

## THE MANAGEMENT OF MILITARY TECHNICAL, TECHNOLOGICAL AND MANUFACTURING SYSTEMS

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**Abstract.** The military establishment is one of the most important institutions to configure a credible system for the state’s national security and also for regional and world security. The paper proceeds with a description of the technical, technological and production systems: the origin, the components’ nature, the action systems hierarchy. The general-functioning structure of an integrated system of production. The military establishment – an integrated system of production. The nowadays trends in the most of the world’s armies have had an influence on Romanian military system too: a fundamental change of organizational structure and of managerial practice, in particular as a consequence of abandoning the mass army model and also a development of military techniques and technologies. The Romanian army efficacy has as a final aim the accomplishing of a structure of force more compact, efficient, with more performance, flexible and compatible with NATO’s standards, and in this framework will be created the structure of forces and will be insured the fighting techniques modernization, through a process of differentiating the military institutions by the civilian institutions and also through the process of creating a professional and complete military staff, both from technical and technological endowment point of view and also from the human resources. A competitive management of an efficient army has to be able to insure in every moment the unfolding of land troops in the theatre of war, super trained and super endowed with the newest „high-tech” equipments.

**Keywords:** technical system, technological system, manufacturing system, integrated systems of production, Romanian army technique efficiency

### 1. Introduction

In general, the engineering science is represented by the practical application of scientific knowledge in projection, making and competitive exploitation processes of technical, technological, manufacturing and public or military service.

*The system* (the figure 1) represents a group of components that action each other, cooperate and function in the limit of some space-time-resources conditions, and ensure finality. Any system is an integer of its components and, in the same time, it is a subsystem of a whole system, the system hierarchy is infinite in space and time.

*The quality of a system* is given by all its features that make the system to be able to satisfy the necessities of the intern or extern environment in the framework of the life cycle stages of that system.

*The competing capacity of a system* represents the *systems’* outputs quantity, with a quality degree enforced by the around environment, that the system is able to produce it in a spell.

Also a system has a *competition property* that represents its ability to win, to obtain the most performance in the competing process in extern environment, in a space-time-resources framework, by using the opportunities given by the joining process with the systems’ networks from its inner and out environment.

These are some of the features needed be drawn by any common system and also a military system. The integrated engineering can be defined as some that allow mixing the integrated and simultaneous products, manufacturing process and there maintenance, including the security quality, terms, costs, purchaser exigency questions aso. That is why the integrated engineering supposes the preparation for manufacturing activity, the manufacturing process indeed, commercialization and the real participation of the specialists, both in time and space, from start to end of the process. In this way is taking into account the problem of developing new products, and the integrated approach ensures to reduce the drawing-up terms and the launch terms of the results, the quality enhance, and the production costs reducing.

**2. A short presentation of technical, technological and manufacturing systems**

**2.1. Technical systems**

The technical system is a physical-chemical one, is composed both from solid and fluid

components resulted by technical means in order to discharge some needed functions in the framework of action systems type, that implies human operating systems and specific technical systems.

