Good morning,

My name is Maj Renato MARZO. I am a Defense Planning Analysis Staff Officer in the Operational Analysis Branch, CE&I Division, ACT.

With this presentation I will give you some info on the CDAG methodology and its application with regard to the OLCM Project.

This is the agenda.
I will spend some words on the logistic planning concept we tested with the CDAG methodology.
Then I will describe the application of CDAG methodology to the mentioned concept.
Finally, I will give some conclusions and recommendations.

The problem with NATO Logistics is how to optimize the logistic support of a Multinational Force that is still relying on National Supply Chains.

Previous and current NATO operations have been supported by effective, but mostly independent, often uncoordinated, and unnecessarily duplicative national support capabilities.

Troop-contributing nations provide much of NATO logistics, effectively creating multiple supply chains. This results in redundant support chains, increased costs and an excessive logistics footprint.

The NATO Nations agreed on the principle of COLLECTIVE RESPONSIBILITY for Logistics : Neither NATO nor a Nation is capable of assuming complete responsibility for the logistics support of a NATO operation.

As a consequence, NATO and nations bear the obligation, taking account of each others' requirements and constraints, to cooperate in the logistics support of operations in a way that their common effort meets the overall requirement.

BUT!

There is no clarity on how this collective responsibility should re realizes. No clarity on roles and responsibilities!!

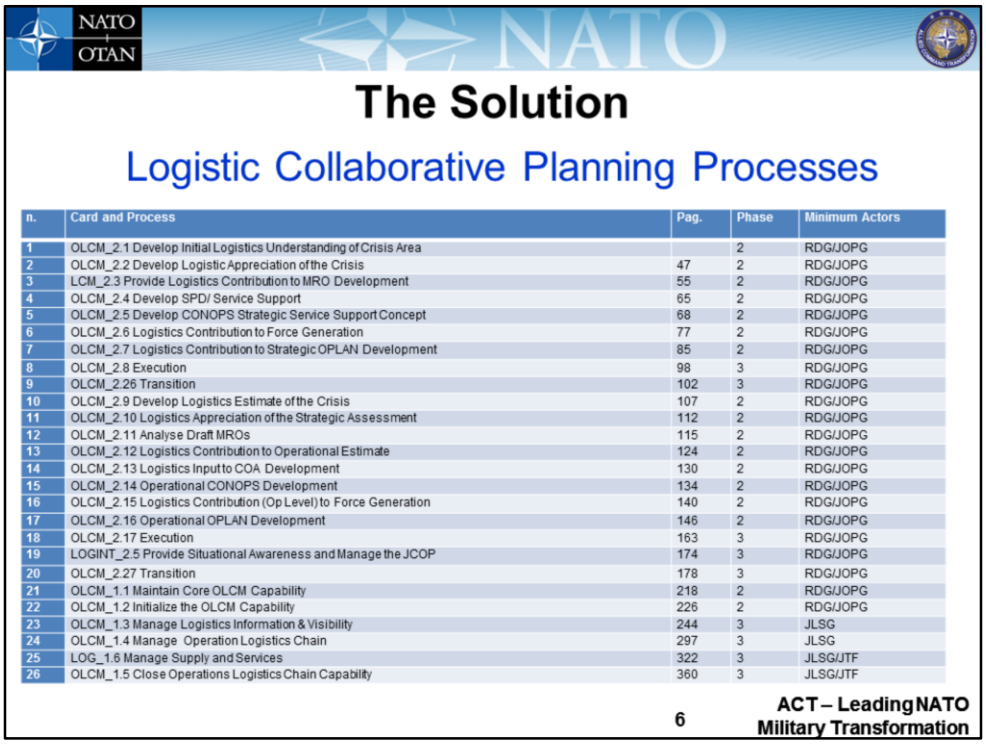
For this reason, the Allied Command for Transformation started in 2006 a project aimed at improving NATO Logistics by developing a capability, named OLCM, designed to **optimize the collaborative planning and coordination of logistic support to the NATO operations**.

In late 2013, the so called OLCM Project Team had completed the creation of the Logistic Collaborative Planning Business Process Model, a decomposition and graphical depiction of all the logistic processes enabling the Logistic Collaborative Planning, identifying:

- roles and responsibilities
- information exchanges requirements
- interactions among all the contributors

And providing a common framework based on:

- Multinational information sharing
- Early engagement of the national logisticians
- Integration of contractor support solutions.



NATO OTAN

The Solution

Logistic Collaborative Planning Processes

n.	Card and Process	Pag.	Phase	Minimum Actors
1	OLCM_2.1 Develop Initial Logistics Understanding of Crisis Area		2	RDG/JOPG
2	OLCM_2.2 Develop Logistic Appreciation of the Crisis	47	2	RDG/JOPG
3	LCM_2.3 Provide Logistics Contribution to MRO Development	55	2	RDG/JOPG
4	OLCM_2.4 Develop SPD/ Service Support	65	2	RDG/JOPG
5	OLCM_2.5 Develop CONOPS Strategic Service Support Concept	68	2	RDG/JOPG
6	OLCM_2.6 Logistics Contribution to Force Generation	77	2	RDG/JOPG
7	OLCM_2.7 Logistics Contribution to Strategic OPLAN Development	85	2	RDG/JOPG
8	OLCM_2.8 Execution	98	3	RDG/JOPG
9	OLCM_2.26 Transition	102	3	RDG/JOPG
10	OLCM_2.9 Develop Logistics Estimate of the Crisis	107	2	RDG/JOPG
11	OLCM_2.10 Logistics Appreciation of the Strategic Assessment	112	2	RDG/JOPG
12	OLCM_2.11 Analyse Draft MROs	115	2	RDG/JOPG
13	OLCM_2.12 Logistics Contribution to Operational Estimate	124	2	RDG/JOPG
14	OLCM_2.13 Logistics Input to COA Development	130	2	RDG/JOPG
15	OLCM_2.14 Operational CONOPS Development	134	2	RDG/JOPG
16	OLCM_2.15 Logistics Contribution (Op Level) to Force Generation	140	2	RDG/JOPG
17	OLCM_2.16 Operational OPLAN Development	146	2	RDG/JOPG
18	OLCM_2.17 Execution	163	3	RDG/JOPG
19	LOGINT_2.5 Provide Situational Awareness and Manage the JCOP	174	3	RDG/JOPG
20	OLCM_2.27 Transition	178	3	RDG/JOPG
21	OLCM_1.1 Maintain Core OLCM Capability	218	2	RDG/JOPG
22	OLCM_1.2 Initialize the OLCM Capability	226	2	RDG/JOPG
23	OLCM_1.3 Manage Logistics Information & Visibility	244	3	JLSG
24	OLCM_1.4 Manage Operation Logistics Chain	297	3	JLSG
25	LOG_1.6 Manage Supply and Services	322	3	JLSG/JTF
26	OLCM_1.5 Close Operations Logistics Chain Capability	360	3	JLSG/JTF

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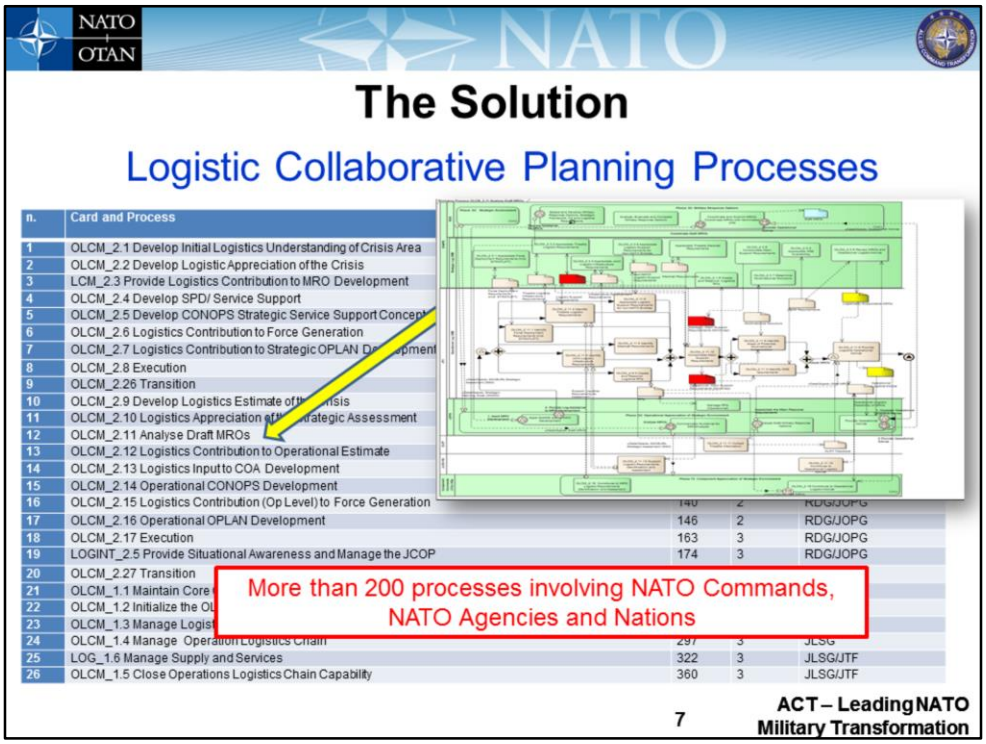
In this slide, we can see listed the main macro processes of the LCP BPM.

Each of them is furtherly decomposed in several sub-processes and so on. For a total of more than 200 processes and sub processes

Here is an example of a Business Process Diagram (BPD).



