Decision-Making Assistance Tools for Planning

In the brigade CP[1], the 4 officers of the S5 cell (MANFUT[2]) are completing, through simulation, the confrontation of two friendly courses of action (COAs) with two enemy courses of action (ECOAs).
The software delivered results are of interest: against ECOA 1, the graph of friendly losses (i.e. personnel and equipment) of own COA 1 is almost flat whereas that of enemy's take a nose-dive.
On the opposite, against ECOA 2, own COA 1 causes more losses but nevertheless allows the mission to be accomplished.
Against both ECOAs, own COA 2 enables the mission to be fulfilled but losses increased and the first level will require re-conditioning which will slow down the brigade momentum. Chief S5 thus decides to recommend own COA 1 to the Brigade's Commanding General (CG) and to propose him an operation of deception which would urge the enemy to conduct ECOA 1.

The CG accepts the recommendation of his Chief S5, but requests him to adapt the COA, should the enemy not be tricked in the deception operation... Then, within one hour, the Chief S5 has to present to the staff the conclusions of the amended COA and a simulation re-run.

In the briefing room, the staff follows the accelerated progress of the simulation. The CGl comments on the action, requires amendments, and asks questions. Do such generated losses question the logistical support? Is the attrition rate of this type of vehicles consistent with the logistic effort? Are we at risk of congestion along this axis at the time of relief?

The CG validates the COA. Each one in the staff has understood what his concept of operation is. The Chief S5, by clicking, turns the COA scenario into a graphic order, which is forwarded instantly to units as WINGO[3] and to the division as report through information networks.

At nightfall, Bn TFs (GTIA[4]) Commanding Officers attend the briefing and discover simulation re-run of own COA against both ECOAs. The lead battalion will have a lot to do but combat support units should open the way at least cost. The time for them to watch the two re-runs even accelerated, they have understood the brigade maneuver and the role their commander is expecting from them.
The briefing was short. The brigade staff included answers to questions raised by mail in the late afternoon. This night, men being self-confident are going to sleep better and longer.
Upon crossing the line of departure, the TOC[5] leader launches simulation re-run in real time on a screen located near the RGP[6].

In the middle of morning, he shows the CG that the brigade current progress is in compliance with planning. One unit is slightly in advance and the first contacts with the enemy show that the deception maneuver seems working. At night, the brigade objective is reached quicker than scheduled, in advance with simulation.
The staff managed to avoid frictions within the brigade while comparing its RGP with the simulation re-run and could issue required FRAGOs timely or even in advance. Decisions were made sensibly. Logistics did not follow..., it anticipated.

Time invested the day before by the S5 enabled refining the best COA , deceiving the enemy to force it to run a maneuver favorable to the brigade and to anticipate action rather than conduct it. In these broad lines, the COA occurred in compliance with planning ...and simulation.

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We can dream of it, but the dream is indeed starting to take shape. It is quite obvious that man should keep the lead - he does do it as he feeds himself the software with real data- and make decisions himself. Moreover the purpose is really to impose his will on the enemy and not to foresee the future. Subsequently, the era of tactical decision-making assistance tools[8] is currently opening in front of our eyes.
In some years, maybe less, the above story could be the daily life of a unit in operation.

What operational requirement?

In "Objectif Doctrine" issue no 22 dated February 2001, Colonel Sainte-Claire Deville, head of operational analysis cell from CROSAT[9] on operational simulation assisting forces engagement, stated that decision making assistance tools should optimize the various steps linked to forces engagement from planning to operations conduct.

He described then two needs:
- assistance to force build-up;
- assistance for operations conduct.

In 2006, the needs have not changed but tools exist or are on the verge to appear for the benefit of strategic, operational or tactical echelons.

ADC Olivier DUBOIS/SIRPA TERRE

State of the art

CFAT experimented **three tools:**
- a decision-making process assistance tool at LCC[10] level orientated towards planning and force generation assistance,
- a specific tool achieved internally for planning and force generation in an engagement on homeland,
- a tool for assisting in the conduct of operations at tactical level (brigade or even battalion).

Assistance for planning and force generation

Designed by NC3A from NATO, *TOPFAS* (*Tool for Operational Planning, Force Activation and Simulation*[11]) is **a NATO level 1 planning tool.** It complies with a process of planning (*OPP*[12]) and assistance for issuing planning documents (*MAB*[13], *DB*[14], *CONOPS, OPLAN*).
It **facilitates a mission analysis** breaking it down into tasks associated with a date and a duration for its execution to which required forces are assigned. Moreover, these tasks may be linked to a location or an action on a map. With all this information, the tool enables the **generation of briefings or orders** under a NATO format.

What assistance for decision making is it providing?

The software spots discrepancies in:
- planning,
- employment of units (units having been assigned several simultaneous missions for instance),
- links between duties assigned to units and decisive points identified during planning,
- sequencing of *the Operational Design,*

and generates SOR (*Statement of Requirements from* NATO).

TOPFAS does not enable quicker work in the early phase of planning. It allows time savings during the phase coming after: once the force generated, it saves time for subordinates thanks to its compatibility with other softwares used by NATO (*ADAMS* for instance).

TOPFAS can be envisaged only with the NATO software family such as *ADAMS* or *DBM* (*Allied Deployment and Movement System* - PIA 04-302 and *Database Management Module France* - PIA 05-402 - catalogue of deployment modules).

ADAMS[15] is an automated decision-making assistance system for **coordination of movements and transports** during planning of multinational forces deployment. It enables the exchange of movement plans from different nations under a single format in order to achieve a harmonized multinational deployment plan. It allows then to simulate strategic and operational plans in order to adjust the strength of deployed forces according to their type and the time available.
It obliges the command to make choices and decisions: for instance, a brigade may be deployed within two days but without combat support units. Should the decision maker want to fully deploy it, *ADAMS* will tell him what the needed periods of time are.