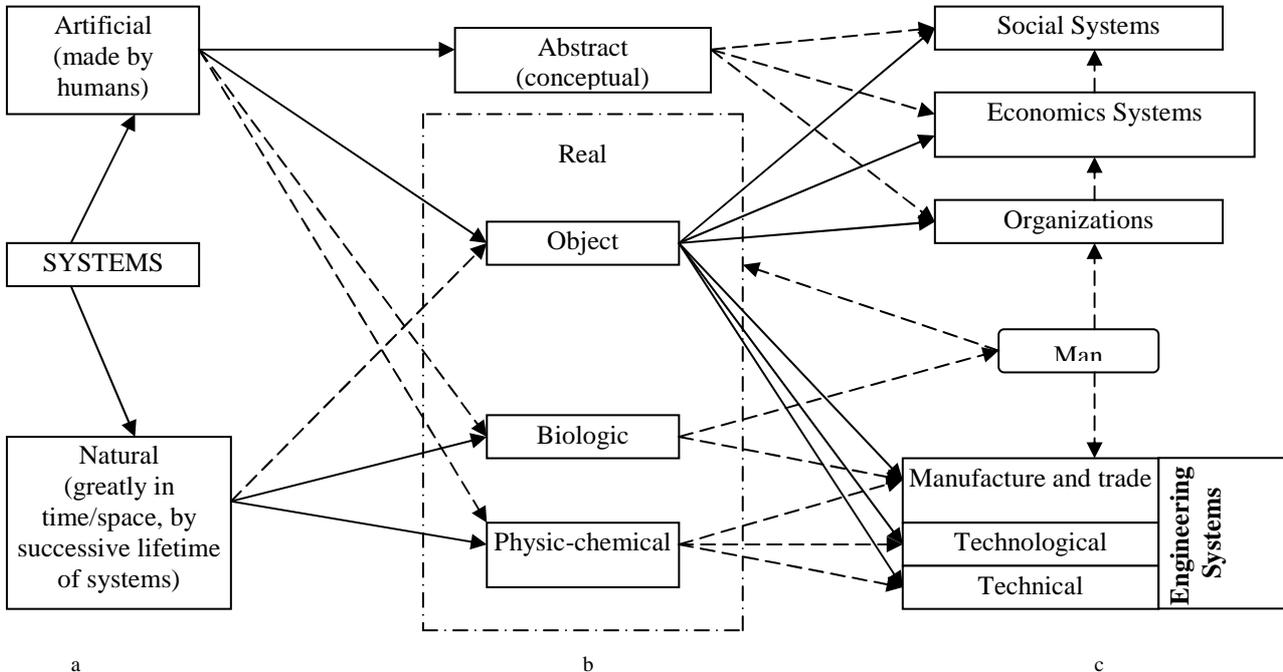


Figure 1. The systems scheme: (a) the source, (b) the parts origin, (c) action systems hierarchy

The typology of the military technical systems is various, but according to our goal, we can mention:

a) From structural-functioning point of view there are three main types:

1. transformation equipments (machines, devices) and adjoining technological equipments. Each of these have subassemblies, pieces, objects, parts, functioning program in order to ensure the proper fulfill the specific functions of the equipments (to transform the input in output, transfer, stocking, process leading). Any equipment has a guidance structure (for command-control-regulation of its functions and for informational interconnection with human operator) and an execution structure (of information, respectively transfer, stocking operating and transforming of substance, energy, specific information).
2. installations – formed from buildings, technical networks. Each of these have subassemblies, pieces, objects, functioning program in order to ensure the proper fulfill the specific functions of the installations (conditioning, transfer of substance/energy/information, stocking, process leading). The machine is a technical system

with machine parts and mechanisms with stereo mechanical motions, able to turn a form of energy into useful mechanical work, no stereo mechanical motions (force machines). The apparatus (device) is a technical system able, without stereo mechanical energy mediation, to transform, transfer, stock the energy or/and the information. The networks are technical systems have ensure the substance, energy, information transfer without their transformation.

b) From the processed resources nature we can divide them in:

- Technical systems processing the substance (for instance manufacturing systems of military materials and pieces),
- Technical systems processing the energy (for instance energetic systems),
- Technical systems processing the information (for instance computing systems and information systems).

**2.2. Technological Systems**

The technology studies the transformation of the substance, energy or information in work technological processes and the possibilities of an efficient settlement in order to obtain the needed products.

From research point of view we can delimitate two groups of action technological systems:

- Small technological systems (at simple or complex operation level),
- Big technological systems organized by a set of small systems.

All these systems are subsystems of other production systems.

### 2.3. Manufacturing Systems

Manufacturing system is a multi operation action system able to transform specific inputs (substance, energy, information and work) in specific outputs (products, services and waste products demanded by market and extern environment. Any manufacturing system has as a component a auto managing subsystem and an execution system.

Manufacturing Integrated System (MIS) is composed both building and land, and the needed technical base, composed generally by aggregates or equipments.

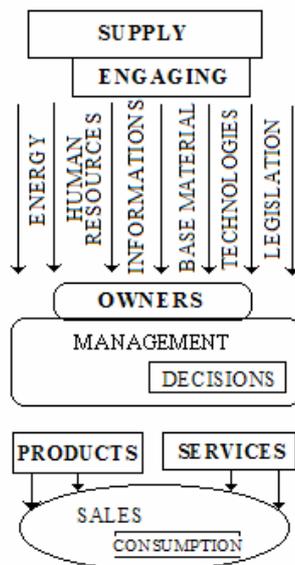


Figure 2. The general functioning structure of a manufacturing integrated system (MIS)

In figure 2 is presented, in a large scale, a general structure of a MIS. Spite, the meaning of the relations is focused on finality given by the satisfaction degree of the clients/consumers that will demonstrate the efficiency of the activity.

