M&S for Influence Operations

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ABSTRACT

Asymmetric conflicts, involving populations that support armed groups, represent an increasingly significant proportion of all armed conflicts where NATO and partner nation are involved. Influence Operations, designed specifically for this type of warfare, is therefore a discipline for which Commanding Officers must now train. Influence Operations training systems are today mainly focused on individual skills improvement and increased cultural awareness.

The main challenges for a more appropriate training system are now:
i) The definition of operational training use cases
ii) The modelling, simulation, and visualization of the abstract concepts of Influence Operations

This paper introduces a solution that departs from existing training solutions, by rising to the challenge of training division- or brigade-level COs and offering a high-level simulation. This solution consists of an innovative platform able to address the operational expectations for the training of Influence Operations COs with vital components (preparation, gaming, supervision and analysis), but also includes high-level models and innovative user interfaces for the abstract concepts required to represent Influence Operations (PSYOPS, KLE, CIMIC).

Finally, the paper presents an implementation and evaluation of this solution using an existing aggregated constructive simulation integrated with a dedicated Influence Operations simulation component with a description of the exchange model.

1.0   INTRODUCTION

 The objective of any intervention of the armed forces is to defeat the enemy. However, the new context of asymmetric conflicts has forced committed democracies into foreign military operations where the use of force is controlled. They are mainly involved in peacekeeping missions, and the reconstruction of institutions, social structures, and infrastructure. Victory through military force alone is not sufficient because democracies do not try to impose total submission of the populations of countries in which they operate. To achieve peace, it is necessary for all parties to accept the victory, especially the conquered side.

However, in the asymmetrical conflicts in Iraq and Afghanistan, we can observe that the victory of the armed forces of democratic countries is never fully accepted and that a group of individuals exploiting organized networks systematically contests it. This type of opposition runs guerrilla operations through combat actions, and above all wages an information war via global propaganda using modern communication technologies. These operations seek to directly attack cultural or national symbols of the opponent to transform the reality perceived by the parties involved. By demonstrating that the military operation is not legitimate, it will directly threaten its presence and effectiveness in the eyes of the local and national populations.

In this context training Commanding Officers (COs) at division- or brigade-level in Influence Operations becomes vital to prepare them for current demands of warfare. Influence Operations training tools, almost exclusively based on virtual simulations, are today mainly focused on the improvement of the skills of individuals, and increasing cultural awareness. Consequently they are not suited to train COs who need high-level information for the planning and successful execution of operations.

The work presented here is the result of a project that aims to implement an Influence Operations training platform. This paper introduces a solution that departs from existing training solutions, by rising to the challenge of training division- or brigade-level COs and offering a high-level simulation. This solution consists of a combination of high-level modelling and an innovative platform able to address the operational expectations of training courses for Influence Operations COs, by incorporating vital components, such as preparation, gaming, supervision and analysis.

Finally, the paper presents an implementation and evaluation of this solution using an existing aggregated constructive simulation integrated with a dedicated Influence Operations simulation component as well as a presentation of an innovative representation of the abstract concepts required to represent and monitor Influence Operations (Psychological Operations- *PSYOPS*, Key Leader Engagement - *KLE*, Local Leader Engagement -*LLE*, Civil-Military Co-operation -*CIMIC*).

2.0   ROLE AND PREPARATION OF INFLUENCE OPERATION COMMANDING OFFICERS

2.1   Purpose and main concepts of Influence Operations

The *Military Influence Strategy* (MIS) to support operational commitments is conceived by estimating the expected effects on the perceptions of the actors involved. The intended effect is to produce a change in their state of mind, or at least a change in their conception of the situation, ultimately leading to the adoption of a position more in line with national interests or multinational objectives. It aims to avoid armed conflict, to create a favourable environment for the deployment of forces and the conduct of operations during an established crisis; to construct and support the legitimacy and credibility of nationals or allies; to use force only if it is absolutely necessary to resolve conflicts or crises, both national and international; to fight the influence sources of opposition strategies thanks to action upon the will, the

knowledge or the means; to strengthen the convictions of favourable target audiences by having an effect on their affiliations and thus their support; to convince neutral or undecided target audiences to adhere to the goals and the means used, or at least not to oppose them; to alter the knowledge and willingness of adverse and hostile target audiences, and have an effect on their decision processes or technical means to weaken, demoralize, discredit or neutralize them, and limit their hostile or aggressive attitudes; to strengthen the resolve of our forces and protect them against the actions of influence and / or propaganda sources of the opposition.

Influence Operations include all activities whose purpose is to obtain an intended effect defined by the MIS through military actions. These influence actions, *IO actions*, are characterized by the desire to use effective tasks that do not necessarily involve the use of force or the exertion of authority. They perform actions designed primarily for strategic (MIS) or operational levels. They are conducted mostly at the tactical level. They deliver credible messages or signals, adapted to the cultural and linguistic specificities of the targets audiences, called Influence Operation targets or *IO targets*.

An *IO Target* is an individual or group of individuals chosen to be the subject of the influence actions, and refers to:
- Opponents of the desired end state (opposition sources)
- Undecided or neutral actors whose support is sought
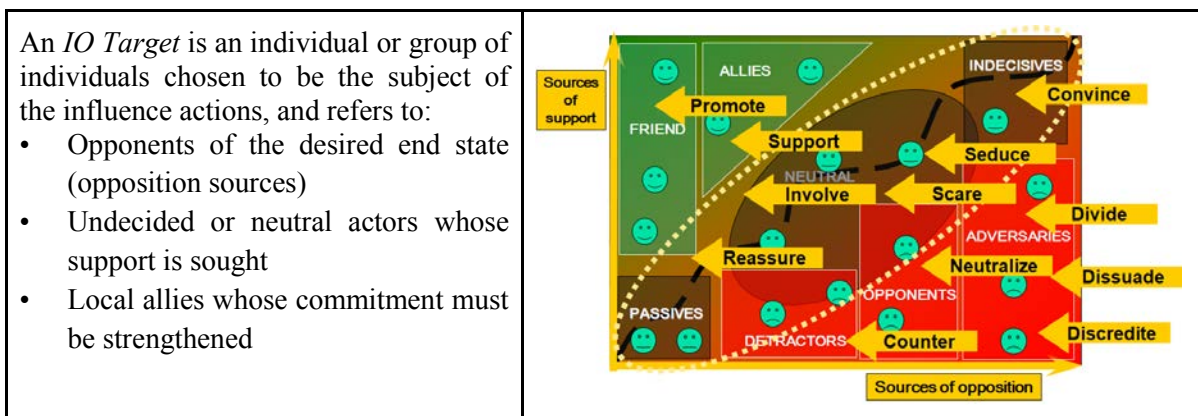- Local allies whose commitment must be strengthened

