

UK Operational Analysis Evaluation of Current Operational Campaign Effects Assessment (2008)

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INTRODUCTION

This study was commissioned by D Scrutiny, within the UK MoD, in order to evaluate the UK “frontline” OA community’s¹ position on Campaign Effects Assessment (CEA), based on their experience up to the end of 2008. The aim of this study is to advance the OA capability to contribute to CEA in support to operations and exercises, and maximise the value that OA can make to the assessment process. This report summarises the study’s findings, outlining the view of the UK “frontline” OA community on the techniques that have utility, capturing best practice, and making a number of recommendations to lead to improvements on current practice.

BACKGROUND

Dstl (and its predecessor organisations) has deployed teams of civilians into operational theatres to provide Operational Analysis (OA) support to operational commanders and their staff since Operation GRANBY (first Gulf War) in 1990.

¹ The UK “frontline” operational analysis (OA) community is comprised of the OA teams based within the UK/UK-led headquarters and warfare centres, and Dstl’s Policy and Capabilities Studies Department’s Support to Operations Group.

During the 1990's in Bosnia and Kosovo, analysts worked with UK military forces to develop CEA and Measures of Effect (MoEs). In 2002 a team of UK analysts deployed to Kabul providing analysis assessing measures of success and effectiveness. From 2003, OA teams have been permanently deployed to Operation TELIC (Iraq), and Operation HERRICK (Afghanistan) since 2006, to support military headquarters (HQ) in their campaign assessments. CEA has become an increasingly prominent aspect of the OA support provided to operational commanders and their HQs; however it is not the only support that these teams provide. OA continues to be applied across the whole spectrum of military endeavour from Conflict to Crisis Operations, typical tasks include: correlation of forces; combat resolution assessment; force sustainability; force protection issues; threat assessment; monitoring of the general environment; indication of the stability of the region; opinion polling; allocation of troops to task; movement analysis; and general modelling of ad hoc issues.

In addition to the enduring contributions made to Operations on the frontline, teams within the Dstl Support to Operations (S2O) Group have supported the CEA process and developed the CEA products on exercises in the Joint, Maritime, Land and Air domains, predominantly through its teams within the warfare centres and HQs.

Many different approaches to CEA have been developed independently by the various UK "frontline" OA teams over the years. In September 2008 Dstl ran a two-day workshop with participants from the practitioners of CEA within the OA teams in the UK and UK-led HQs and Commands, drawing on their almost 20 years of experience in supporting the assessment process in military HQs, to evaluate the current state of CEA from a UK perspective, to share experiences, lessons learnt, and best practice. The aim of the workshop was to advance the OA capability to provide MoEs and CEA to support operations and exercises. A range of issues were discussed, with best practice being identified where possible. The main points from the workshop are captured in the sections below.

CAMPAIGN EFFECTS ASSESSMENT (CEA)

WHAT IS CEA?

The UK's Comprehensive Approach (CA) is a conceptual framework which recognises that the military instrument cannot operate in isolation and successful operations and enduring outcomes will involve a wide range of contributors and influences. Comprehensive analysis, planning, execution and measurement of effectiveness should enable a more effective and efficient deployment of finite national capabilities, including heavily tasked military assets. The CA embraces the Effects Based Approach (EBA) and could be used to improve the coherence of responses to future conflicts and crises². CEA is entirely consistent with the UK adherence to the Comprehensive Approach. UK doctrine states that CEA is:

"Evaluation of campaign progress, based on levels of subjective and objective measurement in order to inform decision-making"

JDP 3-00, Chapter 4.

² The Comprehensive Approach, Joint Discussion Note 4/05.

“Analysis conducted at the strategic, operational and tactical level to monitor and assess the cumulative effects of military actions with respect to centres of gravity in order to achieve the overall campaign end state”

JDP 5-00, Paragraph 267.

CEA is concerned with campaign progress – are the “right things”, done “properly”, getting us where we want to go/need to be? While the staff may assist him in his deliberations, CEA is the predominant concern of the Joint Force Commander (JFC).

CEA should provide a continuous assessment of the operation, utilising the application of intellect, empirical evidence, and expert judgement. It needs to be flexible in order to meet the demands of the operational tempo and the Commander’s requirements.

The process should serve as a “feedback” loop on the planning cycle, to test whether the intended effects of the enduring campaign, or short to medium-term operations, have been achieved. Investigating why aspects of the campaign are seen to be succeeding, failing, or not performing as expected is a role for the deployed OA staff supporting the HQ.

