Application of NCO Conceptual Framework to US/UK Coalition Combat Operations during Operation Iraqi Freedom

International Command and Control Research and Technology Symposium 2004

Copenhagen, 15 September 2004

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PA Consulting Group

Scope of brief

- Scope of project
  - What we were asked to do
  - How we conducted the research
  - Background the deployment of FBCB2/BFT
- Research findings, in terms of increasing effectiveness in:
  - Tempo
  - Command and control agility
  - Synchronisation
- Conclusions
  - Deployment density and training
  - Some cultural factors …
  - Integration issues

Research objectives

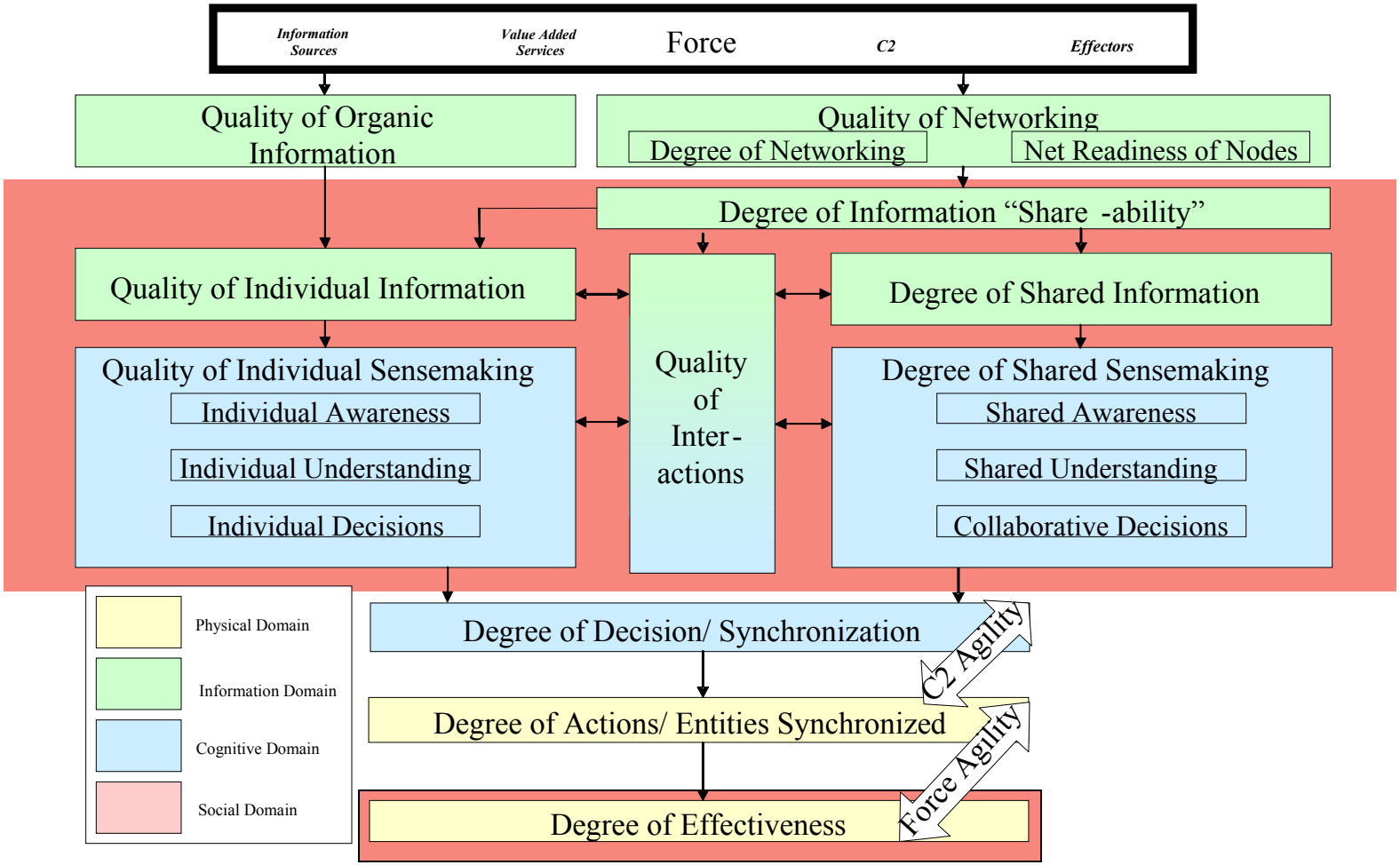
- **Assess the effectiveness of a networked force relative to a non-networked comparator *utilising the NCO Conceptual Framework as the vehicle for research***
- **Identify levels of effectiveness related to the degree of networking**
- **Evaluate the following hypothesis:**

During Operation TELIC/IRAQI FREEDOM, the direct accessibility to network centric operations (NCO) capabilities by UK and US units provided:

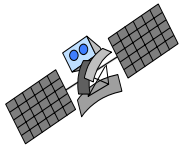
- *Improved individual sense-making*
- *Enhanced the quality of interactions*
- *Improved shared sense-making*
- *Increased mission effectiveness*

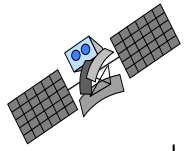
… relative to previous operations and training without networked capabilities

The NCO conceptual framework



A new capability for networking: What is FBCB2/BFT?





SATCOM Hub/Switch

Enhanced Information System (EIS) and Communication Control Server

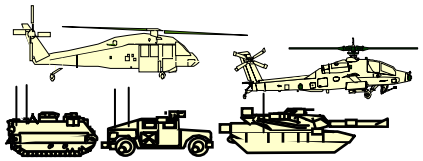
(CCS) compile messages and forward them to ground stations.

Via L-Band Transceiver

Via L-Band Transceiver/ Receiver

FBCB2

5'/800m



PLGR

(x, y, z, t)