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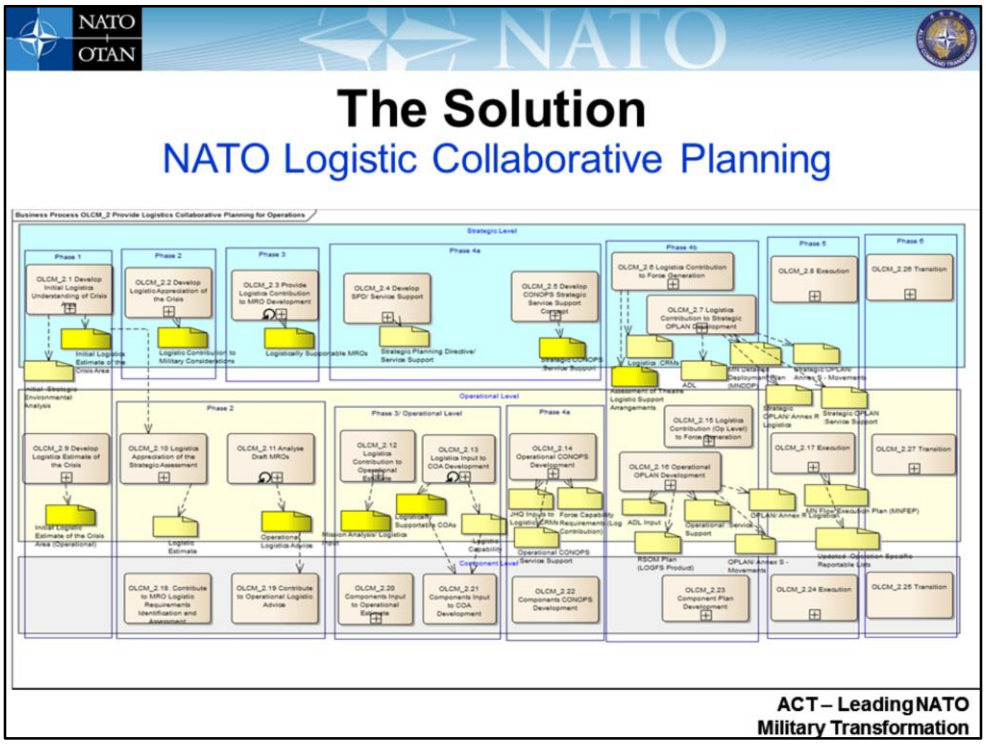
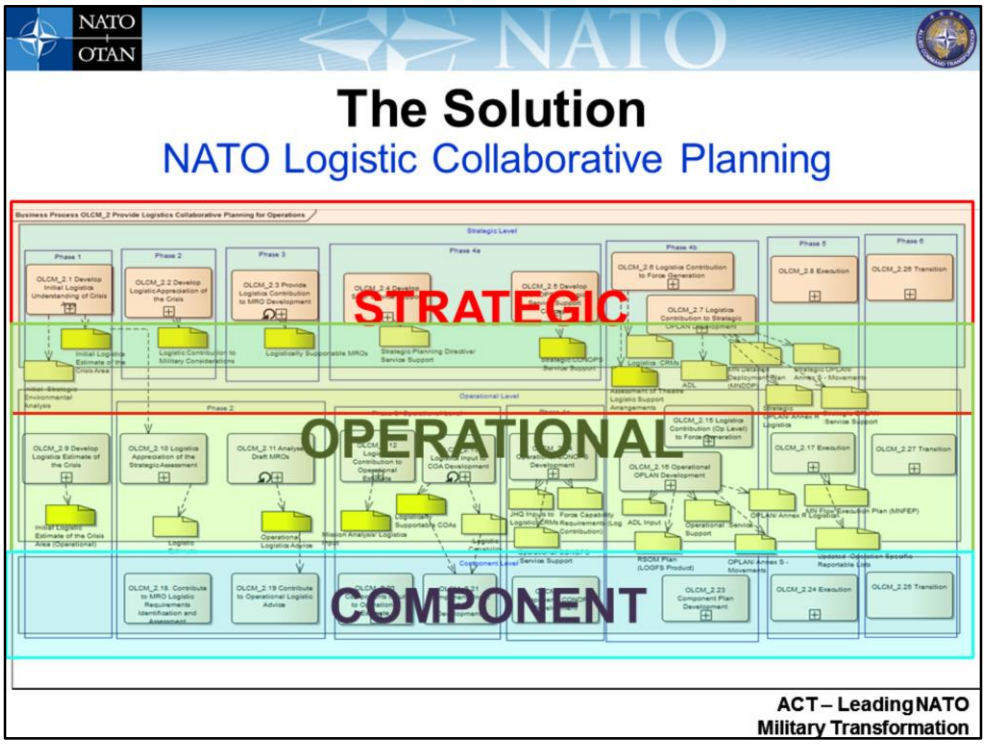


These processes mapped for the first time with the BPM methodology the collaboration among SHAPE, the NATO Joint Force Commands, the Joint Logistic Support Group HQ, the NATO Services and Procurement Agency, the NATO Communication and Information Agency, and the National Joint Operation Center in order to contribute to the planning of a Crisis Response Operation.



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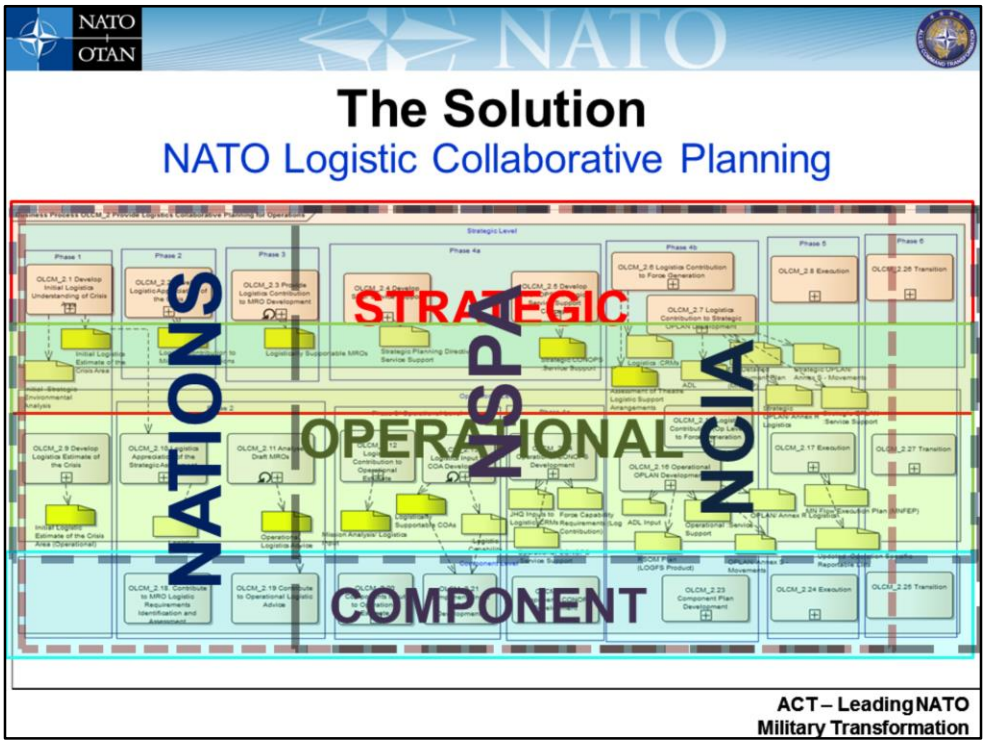

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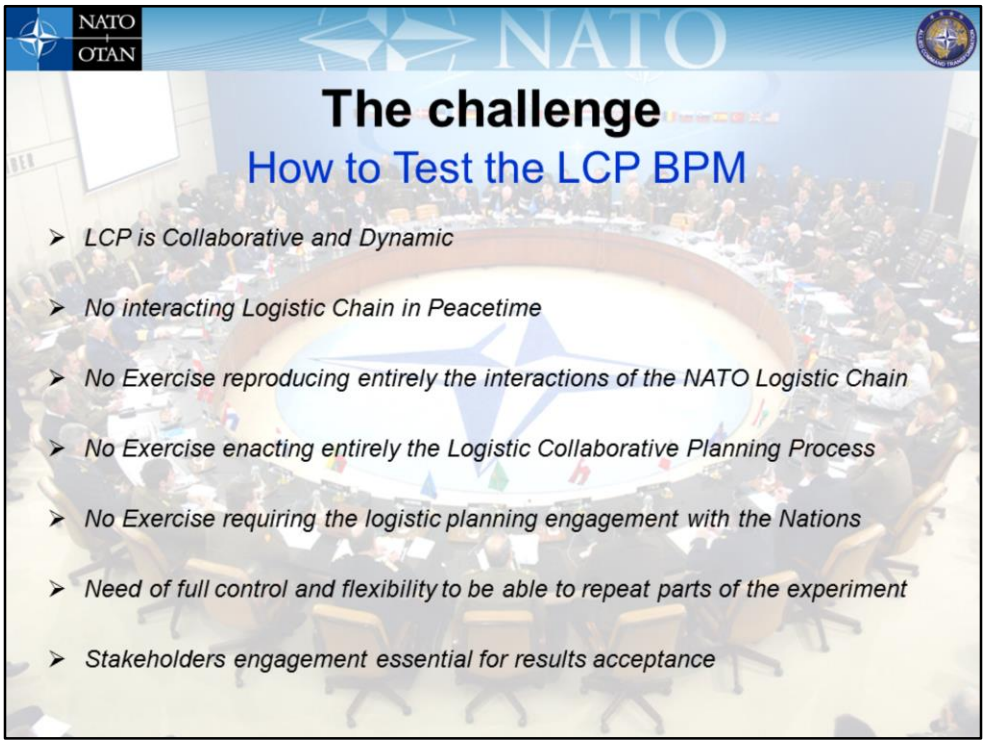


Once completed the LCP BPM, ACT, as part of the NATO Concept Development and Experimentation Process, had to organize an experiment with the aim to assess the practicability and the utility of the new processes.

