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COALITION COMMAND AND CONTROL IN THE NETWORKED ERA

Assessing the accurate transmission of Commander's Intent

Cognitive and Social Issues, C2 Metrics and Assessment, Network-Centric Experimentation etc

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Fundamental to both Network Enabled Capability and Effects-Based Operations is that a Commander will start his/her Orders with the specification of what they intend to achieve. If this takes place in a command hierarchy, that commander is dependent on subordinates to transmit that intent down to the next subordinate level. While the modern fully networked force will have a vastly greater common understanding (or Battlespace Awareness), achieving the desired effect is still dependent on the correct transmission of Commander's Intent. It can be argued that if this Intent is not correctly transmitted, the decisions of subordinates may be (even will be) made on the basis of a faulty understanding of what is required of them. This paper will detail the approaches and tools currently being developed (as part of the current UK/US International Technology Alliance) to assess the correctness of a transmission of Commander's Intent, from the viewpoint of the originating commander. Also under investigation is the use of such tools and methods as a way of de-risking orders as an expression of desired effect.

Assessing the accurate transmission of Commander's Intent

An essential, even prime, component of any military order structure is Commanders Intent. It states the purpose of the activity about to be undertaken, and if it is not transmitted accurately, the desired effect is unlikely to be achieved. This paper will outline a programme of experimentation aimed at assessing the transmission of Commanders Intent:

Orders – containing the expressed Commanders Intent – are passed down the Command Hierarchy. It is convenient to consider them as starting at the level of Divisional Commander, or Brigade Commander, or Force Commander, though they will in reality have originated above this level. We have to assume that the originator is satisfied with his, or her, own expression of intent, but looking below this level may serve to indicate if this is with good reason, and should also indicate if the onward transmission accurately reflects the intent.

A suitable model for the progress of orders through any command structure, has been described by Bateman as the RUDE Cycle (Receive, Understand, Disseminate, Execute), with the same RUDE process occurring at each stage down the command hierarchy. It follows from this that at each level below the top of the hierarchy, a sub-commander must carry out the first three components and then prepare for the fourth. Thus, if a Commander carries out an assessment of the orders handed down by his direct subordinates to their subordinates – that is to say: at two levels down from his own – then the Reception, Understanding and Dissemination components can form a framework for that assessment. If the hierarchy is sufficiently large, "three-down" assessment may be possible.

If we refer to our top-level, or starting-point, Commander as "CMD", then his direct subordinates will be SUB1, their direct subordinates will be SUB2 and so on. In reality, there will be only a few levels below our CMD, but these may vary from nation to nation. As an example, a British Brigade Commander may have two or three Battle-groups to command. Each Battle-group Commander will have (say) two Infantry Companies and two Squadrons of Armour. Each Company or Squadron will have two or three Platoons or Troops, each comprised of the individual tanks or infantry sections. With regard to detailed orders, there are only four levels of command (in the UK) that may need to be considered in detail (the US may have one more level).

If we assume that a CMD, having issued a set of orders to his SUB1s, is the best person to establish if his intent has been correctly transmitted, it seem logical that the CMD can then assess this by a study of the orders passed down from SUB1s to the SUB2s. In the case of British command structure, taking CMD to be Brigade level, this offers three points at which orders can be assessed for transmitted intent on the basis of how the original intent has been passed down the command structure. This resembles the "Chinese Whispers" game beloved of children's parties, but with the originator being able to check (but not amend) the message as it is relayed. This approach is shown in Figure 1 on the next page. A tool for the assessment, by the Commander, of lower level orders is currently being developed, but is not yet validated.

In practical terms, a Brigade Commander (CMD) issues orders to the Commanders (SUB1) of two Battle-groups. Each B-G Commander (SUB1) will then issue orders to probably four Company or Squadron Commanders (SUB2); these will in turn issue orders to a number of SUB3s. Our originating CMD can now assess:

Orders SUB1 to SUB2
Orders SUB2 to SUB3

Moreover, SUB1 can assess the orders from SUB2 to SUB3.

While this may serve to show the accuracy of order transmission, and probably give good indication of where errors may have entered the order system, it may not indicate why those errors have crept in. A typical question is:

Did SUBs show clear commitment to the Orders passed down to them?

This will also need a military Subject Matter Expert (SME) opinion.

