

## Operating Simulation Adequately: from Issuing Requirements to Operations

The improvements that have been carried out in the field of ADP (Automatic Data Processing) for about twenty years have enabled simulation to develop to a large extent. Today, it is everywhere; let us mention the EDF Company (French Electricity provider) for example: it uses forecast consumption models enabling to regulate the production of power plants; or even the CEA (French Atomic Energy Agency) that has just implemented powerful simulation assets to specify and develop the future nuclear armaments, a true guarantee for the integrity of our territory.

**The French Army** does not lag behind, and it procured some **simulation tools mainly devoted - for the moment - to forces' training**. We have to wonder about the way it is being used.

The purpose of this article - on purpose controversial - is not to show all the advantages of simulation as the whole issue is devoted to it. On the contrary, we will endeavor to look for **the main factors that significantly prevent us from using simulation tools efficiently**. Of course, they have their own constraints and drawbacks (development time and costs, model limitations, manpower costs to implement them, etc...) but, globally, **the main obstacle** to simulation use is **above all of a cultural nature**. Higher-ranking militaries appointed to jobs enabling them to boost simulation, are generally reluctant to put a lot of effort into a field that they consider to be too *technical* - this last term being used in a derogatory fashion.

This significant behavior can be observed as early as requirements are given, which is the basic first step that will lead to the development of a simulation tool. The situation is similar when we enter the validation phase and we have to use simulation; it will result into some lack of confidence and consequently **some overcautiousness as regards the use of assets**.

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### Expressing requirements properly<sup>1</sup>

Simulation, as any computer software or armament program, results from an operational requirement that has to be assessed as accurately as possible. It is a **vital stage** for which committed personnel have tremendous difficulties to carry out the required abstraction efforts to guess what their actual needs will be at the time when simulation enters service. To illustrate the time gap between a requirement outline and the delivery of a tool - let us take the example of SCIPIO. The first AURIGE exercise with this simulation took place in November 2005, whereas the early thinking about requirement outlines date back to 1997-98. This is a somewhat extreme example as regards time spans but it enables to understand that on the one hand the first users are not those who expressed the need, and on the other hand the very requirement changed.

Thus, the determination of requirements is the **beginning of a long process** that requires having a prospective vision. Even if we do not have

the actual users, it is extremely important that **the people taking part in this phase have enough experience and the right potential**. It is a pity to notice that this category of personnel is also the scarcest one and the most demanded one for other tasks that are as important. Hence, to carry out this job, headquarters are tempted to task such officers that, although they have the will to do it, do not always have sufficient authority for decision-making. Or, as it is also observed, headquarters could either carry out an empty chair policy or send different people to the subsequent meetings. Furthermore, we often have two kinds of unproductive behaviors, which are diametrically opposite, according to the personality and the sensibility of the people involved into the determination of requirements. First of all, there are people who are not familiar with simulation and who tackle the problem skeptically by expressing very vague - even desperately commonplace - requirements. Conversely, there are people who are convinced that they know everything, very often the victims of what they have seen in movies or during numerous presentations from our firms. Very often,

this latter kind has a strong tendency to want something and its contrary, getting into details that are completely irrelevant at this stage of tool development.

Eventually, we also have to notice that there is never one single requirement. When several people meet together, it is difficult to have a consensus; and sometimes, according to people's points of view, the way they work or the interests of the represented agency, requirements could be antinomic. As a consequence, agreed-upon requirements for a future simulation tool **are very often a compromise** that never fully meets all represented agencies' requirements. Moreover, requirements are very often beyond allocated budgets, which always leads to limit initial wishes; thus, it increases the dissatisfaction rate of the people involved.

### Being aware of the capabilities of the required tool, but also of its limitations

Once the requirement expression is completed, the process will get out of the hands of users, as it will have to be submitted to the various phases - set by the French procurement contract code - and carried out by an integrated programming team ("EPDI"<sup>2</sup>). On the other hand, **future users' representatives** are in demand again as early as the first technical achievements are completed; and they have **an important part to perform to check the work of the teams tasked to develop the product and to authenticate it**. Once again, it is an important phase, for which the various operational agencies do not always allot the right manpower and required delay. Checking operations are carried out summarily; very often, they are not carried out in correlation with the conditions of use for the future tool.

To end with, when simulation is implemented, users have to appropriate it. This phase should be carried out, not only by the future center(s) that are going to implement it, but also by those for whom it was developed, i.e. exercise designers. Indeed, they have **to be fully aware of the capabilities of the tool, but also of its limitations**, in order to take the best out of it and to develop relevant tactical themes. Using simulation properly requires an important training investment. Just a comparison: using a *PACK OFFICE* rationally on our computers is directly proportional to the time spent to try all the functionalities and to operate them. Without any important personal experience, a staff officer will not be able to use more than 10 % of the EXCEL software's capabilities (for example). The situation



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is similar for simulation tools: in spite of all the improvements that have been observed in recent years, they are still difficult to use, owing to the sophistication of what has to be achieved.