The MoEs should be structured such that they are aligned with the campaign plan³, but the HQ should be mindful of the data that will be available to them in theatre when designing the MoEs. However, MoEs may be developed before the HQ knows exactly what data is going to be available to them; hence some MoEs may lay dormant until such a time that this data becomes obtainable.

WHAT SHOULD OA’S ROLE BE IN CEA?

UK doctrine states that:

“In a JTFHQ, J5 provide the lead support to a “JTFC” during CEA, drawing on J3 Opts Spt as necessary”

JDP 3-00, Chapter 4.

“Some effects may not prove enduring, and an understanding of why they have been realised, and how own [sic] activity has contributed to them, supports adaptive planning and execution. Operational Analysis (OA) staff can provide advice.”

JDP 3-00, Chapter 4.

“OA staff can assist [in evaluating MoEs and CEA] but ultimately this is dependent on military judgement, supported by metrics”

JDP 3-00, Chapter 4.

CEA is a military-owned process; the role of the operational analyst is to provide advice and assistance in the design, development, application, and evaluation of CEA and MoEs.

In the evaluation of CEA, OA staff should support the understanding of the issues arising from the CEA process. They should use empirical evidence to test the validity of the original

³ This is the prescribed method, but there have been occasions where the MoEs are developed before the campaign plan is written.

assumptions, focussing on the areas that can be influenced, and conduct analysis that informs the Commander's decision making.

The OA approach needs to be proactive, agile, and the analysts need to be capable and willing to engage with the Commander and other decision-makers, challenging their views when the analytical evidence runs contrary to these.

When observing trends, analysts must ask themselves the "so what?" and "why?" questions. The Commander is the best briefed person in the HQ, and will already be aware of the bigger picture of the current situation on the ground, but may not know the details, possible causes, and why these effects are being seen. OA should investigate the operational data gathered for the military-led CEA to look for the causal relationships and deeper understanding in an attempt to gain greater insight.

OBSERVATIONS ON CURRENT OPERATIONAL CEA

CEA is being conducted on current operations, but analysts perceive that it is falling short of the potential impact it can achieve. The barriers that have been identified that are limiting the effectiveness of CEA fall into one of two broad categories; issues with the CEA process, and issues with the CEA products. This section considers the following issues in further detail:

a. Issues with the CEA process:

1. Absence of a coherent approach: No coherent approach exists between the tactical, operational and campaign-level assessments.
2. Information Management: OA are drawn into the information management (IM) role, limiting the time available for in-depth analysis.
3. CEA as a mechanistic series of products: For OA, CEA becomes the production of a routine series of products rather than a more insightful assessment of the campaign.

b. Issues with the CEA products:

1. Too many metrics: An example of this is the MPICE (Measuring Peace In Conflict Environments) tool. Designed jointly by the U.S. Institute of Peace, U.S. Department of Defense, U.S. Agency for International Development, and the U.S. Department of State, MPICE measures the conditions which impede stability in a society, and contains circa. 2,000 different metrics.
2. Aggregation of metrics: An example of this is TRUMP (Tool for Road Map Update and Measurement of Performance). Used on ISAF IX, it is a tailor made NATO database that automates the collection and aggregation of measures to assess progress.

3. Weighting metrics: An example of this is the CAB (Coalition Assessment Board) produced by OA within the Coalition Operational Net Assessment (C-ONA) team for the Maritime Component Command (MCC) in Bahrain and used to assess the progress made against the Commander's stated aims.

LESSONS ON THE CEA PROCESS: ABSENCE OF A COHERENT APPROACH

Within the CEA process the Tactical, Operational and Campaign assessments are not coordinated and coherent across the levels. An example of this is in Afghanistan, where HQ ISAF (Corps), the Regional Commands (Divisional), and the Task Forces (Brigade) all employ different metrics and methods of assessment. It is evident that in the design, development and application of CEA there is little communication between the formations. Even when comparing the CEA processes between each of the four Regional Commands in Afghanistan, there is little parity in the approaches. Given that all are working to the same end state, but are using different metrics, it shows that there is a lack of coherency and a missed opportunity to exploit the CEA between the HQ formations and amongst each of the Regional Commands and Task Force HQ.

It is perhaps worth mentioning that since the example above was identified, the situation appears to be changing as there is an ISAF push to get CEA aligned across Regional Commands and as part of this the Afghan Assessment Group (AAG) in Kabul is being augmented by OA.

