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Military technology comes from club to attack/defense robots by Research and Development (R&D)

GYÖRGY SERES

Miklós Zrínyi National Defence University, Budapest, Hungary

In the first part, the author shows some selections from the history of Military R&D for illustration. In the second part, a new universal model of the military systems is demonstrated for study of Military R&D.

This model of military systems is universal, because it is suit for duty: any level of military systems; coherence among human, technology and organization subsystems; influence of different purposes for military systems; armed combat, if technology level of sides is and isn't comparable; role of technology in terrorist military system.

What's different between animal and human being?
Only human being uses military technology.

Introduction

First, I show some selections from the history of Military R&D for illustration.

1. Attack tools
   - Versions of club from bludgeon to baseball-bat
   - Swords and sabres
   - Tools of individual distance shooting from sling to machine-gun
   - Tools of artillery from catapult to missiles
   - Bombs to the nuclear weapons
2. Defensive and logistic tools
   - Defensive tools from faithful mask to fort
   - Military vehicles from martial cart to unmanned land, undersea and air combat vehicles
3. Military systems
   - Air defense system
   - Strategic Defense Initiative[1] (SDI or Star Wars)

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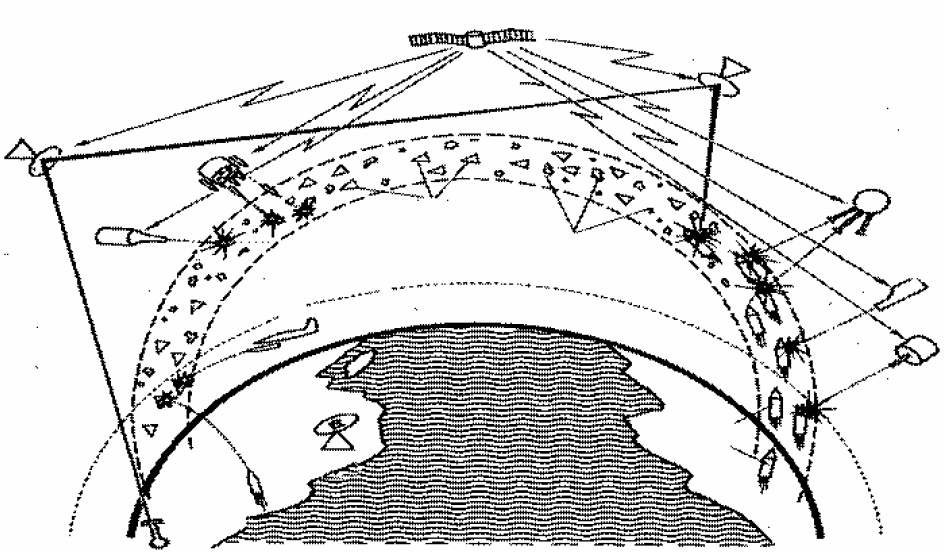
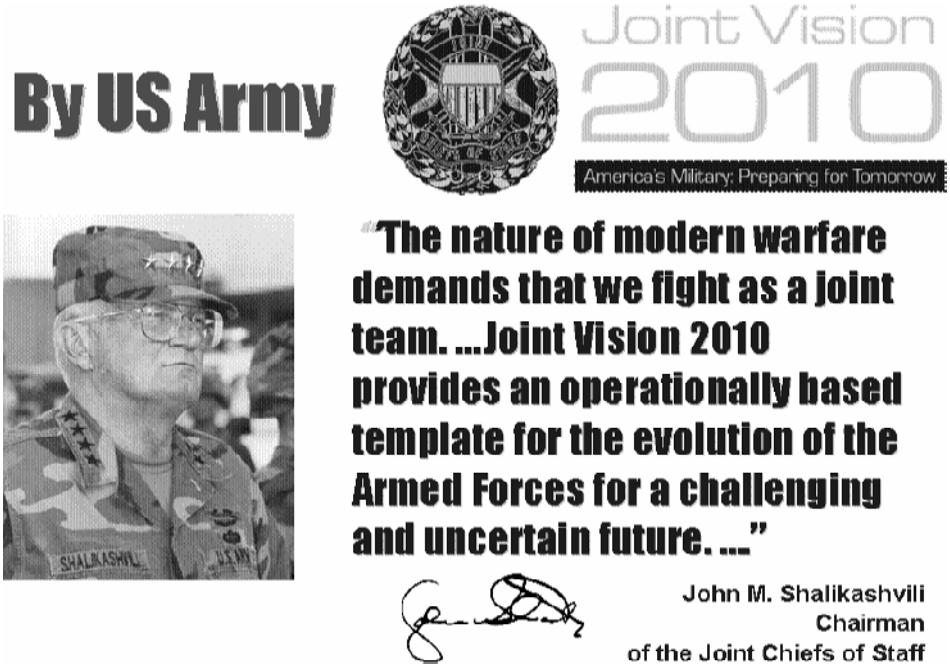
Address for correspondence:
GYÖRGY SERES
Miklós Zrínyi National Defence University
P.O. Box 15, H-1581 Budapest, Hungary
E-mail: drseres@jata.org



