Introduction
Simulation «In the Boat»

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Before the widespread use of the digital machines, relationships and activities in the scientific-engineering approach were largely determined by the human mind, its formalization and analytic powers. The scientist or engineer who approaches a real world process tries to gain insight or an understanding of the phenomena on the process under study. One of the very powerful methods consists in trying to obtain an abstract or formal model or representation of the process. The activity is defined as model building and formalization. In essence the procedure requires abstraction and simplification. Simplification is necessary to restrict the complexity of the representation. One only chooses those properties within given boundaries of space or time which are believed to be connected with each other but unconnected with other properties or other parts of the world. Basically the model builder proceeds by hypothesis, induction and deduction. The complete body of methods is called modelling methodology.

Modelling itself is for a part still considered as an art. There are a large number of factors that come into play. The representation process involves almost always "inter- or extrapolation". Certainly, a large body of methodology is objective and mathematically sound. Many tools are well-defined and clearly stated. Statistical techniques and parameter estimation
procedures have a firm logical basis, but standard techniques cannot solve all problems. The final product is the result of careful trade-off's between existing facts, decision on the choice of representative details, careful experimental work and its interpretation. Examples of such issues relate to the choice of formalisms, the evaluation of the validity of à priori facts, the required level of descriptive details etc.

Ancient Greeks had problems with deception. The legend tells us that Ulysses was tempted at sea by the sirens who allured him into destruction with their treacherous songs and it was only by training his crew to tie him to the mast that he could avoid the ruin.

In modern electronic world it is JUST AS NECESSARY TO HAVE A HIGHLY TRAINED CREW not only for ONE anticipated mode of deception, but for a horde of possible situations.

It has sometimes been said that systems with automatic support devices are far better off than a system with a crew that has to evaluate threat and then take precautions; the automation is thought to be faster and without having THE TROUBLE WITH HESITATION BETWEEN STEPS to be taken.

Model integration is introduced; different descriptions of the same real world process are compared, screened for consistency and integrated into a whole. This activity is a basic step in scientific work, especially in the process of developing a theory and working out general principles. The formal model, though a simplified representation of reality, always summarizes a vast amount of information, comprising facts, axioms and hypotheses. If its validity is high or in