

Toulouse, France, May 10, 2005

VERSIM

**Modeling and Simulation Dictionary:  
The Aim, the Approach, the Status,  
and the Future of the Work**

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## The Aim and Scope of the Work:

- The French-English M&S Dictionary preparation is an **MSNet project** and is jointly done by the members: **LSIS** (France) and **OC-MISS** (Canada) of the M&SNet.

## Brief History:

- The first list of simulation terms was:  
Ören, T.I. (1977). A List of Simulation Terms.  
ACM Simuletter, 8:4 (Summer), 63-72.  
It was published as a self-test (a challenge) for the simulationists to check their knowledge of simulation concepts.
- Ören also published on “English-Turkish M&S Terms”.
- At the start of this joint project, in 2004, there were about 3000 English terms; with some French and Turkish equivalents.

- We **aim** to have:
  - A **comprehensive and systematic inventory** of the M&S terms in English; hence, in this version, definitions are not part of the project.
  - The **French** equivalents and
  - The **Turkish** equivalents.
- The dictionary is on Excel; hence by the filtering ability, we can easily check (and correct) inconsistent usages.
- Currently, it has over 4000 English terms; and over 3000 agreed French equivalents.

As an example of the:

- **comprehensive and systematic inventory** of the M&S terms in English, consider, the following example:
- There are over 100 types of “variable” listed in the dictionary.
- To ease managing terms common to a concept, an **inverted** representation is used.

variable	variable, Boolean	variable, decision
variable, across	variable, bounded	variable, dependent
variable, action	variable, change detectable	variable, descriptive
variable, activation	variable, class	variable, deterministic
variable, algebraic	variable, constrained	variable, discrete
variable, allocated	variable, continuous	variable, discrete-change
variable, antithetic	variable, continuous-change	variable, discrete-time
variable, arbitrary	variable, continuous-time	variable, discriminant
variable, argument	variable, control	variable, dual
variable, artificial	variable, controllable	variable, dummy
variable, attached	variable, controllable input	variable, endogenous
variable, auxiliary	variable, controlled	variable, essential
variable, behavior	variable, coordination	variable, exogenous
variable, binary	variable, correlated	variable, external

variable, flow	variable, instrumented	variable, logical
variable, formal	variable, integration	variable, mediating
variable, free	variable, interest	variable, monitored
variable, fuzzy	variable, internal	variable, nonnumerical
variable, Gaussian	variable, interpolated	variable, nonobservable
variable, global	variable, irrelevant	variable, numerical
variable, goal	variable, key	variable, observable
variable, holistic	variable, lag	variable, observational
variable, independent	variable, lagged	variable, output
variable, input	variable, latent	variable, qualified
variable, instance	variable, lead	variable, qualitative
variable, instantiated	variable, level	variable, quantified
variable, instrumentable	variable, linguistic	variable, quantitative
variable, instrumental	variable, local	variable, random

variable, rate

variable, relevant

variable, run control

variable, simple

variable, slack

variable, state

variable, statistical

variable, stochastic

variable, subscripted

variable, temporal

variable, temporary

variable, through

variable, time

variable, transition

variable, typed

variable, uncontrollable

variable, unqualified

variable, yoked

**There are many other inverted terms.**

For example:

Data over 50 entries

Model over 500 terms

Simulation over 200 terms

## The Approach

- **The approach is Cartesian:** René Descartes: “Discours de la méthode pour bien conduire sa raison, et chercher la verité dans les sciences” (1637).

(However, when needed we can also be pragmatic. Remember for a camera, infinity is about after 20 meters.)

- The **first** was to never accept anything as true which I could not accept as obviously true; that is to say, to carefully avoid impulsiveness and prejudice, and to include nothing in my conclusions but whatever was so clearly presented to my mind that I could have no reason to doubt it.



- The **first** rule:

- Hence, in **this orchestrated effort**, if you see me in doubt, (it is scientific doubt) and it is not your ability, but my own lack of understanding which obliges me to doubt.
- Furthermore, I avoid the trap of single-vision understanding which may lead to dogmatic understanding.

(More on several **types of understanding**:

Ören, T.I. (2000 – Invited Opening Paper). Understanding: A Taxonomy and Performance Factors. In: D. Thiel (ed.) Proc. of FOODSIM'2000, June 26-27, 2000, Nantes, France. SCS, San Diego, CA, pp. 3-10.)

- The **second** was to divide each of the problems I was examining in as many parts as I could, as many as should be necessary to solve them.
- The **third**, to develop my thoughts in order, beginning with the simplest and easiest to understand matters, in order to reach by degrees, little by little, to the most complex knowledge, assuming an orderliness among them which did not at all naturally seem to follow one from the other.

- And the **last** resolution was to make my enumerations so complete and my reviews so general that I could be assured that I had not omitted anything.