Figure 1-1: Enter text

Influence messages or signals must precisely match IO targets in their content, form, timing and means of distribution. A thorough analysis of the environment, the *influence audience environment*, is necessary and must respond to these specific constraints.

3.0   RELATED WORK

This section describes existing technologies in three categories: the individual socio-cultural preparation tools, the Influence Operations COs training solutions compared to Combat arms COs training platforms, and the existing research project in group- or population-level dynamic simulations.

3.1   Tools for individual training and preparation

From the Influence Operations analyst in the command centre to the unit leader on the ground negotiating with a village elder, the ability to understand socio-cultural behaviour is vital for achieving mission success. According to Schmorrow (2011), accurate analysis of socio-cultural behaviour requires a "thorough perception and comprehension, grounded in social and behavioural science, of the socio-cultural features and dynamics in an operational environment".

Learning and training tools that can use conversational simulations or immersive simulations aim to enhance the observation and deduction capabilities in a foreign cultural environment; to inform the user of the specificity of a new cultural environment, and to explain to the user his/her own assumptions and cultural bias.

Cultural Awareness for Marines Operation (CAMO) (Aptima Inc., Jean McMillan, Alexander Walker,

Ellen Clarke, Yale Marc, 2013) and Culture Gear (361 Interactive LLC, MacCloskey & Behymer 2011) are good examples of these innovative tools. They propose to enhance user cognitive capacities related to the cultural/economic/historical or political environment.

Some immersive simulations, such as Bilateral Negotiation Trainer (BILAT) or Cultural and Cognitive Combat Immersive Trainer (C3IT) are even used by the army to prepare for operations in a foreign country. They simulate interactions and negotiations with specific profiles of individuals and inspire confidence in such operational needs.

3.2   Tools for understanding group- or population-level dynamics

The second group of technology-based tools aims at developing a simulation of the theatre at operation level. By integrating diverse and complex data, they aim to propose a realistic evolution of the simulation that the human brain cannot easily calculate because of the breadth of the terrain and its characteristics. These simulations are not used for training but rather by scientists for analysing and course of action experiments.

For example in Simulating How Utterances Transmit (SHOUT), TNO Human Factors (Netherlands), FOI - Peter Svenmark, J. Huibregste, A. van Vliet, Dianne van Hemert, Pjotr van Amerongen, Mikael Lundin, Eric Sjöberg model the diffusion of messages throughout the population of a country. The population is represented by groups geo-localized and characterized by cultural factors and connected to each other.

3.3 Conclusion: No operational system for Influence Officer training

Concerning training, as far as we know, there are no existing tools helping the Influence Operations teacher or trainer. In France, officers are trained and evaluated using real-life simulation or table-top exercises. For this specific purpose, at the French Joint Force and Training HQ (Centre Interarmées des Actions sur l'Environnement - CIAE), a scenario is prepared a couple of weeks beforehand, and the initial situation is then given to the future trainees. An exercise is then organized on this basis. The trainees are brought together in a room with specific roles in an Influence Operations cell, as if they were at headquarters. They get reports and situational information thanks to printed reports and phone calls. They are in charge of the planning, the execution and the monitoring of their Influence Operations course of action. A "game master" has complete control over the evolution of the situation, and is responsible for the success or failure of the missions and their effects. To train the IO officers to communicate with the staff at headquarters, the CIAE participate in large national or international exercises such as Guibert or Rochambeau. In these situations, even if there is a supporting simulation platform, their missions are not simulated by the simulation engine but instead by a specified animation cell.

On the other hand, there are many simulation platforms for the training of combat arms. For example, SWORD, VR-Forces, OneSAF or STAGE are simulation platforms for training headquarters from the division level to the platoon level. SWORD is used by the French, Brazilian, Peruvian, Colombian, Bulgarian, Bangladeshi, Chinese, Australian and New Zealand armies to train at the division, brigade or battalion levels. OneSAF is used by the US-Army and the Canadian Army to train at lower levels. However, all of these simulations have a large scope of operational scenarios (ground and joint). Therefore some of them contain AI technologies (Direct IA, Finite state Machine) that offer autonomy for the simulated entities in order to propose a realistic evolution of the situation with a minimum number of operators.

We can ascertain that in any training method or solution (specific tools or simulation platforms) the organization remains globally the same. The trainees are evaluated in their working environment and the trainers give them objectives (or orders) as if they were their commanders and reply to their orders by simulating a credible evolution of the situation.

4.0 INFLUENCE OPERATIONS MODELLING

4.1 A modelling approach driven by operational needs

Our initial objective was to depart from existing simulations by proposing a generic and operational modelling of influence operations. By generic, we meant a tool capable of representing a range of radically different situations such as those found in Africa, Afghanistan, Easter Europe, etc. By operational we meant that the tool had to be specifically designed for Influence Officers, appropriate considering their knowledge of the tactical situation, use vocabulary they are familiar with, and suited to their conceptual awareness and culture.

Consequently we decided to first base our work on military doctrine and methods and on interviews with operational officers and trainers, and in a second phase to establish a connection with existing scientific models.

