Why Crew Resource Management needs to take resources seriously: a case study in Human Terrain Mapping

Richard McMaster & Chris Baber
The University of Birmingham, UK

UNIVERSITY OF BIRMINGHAM

www.hfidtc.com

Human Factors Integration Defence Technology Centre

Aims & Approach

Aims

1. Investigation of CIMIC Human Terrain Mapping (HTM) in practice

2. Application of Crew Resource Management and Distributed Cognition frameworks to HTM training

Approach

- Observations of classroom training and field exercises during pre-deployment training

- Semi-structured interviews with MSSG HTM subject matter experts

Argument

- Crew Resource Management (CRM): notion of crew being a resource during decision-making
- Distributed Cognition paradigm includes artefacts amongst available resources
- We contend that CRM neglects the broader notion of resources and provides an incomplete account of group activity
- Use of Human Terrain Mapping to illustrate the argument

Military Stabilisation & Support Group

- MSSG formed in 2009
- Train 6 person teams (MSSTs) who are then sent in-theatre to perform CIMIC at the tactical level
- Work is spread amongst the team to collate an overall picture
- Training programme still under development
- Limited definition and evaluation of non-technical skills

Mapping the Human Terrain

- Understanding culture in order to influence outcomes to support the mission
- Information pooled from a number of sources
- Provide briefings to BG Commander and Provisional Reconstruction Team
- Act as HTM ‘Hub’ for BG

Example training scenarios

Crew Resource Management

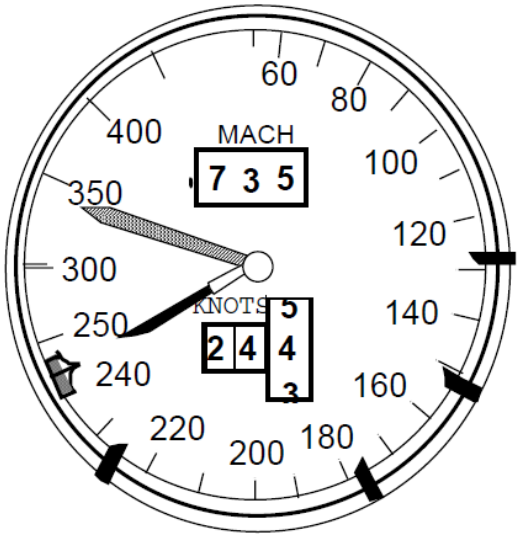
"...is the effective use of all resources."

- Concerned with the optimisation of interpersonal behaviours to improve decision making and safety
- Training in non-technical skills required in order to work effectively as a team
- Identification of behavioural markers for training and evaluation

