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Paper 032

Improving Capability Effectiveness in a Complex Environment

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ICCRTS June 2010

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Improving Capability in a complex environment

- A bit of background to defence projects
  - Nature of the environment
- Why is experimentation so important?
  - Dealing with complexity
- About Niteworks
  - A unique mechanism
- How does experimentation make a difference?
  - Worked examples
- Lessons learnt
  - Some conclusions for the future

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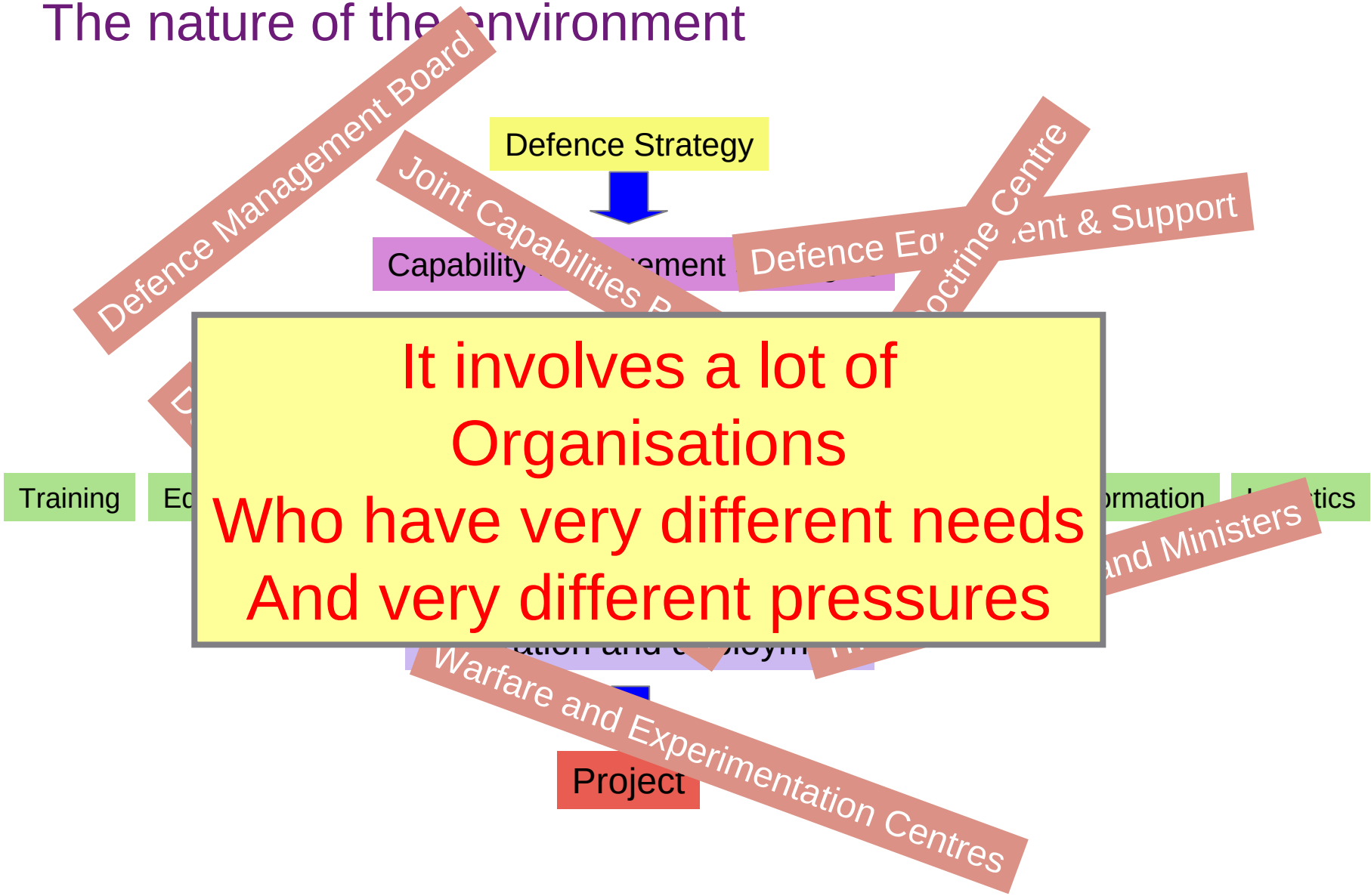
The nature of the environment



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Problems faced by defence solutions

- Optimism at the bid stage – *'must win'* contracts
- Untested or unreasonable requirements
- Complex components/constituents
- Resilient and reliable solution - long life expectancy
- Use of new technology, technology immaturity
- Complex integration
- Emergent properties

Maybe a 'playpen' would help?

And a linear acquisition process that limits the ability to prototype

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……better by experimentation

SERVING DEFENCE AS THE DEFINITIVE PARTNERSHIP

"…. experimentation is critical to ensure we deliver what the front line needs. Niteworks provides a unique ability to link from 'current to concept' and ensure we deliver practical, affordable increments..."

VAdm Paul Lambert, DCDS(Cap)

THINK NITEWORKS FIRST

"Niteworks is the only thing which saves me money"

(Outgoing) DCDS(Cap)
Lt Gen Andrew Figgures

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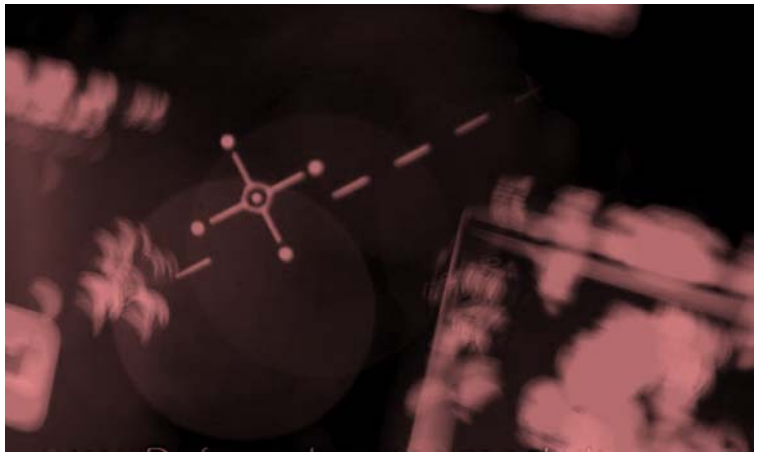
An impartial environment where MOD and Industry work together

- A gateway to breadth and depth of expertise that has no individual company bias
- An extant, flexible and proven contracting mechanism
- A capability that delivers scalable decision support
- A team which provides trusted evidence
- A means of getting answers quickly to meet the needs of operational tempo



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Strength of the Partnership

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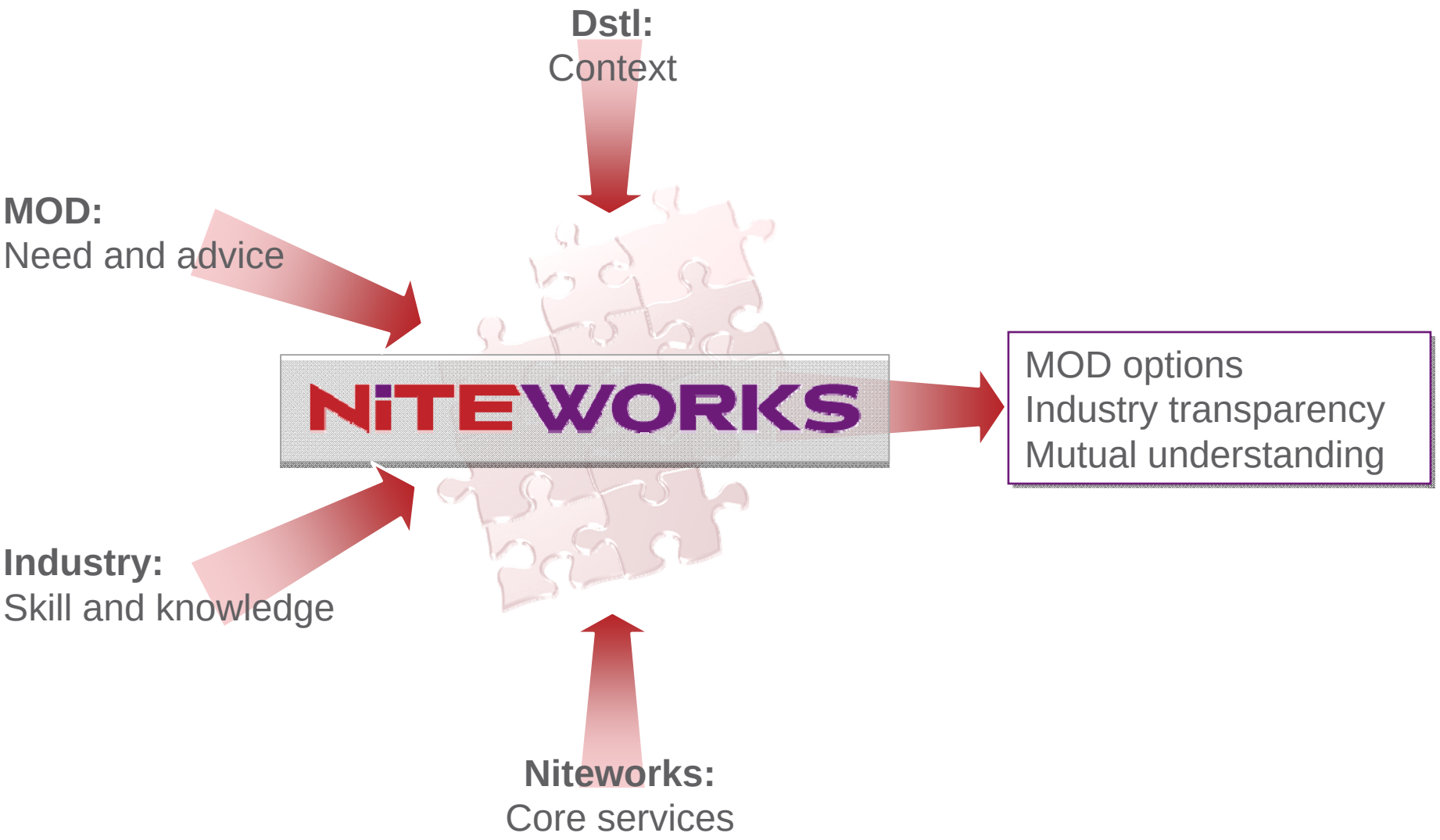
The partnership perspective



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Advantages of experimentation?

- Look into the future before committing
- Fast forward scenarios
- Play what-ifs
- Make trade-offs
- Optimise solutions – and not just equipment!

- Improve alignment and thinking between stakeholders
  - At all levels !!

- Build Confidence, understanding
- De-risk
- Reduce uncertainty, ambiguity

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n essential aid to Managing Complexity

Most major projects are non-repetitive

- Treating them as if they are is the first mistake

Stuff happens

- Is the environment in which you work prepared for this?

Everyone is a stakeholder

- You just have differences which must be reconciled, not ignored

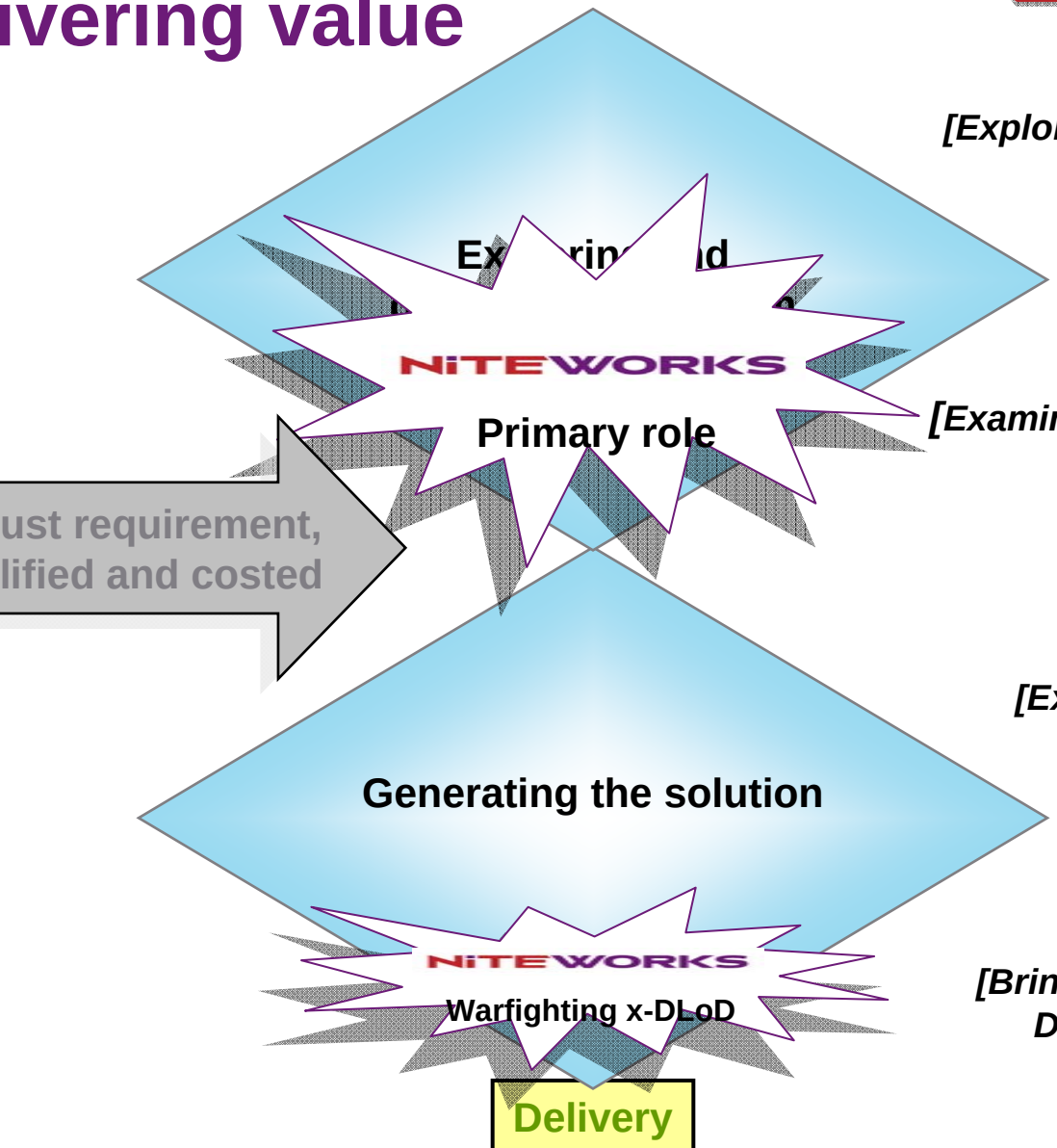
Preparation is everything

- Experimentation can significantly de-risk

Risks abound

- They must be worked on as if they are mutually owned

ivering value



Divergence
[Exploring the question, testing the problem]

