

Ministry of Defence

User Perspective on Design Logic in Military Simulators

Maarten van Veen, Paul van Fenema, & Tim Grant
Netherlands Defence Academy

MJP.v.Veen@NLDA.nl

tel: +31 76 527 3280

Outline

Goal:

- To initiate discourse on advantages, disadvantages, choices, interpretations, & constraints in complex information systems for military modelling & simulation

Overview:

- Introduction & motivation
- Philosophy of military technology
- Military training simulators
- Example Dutch training simulators
- Design logic in RNLN's ASTT
- Conclusions & further research

Introduction

Authors:

- Maarten van Veen:
NLDA lecturer (with time off for his PhD)
- Paul van Fenema & Tim Grant:
NLDA co-supervisors

Maarten's PhD project:

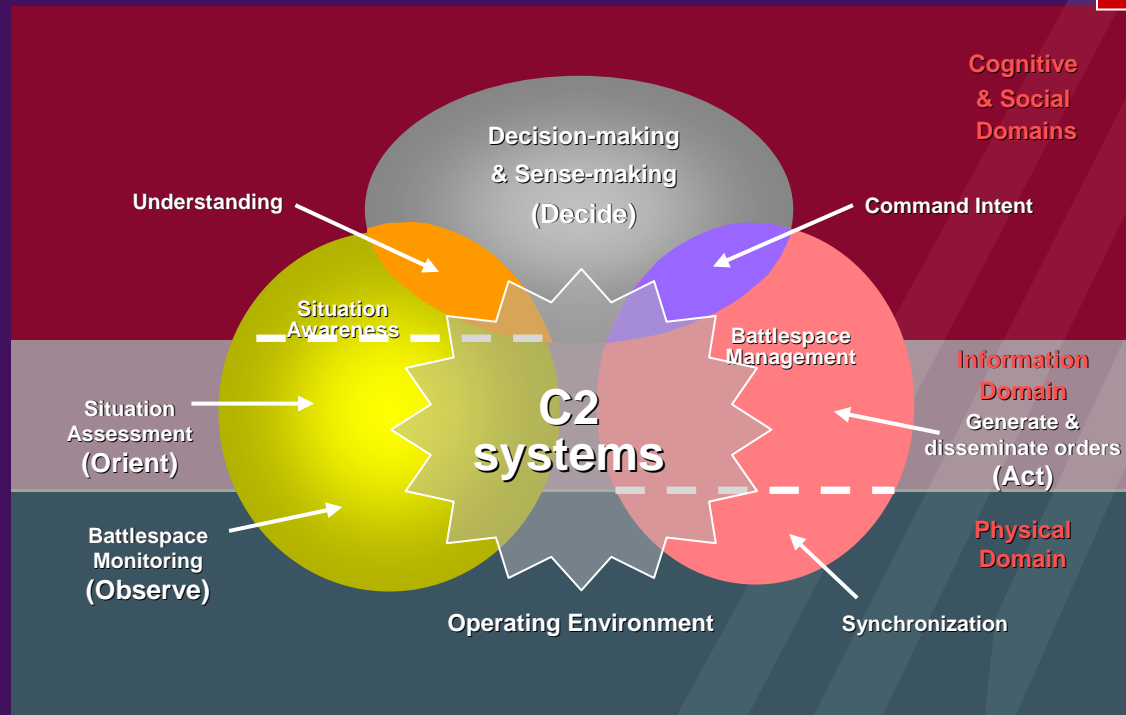
- “Making sense of ICT use in NEC” (NEC-05)
- Supervised by University of Humanities, Utrecht, & University of Amsterdam (both NL)
- Started mid-2006 (N.B. part-time)
- Focusing on military training simulators
- This paper results from exploratory phase

Motivation

Maarten's theoretical basis:

- Philosophy / history of military technology:
To become effective, technological inventions must be embedded in social context

De Landa, 1991



Philosophy of military technology (1)

Thread in 2 literatures:

- Information systems
- Sociology

Key ideas:

- History of technological development forms an evolutionary tree (“machinic phylum”)
- Technological evolution – like natural evolution - is self-organizing but constrained by mathematical laws