This was not easy task as:

1. NATO Logistic Planning as described in the BPM is COLLABORATIVE. Parallel, not sequential, collaboration among Nations, NATO HQs and NATO Agencies is the engine of the OLCM proposed solution. Thus, we <u>needed</u> to observe Interactions.

BUT

1. There is not a NATO Logistic Chain in Peacetime. The NATO Logistic Chain is created when there is a need, such a NATO Operation.

2. Logistic Collaborative Planning is a part of the NATO Operation Planning Process. The NATO Operation Planning Process itself can only be observed when it is conducted or when it is exercised.

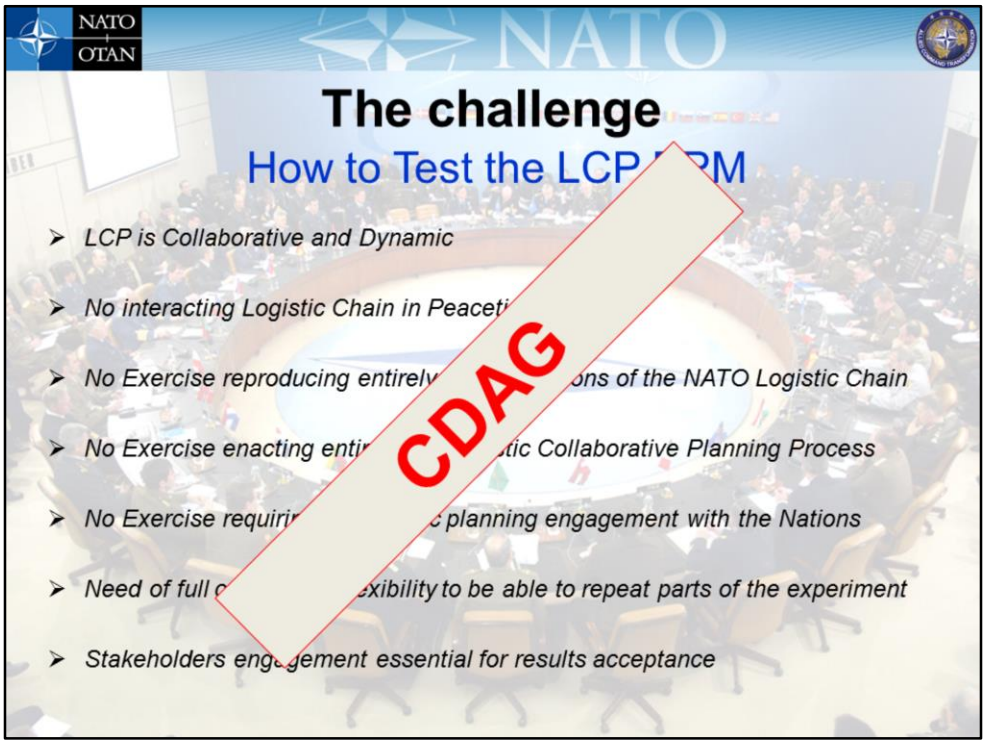
3. Exercises are focused on Operational (Fighting) considerations not Logistic. Thus the Logistic Chain is not realistically activated or entirely involved in NATO exercises. Things are slowly changing.

4. Logistic Collaborative Planning is not entirely played in Exercises. Most of it, such as the nations involvement is only simulated.

5. The Nations are not required to participate to logistic planning if not as observers

6. Ideal testing often requires repetition. This means full control of the exercise execution of these processes step by step according to the sequence highlighted in the BPM

7. Success for the LCP BPM was heavily dependent on stakeholder acceptance of the proposed solution as requiring a new form of commitment from the Nations. All NATO decisions are made by consensus, after discussion and consultation among member countries. Consensus decision-making means that there is no voting at NATO. Consultations take place until a decision that is acceptable to all is reached. Sometimes member countries agree to disagree on an issue. The consensus principle applies throughout NATO. Also at Transformational levels where the ACT operates.



The experimentation then presented a set of complex organizational requirements that led to the selection of the CDAG as methodology for experimentation.

NATO OTAN

NATO

AGENDA

1. LOGISTIC PLANNING
2. CDAG
3. CONCLUSIONS

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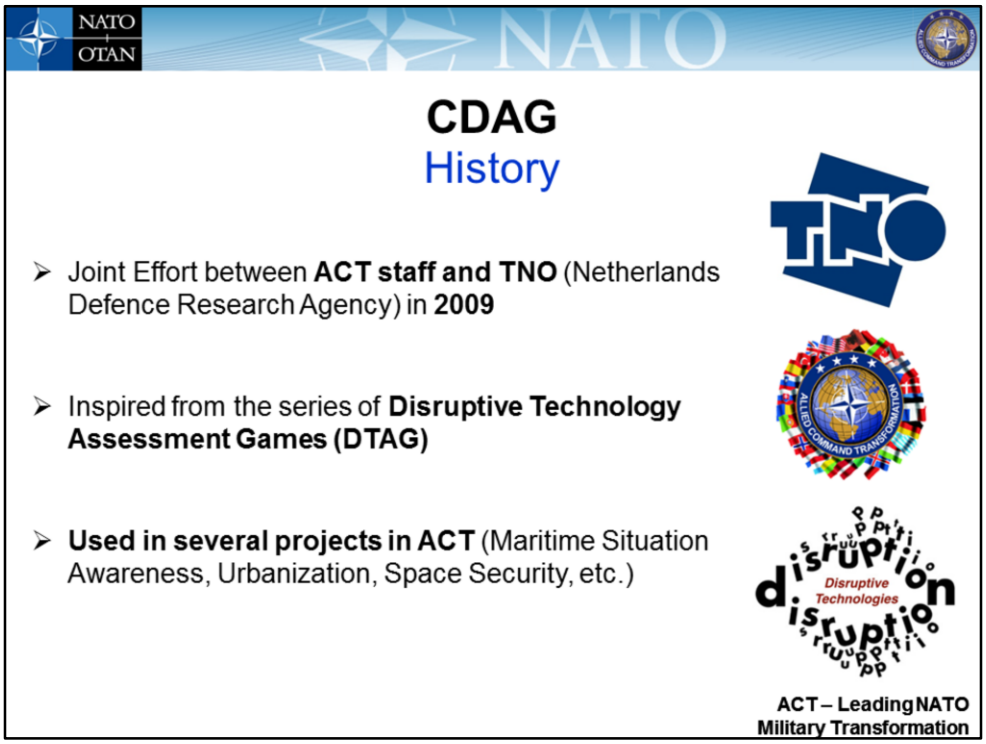
So, what is a CDAG?

CDAG is a qualitative, not a quantitative analysis methodology.

CDAG provides an environment for rich discussions which are the main source for data collection.

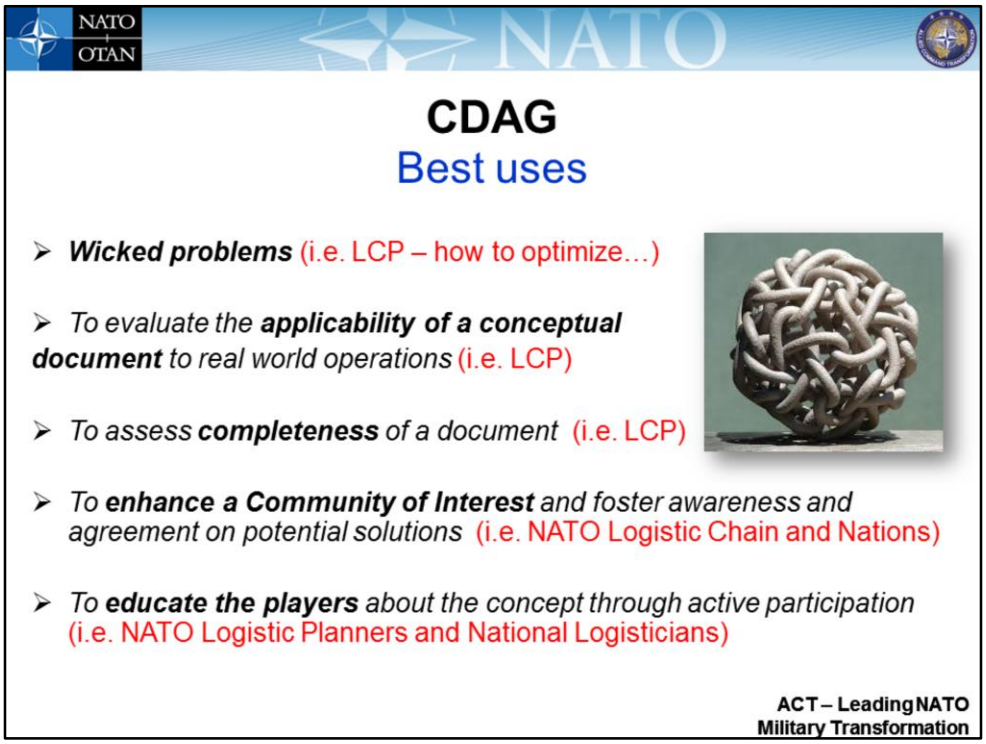
CDAG provides recommendations through a collaborative process



Joint Effort ACT – TNO

Evolution of DTAG, created through the NATO Science and Technology Organisation

Used in several project in ACT to test business processes and tactics in order to refine them before implementation into a live exercise,
because it is simple, low cost and good for tackling wicked problems engaging stakeholders since the beginning and all along the process of concept development.