4. General lines of the future of R&D[2,3]



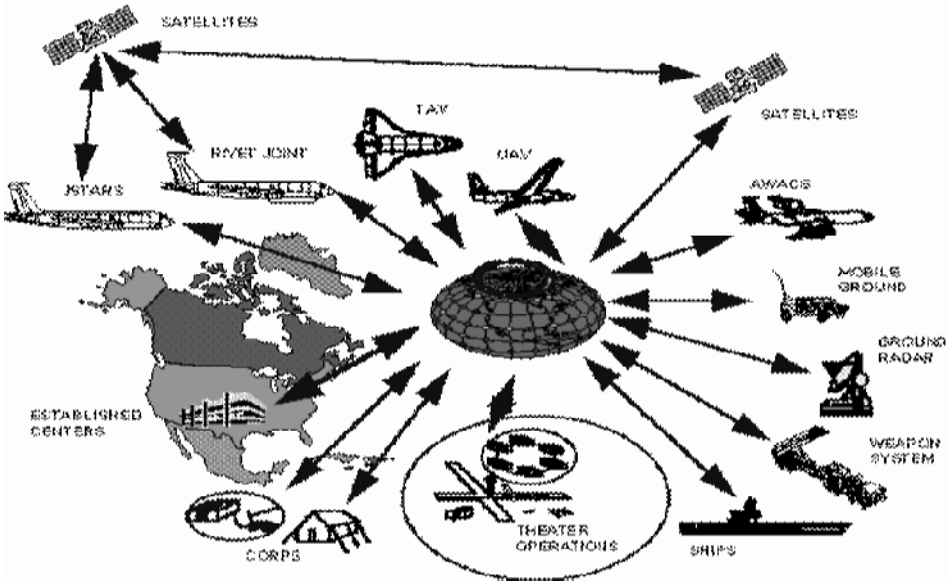
By US Air Force **„Air Force 2025"**

JOSEPH J. REDDEN
Lieutenant General, USAF
Commander, Air University

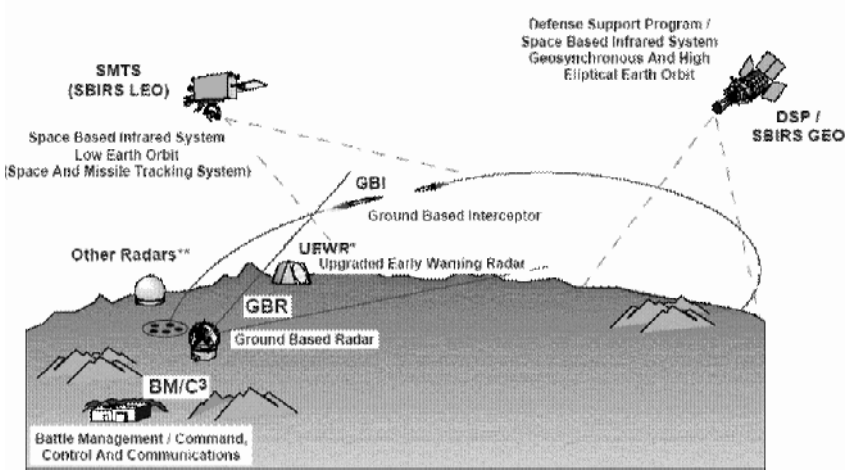
The Air Force University conducted a study to identify the concepts, capabilities, and technologies the United States will require remaining the dominant air and space force in the first quarter of the 21st century.