During the planning stage, the information operation focuses simultaneously on two aspects: the initial threat, which opposes forces during the intervention phase (principal deployment areas, and other implicated areas); and on the entire theatre by seeking to determine the courses of action the enemy is most likely to take, and assessing its capabilities and vulnerabilities.
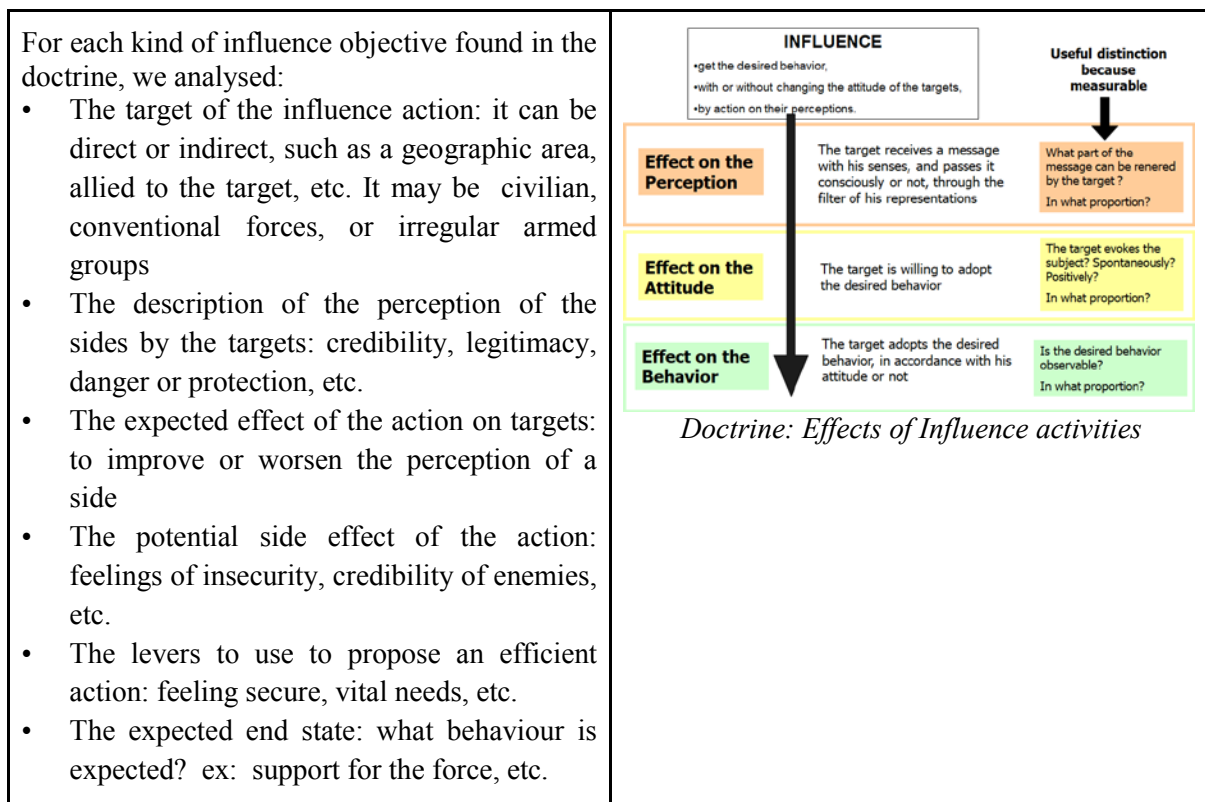
Adapted to the forces and their missions, the Military Influence Strategy (MIS) is constantly overseen by the Commander In Chief in order to strengthen the legitimacy of the forces through actions having effects

on the perceptions of all stakeholders (allies or opposition forces) in order to change their mind-set and perception of the situation and, ultimately, their behaviour.

The process aims to achieve the end state targeted by the force, using only political power, rather than the use of force.

To this end, it sets out the effects to be achieved by actions on the perceptions and the operating environment (APEO), termed the *Influence Objectives*. The same process is then applied at the operational and tactical levels. Tactically, for each individual level, the objectives are refined: temporal granularity, geographical areas and targeted audiences. At each step, the effects/objectives are analysed and processed. This clearly defines the effects/objectives at a specific level that contribute to the desired effect produced at the higher level. They are then distributed to the lower levels in specialized cells: LLE, KLE, CIMIC, and PsyOps. At each level, coordination in space-time is a priority. At the end of the process, each specialized cell formulates the missions to distribute to the relevant tactical field unit.

At their creation, each objective is accompanied by an efficiency measure, which lets us gauge the extent to which the desired effect is attained (for example the decrease in support within the population for an armed group can be measured by the decrease in the number of Improvised Explosive Devices, or the increase in the trust the population has in a force can be measured by the number of people entering medical structures provided by the said force).

For each kind of influence objective found in the doctrine, we analysed:
- The target of the influence action: it can be direct or indirect, such as a geographic area, allied to the target, etc. It may be civilian, conventional forces, or irregular armed groups
- The description of the perception of the sides by the targets: credibility, legitimacy, danger or protection, etc.
- The expected effect of the action on targets: to improve or worsen the perception of a side
- The potential side effect of the action: feelings of insecurity, credibility of enemies, etc.
- The levers to use to propose an efficient action: feeling secure, vital needs, etc.
- The expected end state: what behaviour is expected? ex: support for the force, etc.

Doctrine: Effects of Influence activities

This analysis allowed us to identify all the operational concepts needed to describe:
- An IO *situation*: the initial analysis of the theatre and the potential audience/target , performed by officers, is summarized by the *IO situation*. We consider here individuals or groups (armed or unarmed). The IO situation describes the global *human situation* (perception of the sides, attitude and behaviour, access to media, etc.) and their organization in *social networks*.
- An *IO action*: according to the planning process, based on the operational *influence objectives*,

officers have to precisely define the expected effects of each message, called an *IO message*, the initial *IO target* of these messages and the way to inject these messages on the terrain (that will further define which cell will be responsible for actually carrying out the work of each task: KLE, LLE, PsyOps, CIMIC etc.). As regards the operational objectives, they have to organize the actions in a global planning context, termed the *IO campaign*.