Wicked Problems. Difficult, non-quantifiable problems that do not lend themselves to mathematical solutions. They seem particularly intractable to resolution because of inscrutable interdependencies and tend to evolve reacting to proposed solutions. Stakeholder agreement is essential part of solution.
The LCP had elements of wicked problems as it implied voluntary disclosure of national information, multinational solutions conflicting with National Interests, conflicting views of NATO HQs roles and responsibilities, etc.

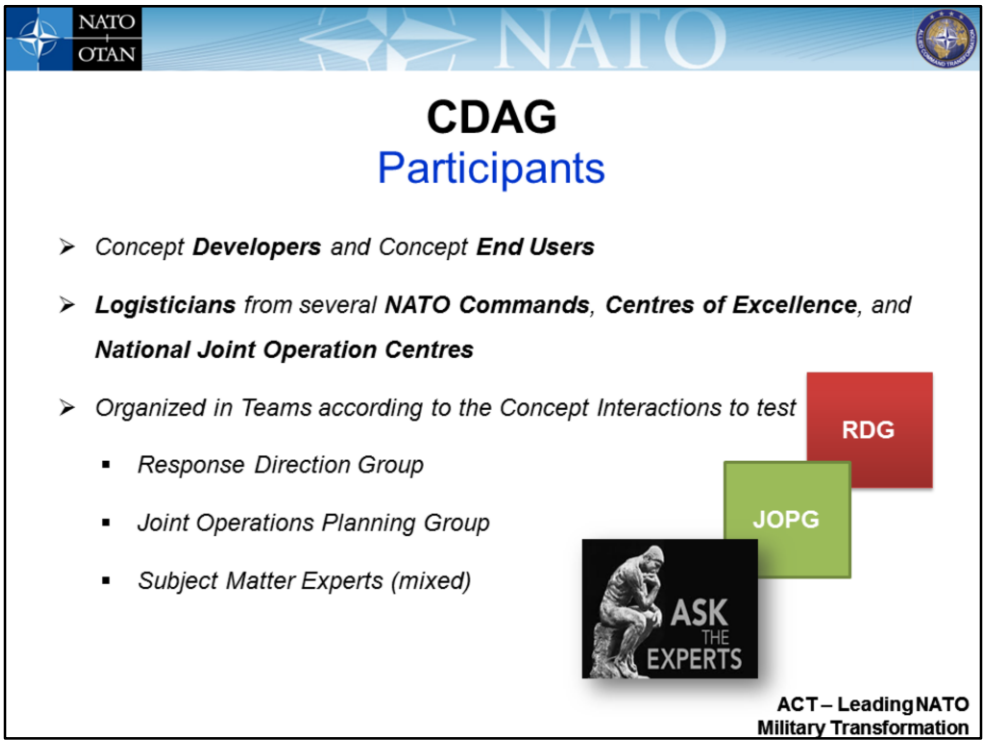
Conceptual Document Applicability. For example, the document may be in the form of guidelines for an operator and a CDAG can be played using operators as players who can assess the value of the guidelines and their applicability to the tasking. **This also was the case for the LCP, containing detailed instructions and business procedures that the end users had to follow in order to generate the desired end state.**

Conceptual documents completeness. The CDAG can be used to test and refine many types of documentation, including concepts, doctrine, policies, handbooks and business processes. If a document needs further development a CDAG can be played to explore the options for development. **Again, this was the case for the LCP. We were asked in fact to assess its practicability of the processes as the combination of their completeness and correctness (for the processes to function)**

Stakeholder engagement. It facilitates the creation of a stakeholder community for

the subject area, or brings together an already existing community. It can then encourage frank discussion about how the theoretical capability may affect people in real life. It also empowers stakeholders to have their views heard at a potentially crucial stage of capability development. **The Logistic Chain needed to be reunited as the success of the LCP BPM was conditioned on the acceptance of all the logistic contributors.**

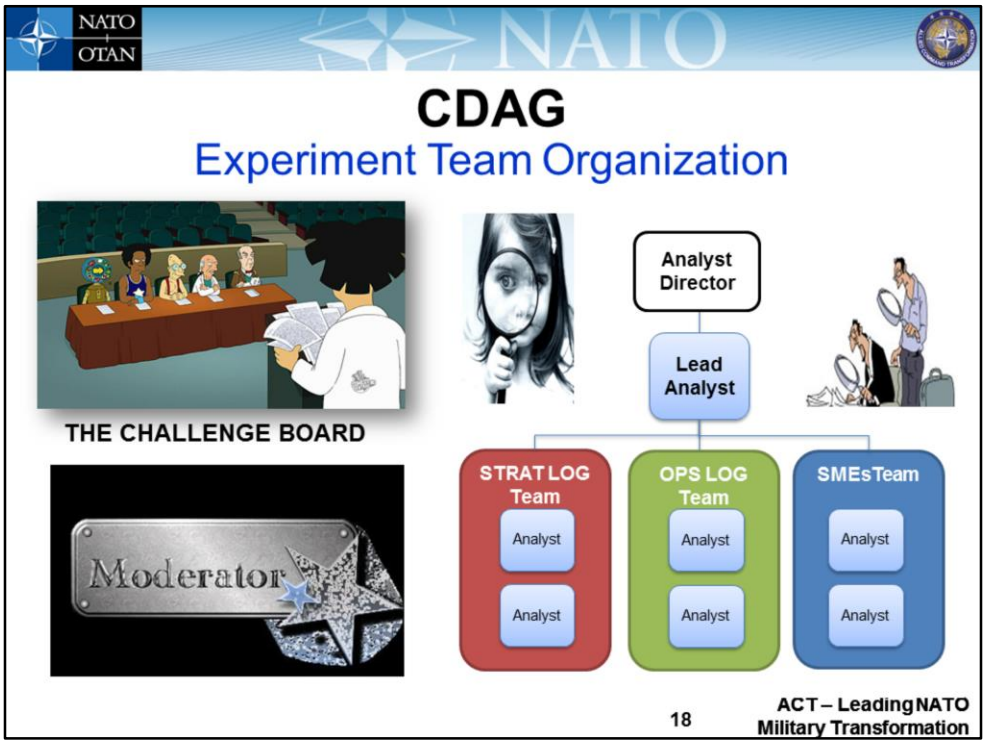
Educate Players. The CDAG is also a useful platform to train the players on the concept. The logisticians that participated in our CDAG greatly appreciated in their feedback this aspect of the event.



For the CDAG, ACT invited logisticians from all over NATO and the Nations Logistic Communities. SHAPE, JFCs, MLCC, HQ ARCC, FRA RRC, NRDC ITA, JAPCC, MC Northwood, NSPA, NCIA, ACT, JWC.

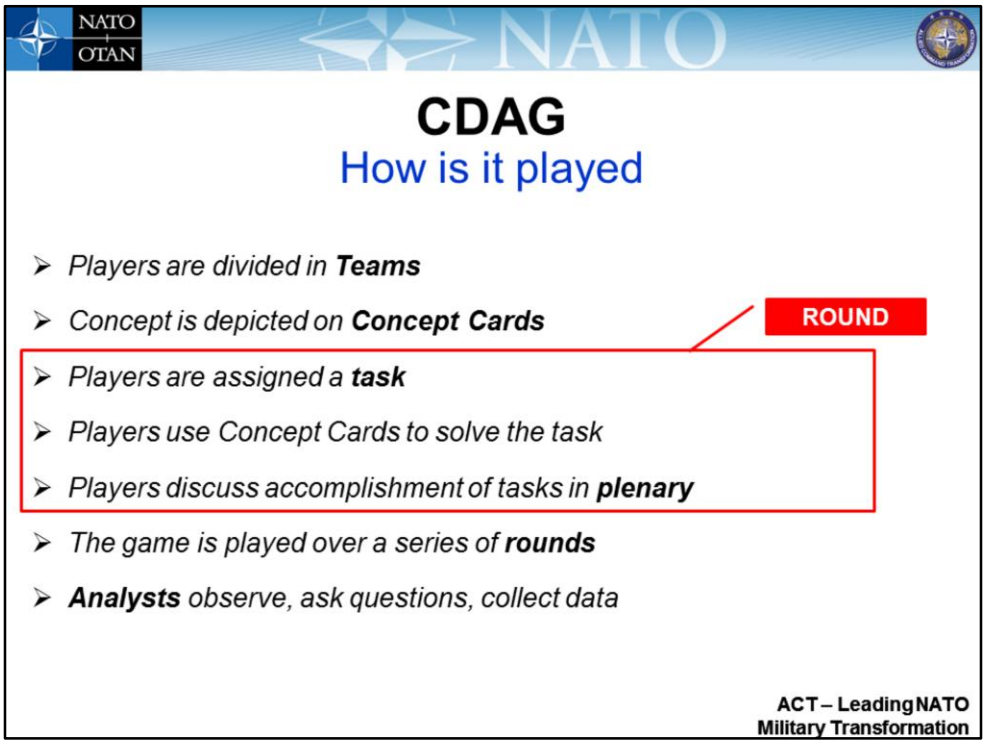
These were organized in Teams, based on their experience and on the number of processes to assess, with the aim to simulate: 1 Response Direction Group at the Strategic Level, one Joint Operational Planning Groups at the operational level, and 1 Team of Subject Matter Experts.