According to doctrine CEA is a military staff-led activity and therefore it should be incumbent on the appropriate lead branches⁴ to coordinate the design, development, application, and evaluation of CEA and MoEs across the various HQ levels to ensure coherency with their respective assessments. A lack of coherency typically has a greater impact on the efficiency of the lower formations, requiring them to collect and assess one set of MoEs for their own benefit and another set for the benefit of the higher formation. Applied correctly, coordination between the military staff branches will minimise duplication of effort by designing MoEs that can inform all the command levels and develop synergies between the HQ CEA products such that one can instinctively feed in to the other as far as is practicable.

In addition to being advisors to their own HQs assessment process, where OA teams exist in different HQs in the same theatre, the analysts should maintain a regular dialogue so that they are providing consistent advice to the military and enabling themselves to oversee the CEA process to ensure coherency across these HQs is maintained.

RECOMMENDATIONS

- The military staff branches leading on CEA should coordinate their MoEs and assessment processes, as far as makes sense to, across the various HQ levels.

⁴ For the UK this is the J5 branch.

- There should be regular communication between the in-theatre OA teams to discuss CEA.

INFORMATION MANAGEMENT

CEA cannot become an effective and influential process unless there is a culture of effective record-keeping within the HQ. The OA experience has been that the military have not been good at information management (IM) and information technology (IT), making it necessary for OA teams to establish and then maintain their own IM system in order to effectively collect, collate, retrieve and analyse data to provide OA advice. This has led to OA being seen as the IM and IT experts and they have become drawn in to the IM role.

However, this is only part of the issue; the other is that having collated data and presented it HQs often want it in a processed form as a briefing or awareness product. This should be the responsibility of the HQ branch owning the data and not OA.

The scale of the IM task will be dictated by several factors, most notably the number of MoEs which drive the CEA process. However, the quantity of data sources, the number of different networks that the data is stored on, and the ease with which the information can be obtained, contributes significantly to the size of the IM role.

Aside from the initial development of software tools designed to collate, aggregate and display the data, the basic process doesn't pose an intellectual challenge to the analysts once the system is in place. OA are being used as the information managers and have "ownership" for the production of the CEA products required by the HQ. This is a lengthy and time consuming process which has been known within HQs to require circa 100 different briefs to be produced from the CEA products on a weekly basis. This "handle turning" and continuous stream of requests for variants (e.g. different periods, locations, etc.) leaves no time for the analysts to investigate the operational data gathered to answer the "so what?" question.

The IM burden alone means that analysts struggle to find available resources to perform any further analysis as suggested above, and the OA end product is merely a high-level assessment, which does nothing more than reinforce the Commander's situational awareness briefs. This then raises questions about how much value OA are adding.

For the OA contribution to maximise the value that it can make to the assessment process, it needs to hand the responsibility back to the HQ so that the analysts' focus remains on providing analysis that supports the military-led CEA process.

One proposed strategy to free OA of the IM role would be to task clerks or NCOs as the information managers for the HQ. To achieve this, OA would have to demonstrate to the Command Group the benefits that would be reaped by allowing the analysts to perform less data collation and more analysis.

Another suggestion is that there could be a clear definition of OA duties along the lines of the World War II (WW2) Army Operational Research Group (AORG) definition of duties from Minutes of Control Meeting, AORG, 20 May 1943, PRO WO 233/22:

- “(i) to investigate the performance of ... equipment ... in field operations.
- (ii) to collaborate ... in studying the performance and use of new equipment.
- (iii) to investigate methods of using ... equipment.
- (iv) to analyse statistically the results of ... tactical methods, whether they involve ... equipment or not.
- (v) to advise ... upon the planning of ... trials of equipment or tactical methods.
- (vi) to be represented ... at ... trials.
- (vii) to carry out any other scientific investigations which may be approved.”

RECOMMENDATIONS

- OA needs to resist acceptance of responsibility for IM to the HQ.
- There should be a clear definition of OA duties.
- The military must undergo a cultural change to foster and invest in good information management.

CEA AS A SERIES OF PRODUCTS

Some CEA products are routinely used to brief HQ Commanders that can be classified as data-heavy and analysis-light. The use of traffic lights⁵ or slide bars are prevalent in many CEA presentations. This type of illustration is an effective means of representing the high-level situation in each line of operation but this should not be the end product. OA should be used to contribute further analysis to look for the causal relationships and deeper understanding.