Consequently we were able to define a global influence operation model for a simulation:

Once an *IO message* is injected into the simulation where the *IO audience situation* has been initialized, the system calculates whether the *IO message* is able to reach and influence the *IO target* and if it propagates it through its *social network*. The benefits and the potential effects of the *IO message* on the actors reached depends on the levers used, the perception of the author of the message, the trust in the sender of the message, the accessibility to the vector of injection, etc.
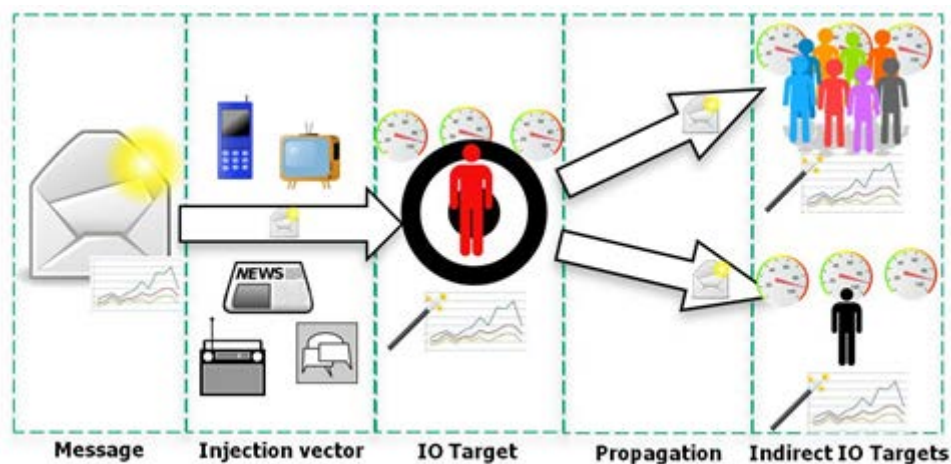
Figure 4-1: Global influence operation simulation model

4.1   Influence operation situation description model
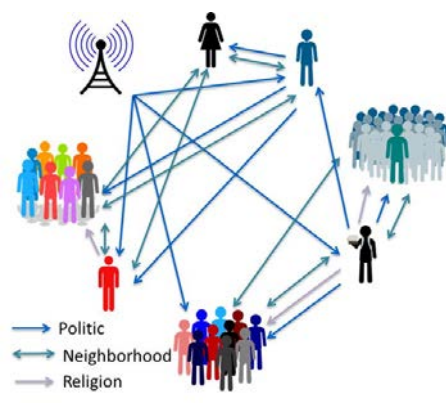
4.1.1   Human situation model

Simulated actors can represent individuals or homogenous groups of population. By homogenous we mean that they will react in the same way to messages. Thank to this large scale of granularity, it is possible to represent different types and sizes of operation theatre: quarters, cities, regions, countries…

As in classical warfare simulations and C2s, actors are characterized by their position, their constitution, their side, but are also enhanced with *IO attributes* in order to represent the influence environment (also called information environment). Thanks to these attributes, it is possible to represent the perception of the forces by actors, their vulnerability, their motivations, their attitudes and behaviours:

- Perception of the forces:

    - Affinity: hostile, opposing, neutral, chilly, proactive

    - Legitimacy: hostile, disagree, neutral, agree, proactive

    - Credibility: perception of the will and ability of the force to attain its objectives

    - Feeling of fear / protection: fear, neutral, protection

- Behaviour:
    - support for each force
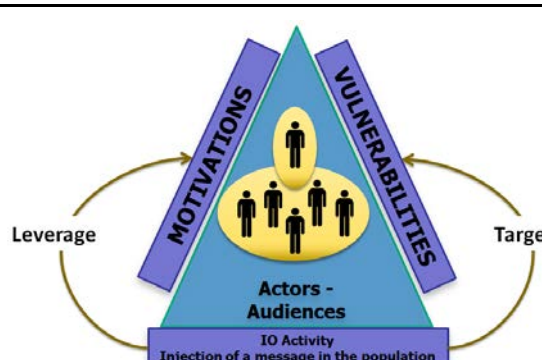- Psychological state and satisfaction of vital needs:

- Morale: low, normal, high, fanatic
- Feeling insecure: perception of the safety in the living area
- Health satisfaction
- Satisfaction with vital needs (energy, water, etc.)
- Communication:
  - Access to communication media: TV, telephone, radio, ability to read, etc.
  - Social networks (interlocutors, trust, theme of discussion: political, religious, health)
- Concept of freedom of action

4.1.2 Social network description model

Each IO target is potentially connected to other actors by a communication link. Each link is characterized by: • an actor: other agent, crowd or population • a theme: used to determine whether a message is being transmitted (if the message theme differs from the theme of the communication link, the message is not transmitted) • a trust factor: is used by the receiver to verify the credibility of information	 *IO situation : Social network model*

4.2 Influence operation description model

4.2.1 IO message model

An *IO message* is described by the following attributes: • Label: summary of the message • Theme: political, economic, religious or health issues, which is used to determine whether a message is transmitted • Author (optional): a force • Lever: used to make the target interested in the message. Ex : security • Expected effect: the values of the *IO attributes* that will be modified by the message in order to change the perception of the force and, ultimately, the behaviour of the target • *IO Attribute + Quantitative (Optional)*	 *IO message description*

4.2.1   IO action model

An *IO action* corresponds to an injection of an *IO message* in the theatre, and is described by the following attributes:

- The reference of the IO message
- The injection vector (television, leaflets, radio, etc.)
- The duration of the application of the IO message
- The frequency of transmission of the message: for example, a message can be transmitted twice a day for 3 days
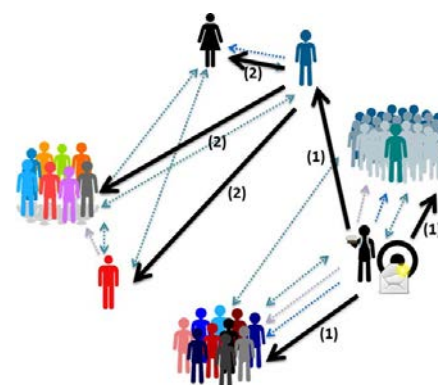- The IO target: this can be an actor or a geographical area

4.3   Influence Operations effect model

The model proposes a life cycle for messages in phases:

1. *Perception*: once injected, the message is perceived by the designated target or the actors present in the targeted geographical area or the actors having means of access to the injection vector, such as the Internet.
2. *Attention*: the attention paid to the message determines its acceptance. Attention depends on the source, the actor, the levers of the message
3. *Acceptance:* the acceptance of a message depends on its perception, attention and the credibility of the information. The effect applied is proportional to this acceptance. Only accepted messages will be propagated.

Once a message is accepted, it may directly change the perception of forces by IO targets (credibility, legitimacy, fear/protection offered by forces). Consequently, the simulation is able to modify the attitude and the behaviour of the IO target (affinity, support, feelings of insecurity, morale, etc.…).

4. If the target accepts the message, it may transmit the information to its social network and consequently, it enters the *propagation* phase. The previous cycle can be applied to each actor affected by the message.	 *Life cycle of a message: Propagation phase*

5.0 INFLUENCE OFFICER TRAINING PLATFORM DEMONSTRATOR

5.1 Training platform use case proposal

An exercise session consists of three main phases: the preparation, the game, and the analysis of the session. Each phase of the exercise requires input and work from the trainers and trainees.

Preparation: first the trainers have to "imagine" a realistic operational environment and story line. In most cases, these scenarios are pure invention, but they are occasionally based on situations that actually existed. The initial situation description must be complete and detailed: geographic data, climate, road networks, population, history, economics, leaders, industry and the humanitarian situation must all be taken into account. Within this framework, they then have to conceive a plan of operations, complete with specific influence objectives, and the means to achieve them. The trainees receive this information before the beginning of the exercise session and have to analyse it with three aspects in mind: general, human and system. The result of this work is often a matrix that for each aspect contains: the weaknesses, the constraints, and the possible levers and connections between all these elements. When they arrive at the training session, they must hand this analysis over to the trainers.
This represents the first step of the training: the trainers will compare this analysis to their own description and evaluate its accuracy and scope.

Conducting the exercise: the trainees are then organized and assigned specific roles to simulate an Influence Operations Cell (and if necessary the specialized cells: PsyOps, CIMIC, KLE), at which point the training session can begin. It is important to understand that Influence Operations, by definition, occur over much longer time periods than kinetic operations: it takes several days, weeks or months to get the desired effects. As a result, current Influence Operations training exercises, with or without a simulation, are not designed to immerse the officers in a real situation. Thus, when they are trained with division or brigade officers at HQ, IO officers explain that the time scale is accelerated and that they are therefore confronted with events occurring every hour, which is not plausible in real life. However, these exercises immerse them in a series of realistic situations they have to manage competently. Rendering effects during an exercise will necessarily be accelerated compared to reality, either by accelerating the simulation, or by offering effects more rapidly. During this session animators inject into the simulation the actions scheduled by the trainees and provide them with information concerning their effects. Each action decided upon by the trained cell is defined by a target (geographic or a specific actor), a target effect and the levers used. If the specialized cells are also trained, they receive (instead of the animators) the previous action and schedule Influence Operations missions that are injected into the simulation. Missions usually contain the same information enhanced by application information such as the injection vector (Internet, face-to-face communication, radio, television, etc.), the message and the time. In addition, the animators can also inject into the simulation exceptional events (for example a disaster or a terrorist attack on the population) and enemy actions or missions. These events have physical effects but also psychological effects on the population. Because they become vulnerable, they become an easy target for enemy propaganda. The trainees have to react efficiently and intelligently to this unexpected evolution in the situation.

Analysing the session (After Action Review-AAR): the trainees and the trainers must be able to analyse the exercise session. For this they need access all session data, but also require specific indicators that summarize the evolution of the situation as it changed following intervention from the trainers.
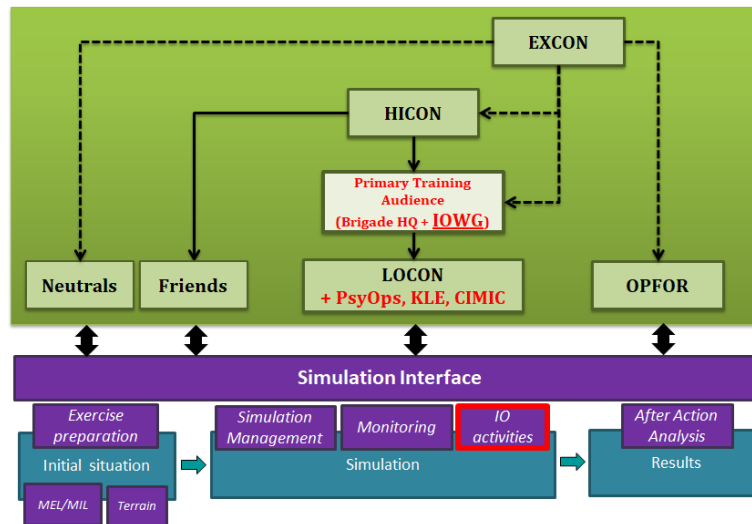
Organization of an Influence training session and associated services

To support the phases described above, we identified a list of the 10 essential services for an Influence Operation training platform:

1.   Physical and decisional data of the simulation setting: the characteristics of simulated entities (physical data and actionable data) used by the simulation in the gaming phase must be customized or enhanced.