Radiant Mercury

Trusted Guard

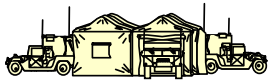
ONE WAY SBU TO SECRET

GCCS Joint COP

GCCS-A/ABCS Army COP

Data Broker

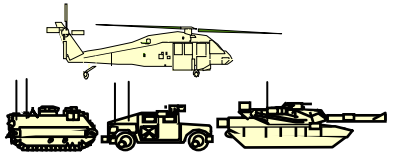
SECRET NETWORK



SA > COP

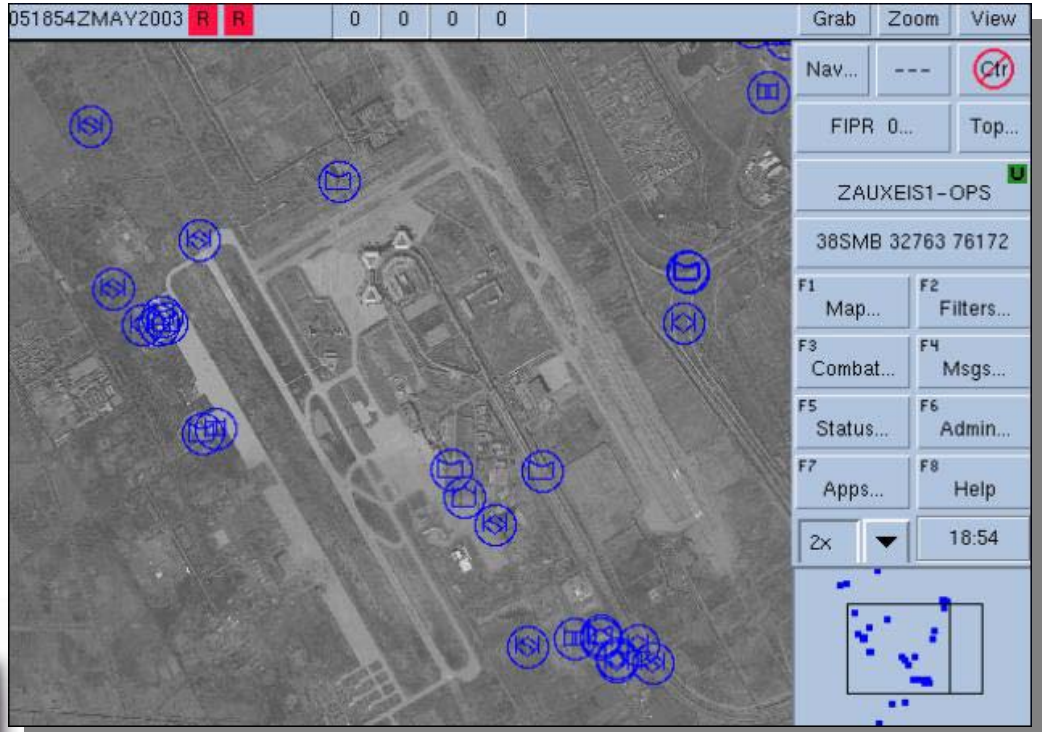
FBCB2

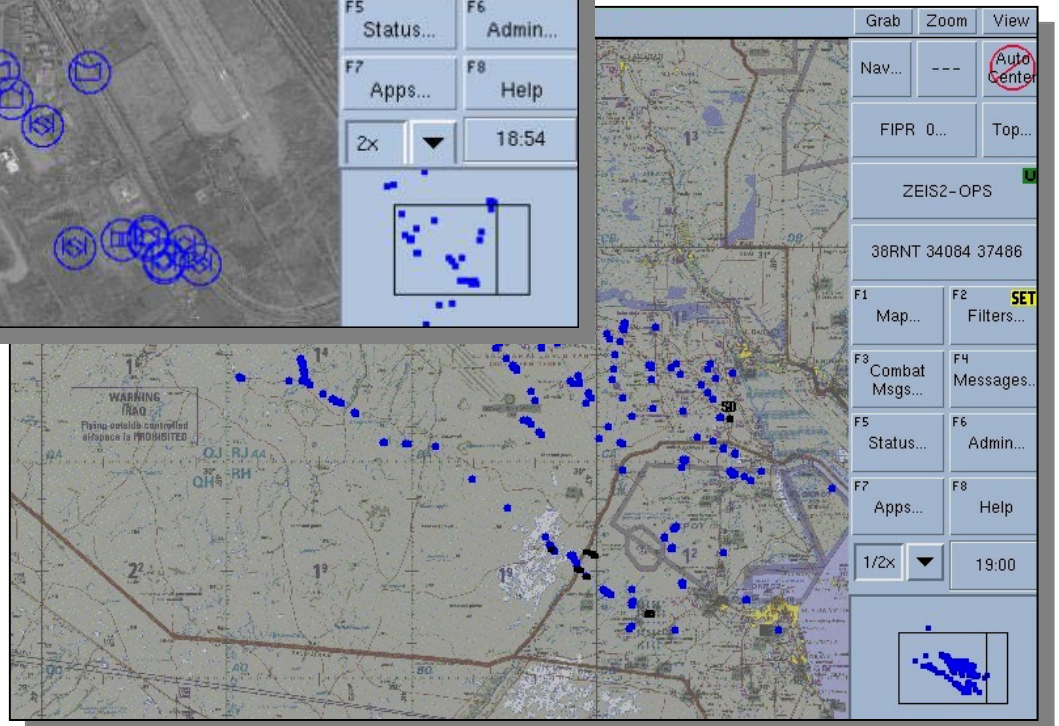
5'/800m



SA

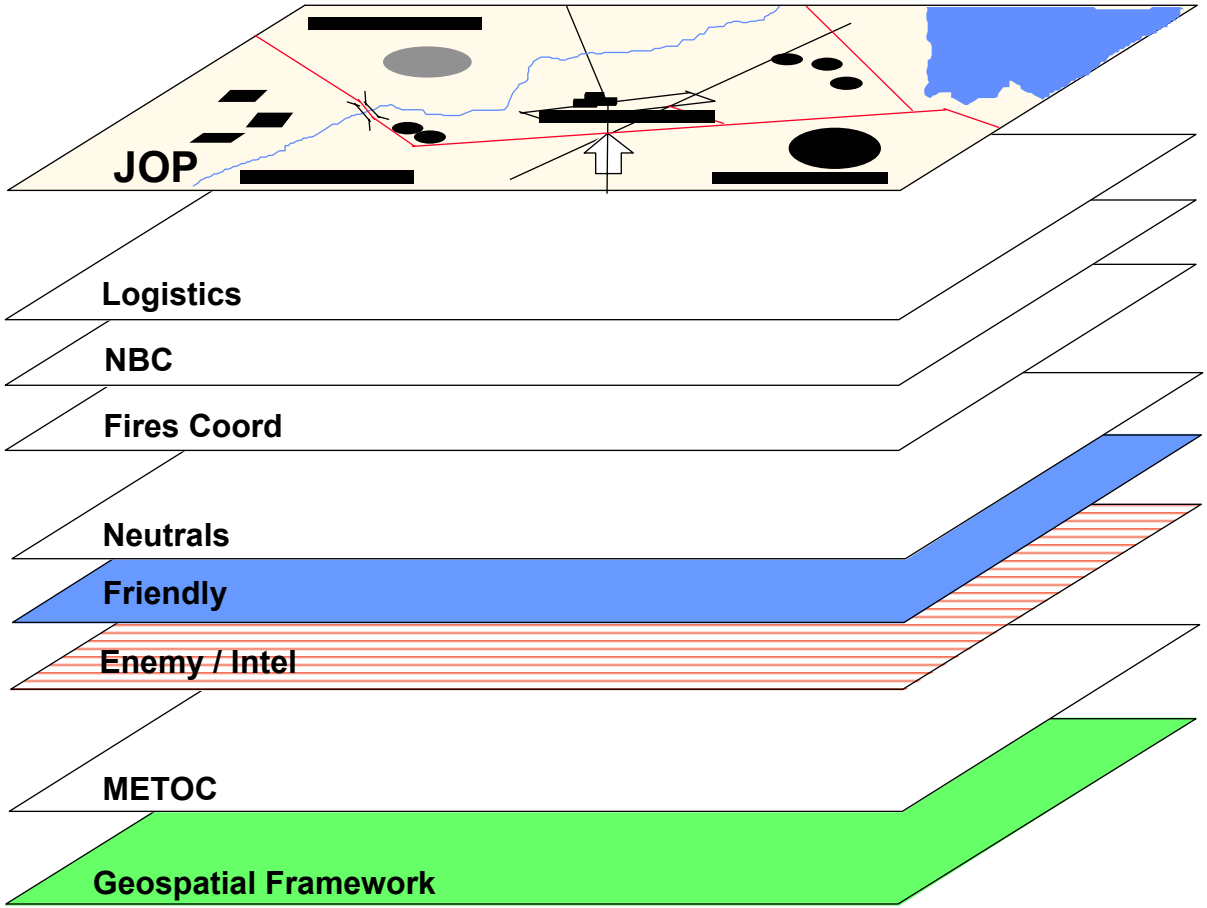
What the operator sees …





FBCB2 functionality

- Absolute and relative positional information on blue forces
- Raster data
  - Mapping
  - Imagery
- Graphical overlay creation and distribution facility
- Text messaging between users
- “Terrain analysis” tools: Line of sight