A **poor knowledge of simulation** - as a support to an exercise - will lead to design inadequate scenarios or to a gap in comparison with the actual capabilities of the tool. In this field, the worst situation is reached when we want to implement a simulation within a framework for which it was not developed. Indeed, each simulation is built for a specific objective (an example for SCIPIO V1: enabling to train level 2 and level 3 CPs within the framework of coercion operations within a digitized environment). Out of this objective, for which there are always tolerance margins, we have to use another tool. For example, it is stupid to intend to assist in operational planning with SCIPIO, such as it was initially developed. Use configurations, model granularity, reckoning time, outcomes sent by SCIPIO V1 are not at all compatible with what we could expect from a planning-support tool<sup>3</sup>. To make another comparison, let us mention another meaningful map example that can be considered as a total simulation tool, in so far as a map is an imperfect terrain representation (and thus a model). Nobody would set up an orienteering race with a 1/1,000,000 Michelin road map. Conversely, a patchwork of 1/50,000 maps is not the best support to drive through France from Brest to Strasbourg. This comparison could seem ridiculous, but it can be compared to what has just been said with SCIPIO.

### Simulation provides us with tremendous possibilities but each tool has its own features.

Anybody who wants to take advantage of it has to put a lot of effort into it and spend much time to learn and discover the tool; he should not be easily satisfied with commonplace ideas - often simplistic and superficial, even wrong and groundless.

## Getting rid of the cultural obstacle

Most - somewhat caricatured - behaviors described in the previous paragraphs have to be adjusted. Simulation tools set up for training level 5 units down to individual soldiers are generally used properly and they are very much used. The situation is very different when we deal with **simulation for headquarters**, either for training purposes or for planning ones. At this level, the **cultural problem** mentioned earlier reaches its peak.

As highlighted previously, using simulation properly requires a specific will from the different people in charge: they have to be very much interested in the capabilities of this tool - including the time that has to be devoted to it. Yet, this requirement is not always compatible with the **preferential liking of our officers for concept handling**, to the detriment of analysis culture - that our British and American friends like very much - and with all the tasks they have to carry out.

Furthermore, simulation-assisted exercises result into **antagonistic reactions - with often specious arguments**. The human cost resulting from the implementation of simulation is what is most criticized about these exercises. And this, to such an extent that AURIGE exercises are currently cancelled because the frantic tempo of the Army does not always enable us to gather the full environment of a player CP. Conversely, everyone agrees with the fact that AURIGE and GUIBERT<sup>4</sup> exercises - whose main targets are oriented towards one-level training - are also an opportunity for higher and lower levels response cells to improve their working procedures by relying on a realistic environment provided by simulation. Well, these white cells layers - between simulation and a player CP - inherited from the BBS simulation drawbacks and from a will to increase the realism of these exercises by depriving response cells from having

more information than they would actually have. As time goes by, it has become a dogma and everyone is pleased with it; we have to retain it whenever it is possible. But it should not be a bind that leads to cancel exercises. Currently, less manpower-greedy solutions can be considered; they will all the more be possible in the future as **digitization and CIS - Simulation systems ("SIC-SIMU") links are gradually implemented**. We should still persuade everyone to accept that some white cells layers be co-located with simulation or that the player CP is not in direct link with all his usual partners.

Eventually, there are the hardliners - happily less and less frequent - who are convinced that nothing can replace in-the-field activities, that simulation outcomes are wrong, or even that it never fits what they would like to do and that it includes too many constraints. All these skeptics should understand that **simulation tools are only some tools among others** to train, to aid in making choices or to throw light on some doctrinal studies. They have no other aim but to support forces and their purpose does not consist in replacing in-the-field live exercises - that occur too rarely - but in preparing for them better. Of course, there is something missing from the set; but when we ask these detractors to express their needs, we expect to get a more serious answer than: *"we want realistic, simple, easy-to-implement and cheap tools, and all this straightforward"*<sup>5</sup>.

<sup>1</sup> Intermediate titles were added by the editorial staff.

<sup>2</sup> Integrated programming team (EPDI) usually composed of a PD (Program Director) from the French Defense Procurement Agency, a project action officer and an Army development team.

<sup>3</sup> It does not mean that the technology developed in SCIPRO cannot be used for another tool.

<sup>4</sup> Only two GUIBERT exercises were carried out; they were achieved with the BBS simulation in 2002 and 2004.

<sup>5</sup> Sentence from briefings delivered during the simulation and operational readiness seminar that took place in the FOCH lecture hall in February 2005.

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Currently, the French Army has **some simulation tools** that are efficient parts in supporting the operational preparation of our forces. These tools are not an end in themselves and they are not **a single answer to all kinds of training and to the experience of real-life situations**. They have their own limitations and their constraints; and sometimes their fields of activity have to be fulfilled with a careful and thorough preparation of scenarios. We have to keep them improving and optimize their rate of use. **Above all, all this relies on higher-level heads being personally involved into it**; they have to be in keeping with these tools and they have to compel a rational use of them so that our forces take advantage of them as much as possible.