Convergence
[Examining what's possible, shaping the requirement]

Divergence
[Exploring the supply side, choosing the partner]

Convergence
[Bringing the solution together, Delivering the integrated components]

Sample Benefits

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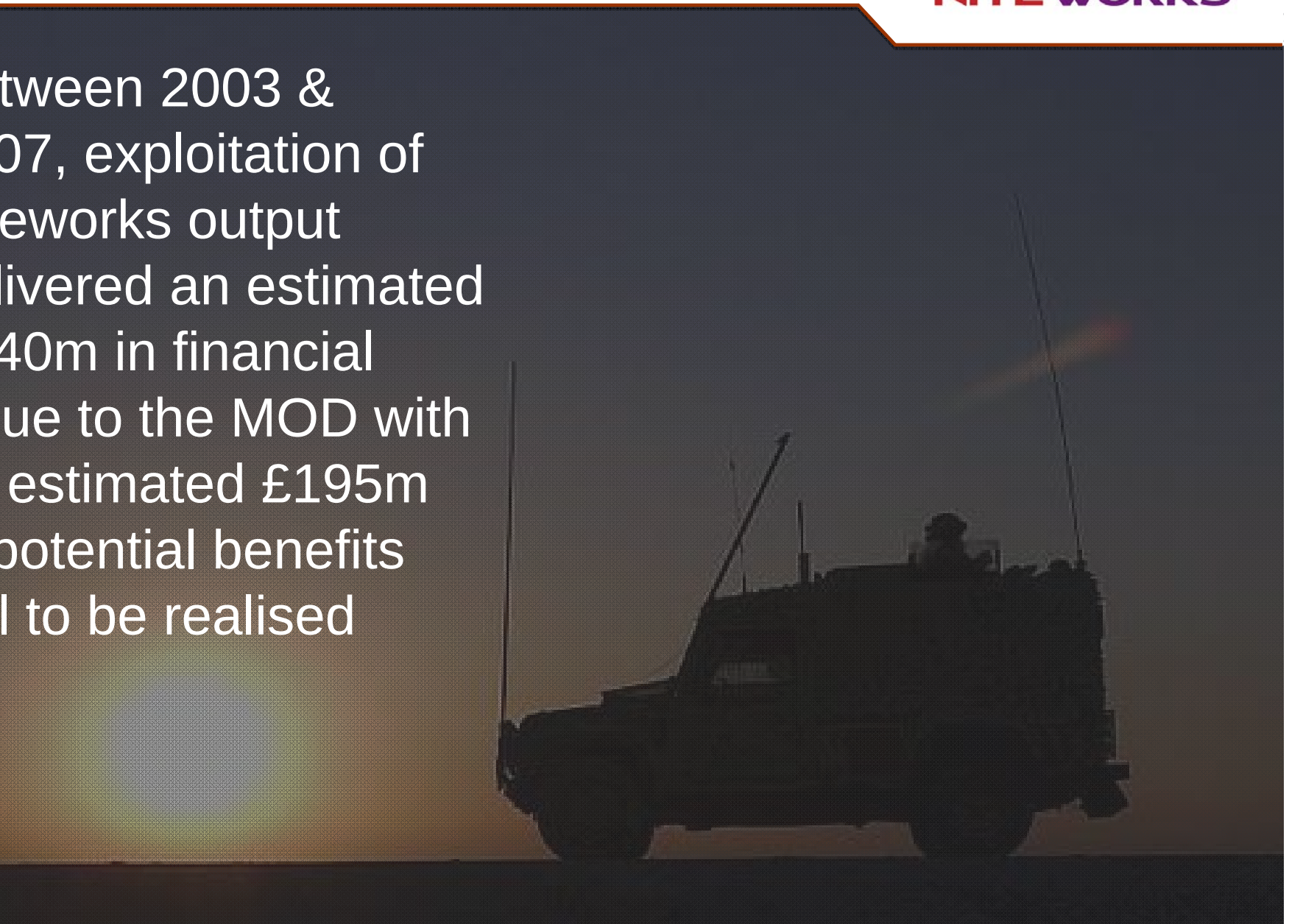
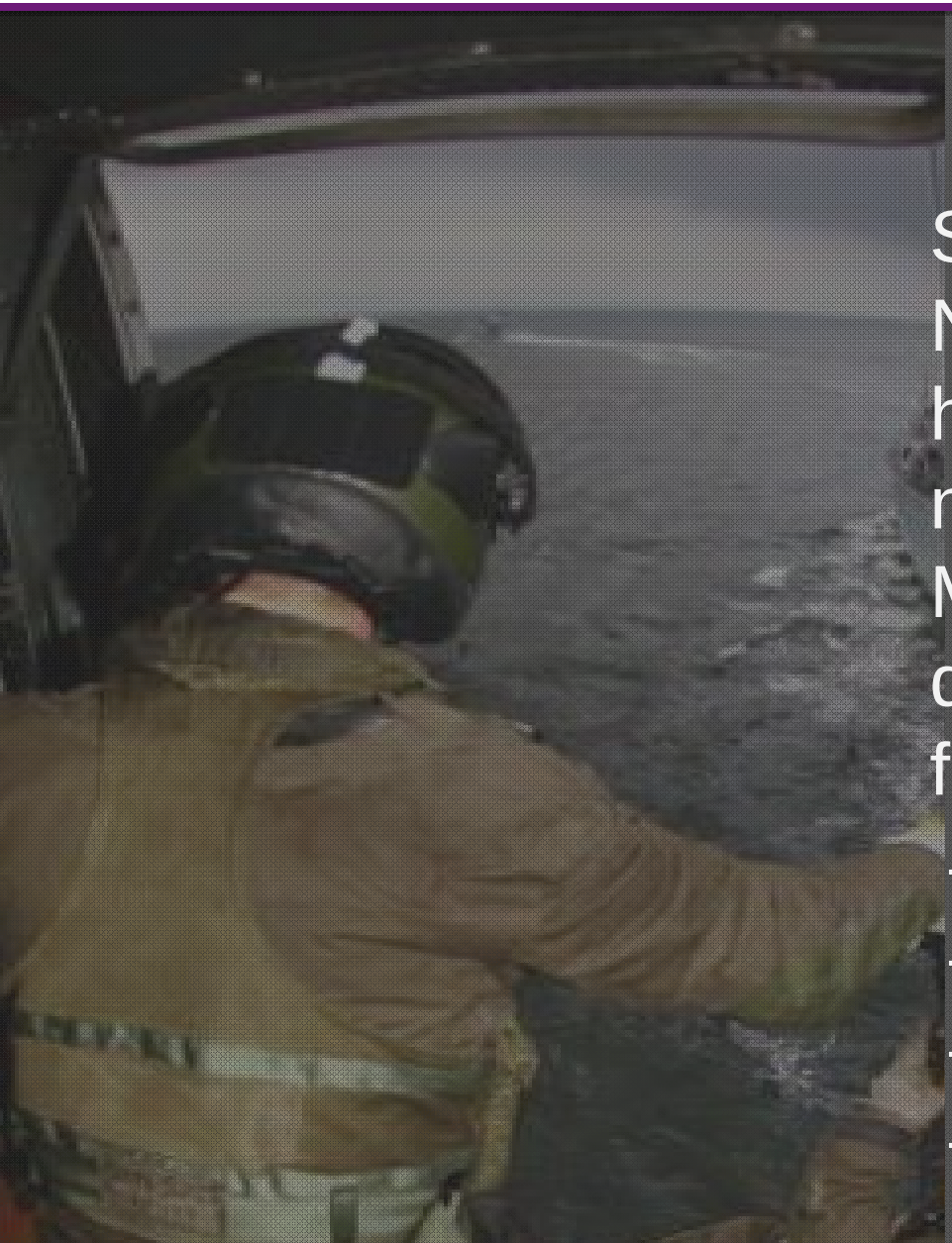
tween 2003 &
07, exploitation of
eworks output
livered an estimated
40m in financial
ue to the MOD with
estimated £195m
potential benefits
l to be realised





Since Jan 2008, Niteworks Projects have de-risked a number of separate MOD capability delivery projects of the following categories:

- 3 x Cat A (>£400M)
- 4 x Cat B (>£100-400M)
- 2 x Cat C (>£20-100m)
- 2 x Cat D (< £20M)

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enefits to Capability Delivery: ISTAR Case Study

formation equirements anagement & esource Tasking RM&RT)

***OD Sponsor**:*
E&S - ISEPO

roject provided dence to support the ial Gate Business se (accepted) for the ABINETT IRM&RT oject

Project output improved precision and accuracy of:

- User Requirement Document (URD)
- System Requirement Document (SRD)
- CONEMP
- Capability Boundary Definition
- Concept of Analysis

Estimated Benefit:

MOD estimated that the Niteworks Project reduced Concept Phase project risk exposure by **£2.28M & 11 months duration**

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etailed Example – experimental results

Army Equipment Development plan (AEDP)

A practical example undertaken for Decision makers which compares options and guides the user through understanding the outcomes

Utilises *TRAiDE* methodology fore decision analysis

All data (e.g. colour scorings of taxonomy elements) shown within the visualisations is, for classification purposes, representative only and does not represent the data gathered all information relating to scenario, assumptions, deductions and key equipment issues has been removed

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RAiDE™

M Robust Acquisition inclusive Decision-making Environment

es of the ***TRAiDE***™ environment

en approach – enabling utilisation of parate sources of data

rmation flows through a **single ormation manager**, regardless of rce/destination

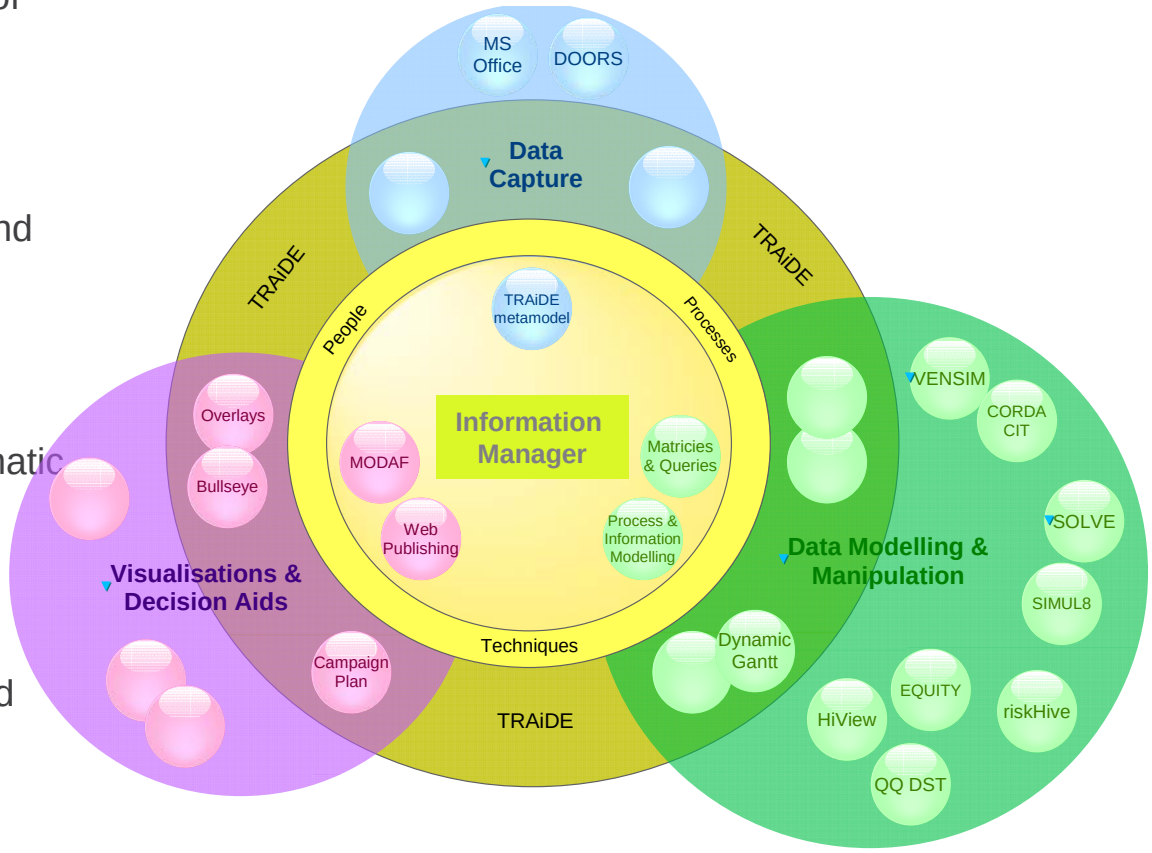
lusivity - designed to utilise new and ant mechanisms, tools and their viders

uitive visualisations – enabling pler interpretation of results

olutionary – incremental and pragmatic velopment based on user feedback

alable – enabling aggregation of rmation at all levels

neliness and quality – appropriate puts, matched to customer need and cisions



Underpinning ***TRAiDE*** is a meta-model

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tion

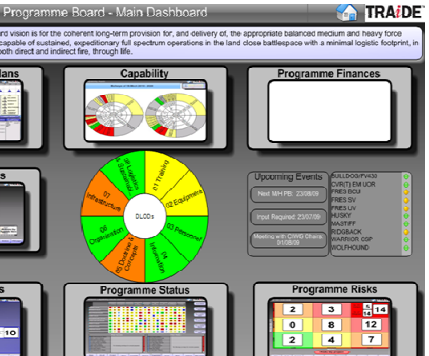
apability Management (TLCM) requires
d decisions and trades at each level in the
e structure and throughout the decision
.

ty decisions and trades requires well
mation, analysed in a coherent way so
VISUALISED.

ards

e used to display real time information,
rious sources within specific domains for
is on business performance measures.
information in a timely manner, minimising
unnecessary embellishments that create
h can lead to inaccurate reporting

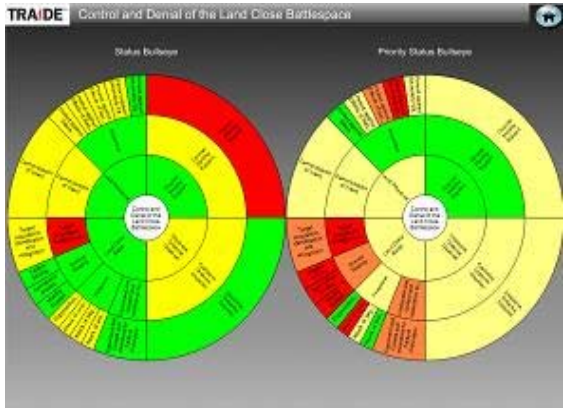
n organise business information to support
sability and maintain consistency of reporting
urate interpretation. The following TRAiDE
used to investigate the status of key
etrics within MoD Programme Boards. Plans,
Capability, Finances, and Previous Actions
ed and reviewed through this Dashboard.
ies were identified between business
easures, allowing consistent analysis to be
n accessing the impact of any given



Bullseyes

The bullseye provides an 'at a glance view' of the status of a number of related elements within a hierarchy, applying a common structure, context and language to support strategy, planning and decision making within an organisation. Applying a consistent taxonomy and measurement framework provides a 'like to like' comparison of capability delivery options.