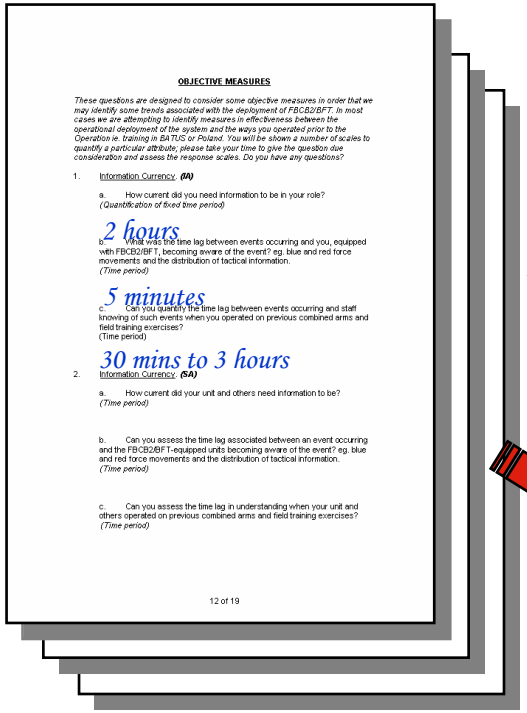


Research process and method

- Requirement was to assess the operational effectiveness of a networked force in high intensity conflict
- Aspiration to analyse coalition exploitation of networking at the lower operational and tactical levels
- Base Line (B) and Treatment (T):
  - Pre-deployment (B): VHF/FM line of sight and limited HF communications
  - Post-deployment (T): Augmentation by FBCB2/BFT using L-Band (satellite)
- Focus was to elicit experiences of the war-fighters and assess the impact of the deployment of FBCB2/BFT
  - High quality of response and findings from subject matter expert interviewees
  - Ascertain the effectiveness of networking at the “working level”
- Research was augmented by:
  - Engagement with wider Defence community, UK and US
  - Analysis of after-action review media

Research process

Interviews



OBJECTIVE MEASURES

These questions are designed to consider some objective measures in order that we may identify some trends associated with the deployment of FBCB2/BFT. In most cases we are attempting to identify measures in effectiveness between the operational deployment of the system and the ways you operated prior to the Operation ie. training in BATUS or Poland. You will be shown a number of scales to quantify a particular attribute; please take your time to give the question due consideration and assess the response scales. Do you have any questions?

1. Information Currency. ***(IA)***

a. How current did you need information to be in your role?
(Quantification of fixed time period)

2 hours

b. What was the time lag between events occurring and you, equipped with FBCB2/BFT, becoming aware of the event? eg. blue and red force movements and the distribution of tactical information.
(Time period)

5 minutes

c. Can you quantify the time lag between events occurring and staff knowing of such events when you operated on previous combined arms and field training exercises?
(Time period)

30 mins to 3 hours

2. Information Currency. ***(SA)***

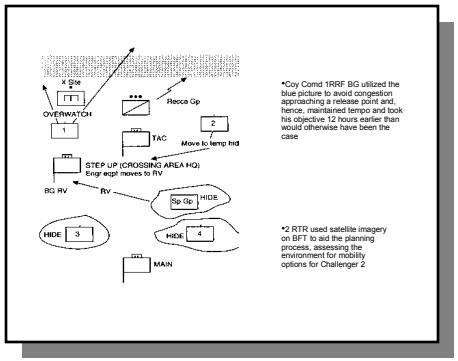
a. How current did your unit and others need information to be?
(Time period)

b. Can you assess the time lag associated between an event occurring and the FBCB2/BFT-equipped units becoming aware of the event? eg. blue and red force movements and the distribution of tactical information.
(Time period)

c. Can you assess the time lag in understanding when your unit and others operated on previous combined arms and field training exercises?
(Time period)

12 of 19

Vignettes



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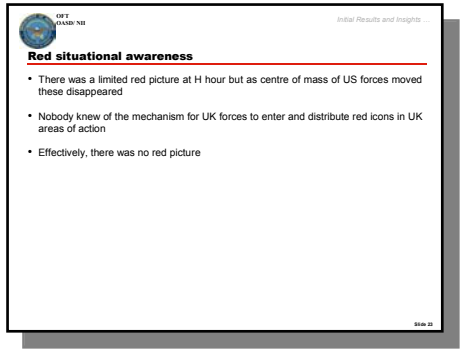
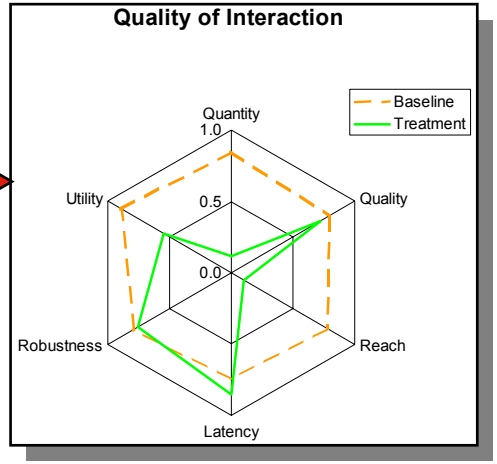
Collate Issues by Category