A demographic questionnaire assured the right composition of the Teams, balancing experience and knowledge.



The Experiment Team included also, as part of the CDAG methodology:

- The challenge board composed by the Project Manager, the Senior Concept Developer, the Stakeholders Representative and the Senior Analyst, with the task to focus and prompt the discussions on the use of the concept;
- The Moderator, with the task to enforce the rules during the event;
- the Analysis Team, with the task to collect data;

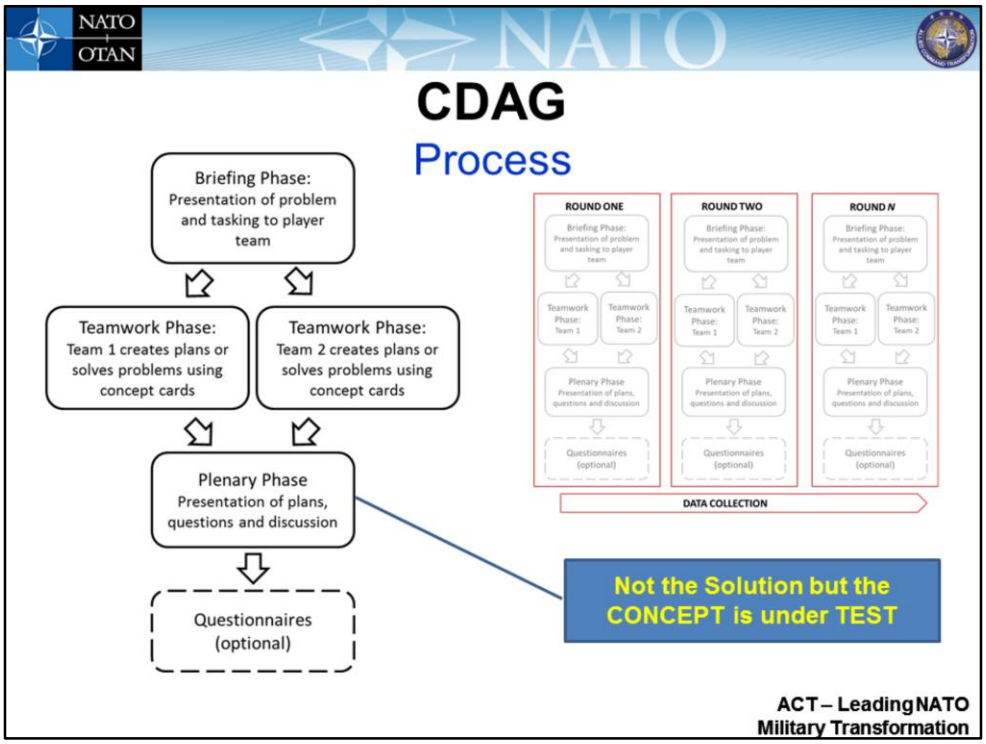


How is it played?

The focus of CDAG is simplicity.
To make a complex conceptual document simple and understandable, it is broken down into manageable elements and depicted on standardized concept cards.

Players can be directed to use certain concept cards to focus them on particular areas of the concept. Supporting technology is also simulated through the use of cards as the game requires no specialized systems or simulation.

A typical CDAG consists of six independent rounds that are played over three days, each round lasting half a day. The number and length of rounds is flexible however.



In this slide, we can see again the CDAG process in detail

Each round is composed of 3 phases: Briefing Phase, Planning Phase and Plenary.

In the briefing phase, each team is briefed on their individual tasking. They are asked to solve the task using the concept cards and to focus on specific aspects of the concept itself.

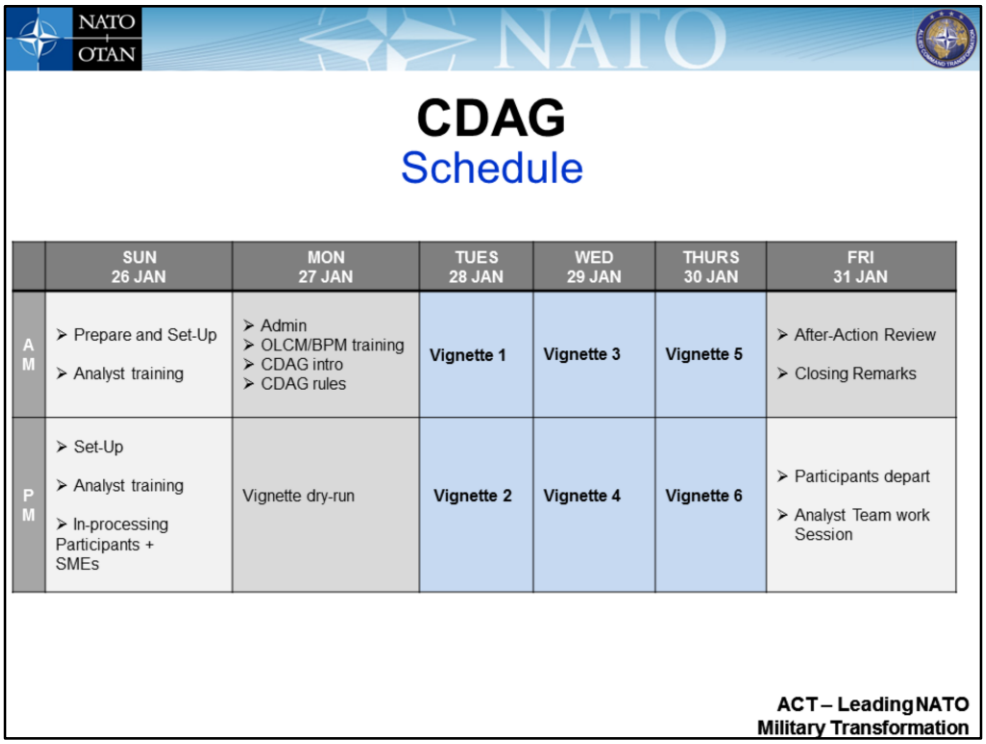
In the teamwork phase, the players complete the task set in the previous phase and prepare a briefing for the plenary in order to show how the concept was used to accomplish the task.

In the plenary phase, the Teams brief their actions and discuss the solution with the other Teams in front of a Challenge Board, that has the role of driving the players in deep into the solution and the use of the concept itself, even challenging the solution itself as a trigger for collective brainstorming. A moderator facilitate this session.

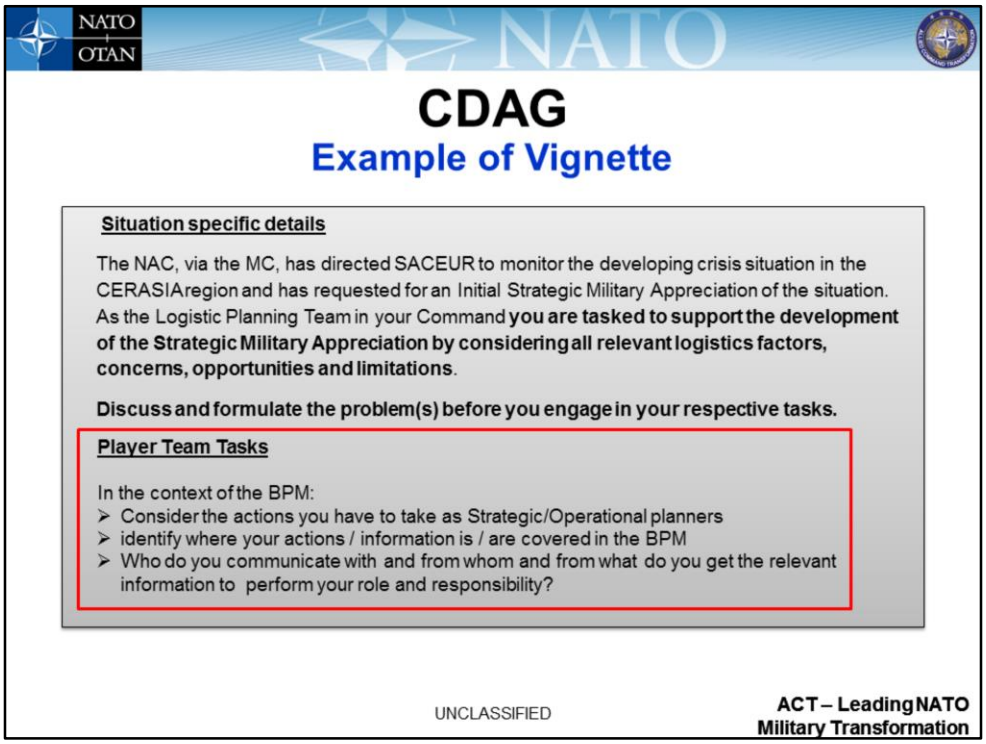
After the plenary, the players are asked to **fill a questionnaire** on their actions, on the application of the concept to the task and on their assessment on its utility.

The Players are supported by SME (experts in the Concept) and observed and interviewed by the Analysts.

The SME group conducts its own assessment parallel to the “Player Teams” in order to understand the same problems and challenges that the “player” teams were encountering. The SME team were also given the task to look at specific questions and provide focused questions for the Plenary Phase.