### 3. Military System Management

The military institution is one of the most important institution for configure a believed system of a state national security and also regional and world security.

The present tendencies in the most world army have had an influence over Romanian military system: radical changing of organizational structure and managerial practice, first because of relinquishment the mass army model, and also the development of military technique and technologies. In this way, we can enunciate 5 issues:

1. passing from a mass Army to a professional Army:
  - unfolding a gradual process in a certain spell time, providing the reorganization the organizational format and structure (the dimension) of the resources and of the army force missions and adjust it to a changing society needing.
  - to quit the compulsory incorporation, for voluntary recruitment (that event has happened in USA in 1973, in United Kingdom in 1967, in Denmark, Holland and Belgium in 1975, in France in 1990);
  - the tendency is to pass from a mobilization military force to a permanent one (force in being), able to a quickly intervention and super performing using high technology.
2. to reduce the difference between civil military field:
  - “civiling” the military profession simultaneously with the military forces penetration in the civil structures (“militarization of the diplomacy” and, in the same time, an “internationalization” and a “civiling” of military staffs);
  - the military staff increasing professionalism as a consequences of the military technology complexity increasing, but also introducing many civil technicians in Army structure.
3. changing the organizational attitude and managerial technique:
  - the authority is based less on the official rank and on the authority offered by the function and is based more on personal leadership, the primary group solidarity and to obtain the efficiency and organizational and technical performance of small unities;
  - is characterized by the confronting of two military leading ideal-types: the classic commandant, that symbolizes the military tradition and glory, and the military manager, an expression of scientific dimension, of the military preparations.
4. changing the modality to recruit officers:
  - the voluntary activity can determine increasing of individual qualities of the recruits, also of social qualities of army staff;

5. changing military missions in accordance with their present importance:

- the prevention of war;
- the keeping of national and international social stability (peace-keeping);
- the military, technical assistance for social and national development (nation building), interventions in emergency situations.

The difference between military and civil institutions can determine, in modern states, a high level of civil controlling and making a professional and complete officer staff, both from technological and technical endowments and human resources point of view.

### 5. The Romanian Army tendency

Romanian Army passes an ample process of reorganization and modernization, opened after the Revolution from December 1989. The measures and acts for the settled operation development and others that follow to be transposed into facts in the next period take into account the trend of security's environment from the Romanian concern area. There is a clear vision over final goal, moving the accent had put on defense army toward a security army the improving becoming essential, so Romanian Army can become a modern and believed force, endowed with performing technique and modern equipment, trained and prepared according to NATO's standards: national Strategy of Security, white Charta of Government' security and national defense, the Law of national defense, the Law of national defense planning and the Law of Romanian Army organization, deriving from Romanian Military Strategy, The strategic Vision Romanian Army – 2010 and so on, in order to enforce the Romanian position for regional security generating, to enhance the efficiency of military efforts, taking part to the crises and war preventing process, the crises managing and collective defense in regional framework and also to solve some civil emergency. Romanian Army reorganization process has the finality to achieve a more compact, efficient, flexible force structure, being compatible with NATO program.

### 6. Conclusions

In order to achieve the objectives of European and Euro-Atlantic integration, Romanian Army has to emphasize the competition spirit, on integrative management of performance. A performing military management has to be able to ensure in every moment unfolding land troops in

the potential war theatre, proper projected and trained, supra trained super endowed with the newest „high-tech” equipments, anywhere is necessary. This is the „high-tech” war that needs high technologies arsenal and a perfected management in order to destroy the enemy vital economic and military objectives.

In conclusions, the infantry fighter become in the era of computers, communication electronics means and high technology, a software fighter, a real combatant endowed both with intelligence, dexterity, tenacity, agility, perseverance, courage, force, physical resistance, self-controlled and professionalism and also a good manager in coordination and leading the military intervention in any environment and condition (night, infrared sight, increasing power also). The third millennium soldier will have to be complete soldier and the Romanian soldier can not be expelled the present trend of new military millennium.

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