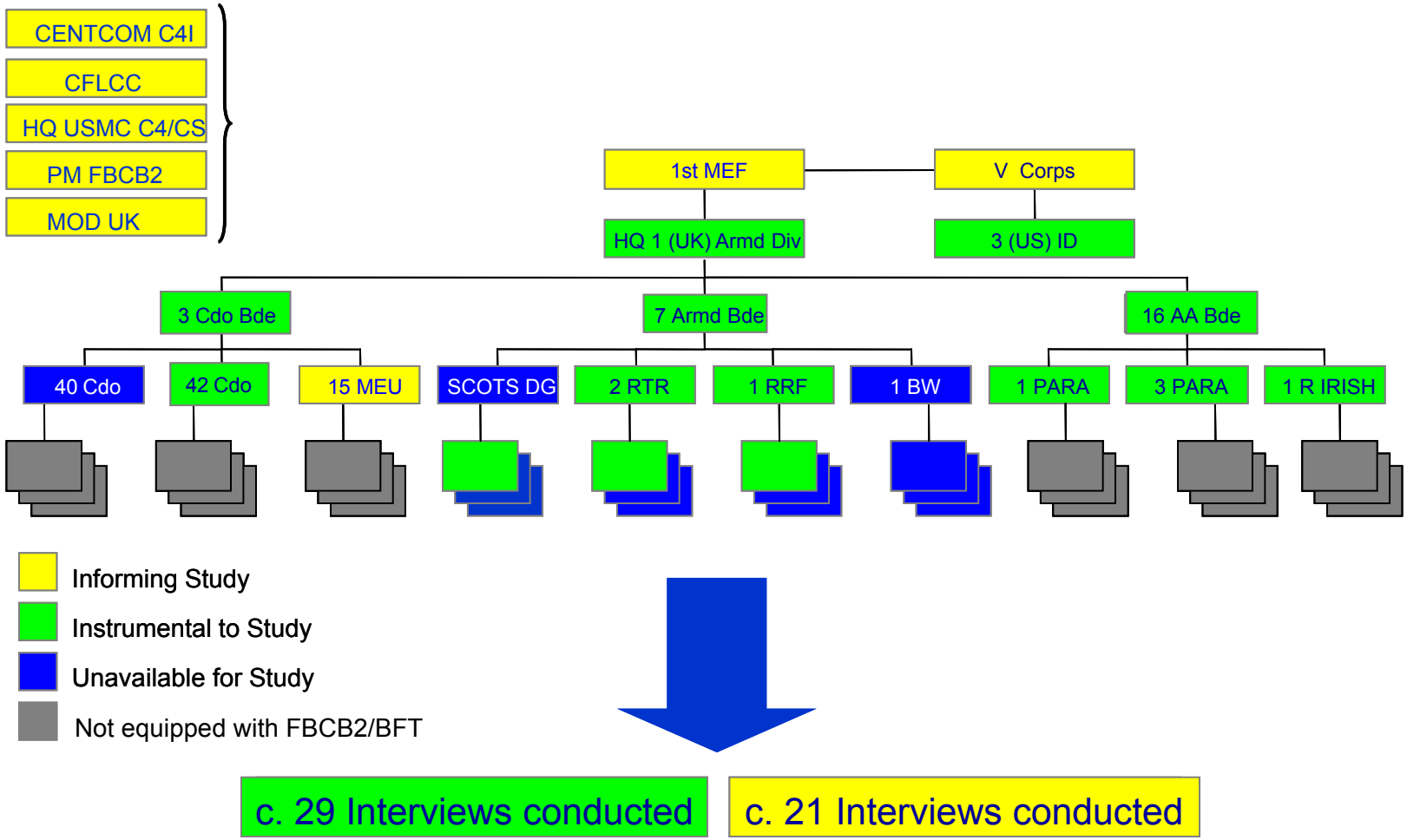
Quantitative Data Capture

						Ilv ref	1	2	3	4
						Name	Mark Hewett	Justin Maciejewski	Dick Scott	Mally Davies
						Rank	Capt	Maj	Maj	Capt
						Role	SO2 G3 O&D	SO2 G3 Ops / O&D	SO2 G3 Trg/EPS	SO3 G3 Trg Res
						Unit	1 (UK) Div	1 (UK) Div	1 (UK) Div	1 (UK) Div
						Date	13-Jan-04	13-Jan-04	13-Jan-04	13-Jan-04
PA Qu.	CF Ref	CF Area	AttributeMetric	Scale						
	4.1.a	Quality of Interactions	Quantity	% of info						
7 (b)						Baseline	90	90	95	10
7 (a)						Treatment	10	10	12.5	10
	4.1.a	Quality of Interactions	Quality	5 pt						
12 (b)						Baseline	5	4	5	3
12 (a)						Treatment	4	4	4.5	2
	4.2.a	Quality of Interactions	Reach	% of units						
11 (b)						Baseline	80	50	100	63
11 (a)						Treatment	40	3		5
	4.3.d	Quality of Interactions	Latency	10 pt						
13 (b)						Baseline	9	6.5	7.5	9.5
13 (a)						Treatment	10	8	10	9.5
	4.4.a	Quality of Interactions	Robustness	5 pt						
14 (b)						Baseline	5	4	5	3.5
14 (a)						Treatment	4.5	2	5	2
	4.4.c	Quality of Interactions	Utility	5 pt						
15 (b)						Baseline	5			4
15 (a)						Treatment	3			3

Plot Statistics

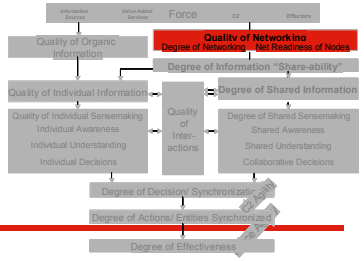


Focus for interviews



Findings

- FBCB2/BFT provided tactical commanders and principal staff with enhanced situational awareness relative to that they had experienced in previous operations and in training for high intensity conflict
- FBCB2/BFT provided a significant amount of information on friendly forces and the environment but limited information on enemy forces
- FBCB2/BFT contributed to:
  - Improved planning
  - More agile command and control
  - An ability to generate and maintain tempo
  - Improved synchronization
- Full potential of the system was never exploited due to limitations in the lines of development

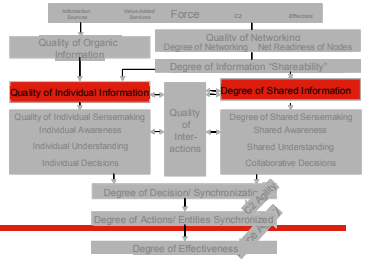


Quality of networking with FBCB2/BFT

Attribute	1 (UK) Armd Div	3ID
Reach	Provision of "horizontal" links Potential for greater reach; not fully utilised	Situation demanded alternate means from LOS voice FBCB2/BFT provided the means
Connectivity	Limited connectivity BG (TF) level in 3 & 16 Bdes Sub-unit level in 7 Armd Bde	Better connectivity than UK All manoeuvre sub-units had system
Quality of Service	Similar assurance to CNR due to ranges operated Quality impacted by serviceability Utility impacted by ConOps	Only means of communication over LOS Very good serviceability record Fully exploited

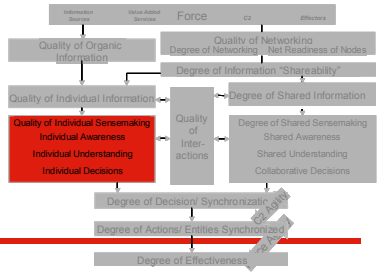
c. 47 systems

c. 150 systems



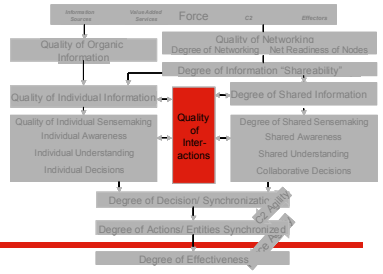
Individual and shared information

Baseline	Augmented with FBCB2/BFT
Near real-time warnings	Real time information on own position (+/- 10m)
Routine reporting 1~2 hours	Blue asset update within 5 mins / 800m
	Multi-scale mapping and imagery



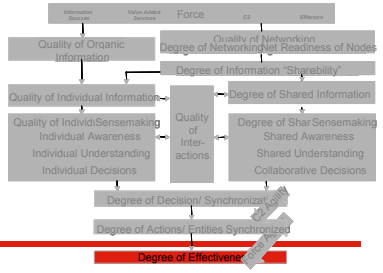
Individual sensemaking

- There were a number of examples of 2 RTR battlegroup exploiting the imagery in FBCB2/BFT
  - Planning from small to large scale, highlighting relevant areas of operation
  - More detailed ground analysis to ascertain:
    - Routes for Challenger Main Battle Tank
    - Impact of obstacles on movements eg. berms, wadis etc
  - Identifying targets for urban raids, specifically, insurgent operating bases
    - Locate the building(s) on the imagery
    - Navigate with confidence to the precise building using PLGR
    - Impact: Unimpeded movement to target and minimisation of collateral damage