Distributed Cognition

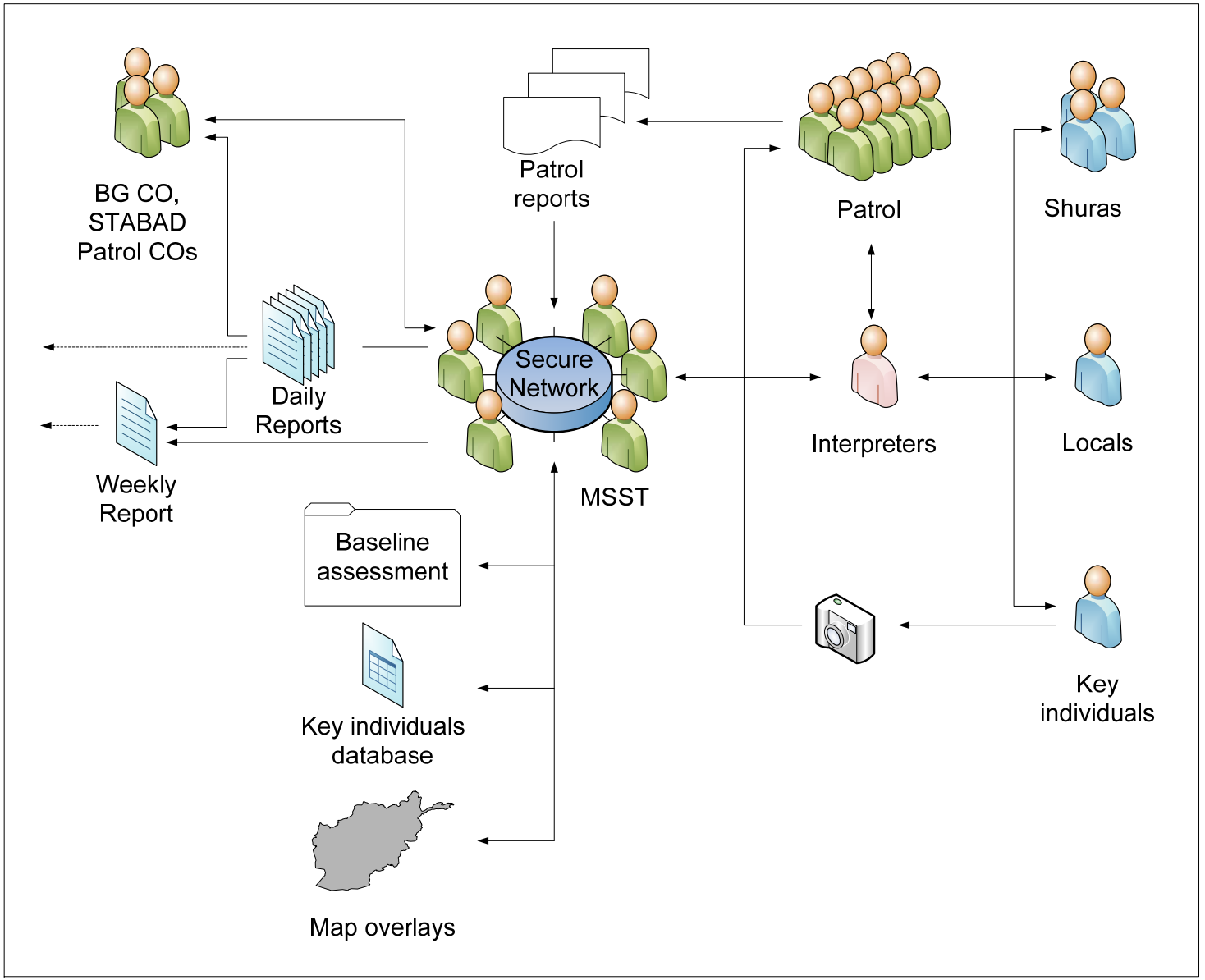
- Study of cognitive processes of groups of individuals and artefacts (i.e. cognition at the systems level)

- Artefacts play an important role in cognition:
  - Reduce cognitive load on individuals
  - Change nature of cognitive task (e.g. from memory to visual perception)
  - Mediate interactions between agents (e.g. temporally and spatially distributed teams)
  - Act as resources for action



(Hutchins, 1995)

MSST process overview



mple - atmospherics

What is the situation on the ground

“In the market, are shops open? How many? What variety of produce? Were there people on the street? Were people out sitting drinking chai? Were you offered any chai? Would people talk to you? Were men working in the fields?”

Provides information on the influences on the community - ‘a snapshot’

Feedback loop on effectiveness of projects

Capture, analysis and use of atmospherics

lication of CRM to HTM

Human terrain ‘system’ is harder to define than traditional CRM domains

People as resources – multiple perspectives

- People as products vs. people as processes
- Information vs. intelligence
- Use of interpreters

Resources as artefacts

- Use of artefacts is not a purely ‘technical’ skill
- Direct involvement in situation awareness and decision making

as a DC activity

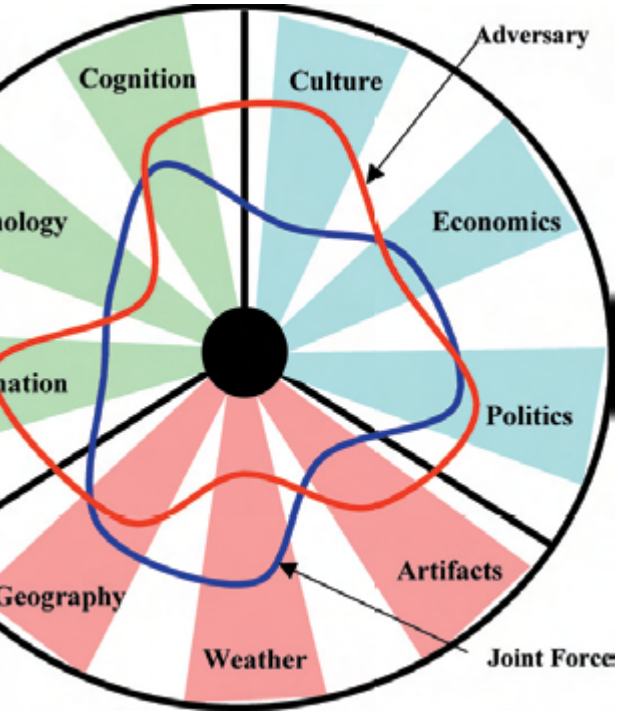
Distributed information processing, supported by artefacts

