C2, information technologies and subsidiarity: from the asymmetry of information to asymmetry of knowledge

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Roadmap of the presentation

> **C2 and asymmetries of information**
>> Information vs Knowledge;
>> Autonomy, prescription and military action;
>> ICTs and information management;
>> ICTs and knowledge management;

> **C2 and asymmetries of knowledge**
>> ICTs and network implementation;
>> ICTs, autonomy and kowledge management;
>> Towards the emergence of joint competences
>> Résumé

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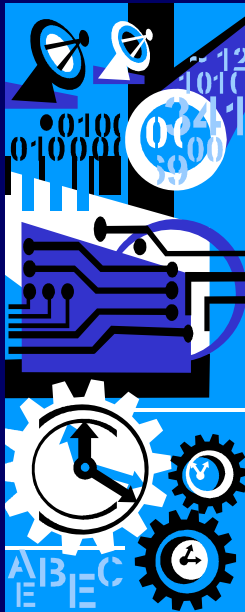the French Air Force*

Information vs. Knowledge

➢ **Information** :
message or signal.
Information corresponds to a flow of data or to a flow of messages.

➢ **Knowledge**
is related to aptitudes, practice and the accumulation of experience. Knowledge represents and results from embodied practices, it embodies answers to the problems raised by every-day or by the operational life.

The production of knowledge depends on learning processes, on individual and collective capacities.

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Autonomy and action : Knowledge *vs* Information

Subsidiarity :

…**implies to strike a balance between**
the unity of political and military responsibilities on the one hand
and the optimization of military operations efficiency on the other one

…incorporates an account for…

Information management

Knowledge management

… the level of prescription

… the definition of the principles ruling on action

… learning processes and competence building

Autonomy in the NCW doctrine

The distribution of authority is based upon the distribution of information and data

Kind of a *deterministic* vision of the efficiency of the introduction of ICTs

NCW concepts entail a redefinition of the repartition of responsibilities in command and control

Decentralization of decisions
Auto – synchronization
Shared awareness,
situational awareness

3 tendencies emerge…

Micro-management (Kosovo, 1999)

Centralization of decisions

Decentralization of decisions

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Prescription and military action

Military actions balance between

- ➢ the uncertainty associated to the mission(s) and opportunities emerging in its execution, …

- ➢ …and the possibilities of prescription made explicit in command intent, in mission planning and in the RoE

- ➢ The nature of prescription associated to C2 conveys either orders in an explicit way or on a generic basis

- ➢ The nature of prescription associated to C2 does not correspond to a style of command, but mainly depends on the nature of the missions, of the milieu and of the weapon systems required.

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ICTs, action and information management

Reference to the nature of action
The level of prescription depends on the nature of the military action and on the precision of command intent

The NCW doctrine minimizes the prescriptive character of action

ICTs are associated to the transmission of all elements prescribed to action by the command chain

Reference to the OODA loop (whatever its speed…)