The study was called Air Force 2025.

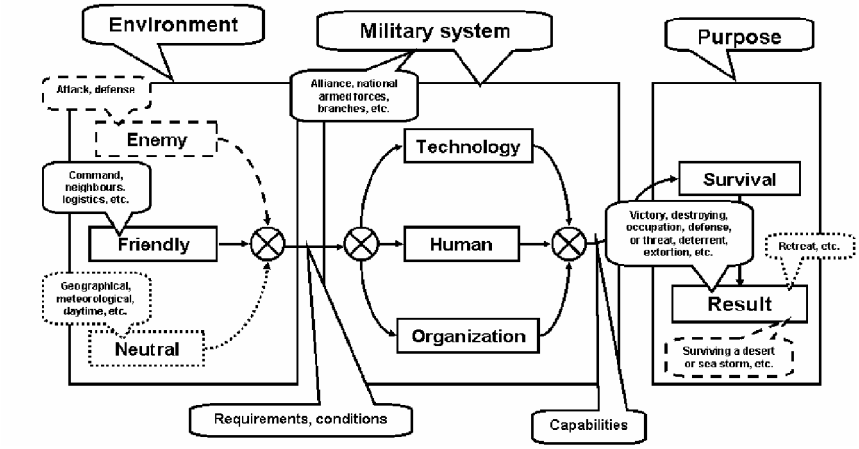
- Worldwide C4I system



- National Missile Defense (NMD) system[4]



A new universal model of military systems for study of Military R&D



Military system

a) Military system can be a system all of levels, from a military alliance to a digital warrior.

- Alliance,
- national armed forces,
- branches,
- etc.

b) Subsystems of military system are:

- Human
- Organization
- Technology

System allocates inputs – requirements and conditions – from *environment* among its subsystems, and integrates their capabilities for outputs for reaching *purpose* of system.

Environment

a) Environment's outputs are:

- Requirements,
- conditions of military system

b) Environment's subsystems are:

i) Friendly

- Command,
- neighbors,
- logistics,
- etc.

ii) Enemy

- Attack,
- defense

iii) Neutral

- Geographical,
- political
- meteorological,
- daytime,
- etc.

The purpose of military systems must be determined by friendly environment, but it can be determinate also by neutral or enemy environment.

Purpose

The purpose of military systems can be determinate by its environment – exclude terrorist military systems, which own purpose determinate itself.

a) Survival

b) Result

i) Determined by friendly environment:

- Victory,
- destroying,

- occupation,
- defense,
- threat,
- deterrent,
- extortion,
- etc.

ii) Determined by neutral environment:

- Surviving a desert, or
- a sea storm.
- etc,

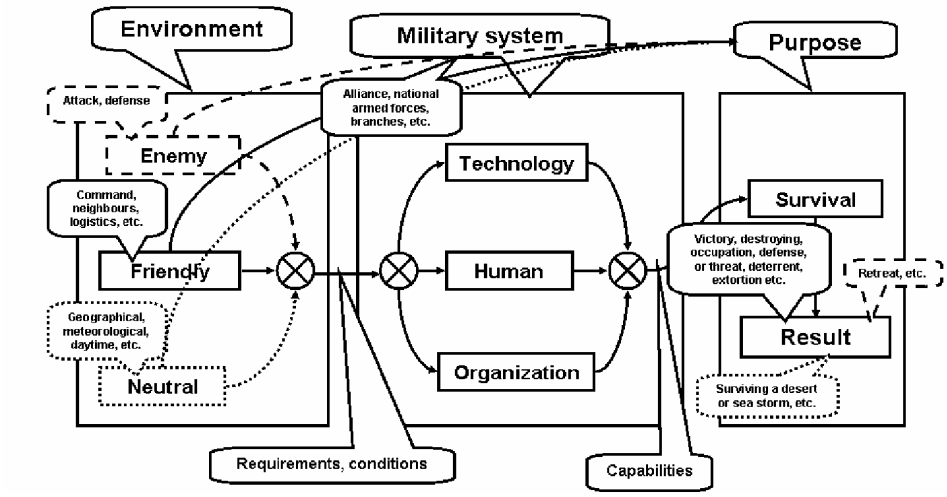
iii) Determined by enemy environment:

- Retreat,
- etc.