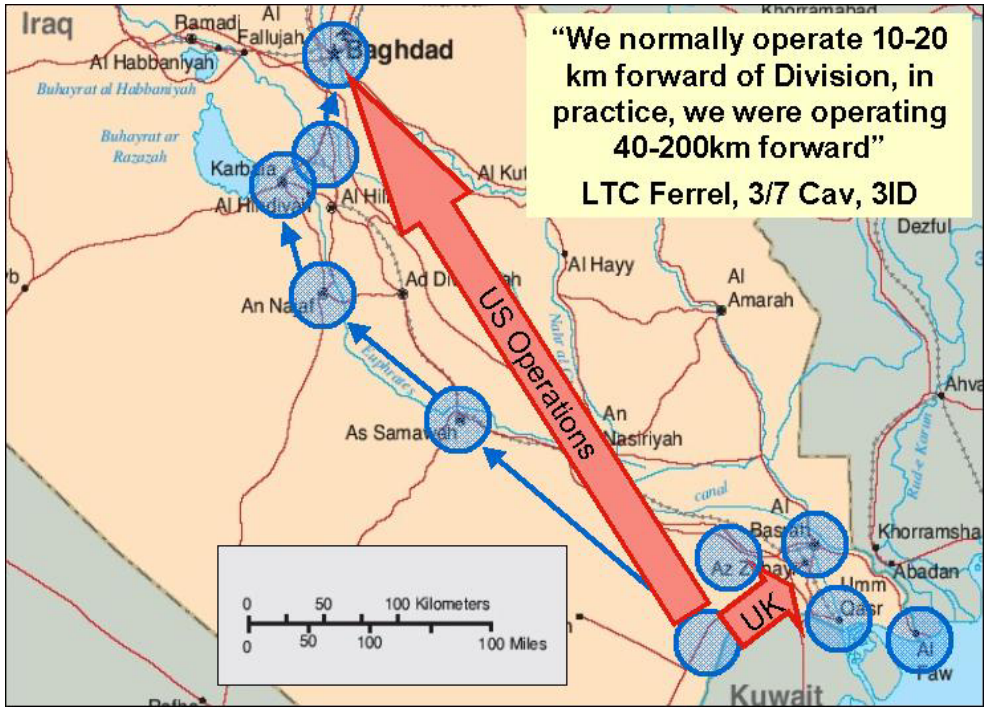


Quality of interactions

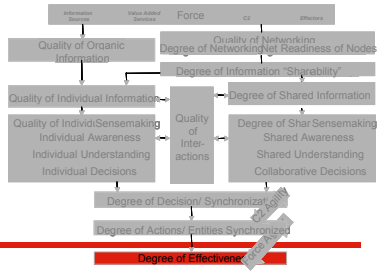
- The provision of another network improved the quality of interaction by either:
  - Augmenting the existing radio networks
  - Providing a network when the radio networks became unworkable
- FBCB2/BFT provided the potential for better quality of interactions:
  - This was fully exploited by the US forces who embraced the capabilities of the system
  - The potential was rarely exploited by the UK



Effectiveness - Tempo



- The speed of manoeuvre experienced during Op IRAQI FREEDOM would not have been possible without the capability to exercise command and control on the move and to such geographically dispersed forces
- FBCB2 provided beyond line of sight communications and the ability to see dispersed assets throughout the battle space
  - Commanders were, therefore, relatively well informed to be able to exploit opportunity
  - There was the ability to know the relative positions of other units to synchronise manoeuvre and actions without the need for direct voice communication within the context of the command intent
  - Consequently, tempo could be generated and maintained



Effectiveness – C2 agility

- **There is evidence that FBCB2/BFT improved C2 agility in:**
  - **Responsiveness**
  - **Flexibility**
  - **Innovation**
  - **Robustness**
  - **Adaption**

Company Commander 2/7 Inf could perceive depth and breadth of blue forces and see flanking units which, he believed, minimised the risk of fratricide

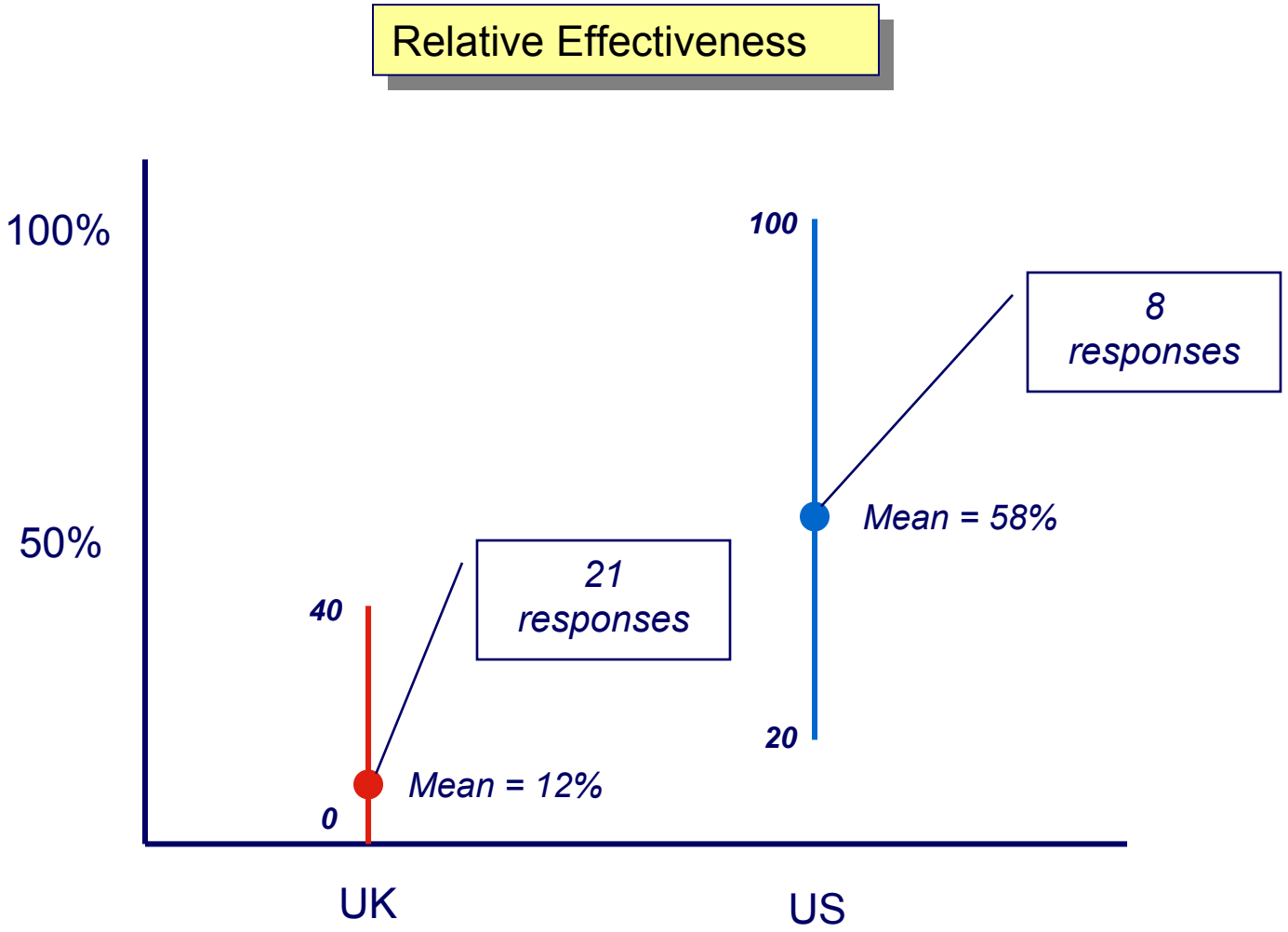
"The systems allowed me to make decisions quicker, give orders quicker and hence we could move quicker (sic)" …

B Company Commander 3 PARA used the line of sight tool to site support weapons: arcs of fire for GPMG(SF), siting MILAN