Artefacts are not optimised for the collection and analysis of human terrain information

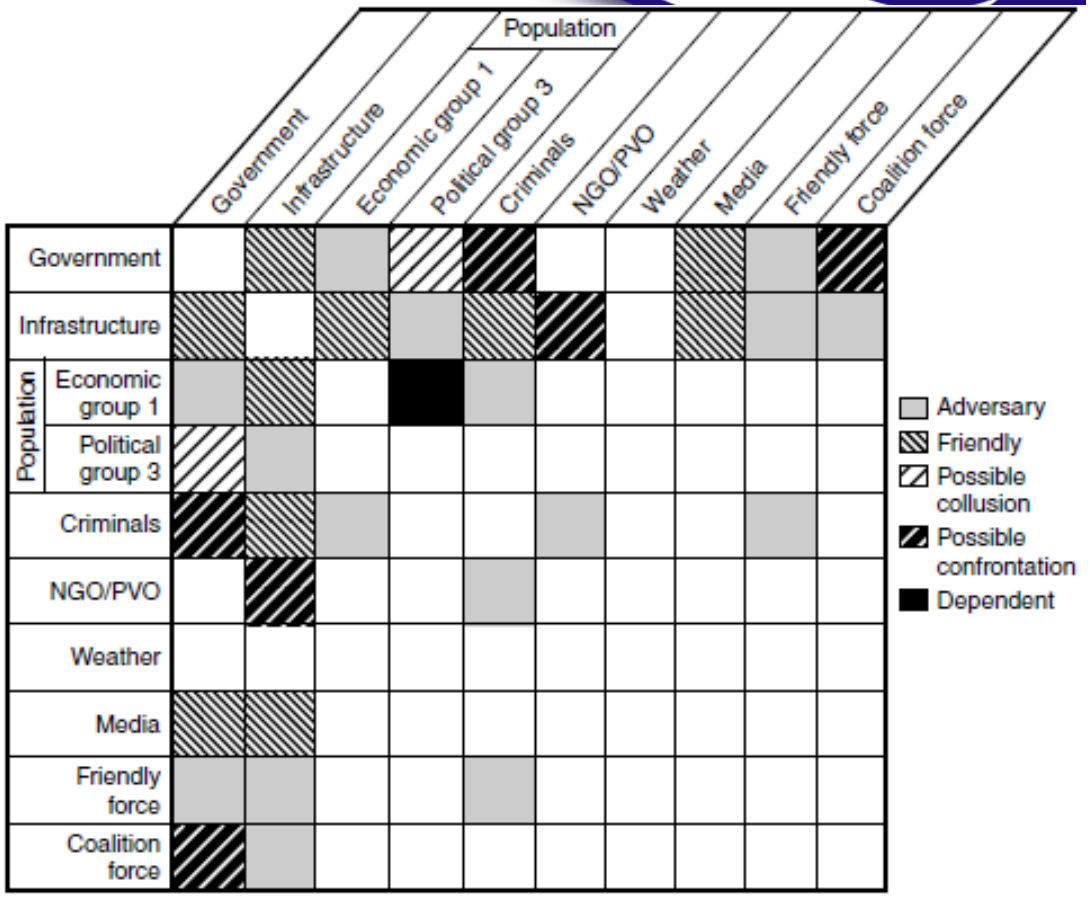
E.g., baseline assessment:

- Relates to information outside of the human terrain
- Does not reflect the totality of human terrain information
- Does not optimise the presentation of human terrain

gning CIMIC / HTM artefacts



(Thomas, 2004)



Relationship matrix (RAND, 2002)

vance of CRM and DC

Many MSST activities relate to and would benefit from CRM training

Extensive use of artefacts within group activity

Design of artefacts is still at early stage

Current failure to capture some Human Terrain information in artefacts limits diffusion and influence on wider decision making

clusions

Applying definition of CRM as "...*the effective use of all resources"* (i.e. including artefacts) revealed aspects of HTM group processes that were not obvious through the traditional focus of CRM on interpersonal skills.

Supports the argument for adopting a more socio-technical approach to the design of complex work systems – macroergonomics.

Any questions?

r.mcmaster@bham.ac.uk