The following left hand bullseye provides a view of the status of risks within a given capability area (colour of each segment). The right hand bullseye provides a view of the status of priority against the same area.

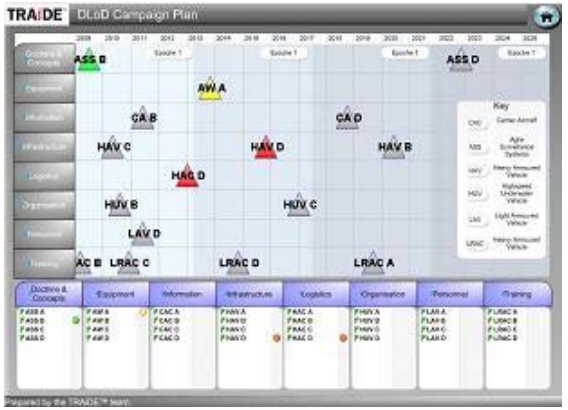


An advantage of TRAiDE is the ability to overlay bullseyes. For example the two bullseyes above can be overlaid to indicate areas of high risk and high priority when carrying out strategic decision making (areas in red).

Campaign Plans

Campaign Planning is the technique that allows activities to be planned and monitored in such a way as to achieve certain outcomes through the delivery of supporting effects. As such it links in directly to the delivery of capability, which also focuses on the achievement of particular effects.

Activities are mapped according to a time line and are organised usually by defence lines of development, as illustrated below.



The Campaign Plan will show interdependences between activities and then activities can be linked into the resource they require. The Campaign Plan itself is dynamic and elements on it can be moved interactively and the result of these movements assessed.

Within the TRAiDE environment you have the ability to drill down into areas of interest and investigate potential solutions and impact of options, allows detailed analysis to be carried out.

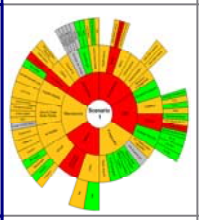
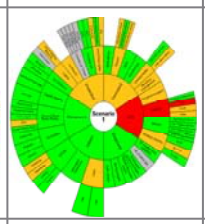
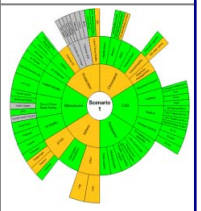
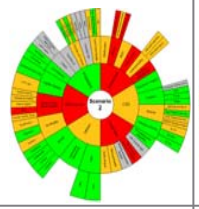
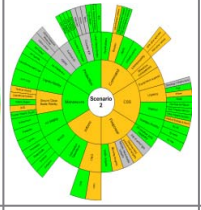
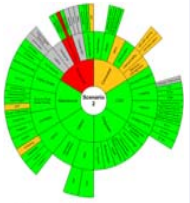
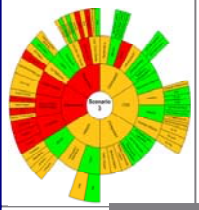
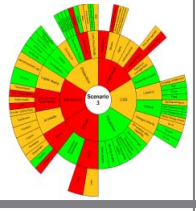
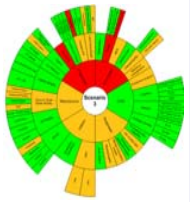
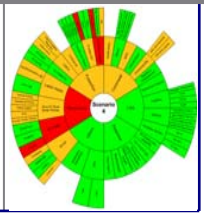
From an industrial perspective this visualisation is commonly called a 'Plan on a Page' or 'Road Map'.

: FAS NS ‘FULL FAT’

tions

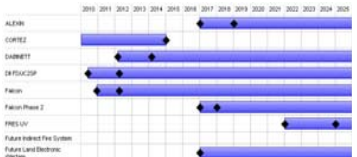
ons/Recommendations

Land outputs

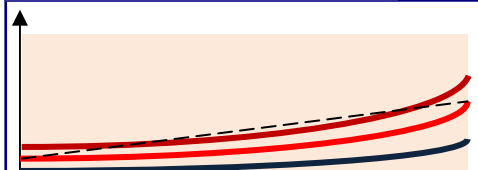
	2011	2015	2020
Scenario 1			
Scenario 2			
Scenario 3			
Scenario 4			

sation Profile:
DR’ FAS NS: Option 1

Key Equipment Profile



Predicted Defence Cost Profile



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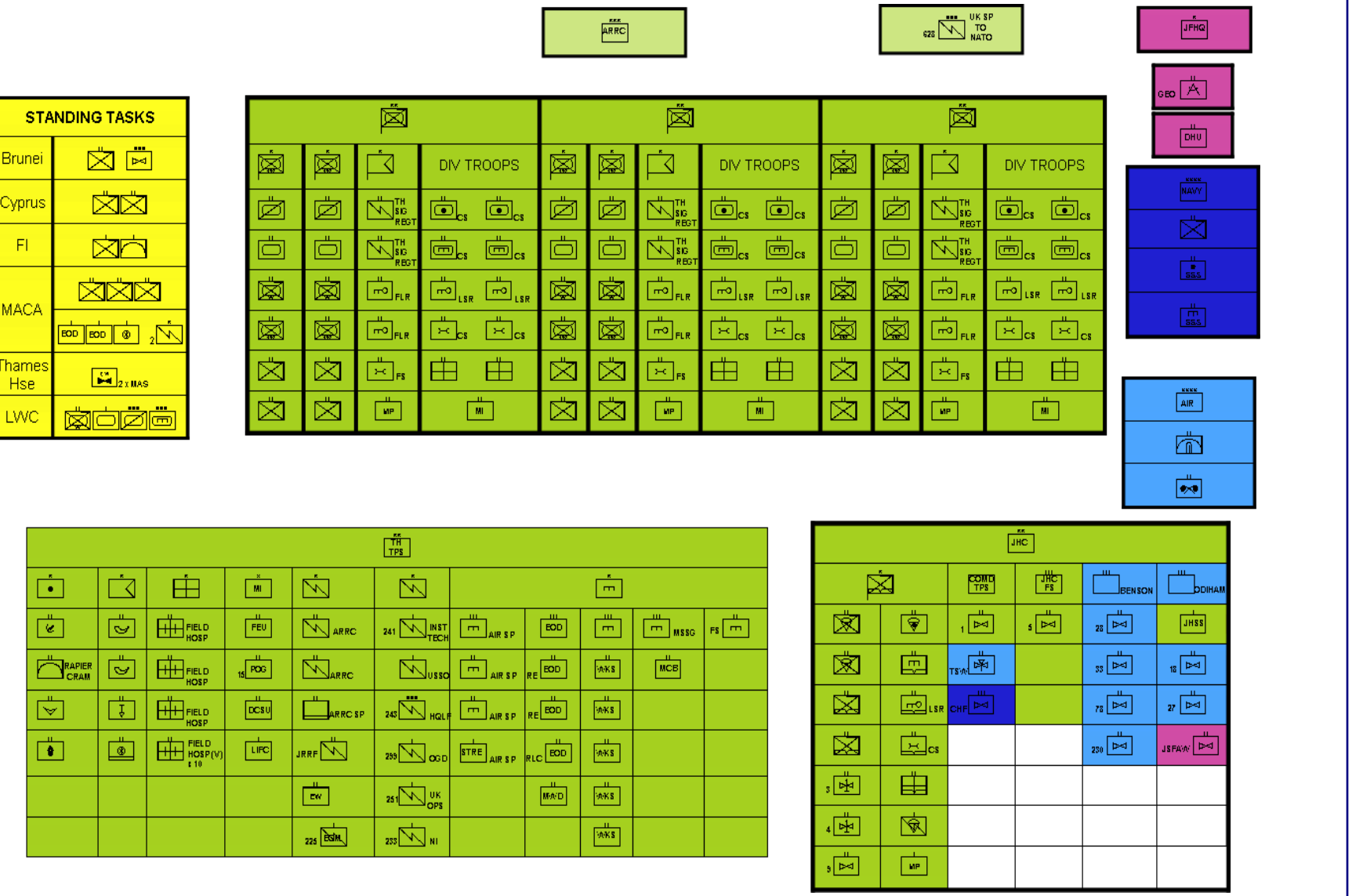
RED	An equipment capability issue/risk impacting Defence outputs that **must** be addressed by ECAB
AMBER	An equipment capability issue/risk impacting Defence outputs that **should** be addressed by ECAB
GREEN	No equipment capability issue/risk impacting Defence outputs
BLUE	An over-supply or overmatch in equipment capability that **should** be addressed by ECAB
GREY	Not required in this scenario
WHITE	Classified

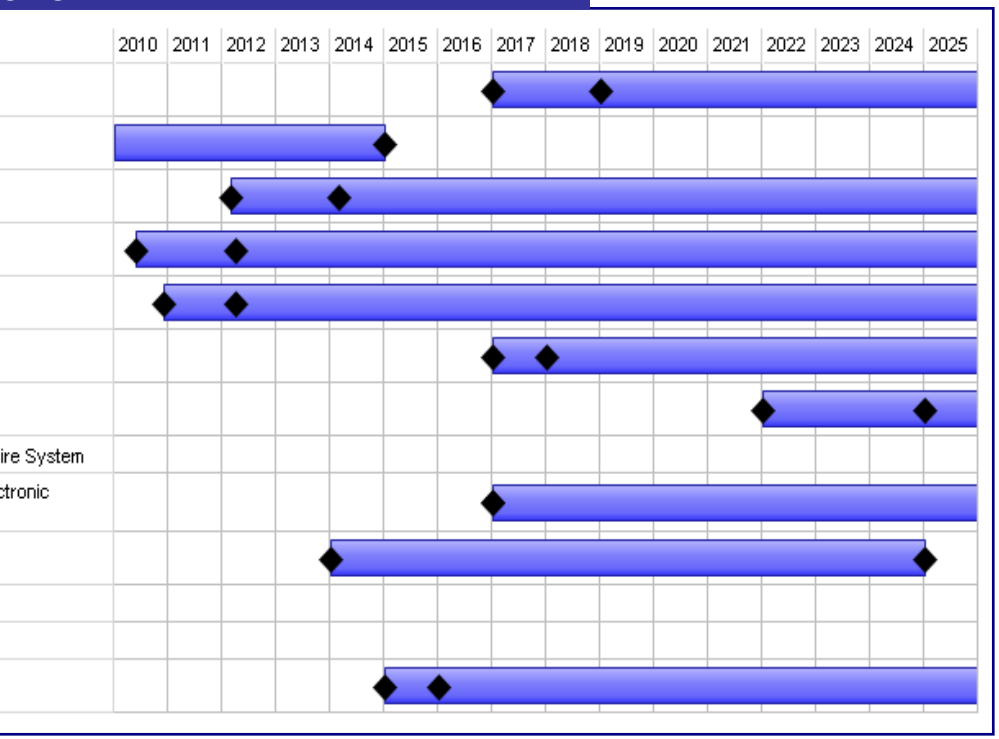
Organisation Profile

S Deployable Army Structure

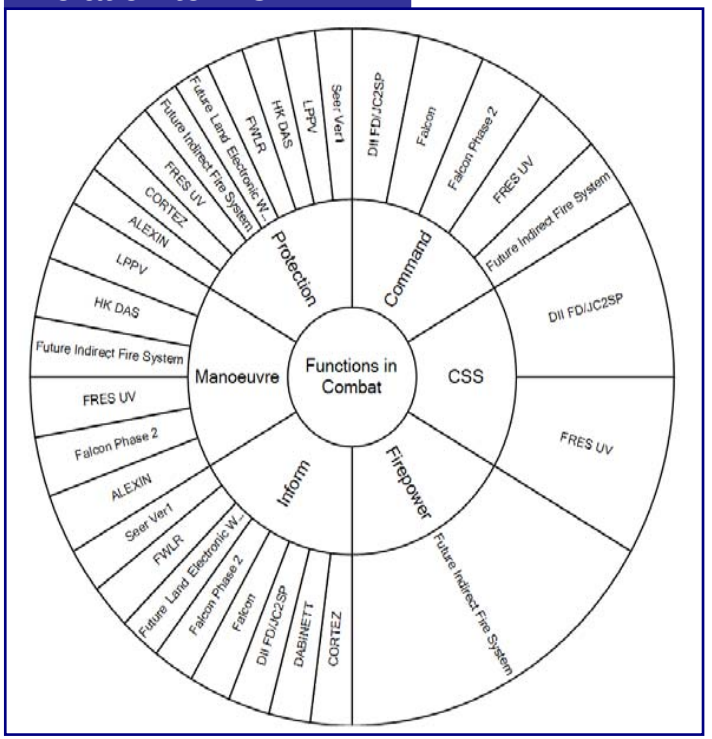


Key Equipment Profile

ofile



Relation to FiC



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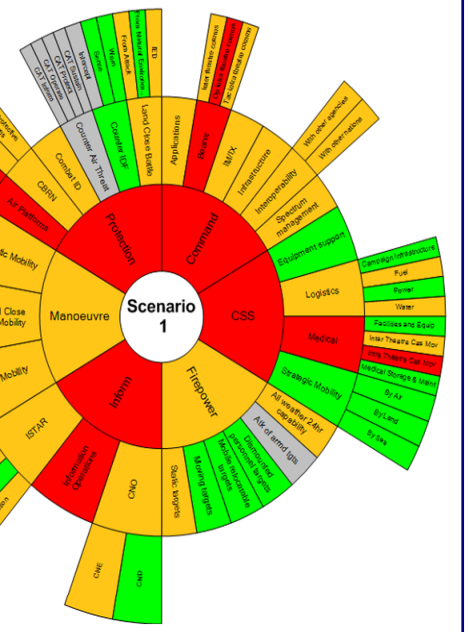
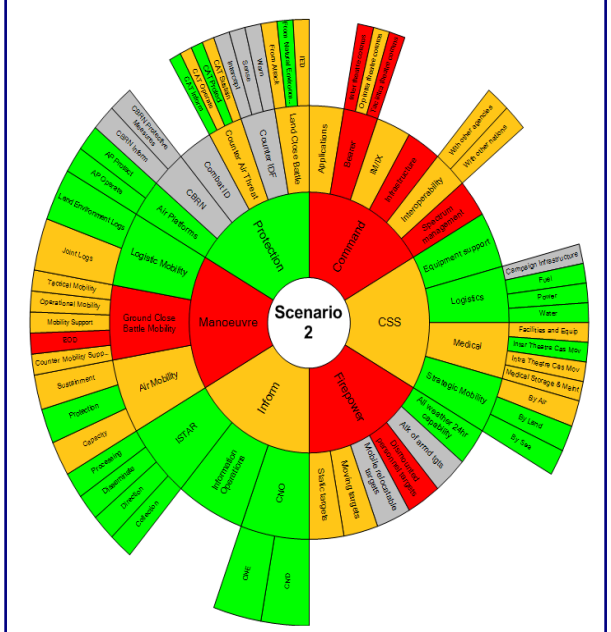
2011