Effectiveness - synchronisation

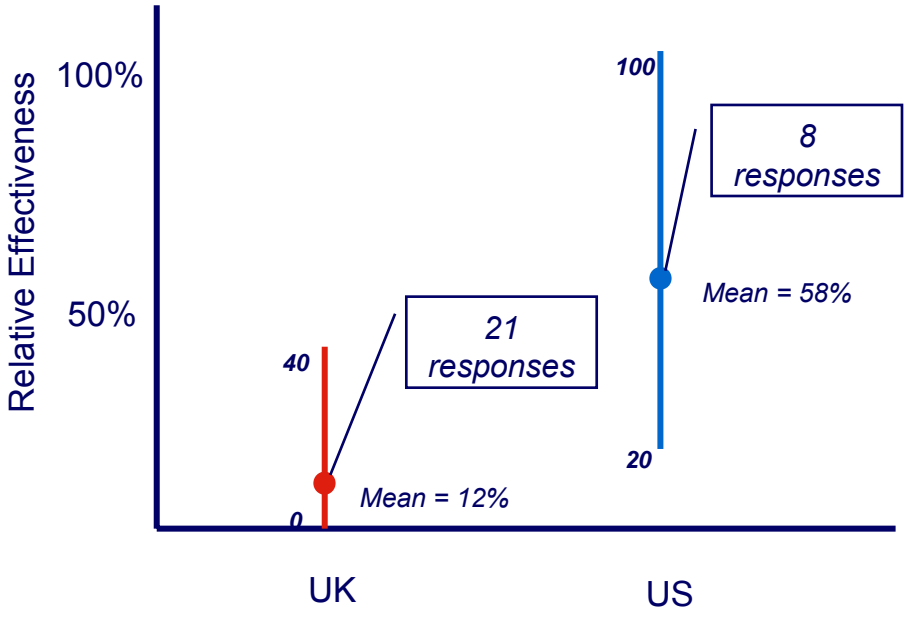
- This networking allowed commanders and units to synchronise their actions with others
- An ideal example is 3/69 Armr (1 BCT/3 ID):
  - Advancing north-west in order to establish a bridgehead at the Karbalah Gap
  - 2 BCT due to complete forward passage of lines to continue momentum
  - 2 BCT are delayed to the south and are well outside of radio range
  - CO 3/69 "*sees*" this and rapidly adopts a hasty defence
  - He maintains this position of 18 hours until advance elements of 2 BCT reach the obstacle

There were significant US / UK differences ....



Relative effectiveness results

Of all the new equipment and systems deployed on the operation, can you assess what percentage of improvement FBCB2/BFT directly contributed to?

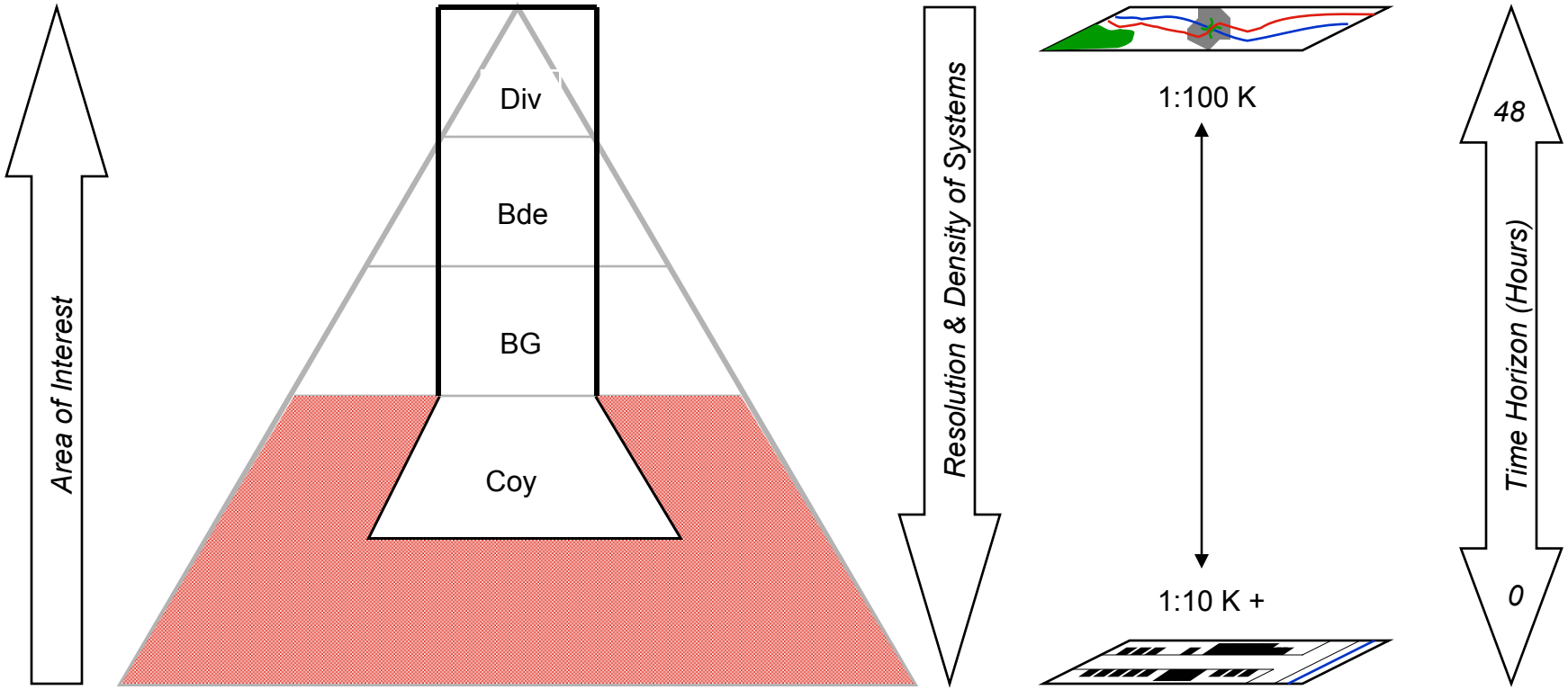


- **FBCB2/BFT provided nearly 60% of US forces tactical Situational Awareness compared to 10% in UK**
- **The UK forces did not exploit the graphical overlay capability for control of boundaries**
- **The US forces attributed significantly higher confidence to FBCB2/BFT-provided information than their UK equivalents**
- **The UK forces did not exploit the potential for improved quality of interaction**

Conclusions ...