This is the schedule we had for the experiment. The CDAG was executed over 4 ½ days, starting with one day for introduction, training and rehearsal (on Monday), and three days of game play (Tuesday, Wednesday and Thursday) followed by a half day of After Action Review (AAR - Friday). During the three days of game, one scenario was used as backdrop for 6 vignettes to be played (½ day each).

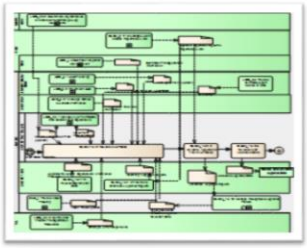


This is an example of a Vignette injected to the Teams. You can see in the red box the tasks assigned to the Players.

CDAG

Concept and Technology Cards

- ***Concept Cards***
  - ***Represent the elements of the concept under test***
  - *Concept translated into easy-to-digest format*
  - *Players use them as a planning aid*
  - *Questions directed at use of cards*



- ***Technology Cards***
  - ***Simulate technological capabilities available to end users***
  - *Can represent future technology*

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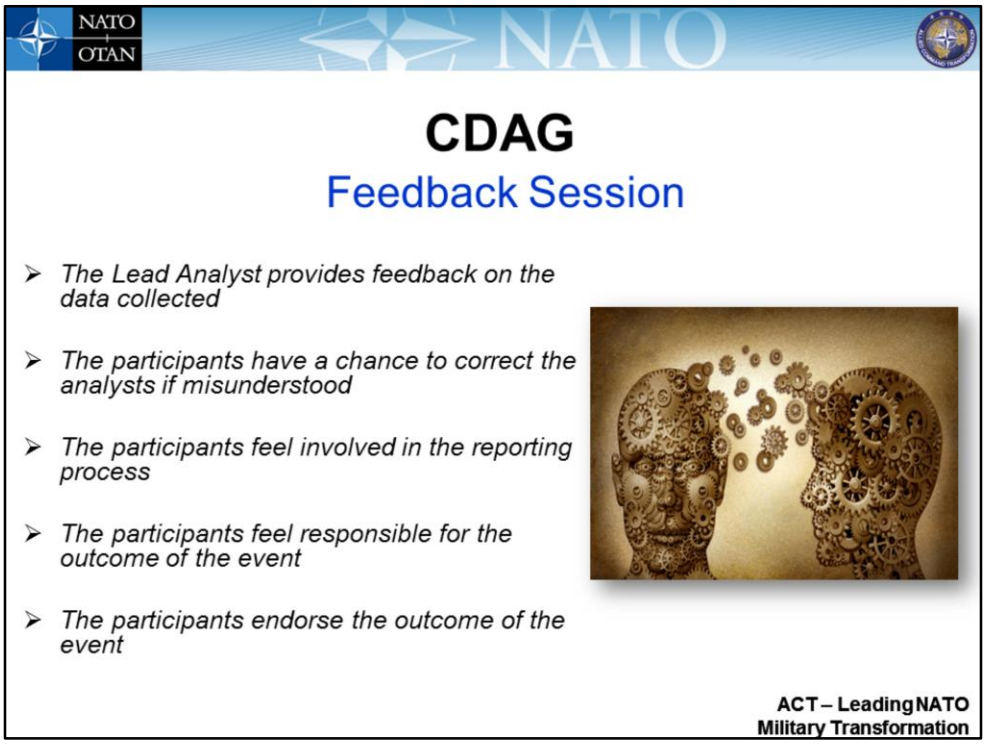
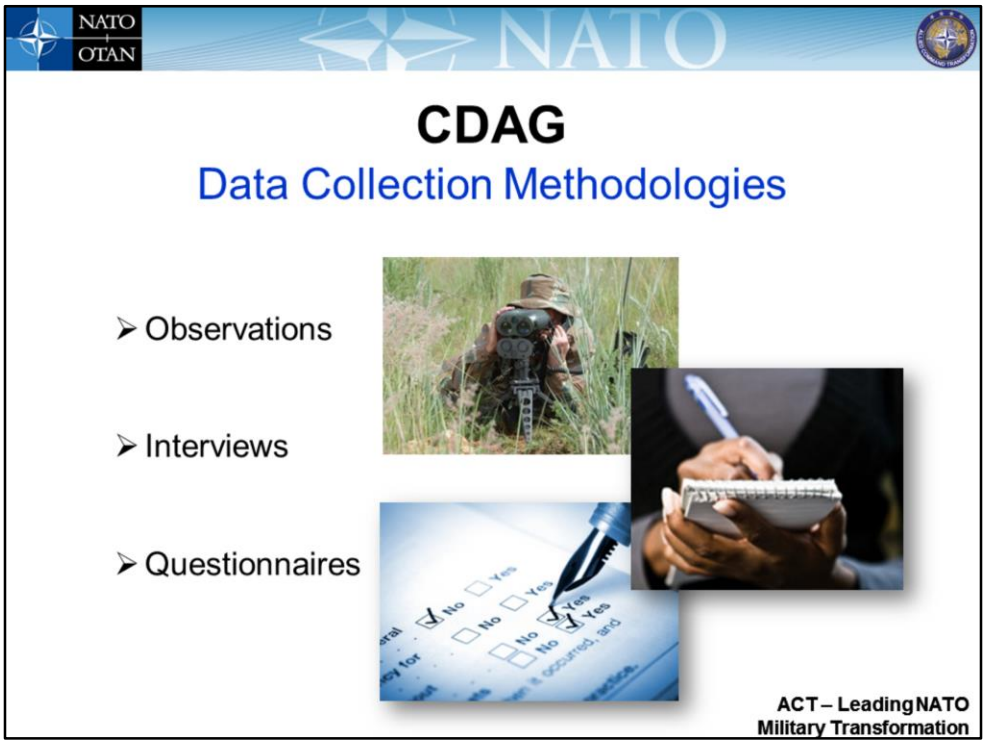
Here Examples of the concept cards that we used and of technology cards.

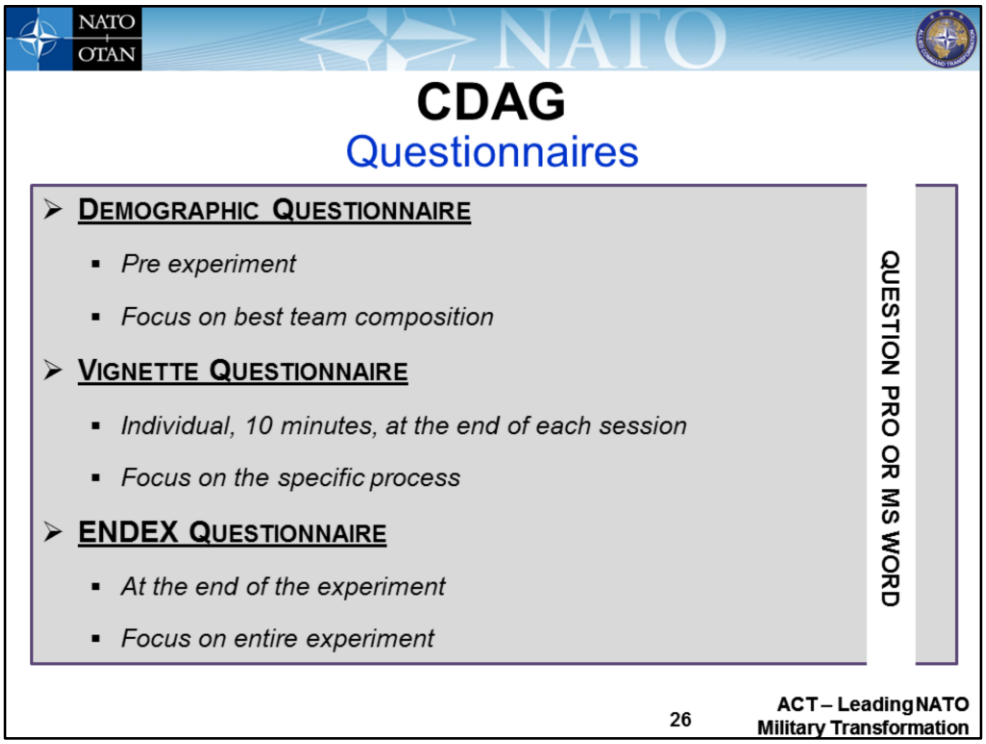


The last day of the CDAG we had a feedback session.
This session is used to provide detailed feedback to the participants, including initial analysis findings based on the data collected through observations, interviews and questionnaires IN ORDER TO:

- Clarify on the spot misunderstandings;
- Stimulate further last moment discussion on specific issues;
- Involve the participants in the outcome of the event;
- Have them feel part and responsible of the concept development process.