ICTs and highly prescribed actions

FLEXIBILITY

The OODA loop improves its efficiency when it evolves at high speed levels, which requires Information be managed In a efficient way
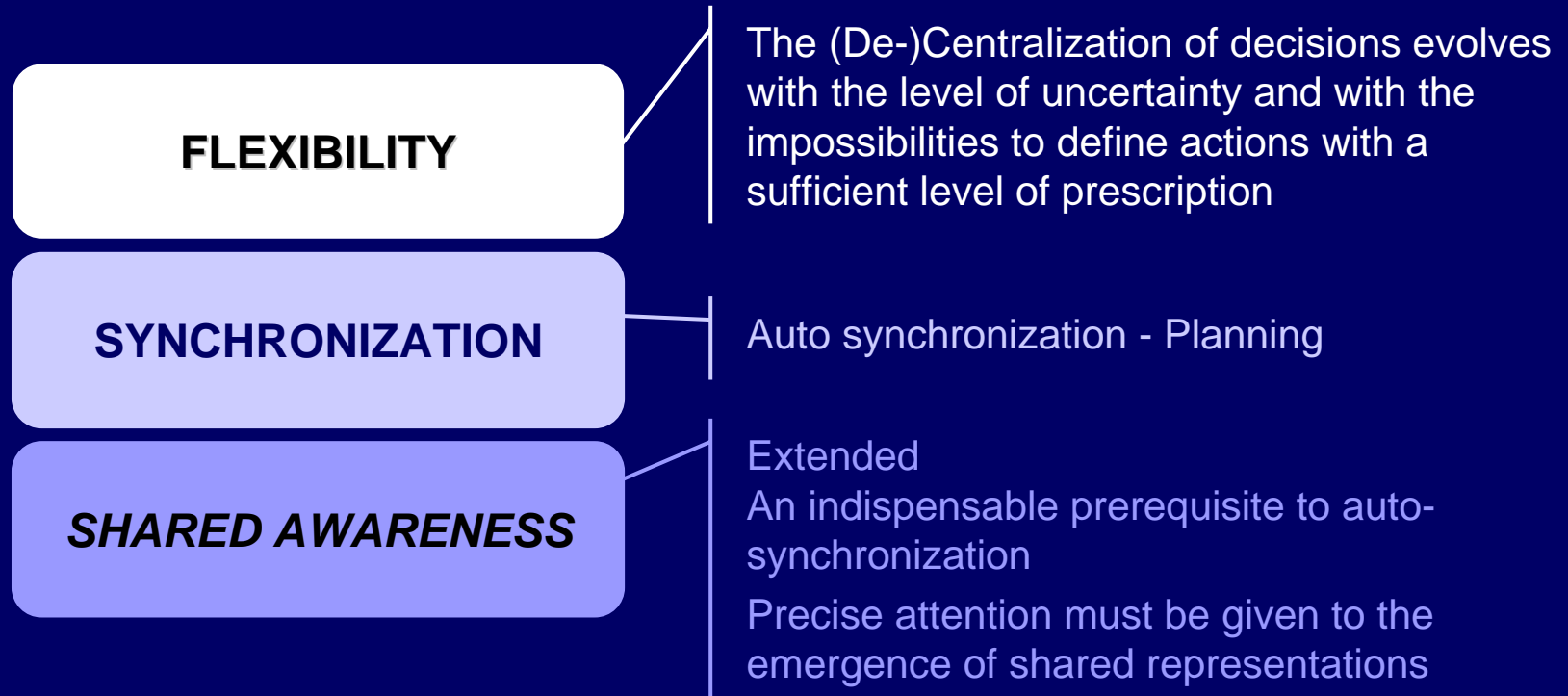
SYNCHRONIZATION

Coordination is improved thanks to a greater efficiency in codification of information and in action planning

SHARED AWARENESS

Restricted here to the various elements associated to military action which allow to cope with unplanned events
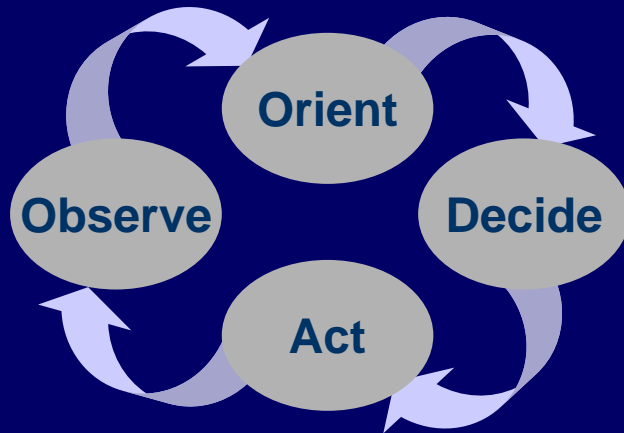
Large tendency towards centralization in the framework of prescribed actions…

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ICTs and actions defined at the level of principles

FLEXIBILITY

The (De-)Centralization of decisions evolves with the level of uncertainty and with the impossibilities to define actions with a sufficient level of prescription

SYNCHRONIZATION

Auto synchronization - Planning

SHARED AWARENESS

Extended
An indispensable prerequisite to auto-synchronization

Precise attention must be given to the emergence of shared representations

This description largely corresponds to the presentation made by the NCW doctrine…