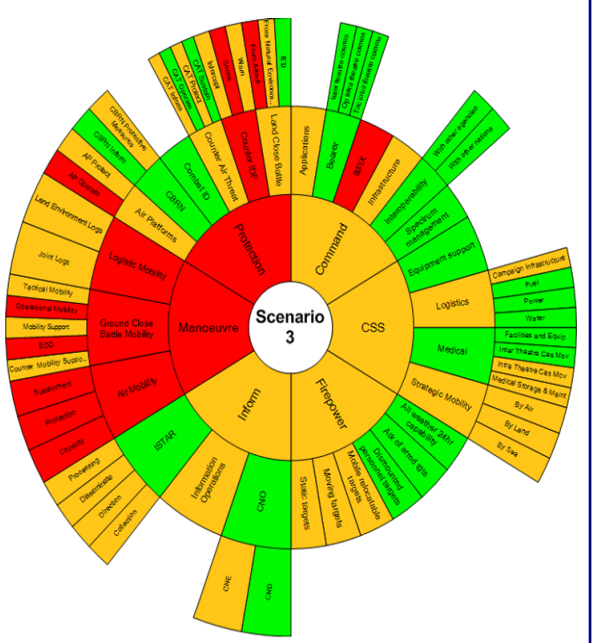
rio 1



Scenario 2

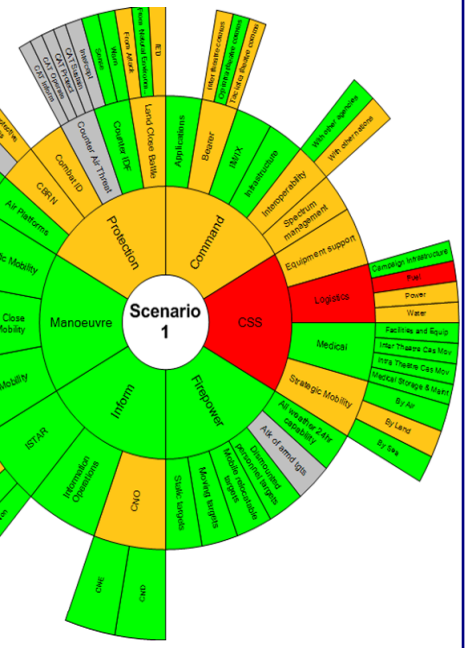


Scenario 3



2015

rio 1



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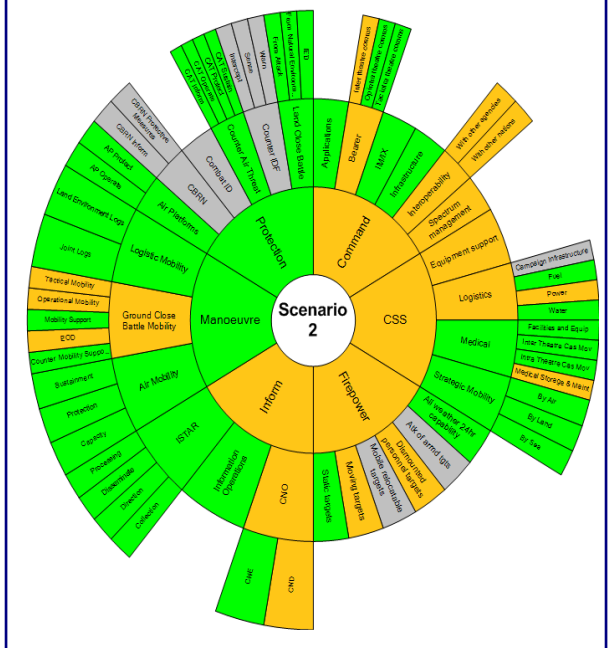

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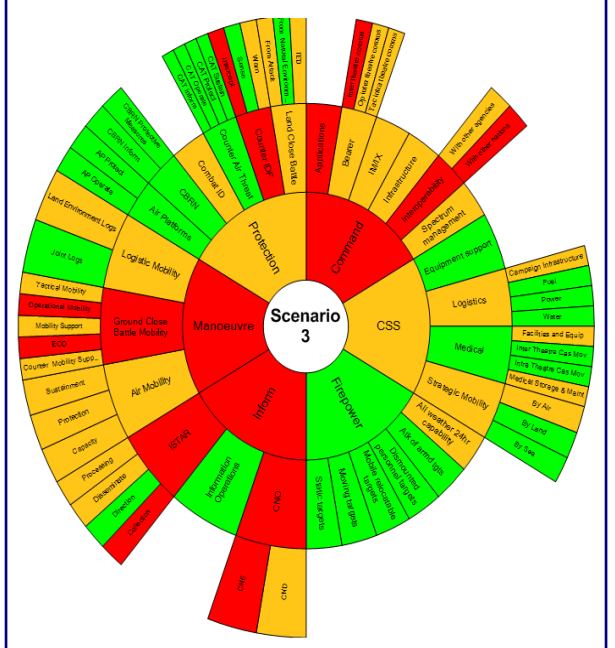
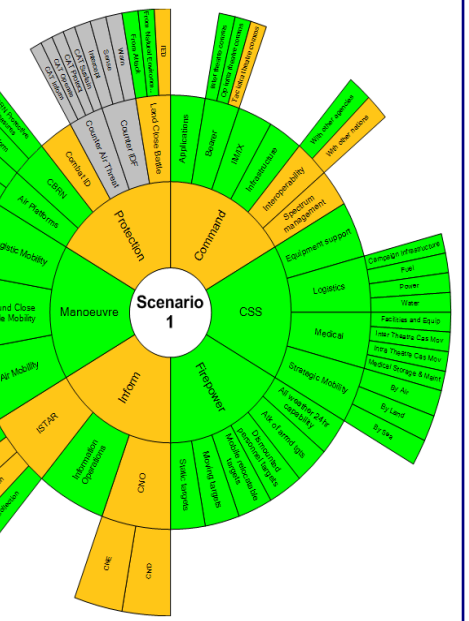


2020

rio 1



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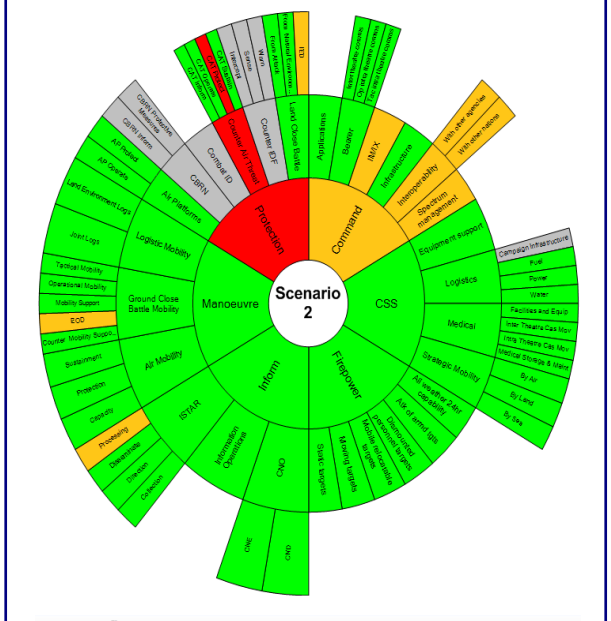

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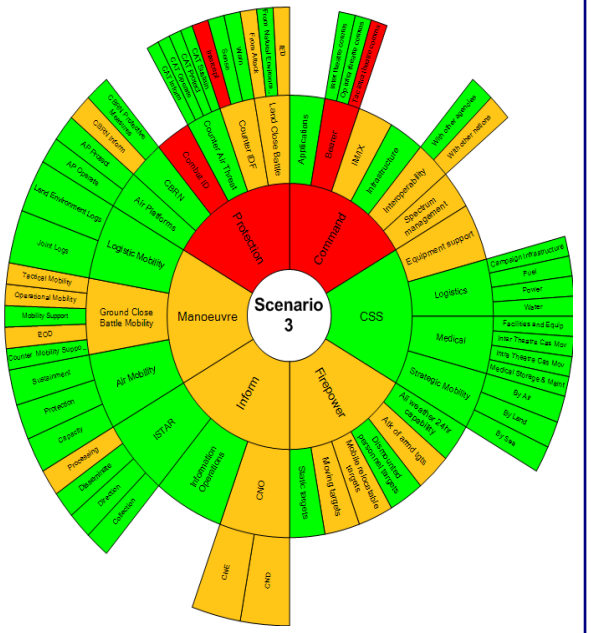
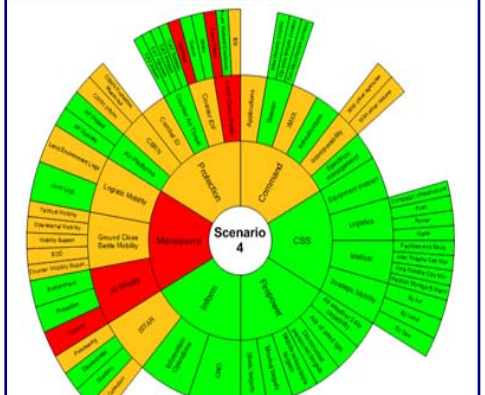
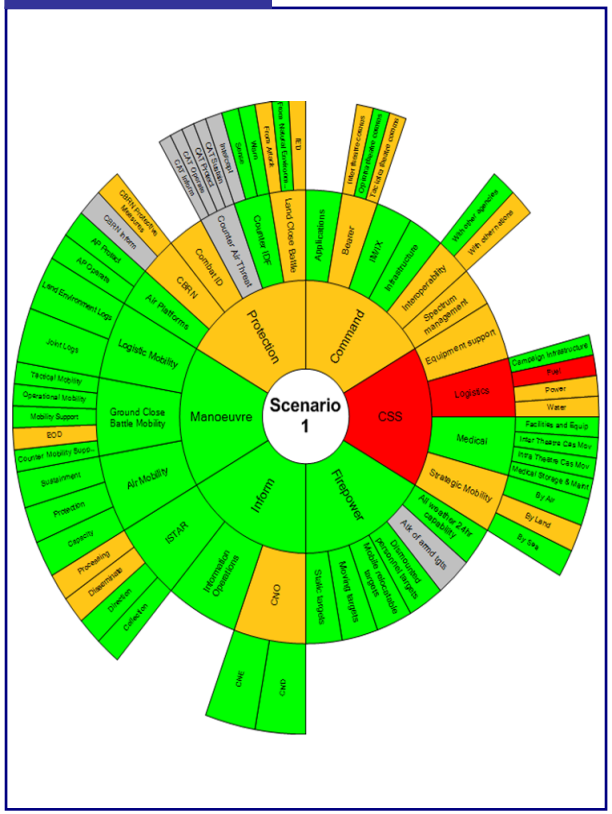