2.   Terrain generation: the geographic map data must be converted into data that can be used by the simulation.

3.   Situation initialization: this service enables the creation of the exercise simulation scenario. It permits the initialization of the human and system environments.

4.   Actions/tasks injection: this service permits the entry of actions/missions or events and their injection into the simulation.

5. Simulating the evolution of the situation: this animates the entities of the simulation and calculates their evolution and interactions during the exercise session.

6.   Recording the session: this service records the whole session in order to be able to analyse it during the after action review phase.

7.   Planning: this service permits the planning of a succession of Influence Operations actions/missions.

8.   Monitoring and reporting: thanks to this service, the trainer can monitor the evolution of the simulated situation and send operational reports to the trainees.

9.   After Action Analysis: this service permits the analysis of the session played thanks to indicators and replay.

10. System Administration: this service permits the management of archived data (field simulation framework, game, etc.)

The diagram below shows that each service (except the administration service) is used in a specific phase of the training process.
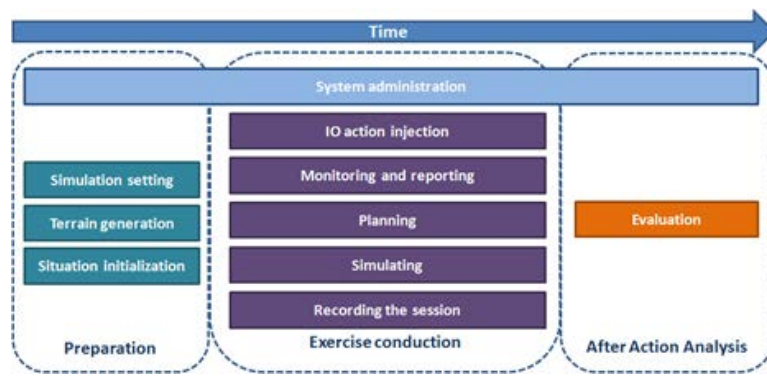
Vital services for an influence training platform

5.2   Influence Operation Training platform demonstrator architecture

We developed a software component in order to simulate the effects of IO actions on civilians and armed groups. This simulation is based on the modelling of human situations, IO actions... as explained earlier. It is then integrated in a constructive simulation, MASA SWORD, which lets us validate in concrete terms the platform conceived and the models designed. The MASA SWORD simulation has been upgraded to allow accurate interpretation and visualization of the output of the propagation algorithm and to provide input adapted to the needs of the models.

Thanks to this architecture and the adaptations applied we can use all the components of SWORD to initialize the information situation, plan and inject messages, and record and analyse the session. The IO simulation is only in charge of computing the propagation of the IO actions through the population, and the effects they produce.
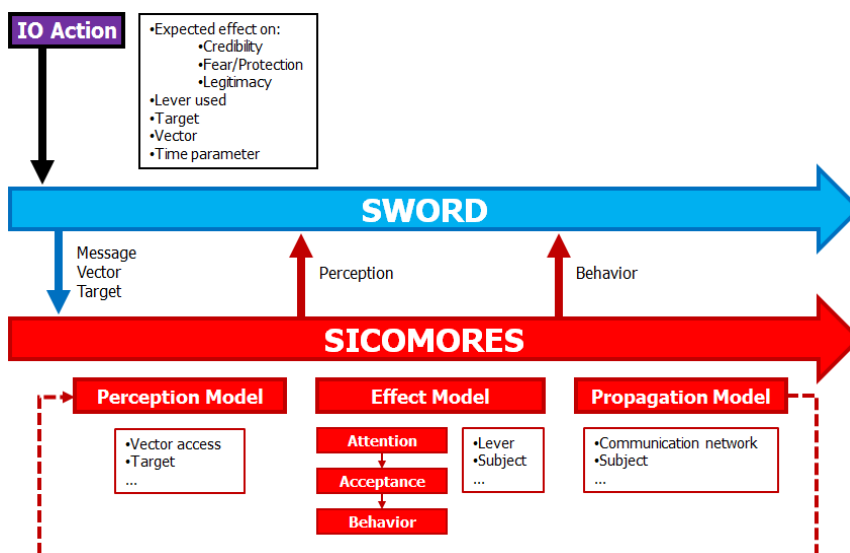
Data exchanges between SWORD and the IO simulation -SICOMORES

5.3   Evaluation scenario: ARZEW, French IO training exercise

The ARZEW scenario is currently used by the CIAE (Centre interarmées des actions sur l'environnement - Joint Influence Action Center) for their officers' training requirements. Based on this scenario, exercises are orchestrated by the military to familiarize forces with the influence operations (Psyops, KLE, LLE,..)

and the management of CIMIC projects.

In a fictitious war, based on realistic courses of action, a certain number of influence operations are planned to attain an expected end state. This scenario offered us an opportunity to represent complex and operational situations with our training demonstrator, and allowed us to evaluate its performance.
The Arzew exercise relates the independence claim of a region. The forces' mission (SAVFOR) is to restore peace within the population, reduce claims for independence, secure the local population, and so on. To achieve this goal, a number of CIMIC and PsyOps actions must be implemented by the military.