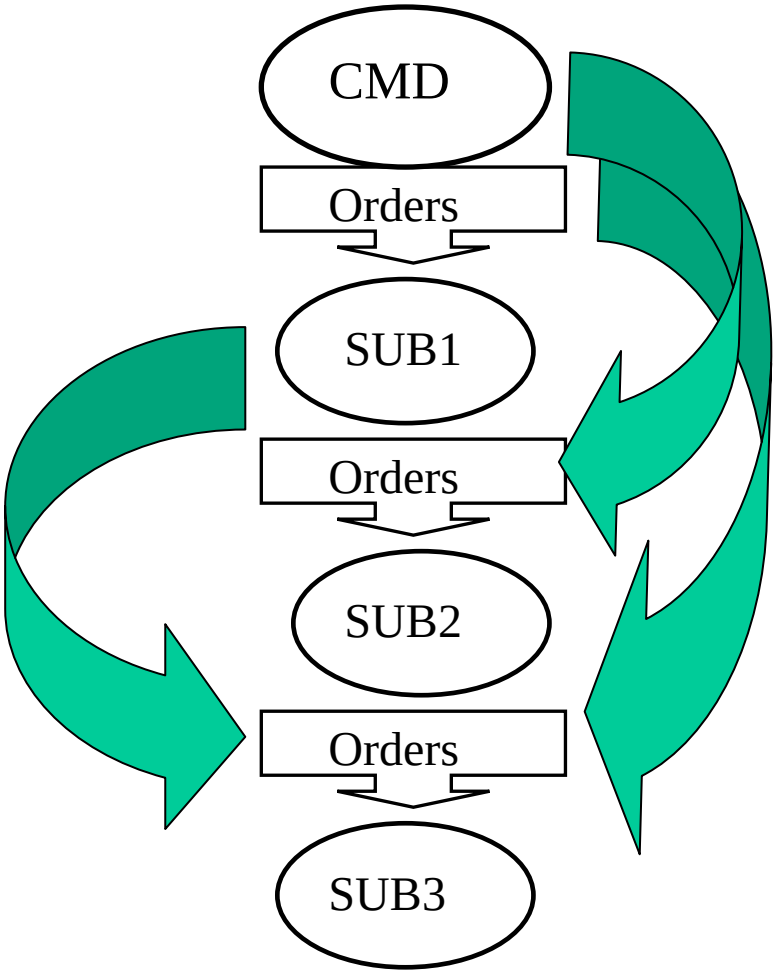

Figure 1

In the case of British forces it is considered that any Commander takes 1/3rd of the available time for his own order generation process, while leaving 2/3s for his subordinates. This 1/3-2/3 rule has a ripple effect down the command structure, with the end of each 2/3rd period being aligned at H-Hour. During a Commander's 1/3rd period, one or more Warning orders may be issued (the first warning order is to be

issued in a "timely manner"), followed by expanded warnings or Operational Concept (CONOP) orders, ending with a Confirmatory or Final Order. This process offers the opportunity to obtain values on a number of measures.

If we assume that some Higher Authority has instructed our Brigade Commander (CMD) to achieve an effect by a given time, we have a practical duration time for the line from "Start" to "H-hour". Along this time-line, a number of events can be plotted:

Exact time for the issue of each Warning order.
Exact time for the issue of a CONOP order.
Exact time for the issue of the Confirmatory order.

This can be done at each level of command. Further, each instance of a SUB, at any level, seeking explanation of any point in his orders can also be plotted, and related to the basic timeline events. Combined with the evaluation of orders issued at one or two levels down (as Figure 1) this would provide data on the best use of available time as related to the transmission of intent. It may also prove instructive to relate any upward queries to the timing and amount of intermediate orders.

There are some further quantitative measures (measurable variables) that can be used. These relate to the actual transmission of orders, and should be considered as independent of the actual method of order transmission. Typically, these could include:

Length of the order (in pages, words, characters, or transmission time, for example).
Length of each sentence, and the number of sentences.
Time for each query (if any).

The work of English and Guppy (1994), as one example, suggests that the more effective tank crews use fewer communications, but it is far from clear if this, or the more general measures, can be directly applied to all military activity. Another tool, to facilitate this approach is also under development.

The measurable variables would almost certainly be usable on direct CMD-SUB orders – provided that some degree of understanding had been obtained first. The judgement of the military value and correctness of an order must be a matter for military judgement. Quantitative measures that can be correlated, both with each other, and with the success or failure in respect of obtaining the required effect, should not need any military validation, although this will be desirable.

The two tools mentioned above have both been prototyped using a generic toolset – primarily developed for the assessment of Human-System Integration. This toolset has already been used for course assessment at the Defence Academy of the UK.