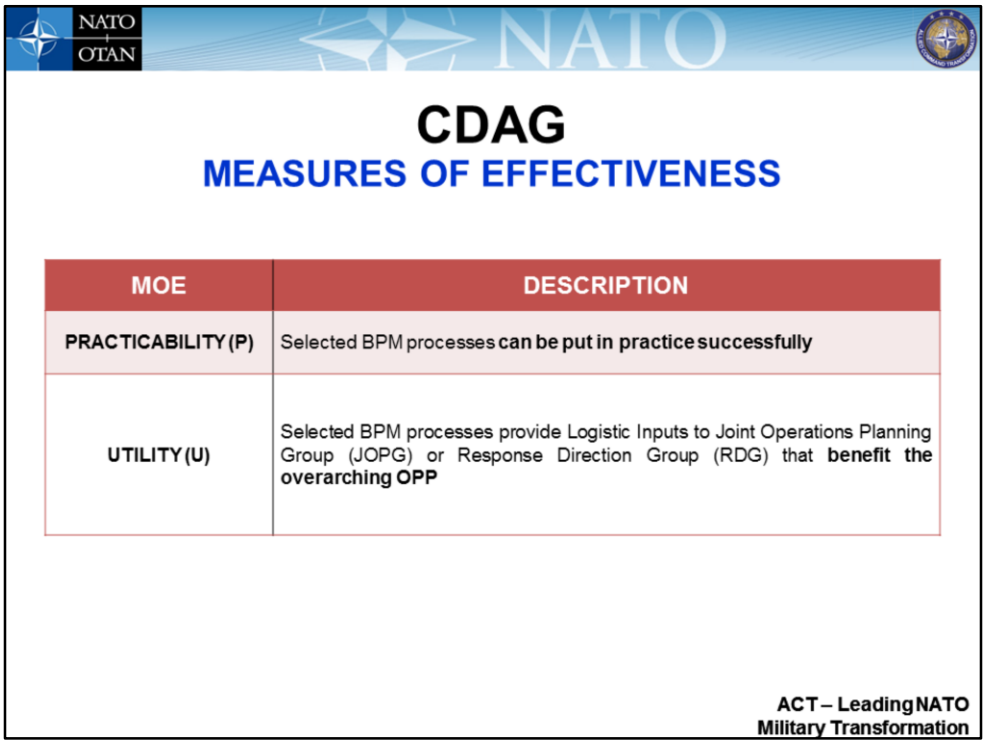


Data can be collected through observations during the planning and plenary phases, interviews and submission of questionnaires at the end of each plenary.

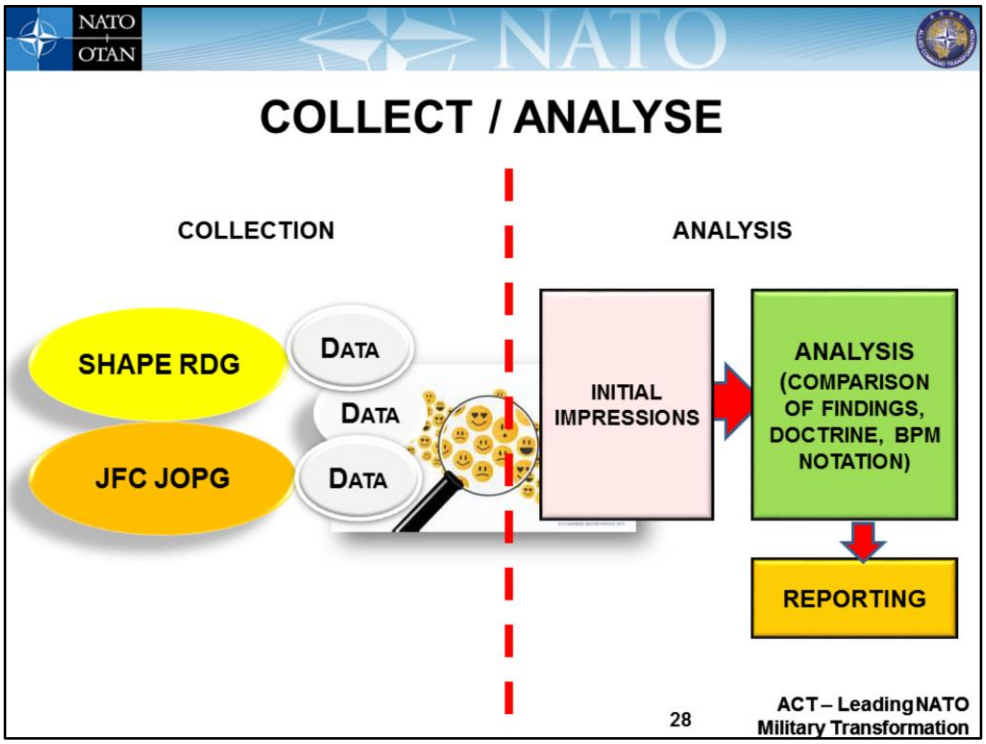


We had three different questionnaires, issued to the experiment audience, one of which using Question Pro® software:

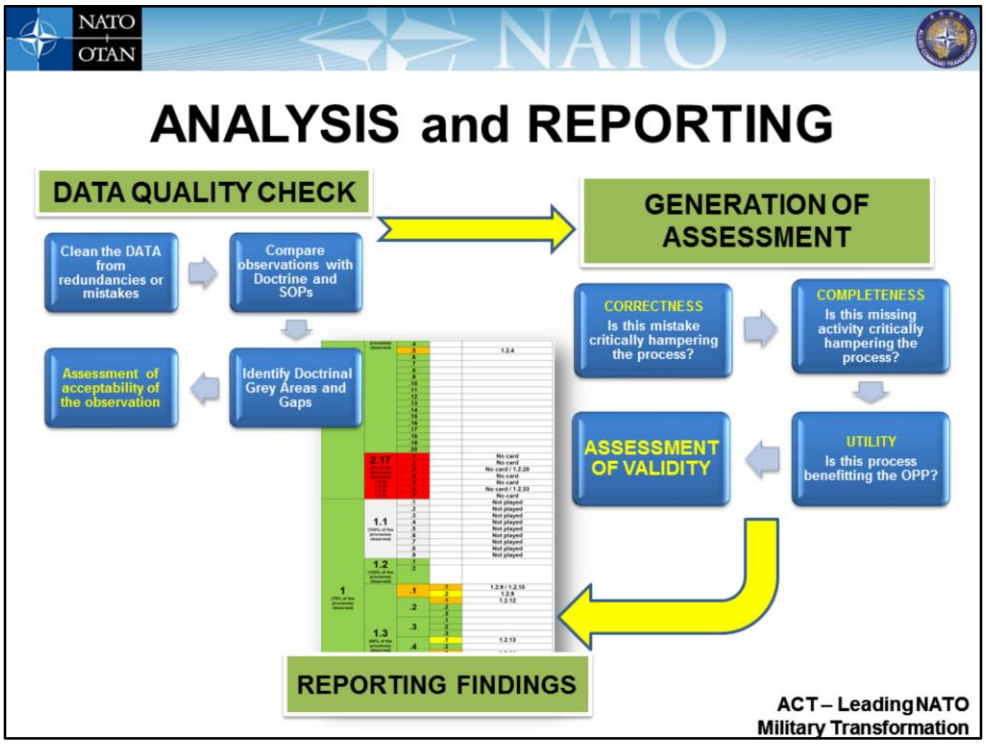
- A demographic questionnaire, to determine the relative operational / technical experience of the experiment participants. It ensured that the most appropriate people were selected for the appropriate team;
- A vignette questionnaire, to capture the individual assessment of the processes applied in the specific vignette;
- An ENDEX questionnaire to capture the individual overall assessment of the LCP BPM and of the CDAG methodology applied to the experiment.



The data collection was guided by pre defined metrics, measures of effectiveness and related measures of performance. These metrics had been defined in coordination with the stakeholders based on their idea of success for the LCP.



Concluded the CDAG, we started the analysis of the data collected.

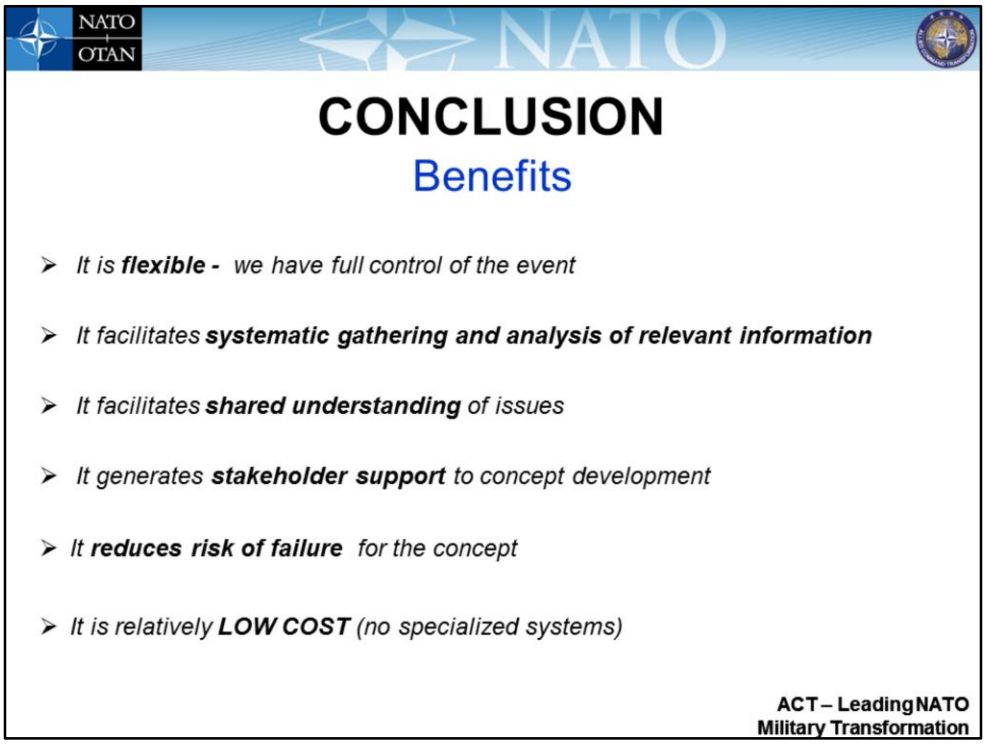


We conducted an Analysis Workshop in order to:

- assess the quality of the data collected
- translate the observation in robust assessment of validity of the processes they were referred to based on the agreed metrics
- Prepare the Analysis Report with the agreed findings

Validity as the effectiveness of a solution as defined by the stakeholders and perceived by the end user

I am now at the conclusion of my briefing.