Scenario 4

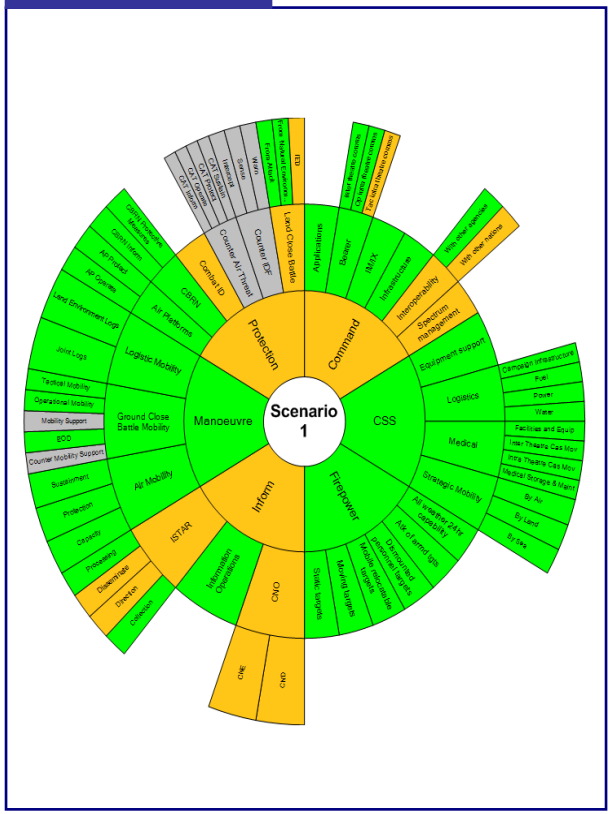


Scenario 1

2015



2020



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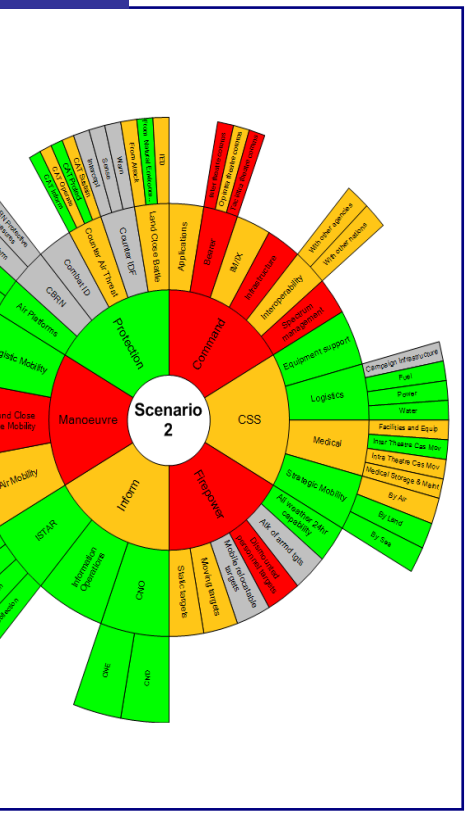
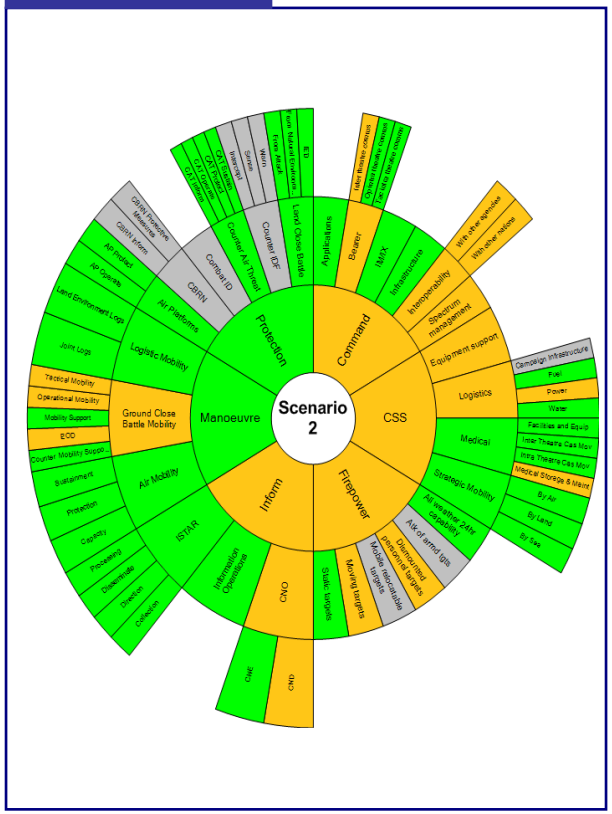
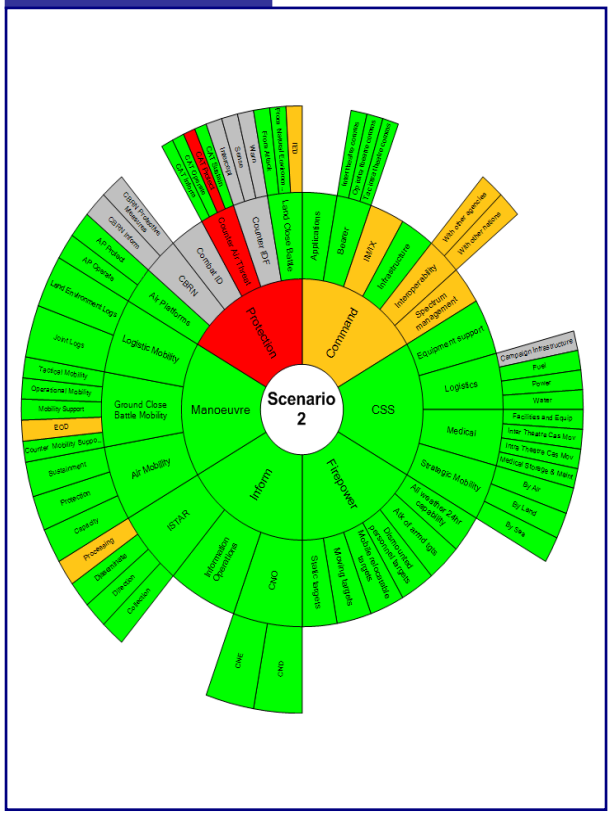


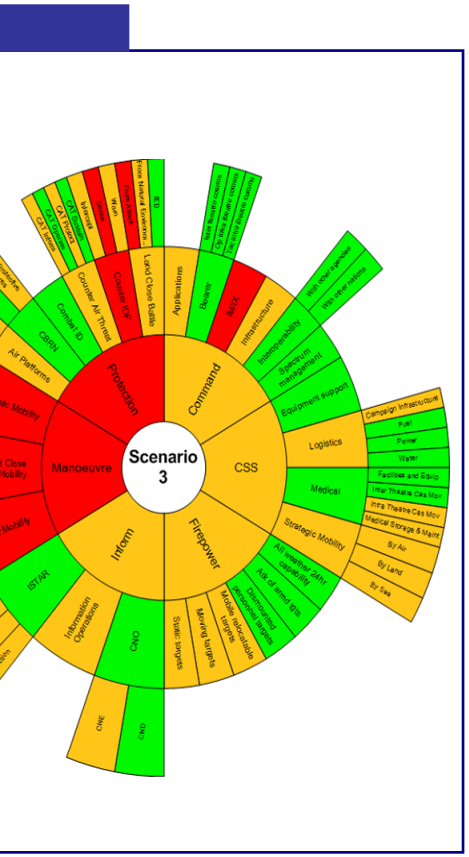
2015



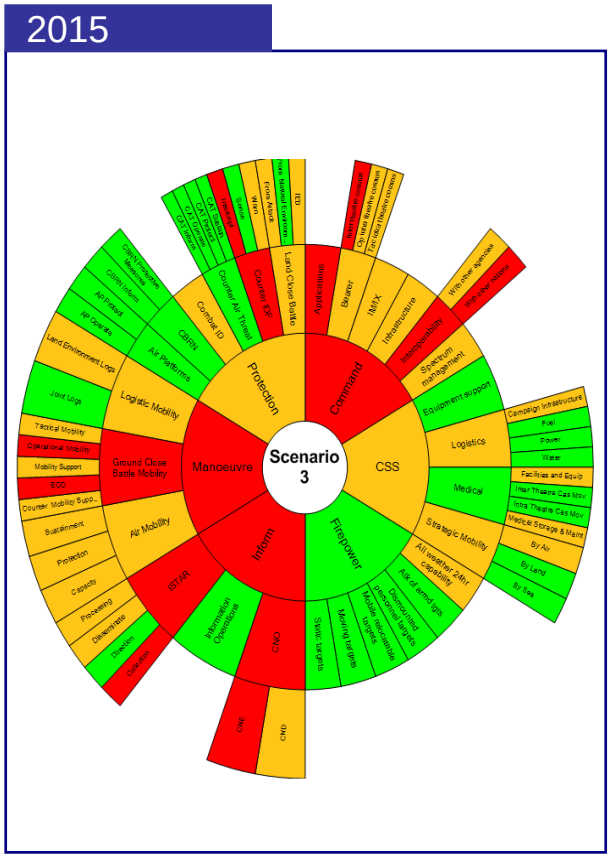
2020



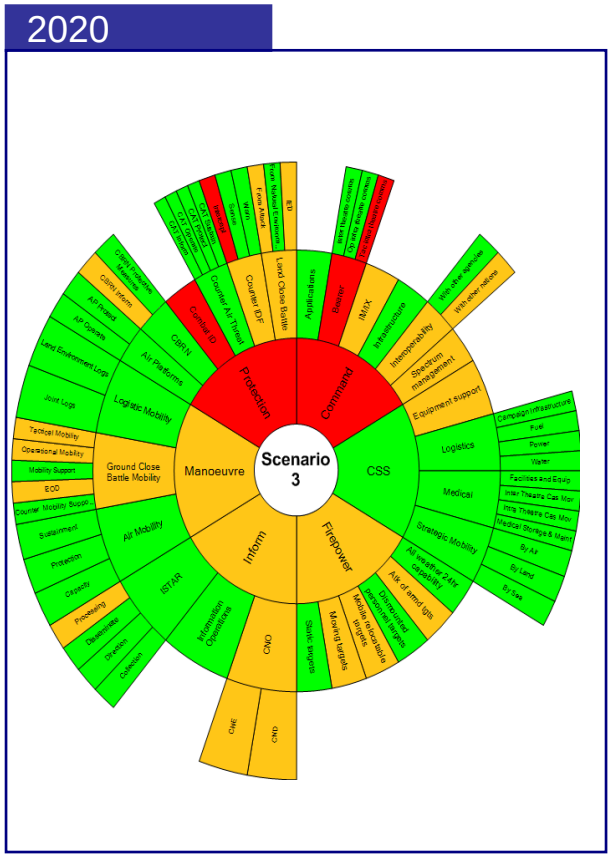
Scenario 3



2015



2020



Scenario 1 2011

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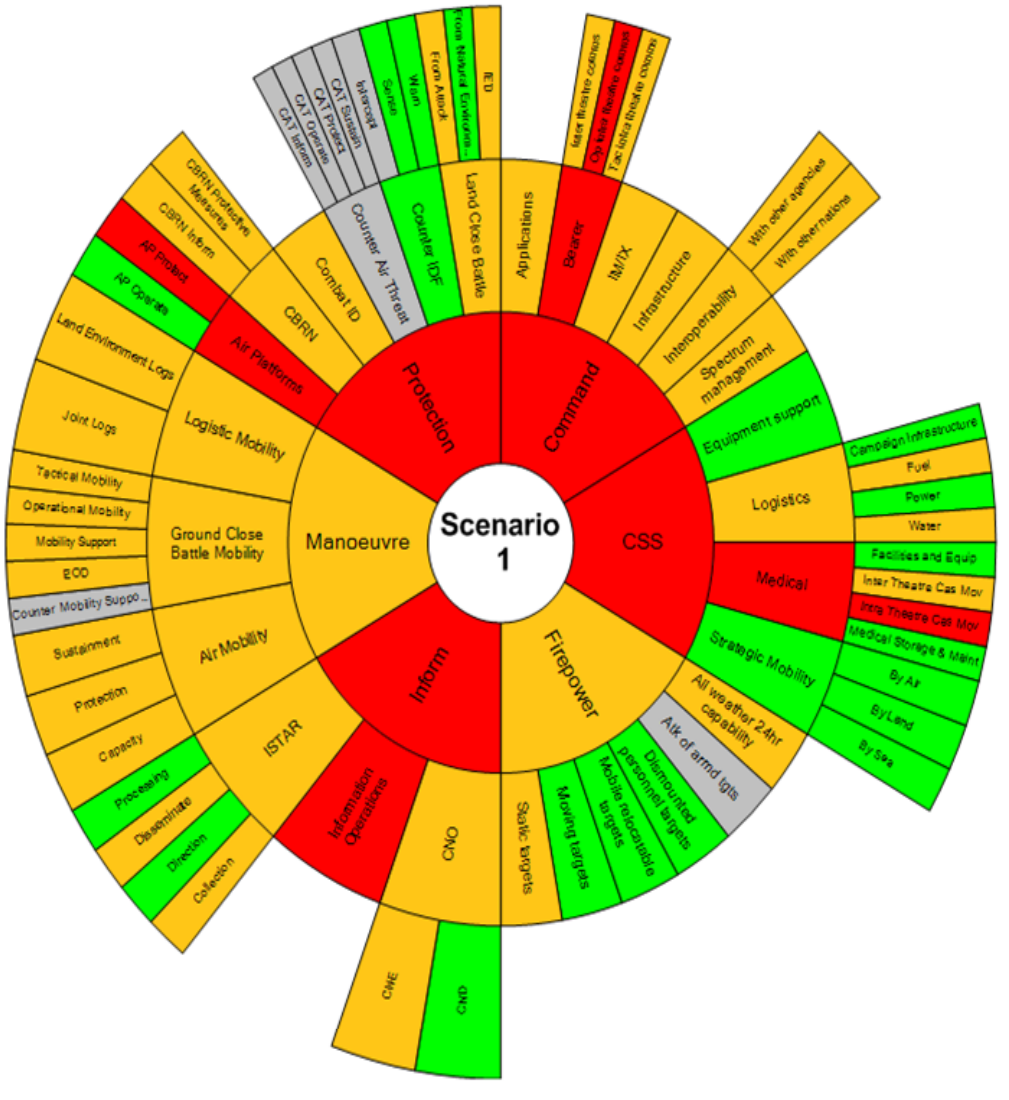
Taxonomy



Scenario 2 2011

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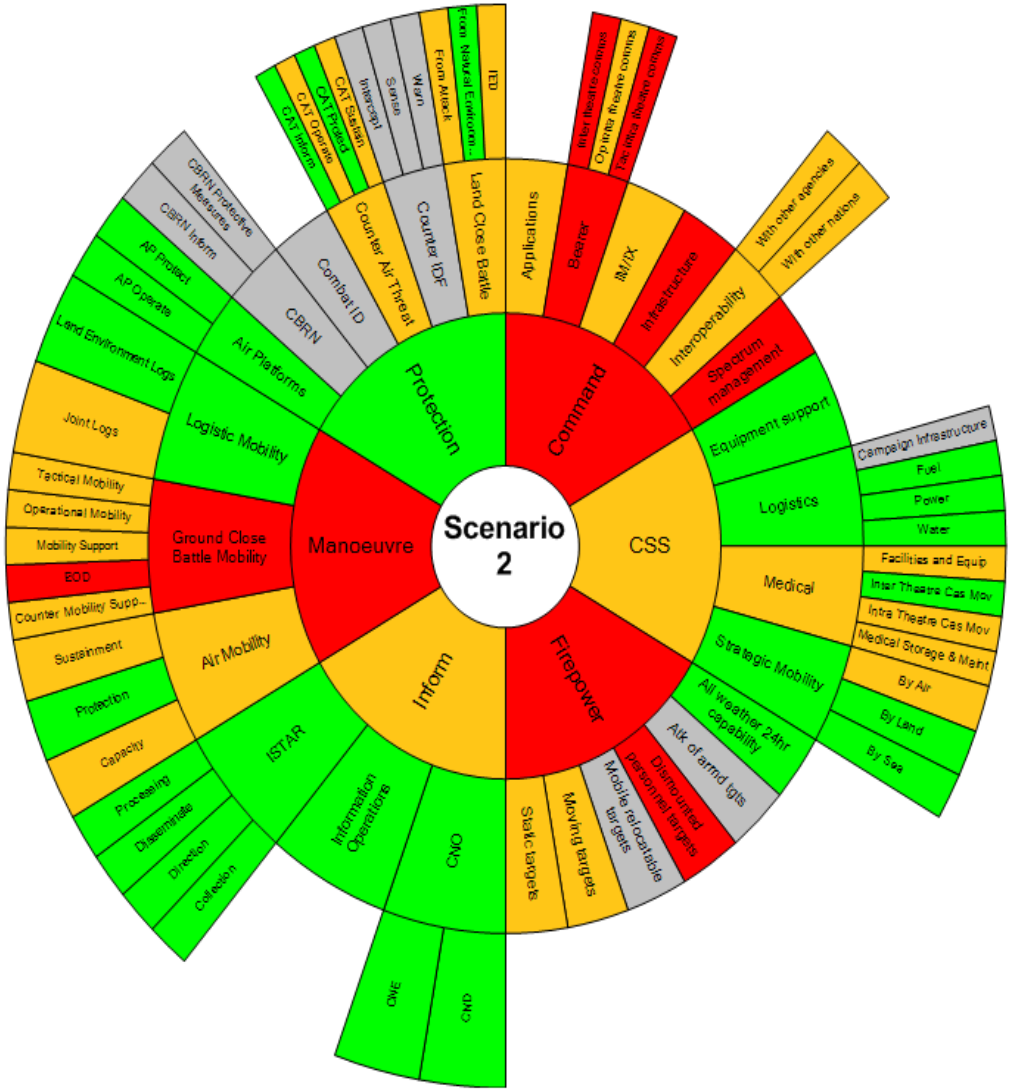