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OODA and the information / knowledge flows

Technical aspects

Time processing depends on the technical aspects of the OODA information processes and on the technical solutions introduced in the C2 chain

Compressing delays relates to technical solutions

Decision processes

Time processing depends on brains and on the connections between the individuals' brain which need to interact

Compressing delays relates to learning processes

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  - ➢ ICTs and information management;
  - ➢ ICTs and knowledge management;
- ➢ **C2 and asymmetries of knowledge**
  - ➢ ICTs and network implementation;
  - ➢ ICTs, autonomy and kowledge management;
  - ➢ Towards the emergence of joint competences
  - ➢ Résumé

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ICTs and network implementation

- ➢ **New adaptation skills at all levels of the military hierarchy**
- ➢ **New organizational paths**
  - ➢ Transitioning from officers benefiting by necessity from some autonomy to officers integrated in a C2 network where action is delineated…
  - ➢ Competences and skills evolve towards more networks integration

Competencies are associated to the techniques prevailing in the organization (tactical level, staff) and strictly depend on practice and training

What is it to happen if suddenly networks and communication fall down?

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ICTs, autonomy and knowledge management

F16C GBU-31 JDAM

Competence building

➢ Specificities of context and of action schemes

➢ Efficiency of individual competences evolve between their emergence and their obsolescence

ICTs entail 3 major consequences:

- More efficiency in decision tempo

- Presence of the hierarchy in the process of competence building

- Evolution of the competences present in the C2 chain

Truly sharing *shared awareness*

Emergence of joint competences

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Towards the emergence of joint competences

The implementation of ICTs relates to 2 different aspects
- the conditions prevailing during the learning stages of the process
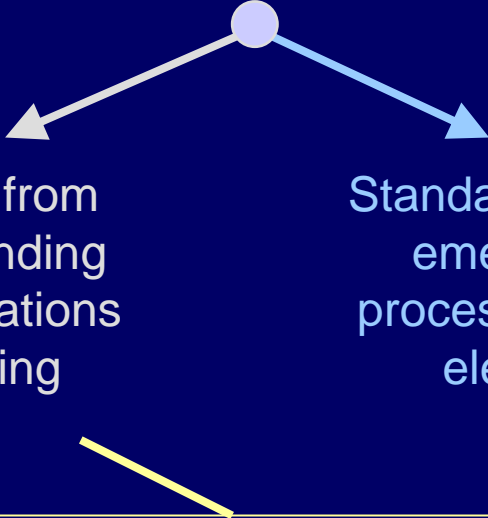- the compatibility of the results of the learning process

The impact of ICTs on subsidiarity is related to the possibility to elaborate new sets of knowledge, and refer to new contexts.

Knowledge construction is contextualized. Learning trajectories are context-dependent and milieu-committed

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Convergence towards joint competences…

> Convergence must emerge, which does not mean necessarily that actions schemes and routines specific to each milieu must be ruled out and merely replaced by new ones. Two options exist:

Coordination emerges from better mutual understanding and converging appreciations obtained in joint training

Standardization and codification only emerge from common learning processes starting from the deepest elements of tacit knowledge
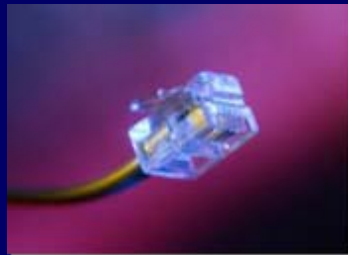
The main danger lies in the possibility of abandoning or of forgetting the basics of the respective identities and fundamental competences.

Résumé

➢ Subsidiarity implies to strike a balance between the unity of political and military responsibilities, and the optimization of military operations

➢ Reducing the analysis to information flows and informational asymmetries does not account for the prescriptive nature of C2 associated to military action

Generalizing the experiments of the US services remains almost impossible

➢ The issues associated to individual competences introduce a perspective towards the appreciation of and appraisal of learning processes

➢ The introduction of the aspects related to knowledge exchanges make possible an account for the nature of (**joint**) action

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