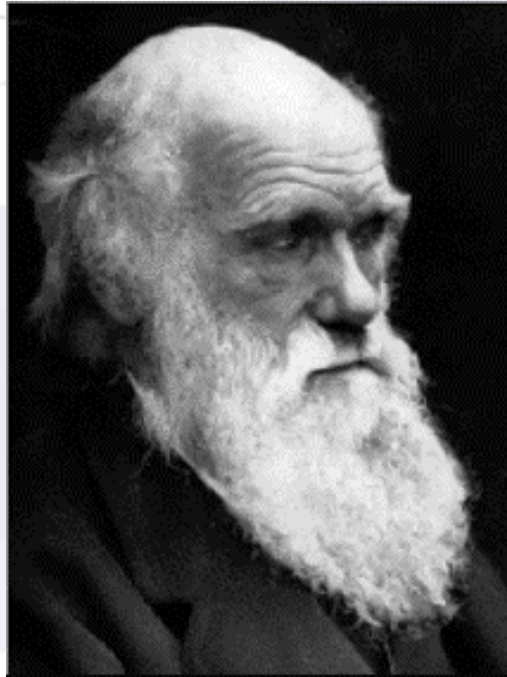


# Euripides Success story

# Euripides the good scheme

- Pidea/Eurimus and now Euripides is the good frame work to experiment and develop such technologies for Defence and security. EADS has been involved successfully in UMANISTA, EMCOMIT, SMART, VISIOPACK, UMANISTA, POWER SMART, POEM, ...
- Because it is a bottom up market oriented frame work, highly flexible, build around ecosystems : large companies,
- It guarantees technology access at European level in order to foster European supremacy in micro/nano systems and technologies

# Last word about Innovation



*“It is not the strongest of the species who survives,  
not the most intelligent,  
but the one **most responsive to change**”*

**Charles Darwin**