Scenario 3 2011

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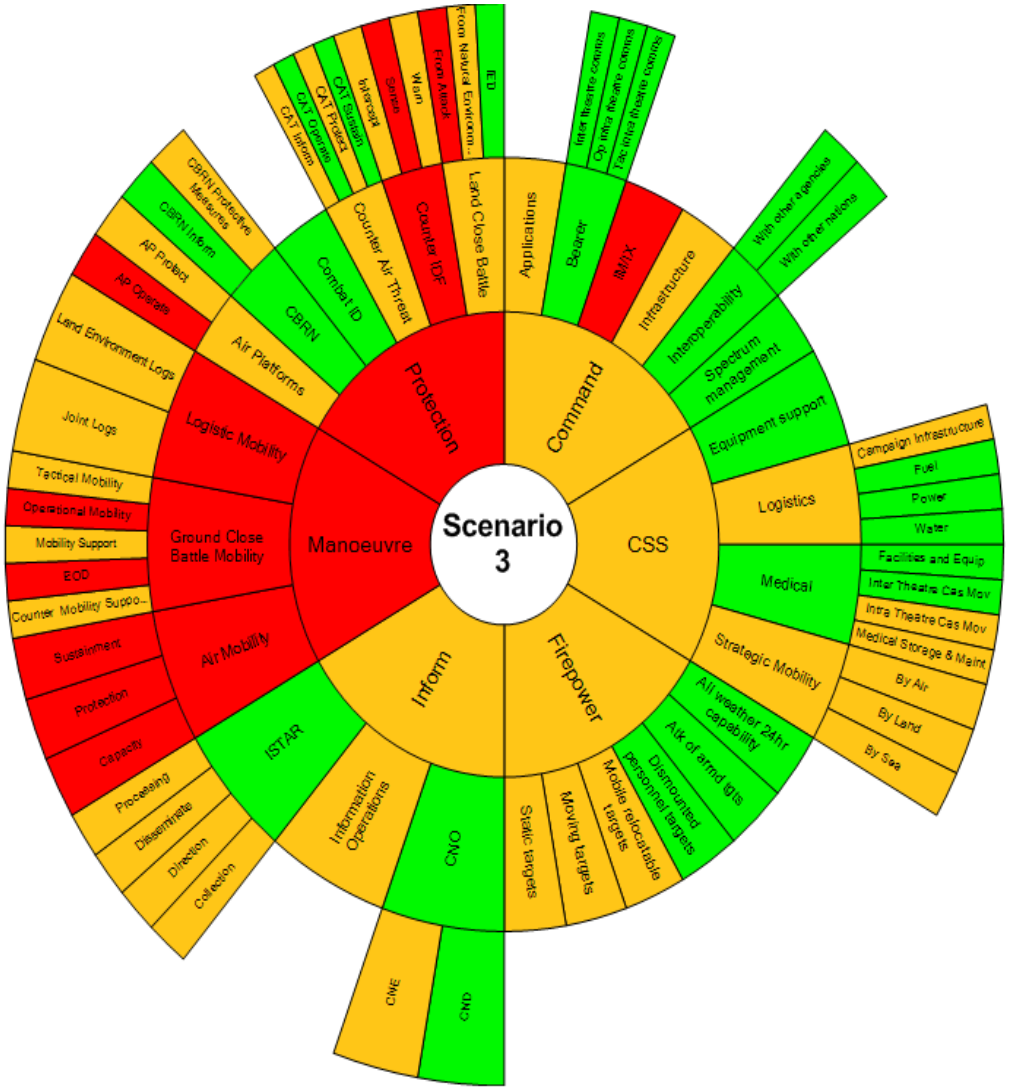

Scenario 1 2015

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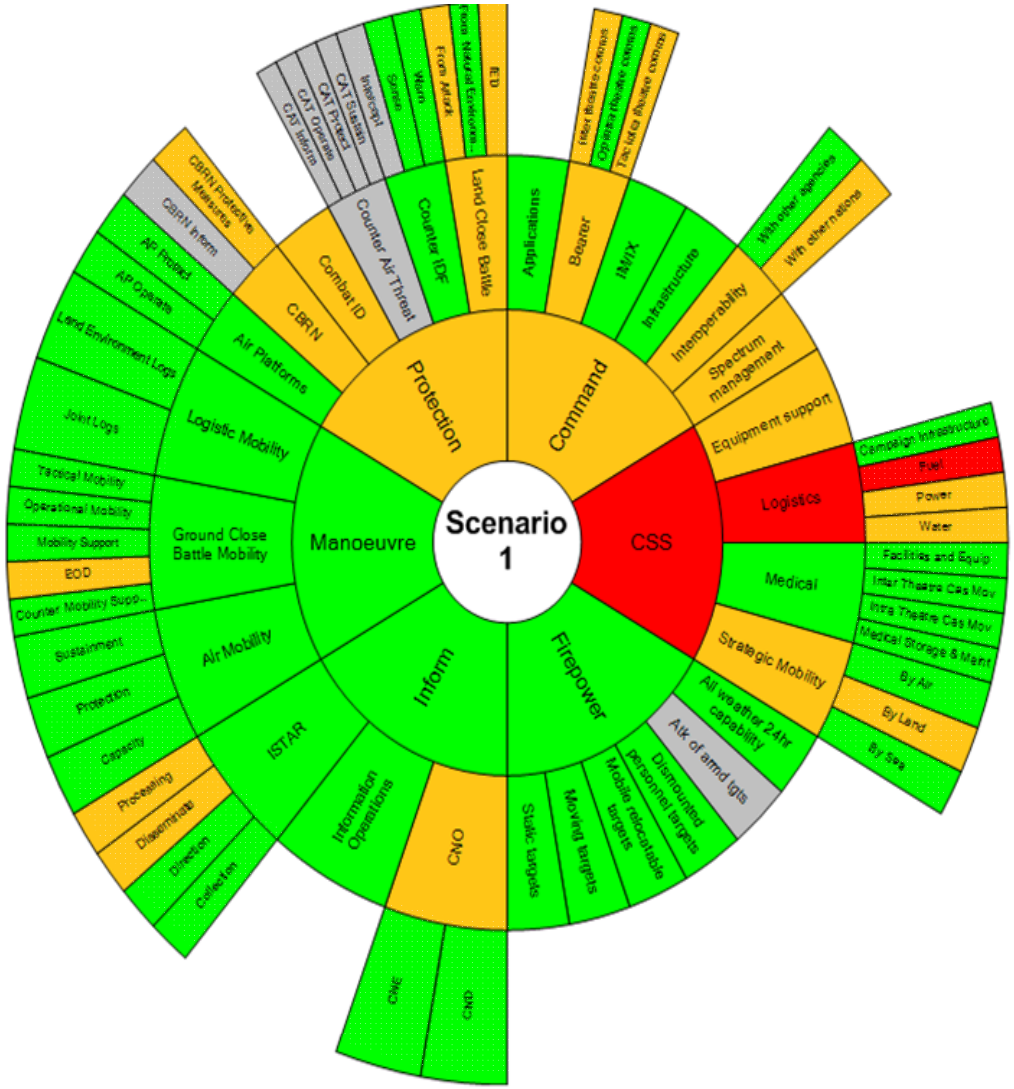
Taxonomy



Scenario 2 2015

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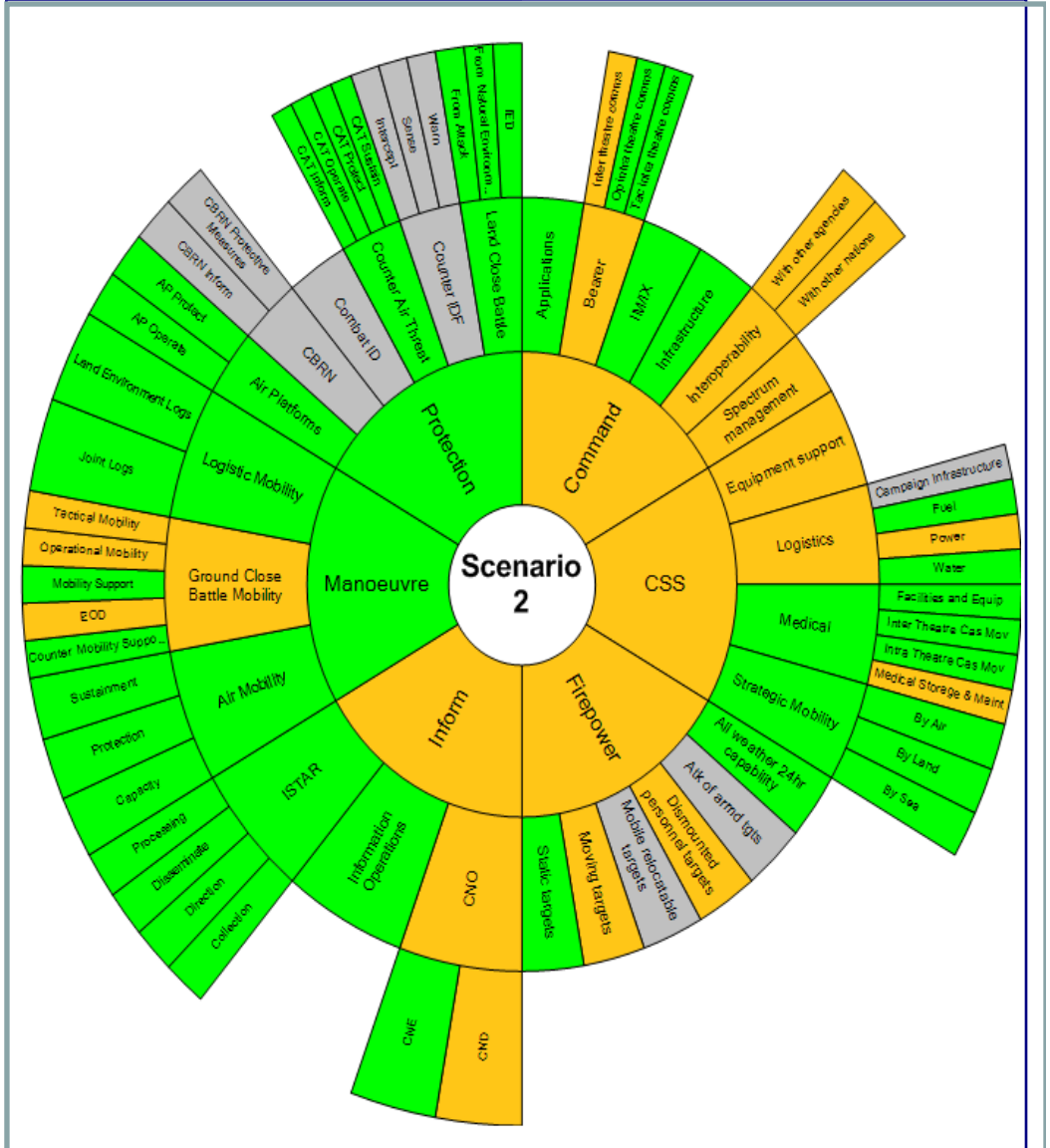
Taxonomy



Scenario 3 2015

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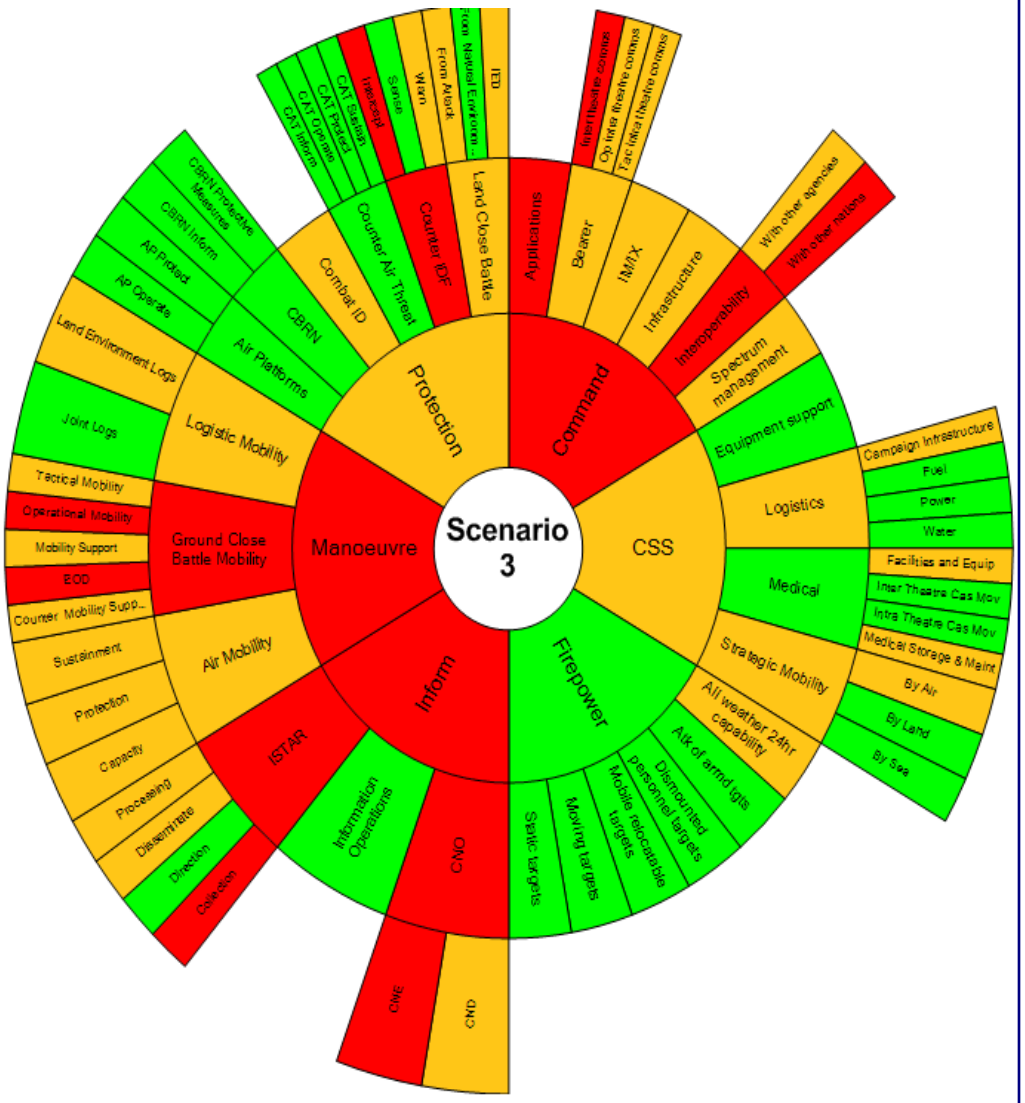
Taxonomy