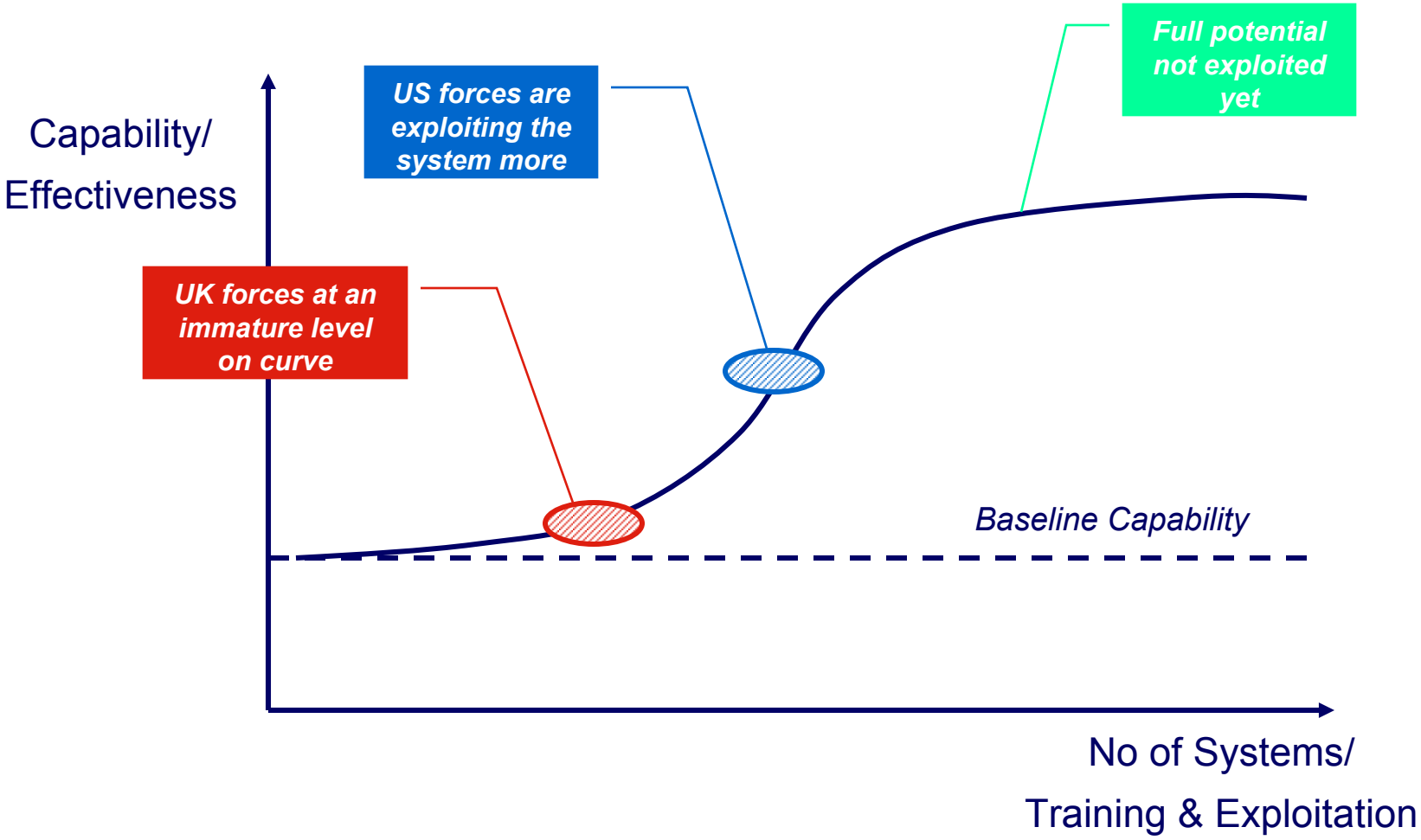
FBCB2/BFT deployment density in UK forces was very limited