Mission of the SAVFOR force:
 • Dissuade opposing forces from crossing the border
 • Increase gaps and tensions among extremist groups on both sides
 • Restore the confidence of the local population in the authorities
 • Communicate positive changes resulting from actions undertaken by the force
The expected end state (EFR) is as follows:
 • People have confidence in local institutions and local influence leaders
 • People actively participate in the development process
 • The population ceases all support for extremists
 • The return of refugee populations
 • Proponents of "Negative influencing" lose the will to oppose to the peace process
 • The militia participate in the negotiation process
For this, the mode of action is divided into three phases:
 • PHASE 1: Prepare minds by convincing people of the impartiality, effectiveness and determination of SAVFOR
 • PHASE 2: Act on the way people think by building public confidence in local authorities
 • PHASE 3: Change thinking by persuading the population not to support the extremists and persuading the extremists to end their campaign

5.4 Demonstrator evaluation

Evaluation of the scope of the demonstrator

The purpose of this demonstrator evaluation is to measure the scope of the proposed training platform, its usability for operators, achieved through a modelling & simulation work based on their needs and culture, and finally to propose innovative user interfaces adapted to information warfare.
During the evaluation the operator was able to:

5.4.1   Initialize the human situation

The system must be able to be initialized with a situation. This situation concerns the human environment (audience situation) and the system environment (available media, communication networks, etc.).
It must include all actors to be simulated: conventional forces, armed groups, population groups, leaders - whether or not they are IO targets. They are defined by operational attributes (conventional and IO attributes).
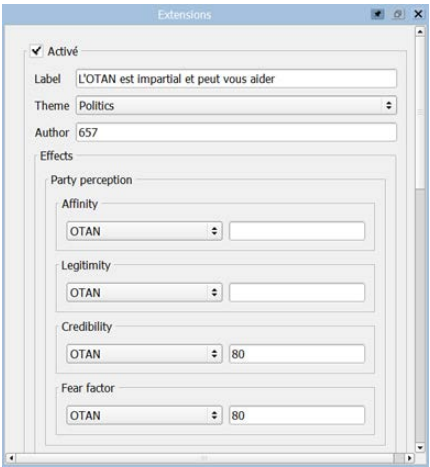Example: constitution, geographical location, psychological state, perception of the forces, etc.

5.4.2   Initialize the system situation

This includes all the actors' communication networks and their accessibility to the media (which serve as injection vectors). The communication networks are constituted by the list of interlocutors for each actor, each link being characterized by the field of communication considered (religion, family, health, etc.).

5.4.3   Define IO messages

The main IO Officer's responsibility during an operation consists in the drafting of Annex L of OPLAN or OPORD. In practical terms, it is formulated by a number of message broadcasting actions to direct or indirect info-targets. These messages are particularly characterized by their intention (or expected effect) and the levers on which they are based. The same 'message' can therefore be injected by means of different media.	*Example of IO messages : Message from SAVFOR to give credence to its impartiality and credibility.*

5.4.4   Inject specific IO messages and evaluate the evolution of the IO target's perception

Once the message has been devised, it is injected into the simulation. The injection action is characterized by the message Info Ops, the injection vector chosen according to the IO target, the target and the time schedule.
The injected messages generate effects on the target's perception. They modify the simulated actors' IO attributes (affinity or perception of the sides present: legitimacy, credibility, feelings of fear or protection, etc.). The effects of a message are therefore observable on the direct info-targets, but also on all actors in the theatre that have knowledge of the message.

5.4.5   Evaluate the propagation and indirect effects of a specific message

Once the message is injected in the simulation, depending on the injection vector chosen and the social network of the target, it may be perceived by other actors. As every message may generate effects on the

simulated actors, each actor who has knowledge of the message may be influenced positively or negatively. The effects of a message on the global theatre are thus observable by monitoring the IO attributes of all actors of the theatre with knowledge of the message.

5.4.6   Plan, execute and monitor and IO campaign

As stated earlier, the main IO Officer responsibility during an operation consists in drafting the Annex L of OPLAN or OPORD, which effectively means planning the global campaign. Thanks to a time line tool, it's possible to prepare, organize and schedule a list of IO actions that will be automatically executed by the simulation. The operator can then monitor the progress of the plan.

5.5   Innovative influence operation user interface

Interviews and analysis of existing operational tools revealed that no research or industrial work has yet been produced on user interfaces suitable for influence operation planning and monitoring...

5.5.1   Synthesis of the information environment

The populations of the same side are represented by the same colours and can be differentiated by their texture.
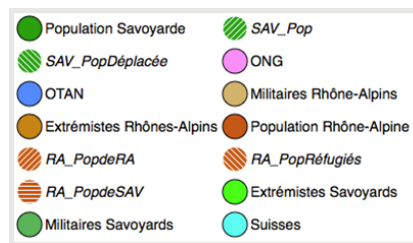

IO situation: list of actors and information on their side

Human situation is defined by the position and the perception of the population's forces.
We propose two different and complementary user interfaces as a synthesis of the information environment analysis.

Geographic position of Actors on the map Sides are differentiated by colour. Military actors and civilians are represented in simplified "APP6" form, while populations are represented by a circle. The size of each circle indicates the size of the population.	Inspired by marketing techniques, we proposed a configurable display of double-entry diagrams of actor/forces/camps perception by IO targets.

IO situation : geographic position of the actors

IO situation: perception of the actor, forces or camps
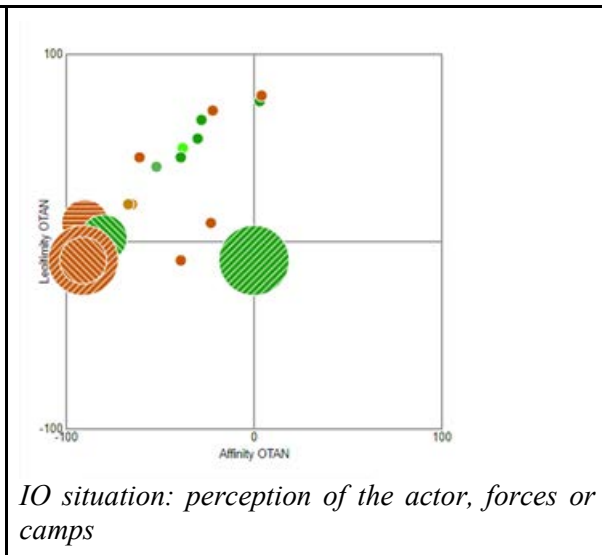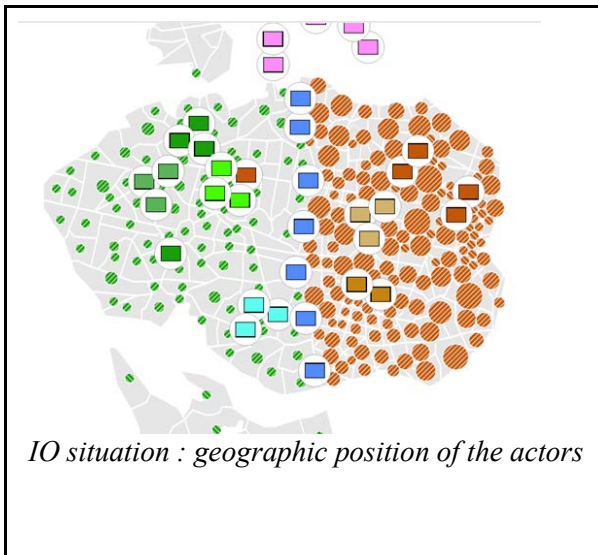
Social networks indicate the communication connections between actors. Because those connections are not bilateral, direction and confidence in the interlocutor are indicated by the size of the link.