DBM FR (*Database Management Module France* - PIA 05-402 - catalogue of deployment modules) is a tool for **database management** developed by *NC3A*[16] which permits to build, **maneuver and organize orders of battle** in order to insert them in the applications TOPFAS and *ADAMS*. This data can be transferred to the French "SICF" (CIS).

Which assistance is not provided?

TOPFAS does not allow confrontation of friendly and enemy COAs in a dynamic manner.

TOPFAS is mainly a planning assistance tool. Only the use of the series of NATO software provides some elements useful for decision making especially for moving troops and its consequences on planning.

Assistance for planning and force generation in an engagement on the homeland territory

To put forward the Army's position from the initialization of the decision making process conducted by the Joint Staff ("EMA") and to formalize as soon as

possible a mandate vis-à-vis its planning chain (Land Forces Command - "CFAT"- and Land Logistic Forces Command -"CFLT"), Army's EMO requested CFAT to realize a simple and complete tool for planning the engagement on the homeland territory.
In concrete terms, this tool enables the **identification of major capabilities and specific know-hows likely to be implemented** to reinforce under short notice the civilian resources which could reveal non-existing, insufficient, unavailable or inadequate to face serious circumstances. **Indirectly, design of strength and type of units is facilitated when viewing the identified know-hows.**

This tool allows a capacity assessment in a first approach, in order to deliver a quick answer to an information request. This tool was put in place under Excel with some macro-commands under *Visual Basic (VBA)*. Its operation and data updating are subsequently facilitated.

Developed within 2 months by 2 officers from G5, it enables time savings in a mission analysis where an answer is urgently required. It also speeds up the force generation.

Assistance for conducting operations

CFAT experimented the **APLET[17] demonstrator** stemming from a preliminary DGA study plan.
The purpose of this tool is to assess the interest and the employment concept of simulation as an aid for planning engagement in a CP of a formation at levels 2 (division) and 3 (combined-arms brigade) being equipped with SICF.
This kind of tools would be used by the S5 cell of the brigade CP.

Focusing point of APLET project, the main concept consists of using simulation models adequate for each CP level to assist the officers in the 2nd stage of the military decision-making process ("MEDO[18]"), i.e. elaborating the maneuver. This assistance is applicable in the stages of confrontation of courses of action, when selecting the friendly COA, when writing the related paragraphs of the operation order.
The tool looked for should adapt to operational constraints, especially
- **minimizing the work load** of users,
- delivering outcomes within **a short period of time.**

CDEF/DSRO[19] provided its expertise in terms of validation of mathematical models, of modeling tactical missions, of delivering operational data. These models comply with the branches doctrines of employments. A series of "triggers" associated with missions (if ENY observation does... if attrition > 30% does... etc.) enables to bring confrontation closest from reality. These complex models are represented as decision flow charts (if yes then... otherwise...).

What assistance for decision making is it providing?

Initially designed to facilitate the **selection of the preferred course of action** through confrontation of friendly COAs with enemy COAs, APLET reminds some civilian *war games*. **Confrontations are led in speed up time** and APLET issues several key indicators providing the needed elements for decision making. The "re-play" mode enables analysis of a specific "combat" phase. The inspiration from JANUS is visible.

Once some problems of input inherent to the software youth have been solved, APLET should be capable not only to provide the assistance for which it has been developed but **also to provide a determining contribution in the amendment of selected COA** and potentially in **assisting in decision-making when conducting the selected maneuver.**

On the one hand, according to experience, APLET does not permit to reduce decision making times. On the other hand, it enables to work in detail on the amended COA. So the COA being validated and issued to subordinate echelons is more refined.

APLET could also be used in the conduct phase to better anticipate the maneuver or identify drifting from initial planning while using simulation/re-play of the COA at the same tempo as real maneuver.

1 CP: Command Post.
2 MANFUT - manoeuvre future = future maneuver.
3 WINGO: Warning Order.
4 GTIA: Groupement tactique interarmes: Combined Arms (Battalion) Task Force.
5 TOC: tactical operation center.
6 RGP: Recognized ground picture.
7 CFAT : Commandement de la Force d'action terrestre : Land Forces Command.
8 Not to be confused with training tools by simulation which require staff to interface between simulation and players.
9 CROSAT - Centre de recherche opérationnelle et simulation de l'armée de terre : Army Simulation & Operational Research Center.
10 LCC: Land Component Command.
11 Gamma.
12 OPP: Operational Planning Process.
13 MAB: mission analysis briefing.
14 DB: decision briefing.
15 ADAMS is one of the softwares with ACROSS (Allied Resource Optimization Software System) and *LOGREP (Logistics Reporting),* of the family *LOGFAS (Logistical Functional Area Services)* NATO developed.
16 NC3A: NATO Consultation Command Control Agency.
17 APLET : aide à la planification et à l'engagement tactique. Assistance for planning and tactical engagement.
18 MEDO : méthode d'élaboration d'une décision opérationnelle. (French) Military Decision-making Process.
19 DSRO : division simulation et recherche opérationnelle. Simulation and Operational Research Division of the Forces Employment Doctrine Center.

For obvious reasons, these assistance tools for decision making are delivering and will possibly deliver in the future only **an unperfected representation of reality.**

However, they enable **an acceleration in the work of writing orders** and also provide **a more and more valuable assistance for decision**, at least to avoid a number of discrepancies and frictions, and to manage in order that the plan not to be the first victim of combats... **The more operating staff are involved in the conception of these tools through lessons learned and operational analysis, the more they will control them and make them efficient...**