- I published (since 1971) several taxonomies of M&S  
<http://www.site.uottawa.ca/~oren/pubsList/taxonomies.htm>
- Furthermore, I am working on a “Body of Knowledge of M&S; and for this project, I am reviewing several M&S taxonomies and preparing updated taxonomies.

**And your contributions will be vital to the success of the work.**

# The Status of the Work & What Needs to be Done:

## English Terms:

- Over 4000 terms exist in the Excel file
- Terms need to be revised for:
  - **relevance** (some terms have to be **eliminated**)
  - **completeness** (some terms have to be **added**)
  - **correctness**

## French Equivalents:

## Turkish Equivalents:

## French Equivalents:

- Over 3000 (agreed on) equivalent French terms exist
- French terms need to be revised for:
  - **correctness**
  - **consistency**
- For remaining terms, French equivalents need to be suggested and agreed on
- For all French nouns, gender needs to be included
- At the end, one more review would be highly desirable

## Turkish Equivalents:

- Large number of terms have equivalent Turkish terms.
- The remaining will be finalized by Ören

## **The Future of the Work: *Phase 2, Phase 3, Phase 4***

**Phase 1:** (Current version) is to finalize and publish a hard copy of French/English/Turkish terms.

(Hopefully, this Summer)

- Phase 2:** Hopefully, the next version (to be finished in 2006) will also include **Spanish** and **Italian** terms.
- This phase can also be a joint M&SNet project.
  - I believe that French terms will facilitate finding the Spanish and Italian terms.
  - From **Italian** side, the Director of MISS Genoa Center (and Director of the MISS), Prof. Dr. A. Bruzzone, promised that he will join forces for this project.
  - From **Spanish** side, already about 1000 terms exist (Ören) and needs to be entered in the Excel table.
  - Prof. Dr. C. Frydman has already started such a study.
  - I hope that our Spanish colleagues at MSDS will join us in this phase of the project.



**Phase 3:** Our dictionary project can be as ambitious as we would like it to be.

- After having five languages, we may suggest **NATO** to adopt it and have their back-up (**as a funded research project**) to enrich it with other languages of NATO (member and friend) countries.  
(For about five years (1996-2001, when I was in Turkey), I was active in several NATO M&S groups).
- NATO has two major organizations involved with M&S:
  - NMSG - NATO Modelling and Simulation Group
  - SAS - NATO Studies, Analysis and Simulation Panel
- In this phase, we can port our dictionary to a database system such as Access.

- Phase 4:** The **definitions** in English can be developed (if we find funding for this phase of the project).
- There are several mostly military dictionaries in English; however, consistency and correctness should be assured.
  - After this phase, since the English definitions will be available, starting with the first 5 languages (and hopefully, including other NATO languages), the English definitions can be translated into other languages.



Now, let's consider what do next!

## Reviewing the French/English dictionary:

- The **vital importance** of the review to enhance the quality of the dictionary.
- Given the time frame we can work together now (~ 90') and realizing the impracticality of reviewing the current work as a group of 25 – 30 participants in such a short time, we have to find an effective way of **coordinating** and **orchestrating** our work.



## **I suggest the following agenda:**

(open to your suggestions / recommendations)

1. Ören shows the dictionary file and points out how we can update it and do the version control.
2. With a show of hands we learn who would like to actively contribute to the project.
3. For those who promise to be active, we collect names and e-mail addresses.
4. Tuncer Ören works together with Lucille Torres to distribute the French-English terms through e-mails.

## **I suggest the following agenda:**

(open to your suggestions / recommendations)

5. Ören and Lucille Torres revise, with a group at LSIS, the comments received and update the dictionary file.
6. The updated file is disseminated (with changes clearly indicated) for another round of reviews.

(Remember what Descartes advises!)





Together we can do it! Thank you for your contribution!



## Post meeting note:

As of May 20, 2005, the following 15 colleagues from France graciously accepted to continue or to start contributing especially on the French terms of the M&S Dictionary:

Table 1: Colleagues from LSIS:

<http://www.lsis.org/index.php>

Table 2: Colleagues from other research laboratories:



## Table 1: Colleagues from LSIS:

<http://www.lsis.org/index.php>

Lucile	Torres
Jean	Caussanel
Alain	Ferrarini
Claudia	Frydman
Aziz	Naamane
Erwan	Tranvouez
Hamri Maamar	El-Amine
Gregory	Zacharewicz

Table 2: Colleagues from other research laboratories:

Frederic	Amblard	IRIT
Jean-Pierre	Belaud	INPT-ENSIACET-LGC
Olivier	Dalle	INRIA/I3S
Raphael	Duboz	IRD
David	Hill	ISIMA
Jean-Marc	Le Lann	INPT-ENSIACET-LGC
Pierre	Siron	ONERA