This user interface solution aims to help the IO officers in their primary human environment analysis by offering them an easy way to understand the structure of the theatre's social network: secluded population, main hubs, etc...


IO situation : Social network
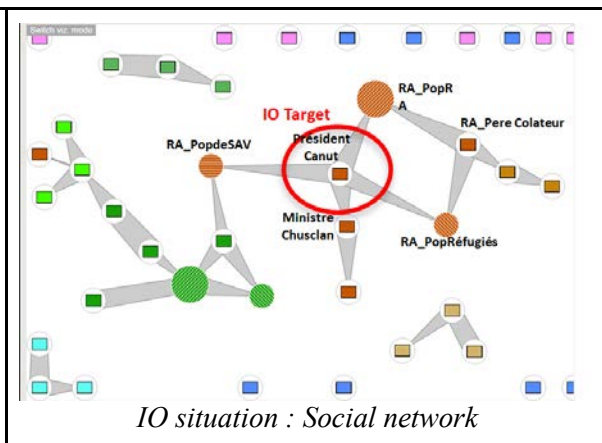
5.5.2   Planning and monitoring the influence campaign

A timeline tool associated with the message conception interface allows users to plan and monitor the influence campaign.

Once influence operations are launched it's possible to monitor them through two different views: a geo-referenced view and a social networks view.

Each injected message and its characteristics are displayed. The degree of knowledge each actor possesses is displayed with a gradient from yellow to red.
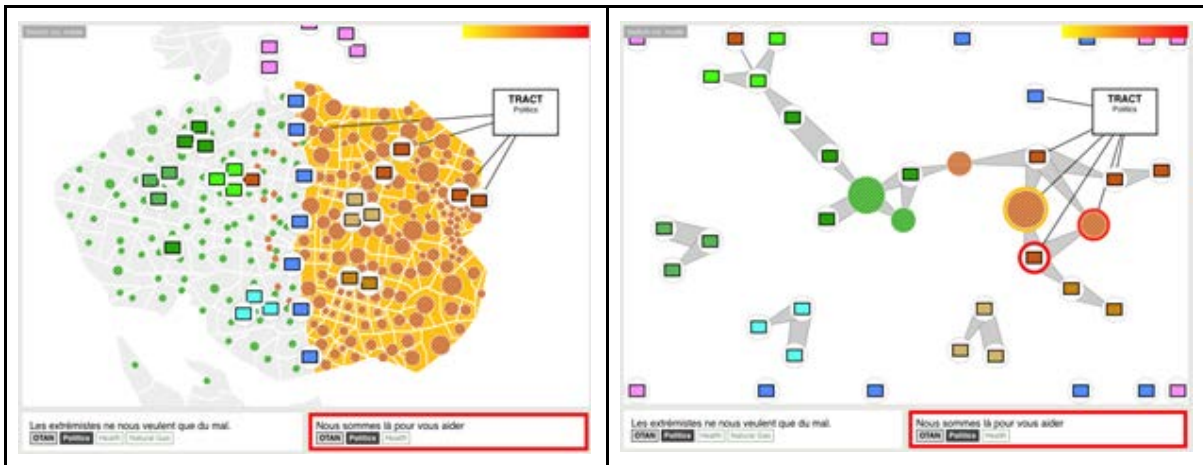
5.5.2   Monitoring the effects of the influence campaign

Again, the system provides two different user interfaces for monitoring the evolution of the human environment: one presents a synthesis, the second a more detailed view. The synthesis proposes a graphic evolution of the perception of the IO target of the forces in a double entry matrix. The attributes displayed can be dynamically chosen according the expected effects of the influence campaign.

Example: Evolution of the perception of the legitimacy and the credibility of extremists?

The second user interface lets you follow graphically the evolution of indicators computed by the simulation. Furthermore, an intermediate solution offers a view where simple colours and arrows convey a synthesis of the global evolution of indicators, as they rise or fall.

6.0   CONCLUSION

An evaluation based on an operational influence warfare training scenario allowed us to confirm that our modelling is well adapted to the field of operational influence warfare. We were able to initialize the system with the available data and to simulate the influence campaign described in the scenario. Moreover, the indicators computed by the simulation were particularly relevant to the global monitoring of the influence campaign. In consequence we are in a position to assert that the modelling of the information environment is operational.

This evaluation also allowed us to verify the impressive functional scope of the proposed influence training system: scenario initialization, influence campaign preparation & simulation, recording & analysis

of the session. The proposed innovative user interface based on marketing interface principles allowed us to monitor and adjust the scenario with ease.

To take the next step and produce an industrial-strength training system, we now need to integrate a validated evolution model for all dynamic computation into the existing simulation: knowledge, interest and acceptance of messages among consistent groups of population, attitude & behaviour modification.

As stated earlier, Influence Officers cannot currently obtain a software tool that describes and follows a situation. The modelling work accomplished and the reflexion on the representation of specific concepts could form the basis of an operational Control system for the use of Influence Officers in their headquarters.

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