The CDAG methodology compared to Experimentation in Exercise presented several advantages such as:

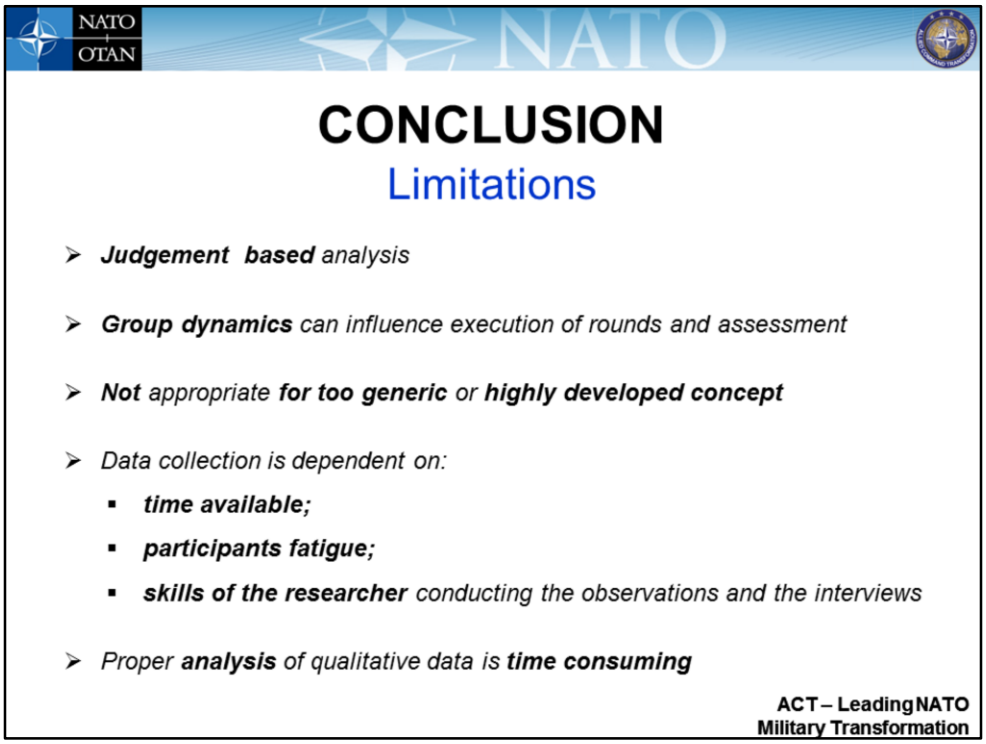
1. The CDAG has great flexibility; adjustments can be made in real-time so that over the course of an event, the game can be changed in order to steer towards specific aims and objectives. You cannot do this in an Exercise.

2. The stakeholders and the end users had the opportunity to use the concept, to challenge it collectively, and to suggest corrections. They all felt part of the process of concept development.

3. Analysts had several opportunities to observe and ask questions as the entire event was built around the data collection activity itself.

4. Low cost solution. We condensed in 1 week a 4 week long process. We had all the end-users reunited in the same place reducing travel expenditures and number of analysts deployed. CDAG did not require any specialized system or equipment.

5. It can test the concept in a theoretical, low-risk environment before the concept is tested in practice.



The methodology has also some limitations such as:

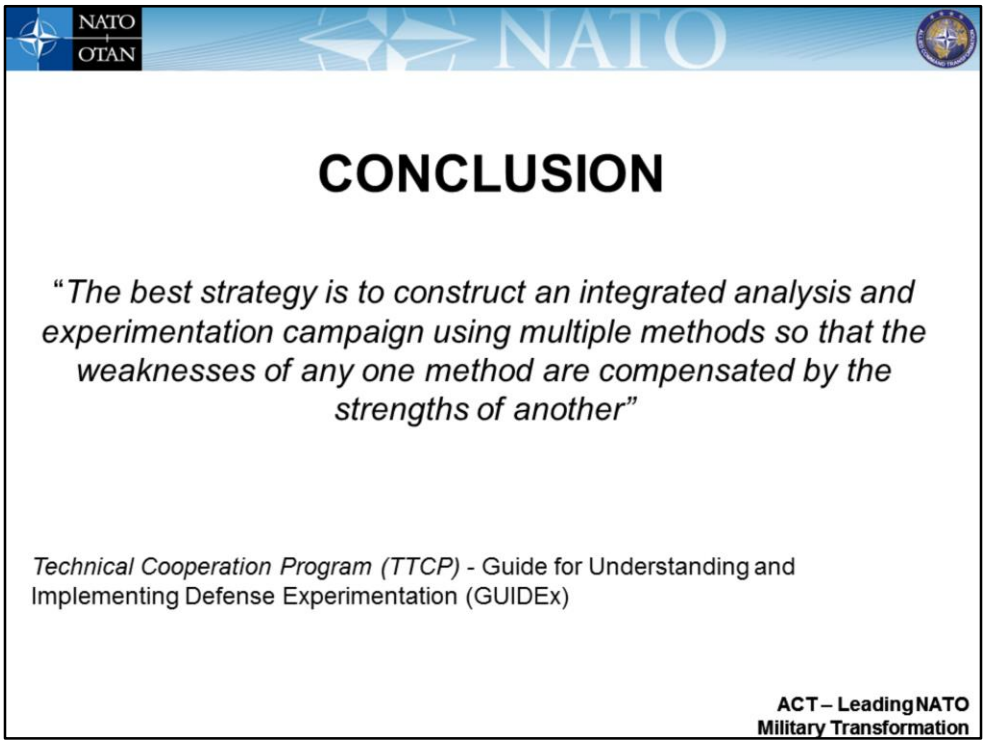
1. Assessments are based on Subject Matter Expert and Players opinion. This is the kind of DATA we collected. Thus it is subject to SUBJECTIVITY up to a certain level. We can introduced mitigation in order to increase rigor

2. Human and group dynamics can influence the execution of the CDAG and the assessment of the concept

3. Highly developed concepts are difficult to represent through cards. Their use often requires data and technologies that are rarely available in a CDAG. Concept at a basic level of maturity do not provide instead enough instruction to be usable to solve tasks.

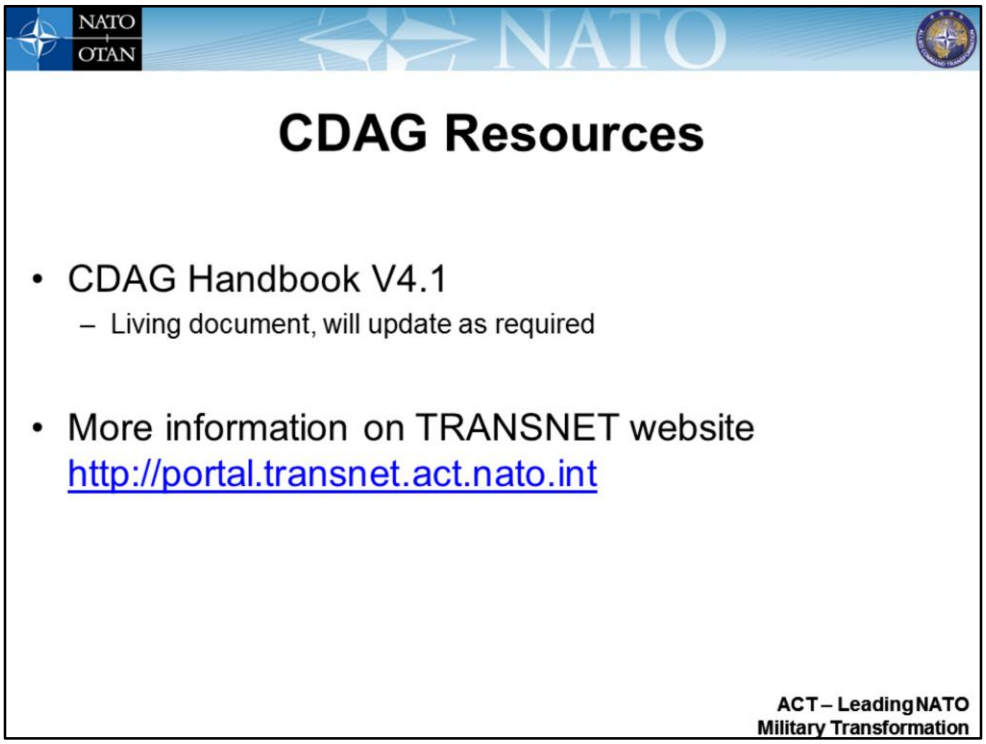
4. The data collection is dependent on time availability, participant fatigue, skill of researcher

5. Analysis is complex. It involves not only collecting the data but also transcribing, coding, and interpreting the data. It requires full knowledge of the issue and of all its interrelations.



In conclusion, a CDAG should never be chosen without giving due consideration to alternative analysis methods,
AND it is often appropriate for it to be played in conjunction with other methods in a 'campaign of analysis' as clearly expressed in this quote of the Technical Cooperation Program (TTCP), Guide for Understanding and Implementing Defense Experimentation (GUIDEx).
The Technical Cooperation Program (TTCP) is an international organization that collaborates in defence scientific and technical information exchange; program harmonization and alignment; and shared research activities for the five nations.

This concludes my briefing.



I will leave you with these references and with my contact in case you need more information