It is the firm belief of the UK “frontline” OA community that the current use of traffic light systems or slide bar diagrams, which are well established in CEA briefs, do not really help Commanders get to the heart of the issues and enable them to make their decisions. They lack the insights and deeper understanding that may be required - there is no indication of how to get from a “red” to an “orange,” in the traffic light context. The key point is that these measures of progress are more like government targets to show the customer that all is well. They do not answer the key questions that CEA is concerned with, that is “are the “right things,” done “properly,” getting us where we want to go/need to be?”, for which an understanding of why the effects observed are or are not happening, and which of “our” actions are having a positive or negative effect. It is this latter sort of information that can actually inform command decisions.

OA should use the regular CEA products to identify the areas of greatest concern or interest for further analysis to be carried out by the analysts to provide insights, and where

⁵ A traffic light “scoring” system is commonly used to summarise the state of a line of operation in one of three colours: red (improvement required), orange (progress is OK) or green (milestones achieved / on schedule).

possible answers, to possible causes and why effects are being seen, to support and provide an understanding of the issues arising from the CEA process.

RECOMMENDATIONS

- OA should use the regular CEA products to identify the areas of greatest concern or interest and conduct further analysis in these areas.
- The OA contribution to the CEA products must provide insights and an understanding focussed on the Commander's current issues.

LESSONS ON THE CEA PRODUCTS

Many CEA products that have been developed by the operational HQs over the years, a small selection of these can be seen in ANNEX A to provide context to the general issues identified by the UK "frontline" OA community.

TOO MANY METRICS

The selection of suitable MoEs is a primary task of CEA. Historical Analysis suggests that in very few cases is a single MoE sufficient and that, in general, Campaign Assessment requires the assembly and interpretation of numerous metrics. This gives rise to a common issue when developing a list of MoE and that is what is the appropriate number of MoE to use? ⁶ Numerous MoE may need to be collected initially, however, after a period of data gathering the more useful metrics can be identified and selected for further analysis.

The design of CEA, not just in-theatre ones, has led many to depend on hundreds and even thousands of MoEs, making them heavily data-dependent. For example, both MPICE and the methodology of CEA that the NATO experimental team wanted to implement contain circa 2,000 metrics. Additionally, within the Joint Force Air Component Command (JFACC) OA produce 80 slides as a result of the CEA output using the traffic light system. With these numbers of metrics and products being produced, trying to relate a group of metrics to a single effect must be a difficult task. CEA will never be perfectly accurate and there is a misconception that more information leads to better decisions.

Whilst there was general agreement within the UK "frontline" OA community that 2,000 metrics is too many, it was unable to suggest a definitive number, or even upper bound for the number of metrics to use. The best that the Code of Best Practice (COBP) for the Use of MoE to Support Campaign Assessment can offer is, "you need as few MoE as possible but as

⁶ Ref: Code of Best Practice for the Use of Measures of Effectiveness (MoE) to Support Campaign Assessment, Dstl/CR14304 V2, Nichola Picken. This report is available in the Handbook of Operational Analysis Reference and Data (HOARD).

many as you need". These will depend on a number of factors, some of which are given in the COBP⁶.

If operational records are maintained properly then new metrics could be added to the CEA process that could be looked at historically for their trends. However, until the issues with IM outlined in the earlier section have been resolved, the set of MoEs should remain static, primarily so that long term trends can be investigated, but the analysis needs to be dynamic by focussing on those metrics that can provide insights into those areas of greatest concern or interest.

RECOMMENDATIONS

- The number of metrics being collected and analysed should be continually reviewed, in order that the more useful metrics be identified and selected for analysis.
- The set of MoEs should be static but OA needs to dynamically select which metrics to use to investigate the current issues further.
- Design CEA to use as few MoE as possible, but as many as necessary.

AGGREGATION OF METRICS

The amalgamation of metrics may be necessary to form the higher level view required to understand how the campaign is progressing in an easily digestible way for the Commander, and how the metrics are used to inform this top level view is an important aspect of CEA.

However, aggregation can hide information and therefore, if not conducted properly, can mislead the decision-maker. As with many processes, it is a trade-off between time and fidelity, the HQ should seek the advice of the operational analyst, who must in turn understand the limitations of the assessment techniques being applied.

A number of tools have been developed that automate the aggregation process. Without the application of intellect and expert understanding of the contribution each metric makes to the campaign effect being measured automated aggregation should be avoided, as the probability is that such a method, without a knowledgeable user of the tool, will produce misrepresentative outputs.