Scenario 1 2020

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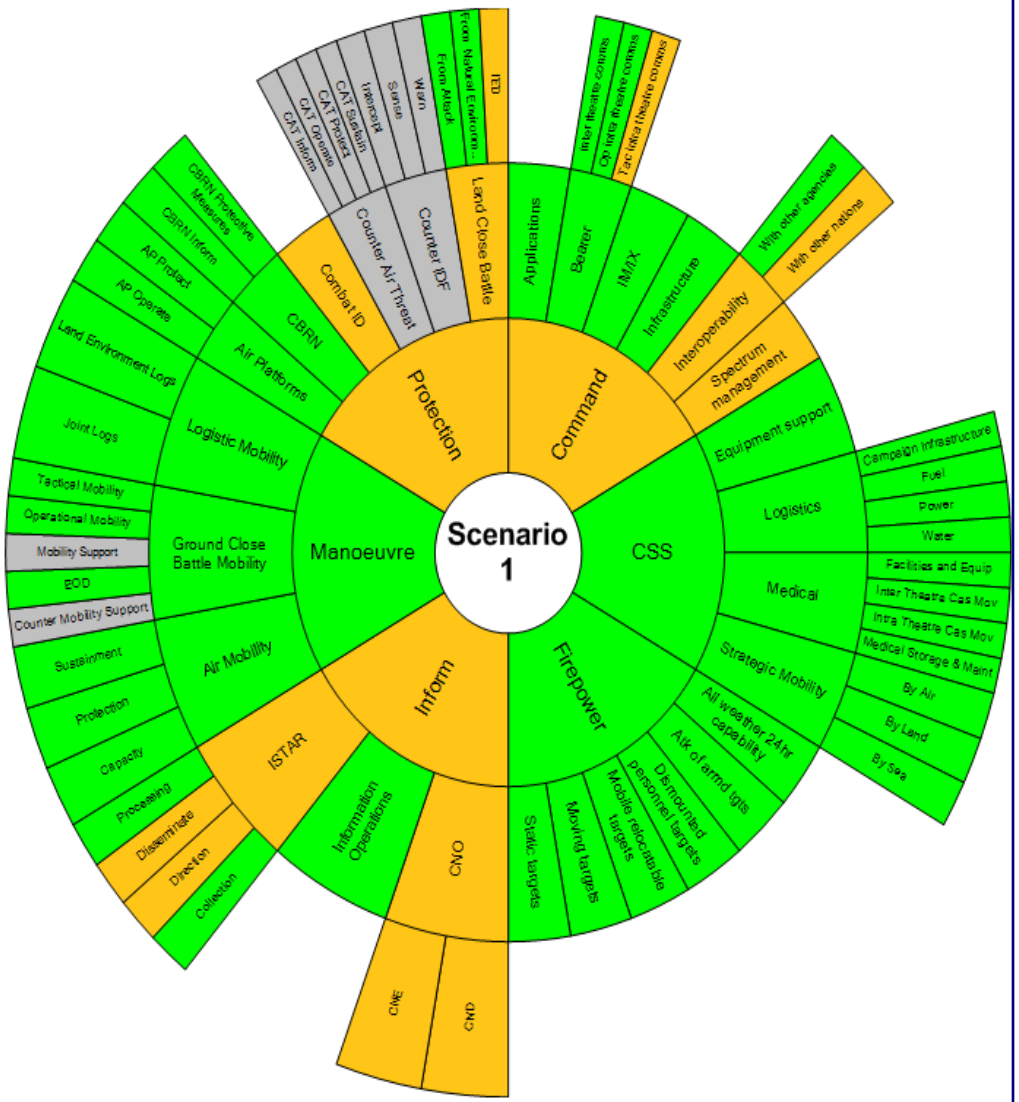
Taxonomy



Scenario 2 2020

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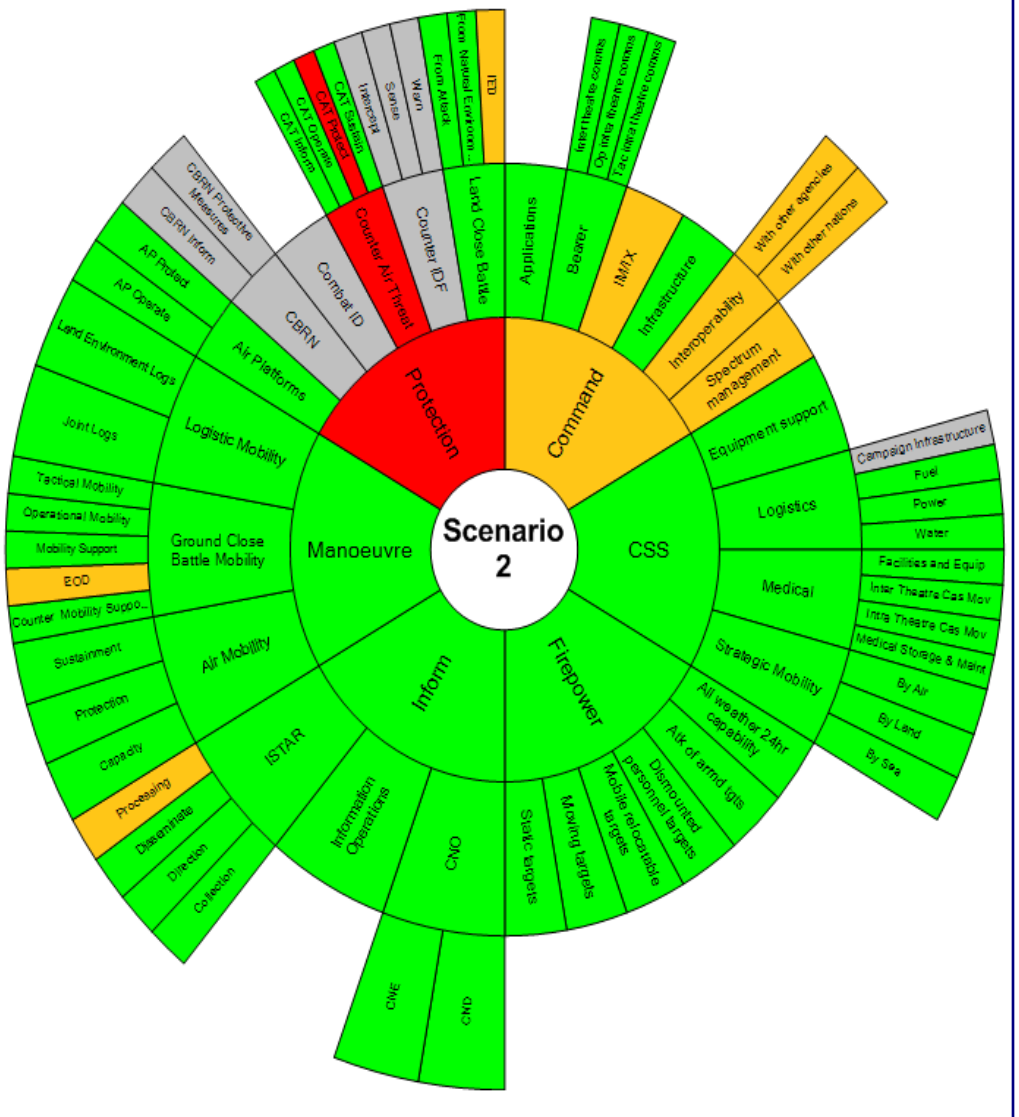
Taxonomy



Scenario 3 2020

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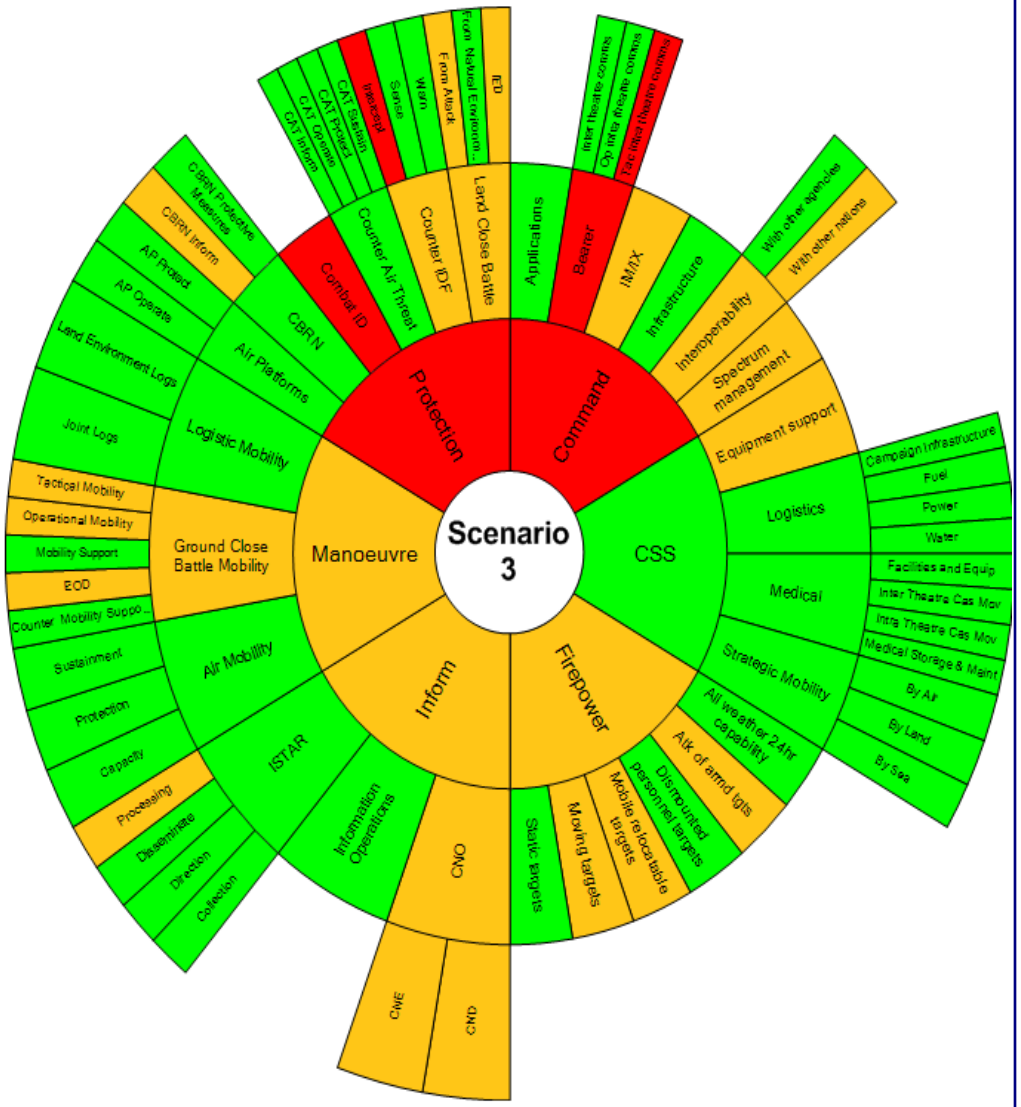
Taxonomy