Conclusions

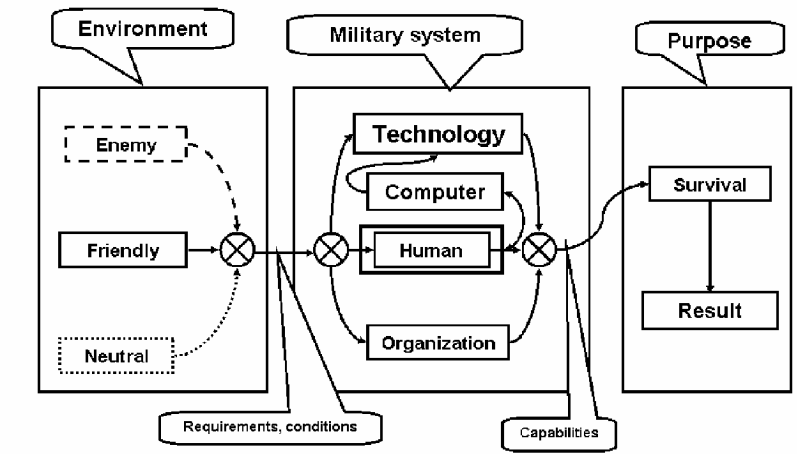
First conclusion

R&D mission: to reach all the purposes of military systems



Second conclusion

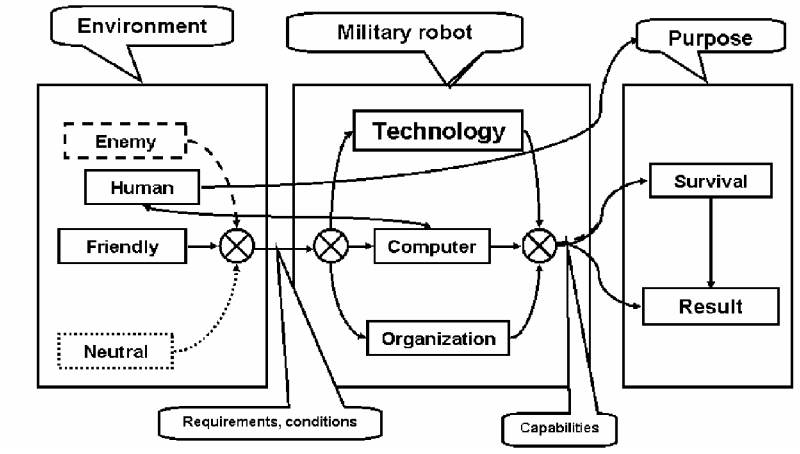
One of main goals of R&D: to decrease danger for human in combat



- by increase radius of attack tools
- by increase efficiency of defense tools
- by automation

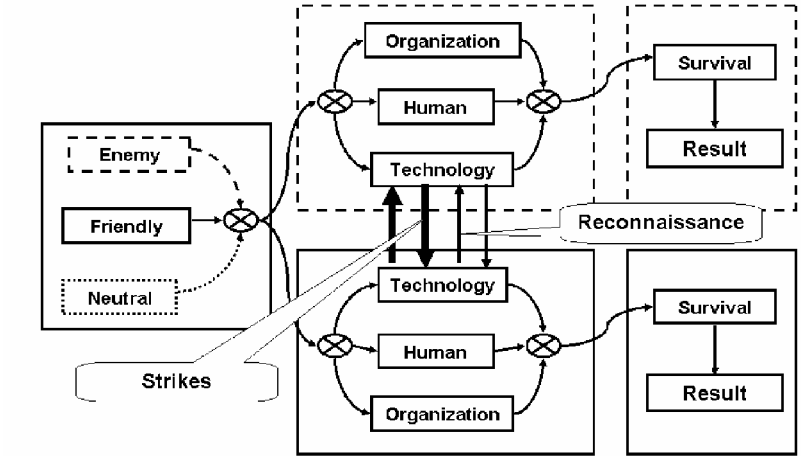
Third conclusion

The ultimate goal of R&D: to make military systems capable to reach its purpose without human participation – military robots