Where aggregation is required, automated aggregation should be avoided and replaced with intelligent aggregation, where the assessment of the metrics is performed at each command level by the military and OA staff responsible for CEA deciding what metrics they need to consider in order to make an informed decision. They will then make their assessment, thinking about the information they have for each metric, of how this is contributing to the campaign progress, and represent this using their assessment system (for example, using traffic lights). It is vital to capture the thinking behind such intelligent

aggregation. This approach allows each headquarters to make their own decision on what these MoE data mean for them at their level.

The “Code of Best Practice for the Use of MoE to Support Campaign Assessment” discusses several techniques for the amalgamation of MoE, including the aggregation of metrics. It is almost certain that different measures will need to be combined to form an overall assessment of an effect, but great care needs to be taken by the analyst to ensure that the analytical method selected is both valid and robust.

RECOMMENDATION

- Where aggregation is required, automated aggregation should be avoided and intelligent aggregation should be used; ensuring that the thinking behind this is captured.

WEIGHTING METRICS

In its simplest form, weighting is nothing more than the multiplication of metrics by one or more factors to increase or decrease the emphasis that will be given to the metrics. The problematic aspect of weighting is related to the selection or calculation of the weighting factors. CEA runs the risk of producing misleading results by not being careful in the specification of the weighting scheme.

In combination with the number of products and metrics that support the CEA process, a number of tools that apply automated weightings to scores have been produced, and are used by some operational HQs in their CEA. Automating the weightings process is seen as an efficient and timely way of working, given it does not require expert knowledge to run, but it removes the application of intellect. Automation in this respect is a dangerous action that may commonly lead to misleading results, and should be avoided.

In general, assigning numeric weightings to scores is appealing because the process becomes pseudo mathematical, which provides a reassuring (but misleading) feeling that a scientific method has been applied, and therefore it is easy to assume the results will stand up to scientific scrutiny.

However, the specifications of the weightings scheme must be defined in terms of the overall objective: What is the purpose of the weighting? In most situations, the obvious answer is that the analyst would like the CEA data to be representative of the "real world". The immediate follow-up to the first question is another: In what ways are the data to be representative of the population? The answer to this question should lead to the selection of an appropriate weighting technique.

The analyst's understanding of the “real world” and the contribution each metric really makes to the fruition of an effect is based on subjective judgement, OA has not been able to provide a robust scientific method for understanding the contribution each metric (or cause) has on each effect. In other words, the weightings being applied to metrics are a best guess

based on widely variable levels of expert opinion. Until the OA can do better weightings should be avoided, or at least viewed with a level of scepticism.

RECOMMENDATIONS

- The OA community should conduct, sponsor, and exploit research into understanding the contribution that specific metrics make to the “real world.”
- Until the OA can do better at understanding the contribution that specific metrics make to the “real world”, weightings should be avoided.
- It is recommended that OA should not use weightings, and should advise others not to.

BEST PRACTICE

CEA should be done, where possible, with scientific rigour. It is particularly important when considering methods of aggregation and weightings, sometimes computer assisted, that their application is judged on a case-by-case basis. Other methods of analysis should be carefully considered, such as the “roll-up” method⁷, which is particularly good at highlighting areas of weakness or failure. The advice of OA staff should be sought.

The Collection Coordination Intelligence Requirements Management (CCIRM) needs to be matched to the campaign plan. That way data would be available in line with the campaign plan that could be used to assess campaign progress, and the metrics used would be able to change as the decisions needing to be informed change.

When OA make their initial footprint within a military HQ, they should ensure that the MoEs have been designed in line with the Campaign plan. They may create software tools to automate processes where appropriate. Once these CEA tools have been established, their ownership should be passed on to military staff for their routine use.

OA should advise the HQ that the CEA products should highlight significant changes and OA should conduct analysis that assists the HQ in understanding why the changes have occurred. This approach will aid the decision-maker, but the OA advice and assistance should be focussed on the areas where the HQ can make a decision that will influence the campaign.

When designing MoEs, the analyst must be mindful that the set of MoEs should be static, primarily so that trends can be investigated, but the analysis needs to be dynamic in order that it can focus only on those areas within the MoE set that address the Commander’s current area(s) of interest, which may mean investigating causal relationships. The temptation to design an unnecessary number of MoEs should be resisted; more MoEs does not mean the

⁷ Information on the “roll-up” method can be found in the Code of Best Practice for the Use of Measures of Effectiveness (MoE) to Support Campaign Assessment, Dstl/CR14304 V2, Nichola Picken.

assessment will be any more accurate. It is the old adage of making the important measurable and not the measurable important.