- actual deployment in 1 (UK) Armd Div …

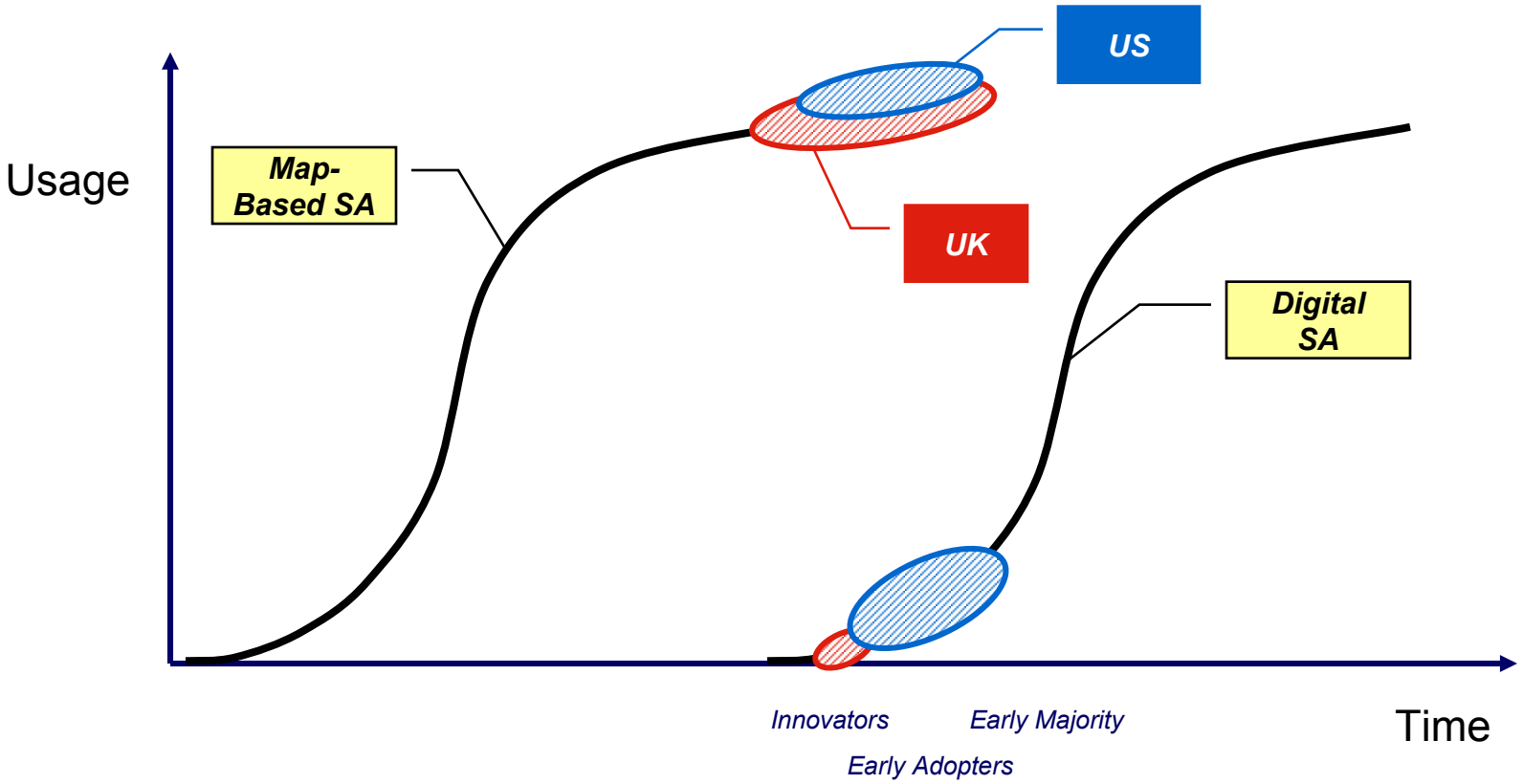


No direct SA from FBCB2/BFT

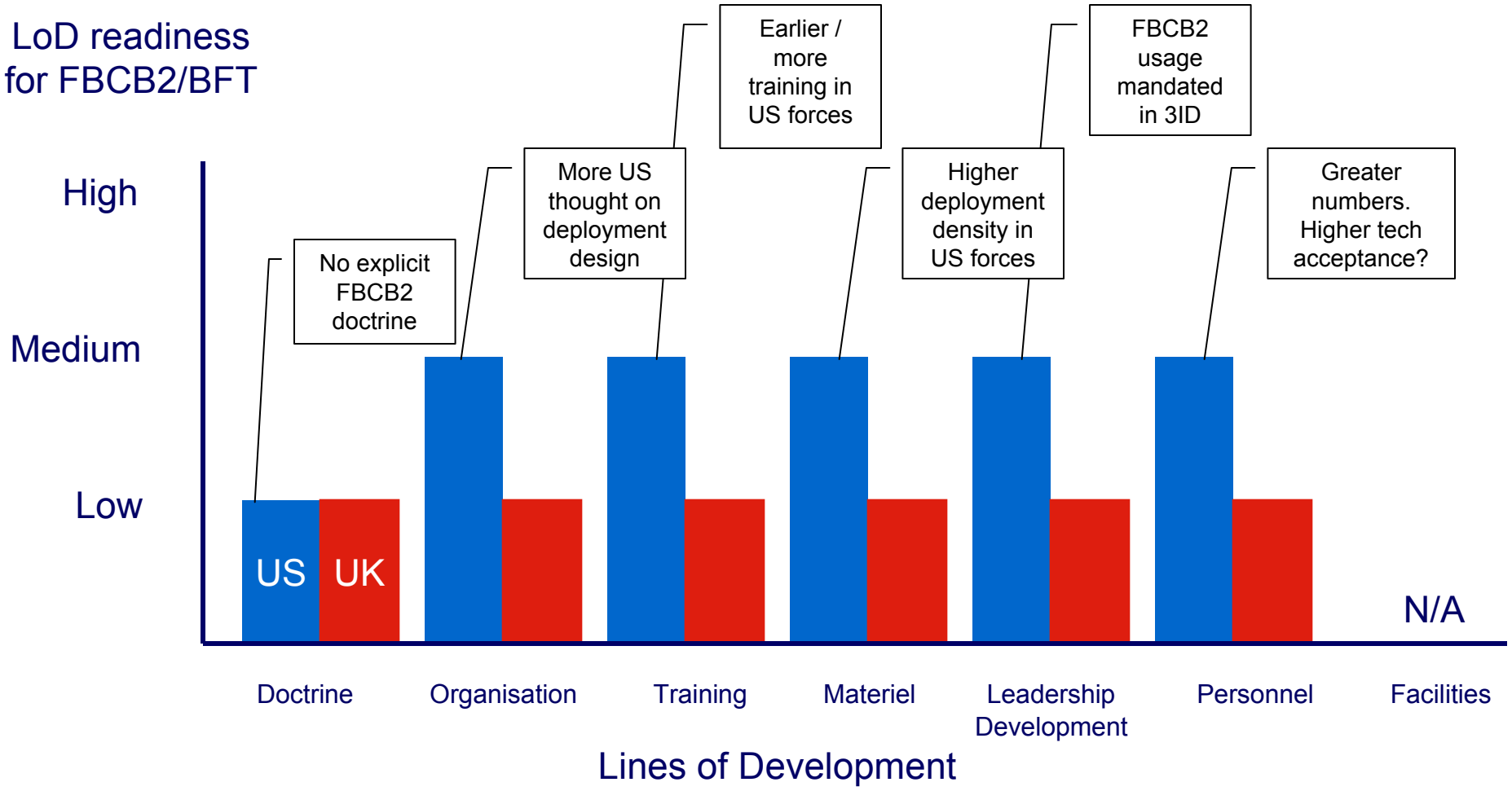
Possible impacts of deployment density and degree of training …



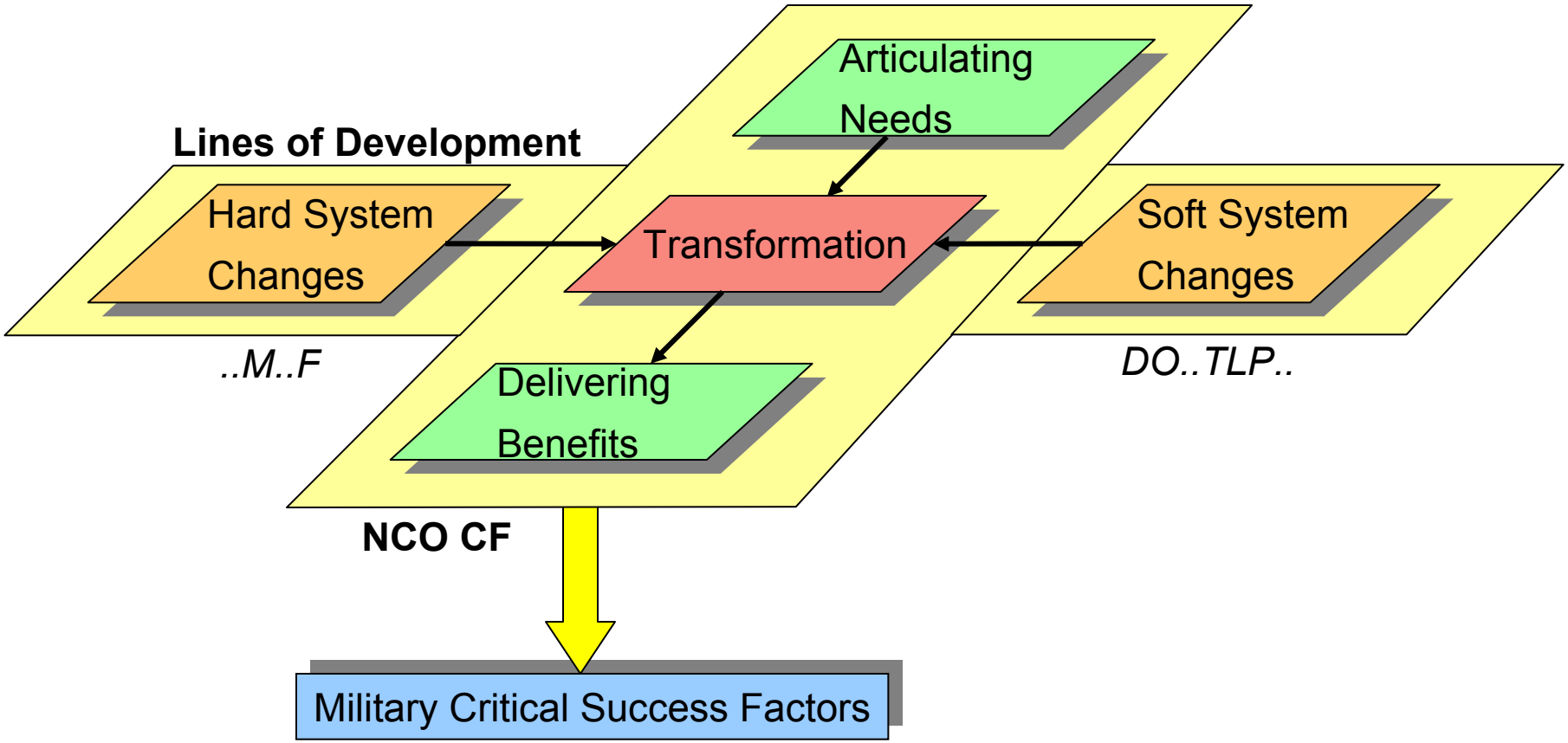
… possible cultural issues regarding technology acceptance



… and comparative integration across all LoDs for FBCB2/BFT



Which stresses the role of soft as well as hard factors in deploying complex C4I capabilities



Summary

- US FBCB2/BFT lessons from OIF:
  - Provided significant enhancement to operational capability
  - Operational tempo and extended lines of communication encouraged its use
  - US forces embraced the technology
  - Consistent direction on the deployment / utilisation of FBCB2/BFT
  - Enhanced command agility
- UK FBCB2/BFT lessons from Op TELIC:
  - Provided very limited improvement to operational capability
  - UK communications were good without needing FBCB2/BFT
  - Limited direction given on the deployment / utilisation of FBCB2/BFT
  - Perceived a great potential for the technology, but not exploited yet
- Common lessons:
  - FBCB2/BFT does not replace voice – it augments it
  - Significant impact on morale – visibility of the macro picture
  - Need to integrate with CS and CSS assets
  - Greater and “deeper” deployment desired

Questions?