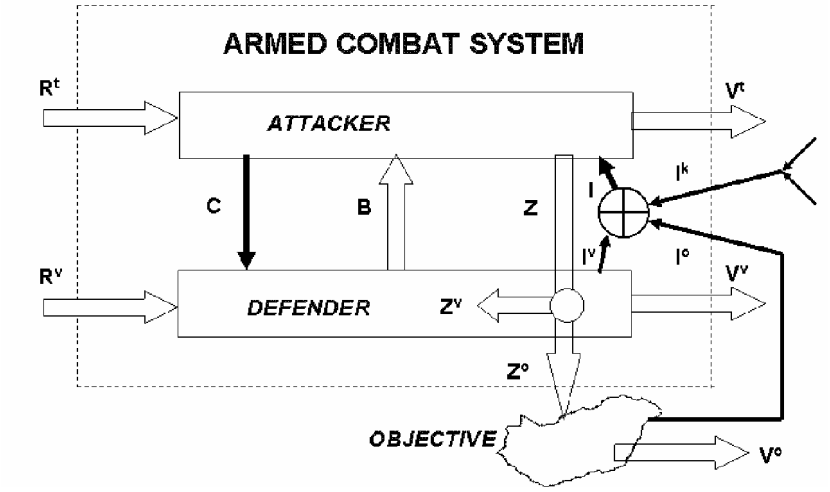
Fourth conclusion

Role of technology in armed combat: contact two adverse systems by mutual reconnaissance and strikes



If somebody remembers

On the first ROBOTWARFARE conference in 2001 I presented a model[5] like this



The basic ideas of my Armed Combat model were the followings:

- The Attacker against the Object and it's Defender are related in combat as close as two subsystems of a big-system.
- Resources of the combat-activity (R^t or R^v) are the inputs, and the losses (V^t or V^v and V^o) are the outputs.
- The relationship between the components are:
  – reconnaissance (I or C)
  – and strikes (Z or B).
- Consequently, the two subsystems form an independent big-system, which is the Armed Combat System itself as such.

This model includes all specifics of a cybernetic system, and that's why we are able to analyze Combat with adequate and rich cybernetic tools.

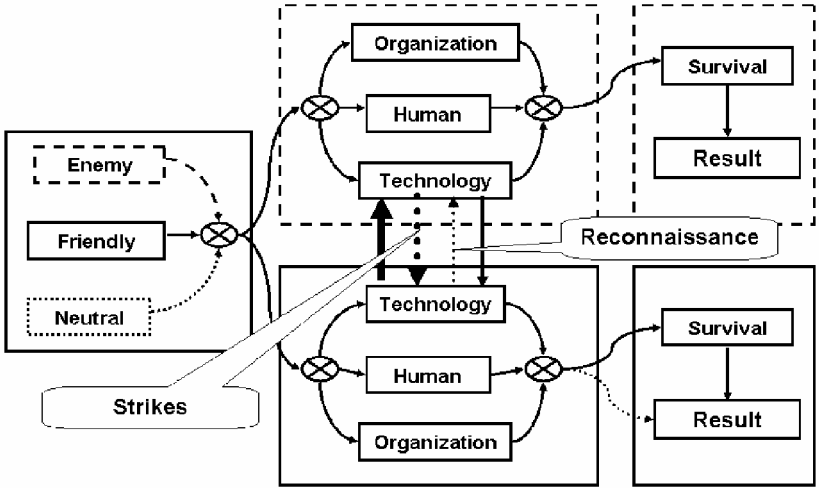
Reviewing the past: I put some questions for myself in 2003

- When two armed forces did really engaged using comparable military technology?
  – 1975, in Vietnam War!
- Which two antagonistic superpowers had comparable military technology, and when?
  – USA and USSR in 1991!

Fifth conclusion

That's why I try: how does my new model work if technology level of two systems isn't comparable?

Armed combat, if technology level isn't comparable



This case of the armed combat has three main types:

1) *Kamikaze type*, if survival is not been purpose of the weakest side.
2) *Yugoslavia type*, if the weakest side's reconnaissance and strike capabilities practically break off after the first strikes of enemy.
3) *Guerilla type*, if the strongest side can't improve its reconnaissance and strike capabilities, because the weakest side has more experience from the neutral – geographical, meteorological or political – environment.