Despite the temptation to remove MoEs during the campaign and replace them with ones which are deemed more appropriate at the time, the analyst must be aware that by doing so, they may be forfeiting the ability to perform long-term trend analysis, and should advise the HQ accordingly. It may be possible that OA can continue to record the MoEs that the HQ removes in order to conduct its own long-term analysis.

Investigating long-term trend analysis is where OA can really add value. If and when analysts are faced with a change in CEA requirement, they should resist designing a new CEA process and instead endeavour to adapt current CEA practice to the new requirements so that the previous months or years of work can still be applied to tomorrow's analysis.

In order to support their in-depth analysis, the deployed analysts must talk to Subject Matter Experts (SMEs) across the appropriate range of branches of the HQ. Analysts should be in constant communication with the people that know best about what is happening on the ground so that they can relate their analysis to the "ground truth."

Analysts should always strive to prove the statistical significance of any trends, conducting the appropriate tests. Highlighting trends by visual inspection is valid, but should be the first step of the analysis. Words such as "significant" and "correlated" should not be used unless the statistical tests have been conducted and proof obtained.

Successive analysts deploying to the same post will each possess varying levels of IT skills. Therefore, whilst it may be personally rewarding for some analysts to build complex spreadsheets, databases, and so on, a thought should be made for their successors. If the HQs processes change and the successor does not have to same skills (Visual Basic, for example), then such work may go to waste. Any endeavours to improve processes with the use of software packages should be made as future-proof as possible.

SUMMARY

The CEA outputs should place less emphasis on reinforcing what the Commander already knows and provide insights into what he does not. Excessive numbers of slides will not focus the Commander's thoughts on the key decisions that need to be made.

Instead, the content of the CEA presentations should be relevant to the Commander's current intent and objectives. The brief should only cover the essential points, but the underlying analysis should be available if and when the Commander requests more detail. As an example, pointing out that security is bad is not an OA role. The analyst should take this observation a step further and ask themselves "Why?", working with SMEs to postulate on causal relationships.

The ultimate goal OA should strive to achieve is to ensure the Commander understands the campaign progress, intended effects and their implications in order to improve the support to decision-making. This is not achieved by a single colour, or an arrow along a bar. It should involve analysis targeted at particular issues that provides insights into the commander's

campaign picture, given as a concise brief containing the essential text, any appropriate pictorial aides and a supporting narrative provided by the analyst.

This study has made a number of recommendations that if endorsed and followed will advance the OA capability to contribute to CEA in support to operations and exercises, and enhance the value that OA can make to the assessment process. These recommendations are:

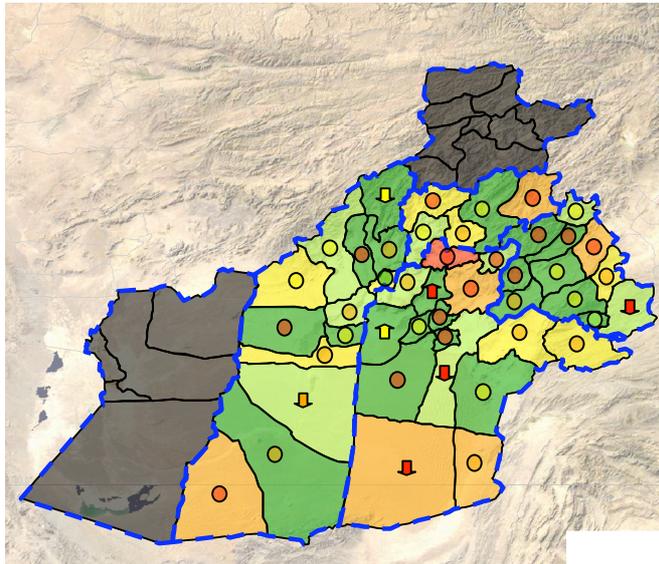
- a. The military staff branches leading on CEA should coordinate their MoEs and assessment processes across the various HQ levels.
- b. There should be regular communication between the in-theatre OA teams to discuss CEA.
- c. OA needs to hand the responsibility for IM to the HQ.
- d. OA needs to demonstrate to the Command Group the benefits of allowing the analysts to perform less data collation and more analysis.
- e. The military must undergo a cultural change to foster and invest in good information management.
- f. OA should use the regular CEA products to identify the areas of greatest concern or interest and conduct further analysis in these areas.
- g. The OA contribution to the CEA products must provide insights and an understanding focussed on the Commander's current issues.
- h. The number of metrics being collected and analysed should be continually reviewed, in order that the more useful metrics be identified and selected for analysis.
- i. The set of MoEs should be static but OA needs to dynamically select which metrics to use to investigate the current issues further.
- j. Design CEA to use as few MoE as possible, but as many as necessary.
- k. Where aggregation is required, automated aggregation should be avoided and intelligent aggregation should be used.
- l. The OA community should conduct, sponsor, and exploit research into understanding the contribution that specific metrics make to the "real world."
- m. Until the OA can do better at understanding the contribution that specific metrics make to the "real world", weightings should be avoided.