Scenario 4 2020

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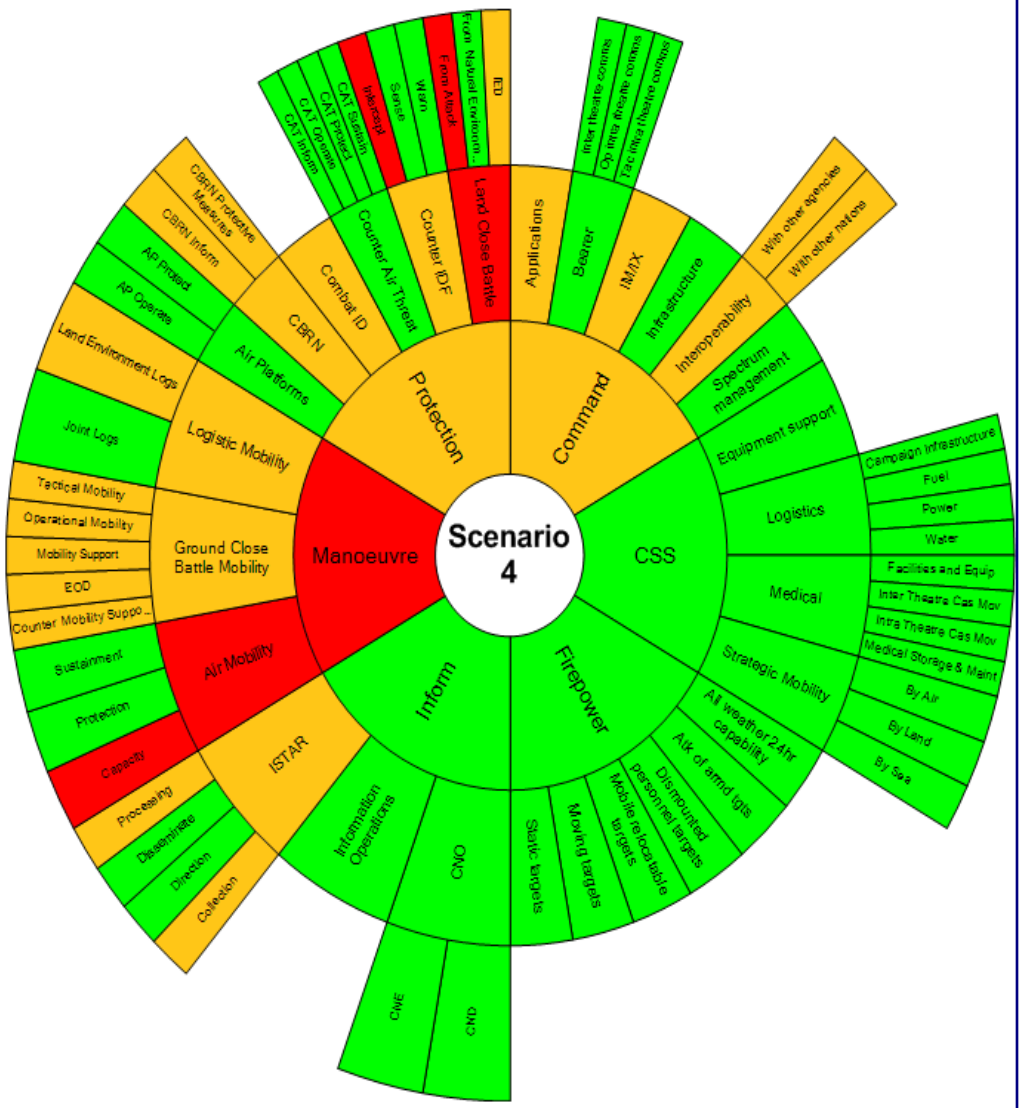
Taxonomy

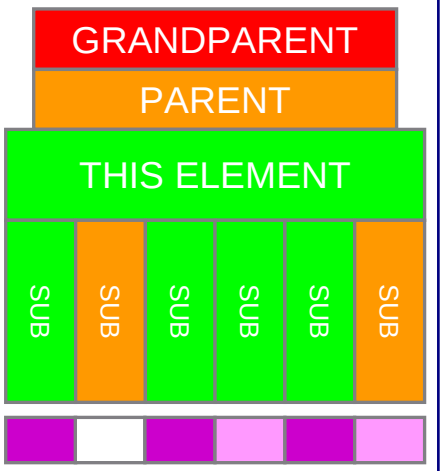


SEGMENT - YEAR - SCENARIO

on

Comments

Hierarchy



pporting Equipment

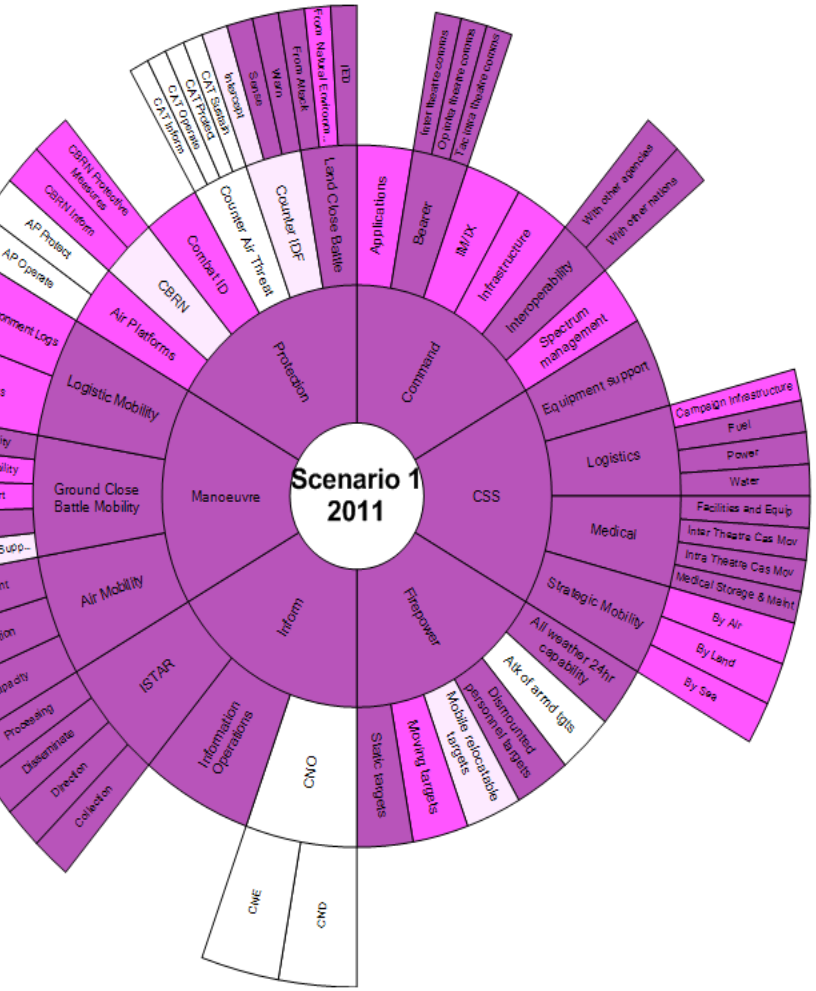
Other DLoD Impact

Measure

	An over-supply or overmatch in equipment capability that **should** be addressed by ECAB
	No equipment capability issue/risk impacting Defence outputs
	An equipment capability issue/risk impacting Defence outputs that **should** be addressed by ECAB
	An equipment capability issue/risk impacting Defence outputs that **must** be addressed by ECAB
	Not required in this scenario

ing Data

Scenario 1 Criticality



Comments

Equipment Look

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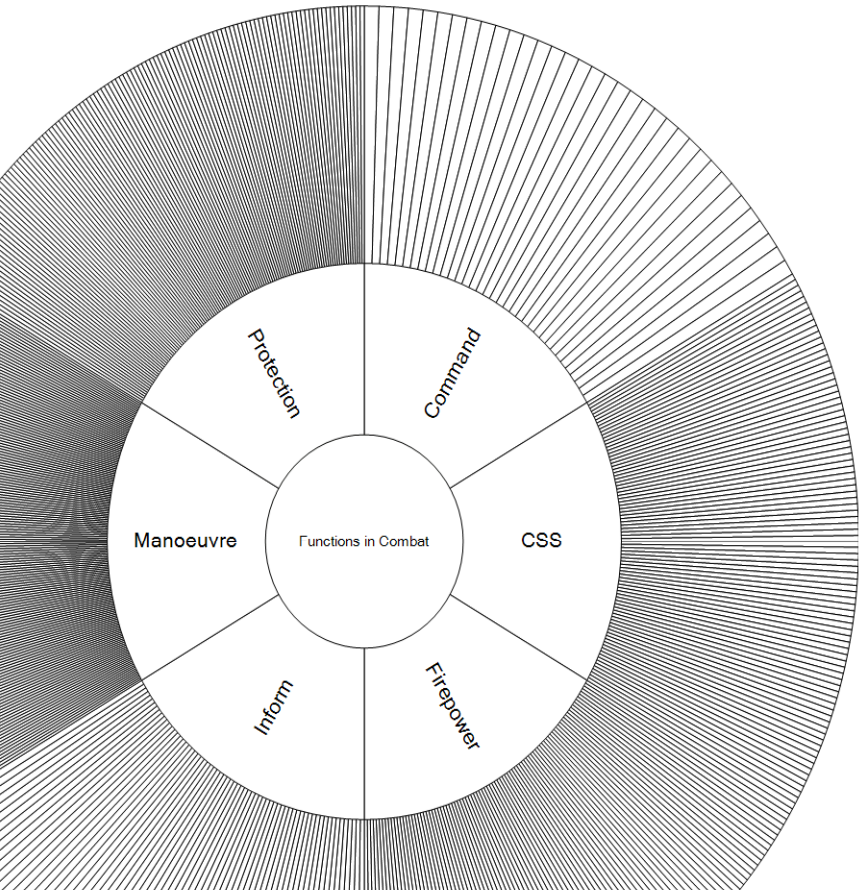
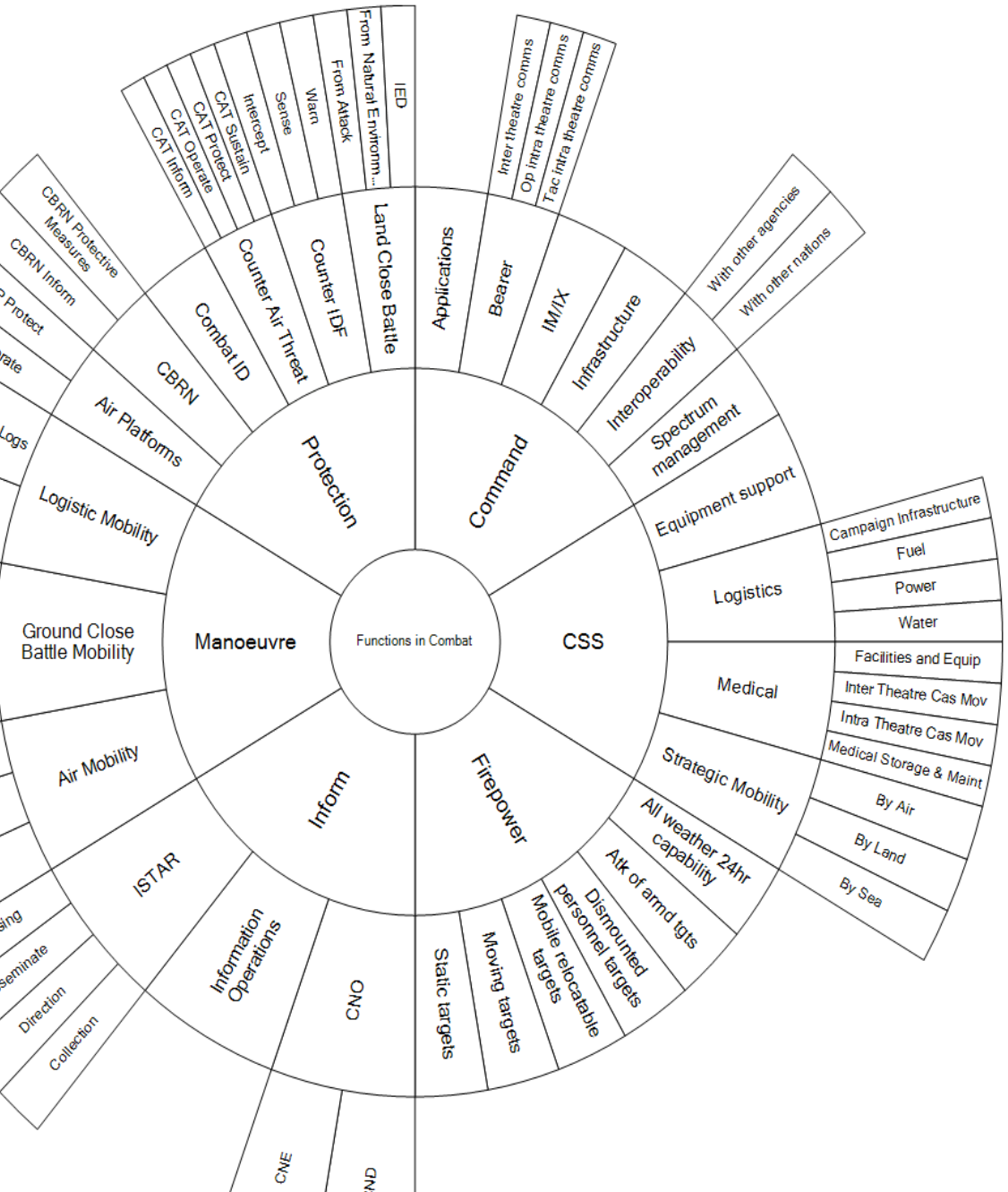


Comments


Functions in Combat
Command
CSS
Firepower
ONO
Information Operations
ISTAR
Inform
Manoeuvre
Ground Close Battle Mobility
Air Mobility
Logistic Mobility
Air Platforms
CBRN
Protection
Land Close Battle
Counter IDF
Counter Air Threat
Combat ID
CBRN Protective Measures
CBRN Inform
Applications
Bearer
IM/IX
Infrastructure
Interoperability
Spectrum management
Equipment support
Logistics
Medical
Strategic Mobility
Static targets
Moving targets
Mobile relocatable targets
Dismounted personnel targets
Atk of armd tgts
All weather 24hr capability
By Sea
By Land
By Air
Medical Storage & Maint
Intra Theatre Cas Mov
Inter Theatre Cas Mov
Facilities and Equip
Water
Power
Fuel
Campaign Infrastructure
With other nations
With other agencies
Tac intra theatre comms
Op intra theatre comms
Inter theatre comms
IED
From Natural Environm...
From Attack
Warn
Sense
Intercept
CAT Sustain
CAT Protect
CAT Operate
CAT Inform
Collection
Direction
Seminate

NiTEWORKS

NiTEWORKS

ey benefits of experimentation - being wiser before e event

- Getting the requirement right
  - Not exhaustive, but test the “art of possible”
- Being prepared for change
  - Stuff happens – the more you experiment the lower the risk
- Managing Integration begins on day one
  - It’s not something you do at the end
- Collaboration up front pays dividends
  - It prepares the supply base
- Knowing where your degrees of freedom are
  - And be realistic about using them

…If you want the truth don’t expect it to come from a bid

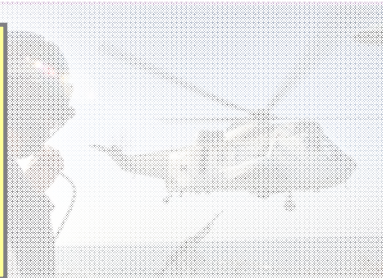
ITEWORKS

Improving Capability Effectiveness in a Complex Environment

"…. experimentation is critical to ensure we deliver what the front line needs. Niteworks provides a unique ability to link fro

VAdm Paul Lambert, DCDS(Cap)

……questions…..



"Niteworks is the only thing which saves me money"

(Outgoing) DCDS(Cap)
Lt Gen Andrew Figgures

Barton MD Niteworks
Whittington CTO Salamander

RTS June 2010