If somebody remembers

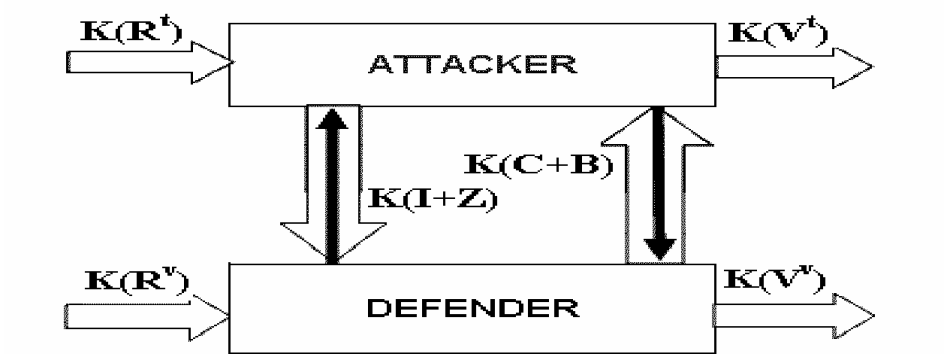
On the second ROBOTWARFARE conference in 2002[6] I formulated a question:

How can we compare different input and output parameters of the Armed Combat System?

My answer was:

Compare material and moral value of input resources, output losses, information gathering or strike resources

And the proposed value-model of the Armed Combat System was



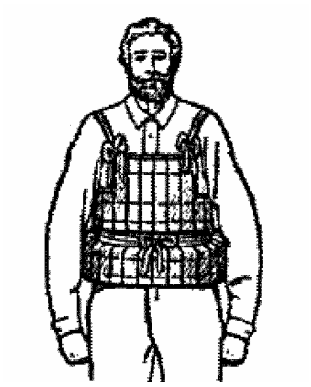
Where:

- $K(R^t)$, $K(R^v)$ – material and moral value of input resources
- $K(V^t)$, $K(V^v)$ – material and moral value of output losses
- K(I+Z), K(C+B) – material and moral value of information gathering or strike resources

Reviewing the past: I put a question for myself in 2003

What does the phrase “Material and moral value” mean for terrorist organizations?

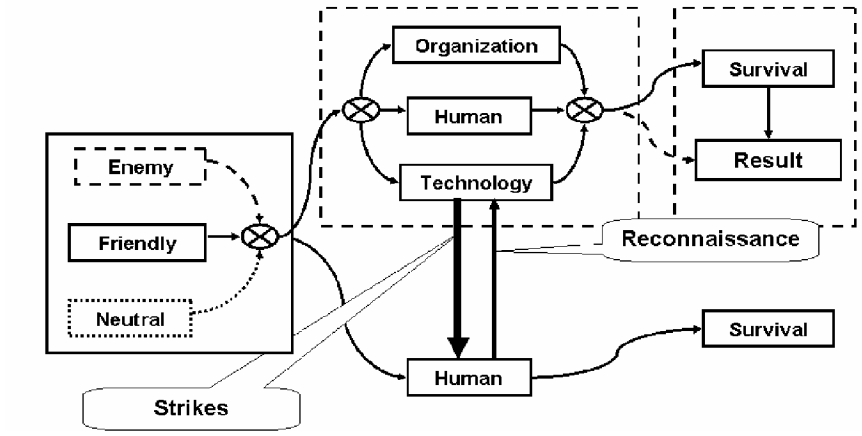
The answer is much known for everybody:



Sixth conclusion

That’s why I try: how does my new model work, if military system is a terrorist organization?

Role of technology in terrorist systems – and in the special case of state terrorism, in the coup, when military system has own goal



- Terrorist systems use military technology against human, without technology and organization.
- Result is often more important than survival in terrorist organizations.

Ultimate conclusion

This model of the military systems is universal, because it is suit for duty:

- any level of military systems
- coherence among human, technology and organization subsystems
- influence of different purposes for the military system
- armed combat, if technology level of sides is and isn't comparable
- role of technology in terrorist military system

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