In addition to these recommendations, there are a number of more specific recommendations for the UK "frontline" OA community; these are not presented in this paper.

ANNEX A

EXAMPLES OF CEA PRODUCTS

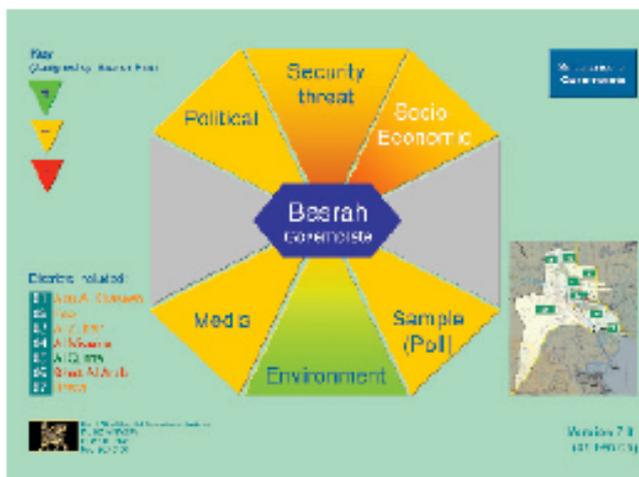
A1. The following examples of CEA products are to provide a context for the discussion about the issues with the CEA products.



Regional Common Operating Picture (RCOP)

HQ Regional Command (South),
Afghanistan

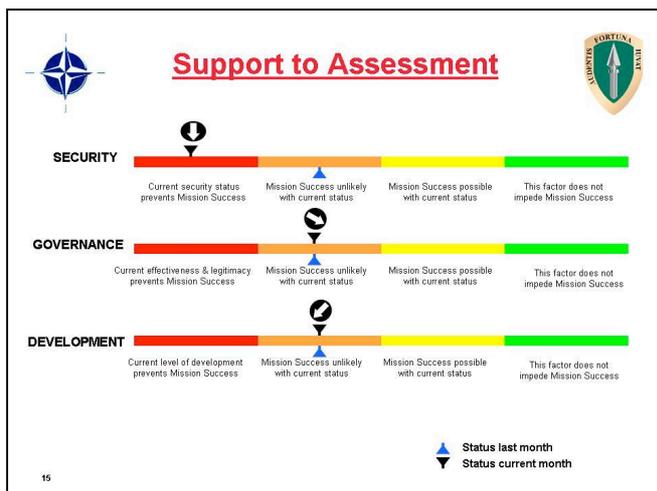
Maps like these were presented to the Commander for each line of operation: Governance, Security, Afghanistan National Security Force and Reconstruction & Development. An arrow within each district indicates the direction of the trend from the last reporting period; a circle means no change was seen. The colour of the district reflects the highest score between two consecutive reporting periods, and the smaller colour within each circle or arrow indicates the lowest score.



Hexagon

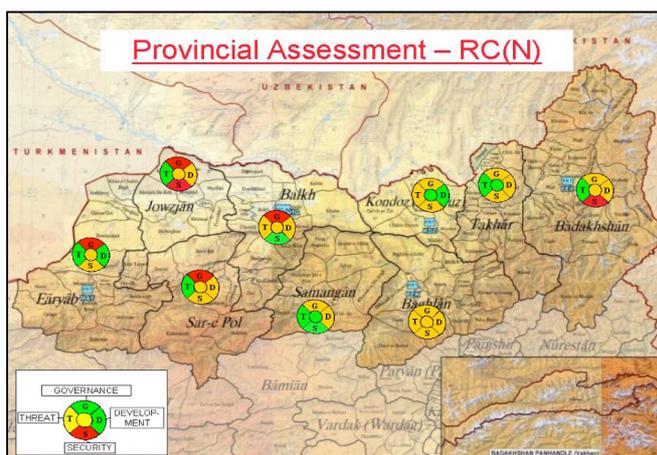
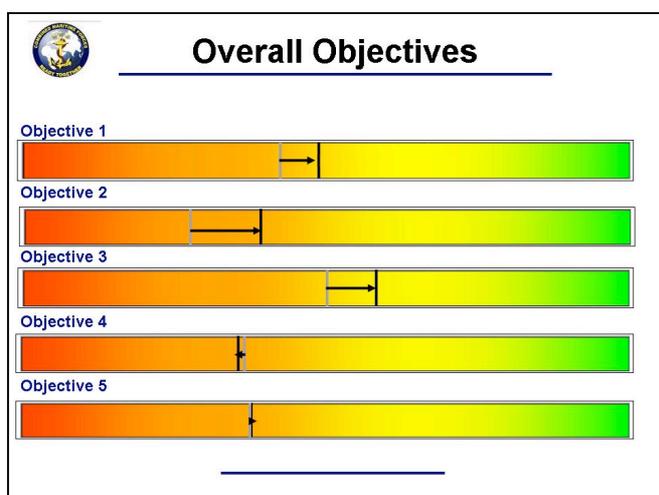
HQ Multi-National Division
(South East), Iraq

An information management system designed to inform operations (planning and assessment) with multiple data sources. The briefing to the HQ consists of an interactive “clickable” PowerPoint presentation, allowing the analysts to select each segment of the polygon to speak about each line of operation in greater depth.



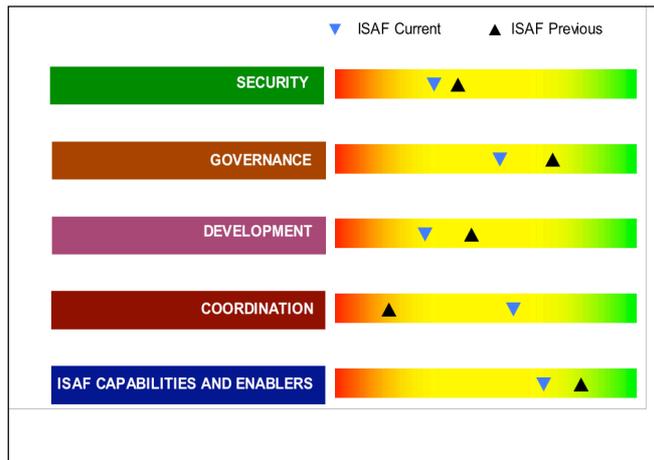
Campaign Effects Assessment (CEA)
 HQ ISAF, Afghanistan

Slides like the one pictured were presented to the Command Group on a monthly basis, illustrating the assessment of Supporting Effects along three Lines of Operation (LOP); Security Governance and Development. This was used to inform the current situation and change in assessment from the previous month.

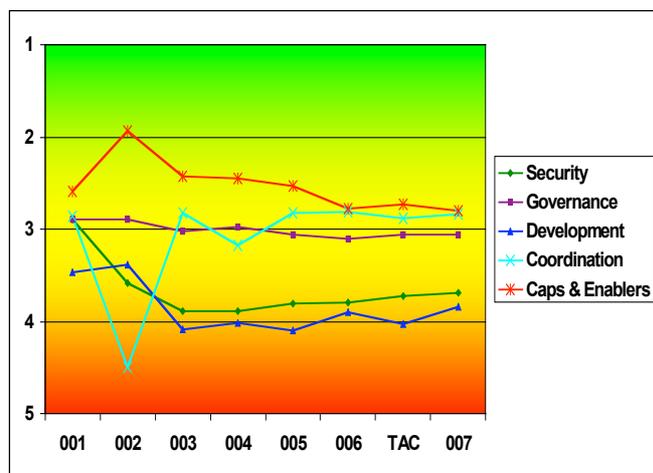


ISAF IX Example 1
 HQ ISAF, Afghanistan

Map-based illustration of the current provincial assessments in each line of operation, denoted using a “traffic light” colour system.



Each slide bar contains a blue triangle (current score) and a black triangle (previous score) indicates the direction of progress against each objective, since the last reporting period.



ISAF IX Example 3 HQ ISAF, Afghanistan

A graphical representation of campaign progression. The x-axis denotes the iteration number of the assessment cycle and the y-axis represents the score assigned to each line of operation during each assessment period.