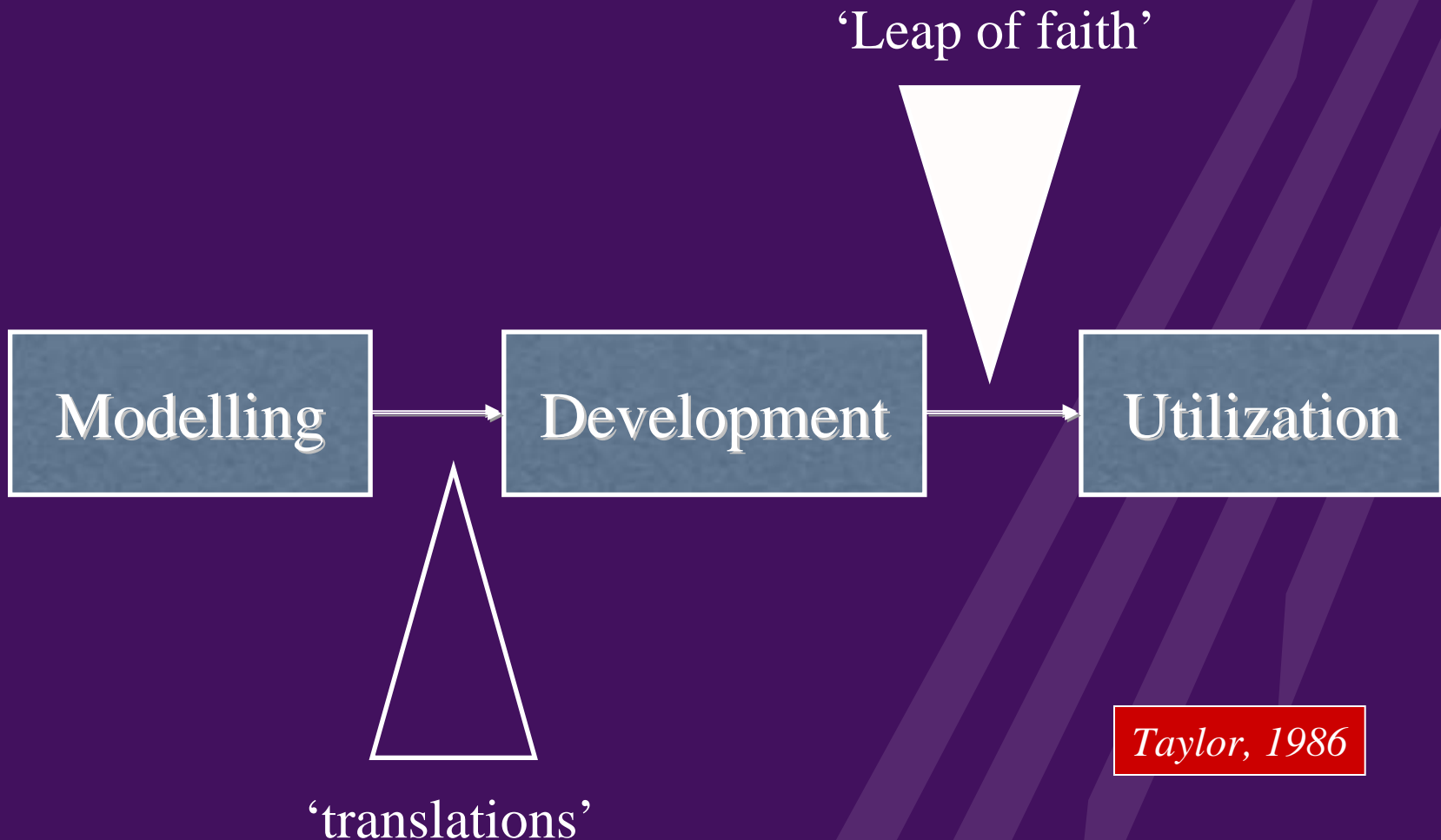
De Landa, 1991

Philosophy of military technology (2)

Leading philosophers of military technology:

- De Landa:
Self-organizing technological evolution
Centralization vs. decentralization
 - Der Derian:
Virtuous war; war becomes a game
Military-industrial-media-entertainment network
 - Latour:
Building system is influenced by social practices (cf. SE)
Actor-Network Theory (ANT)
 - Orlikowski:
Developers shape 'deep structure' of system
Users appropriate system to their context
 - Taylor:
Users take developers & system on trust
- Object of study:
training simulators
- Compare developers'
& users' 'deep structures'
-

Philosophy of military technology (3)



Military training simulators

Simulation means:

- Mock combat in safe environment

Categories of simulators:

- *Constructive*:
Simulated people operating simulated systems
Train command & staff decision making
- *Virtual*:
Real people operating simulated systems
Train motor, decision, & communication skills
- *Live*:
Real people operating real systems

Example Dutch training simulators

Action Speed Tactical Trainer (ASTT):

- Constructive, COTS product
- Royal Netherlands Navy (& other navies)

Tactical Indoor Simulator (TACTIS):

- Virtual
- Royal Netherlands Army

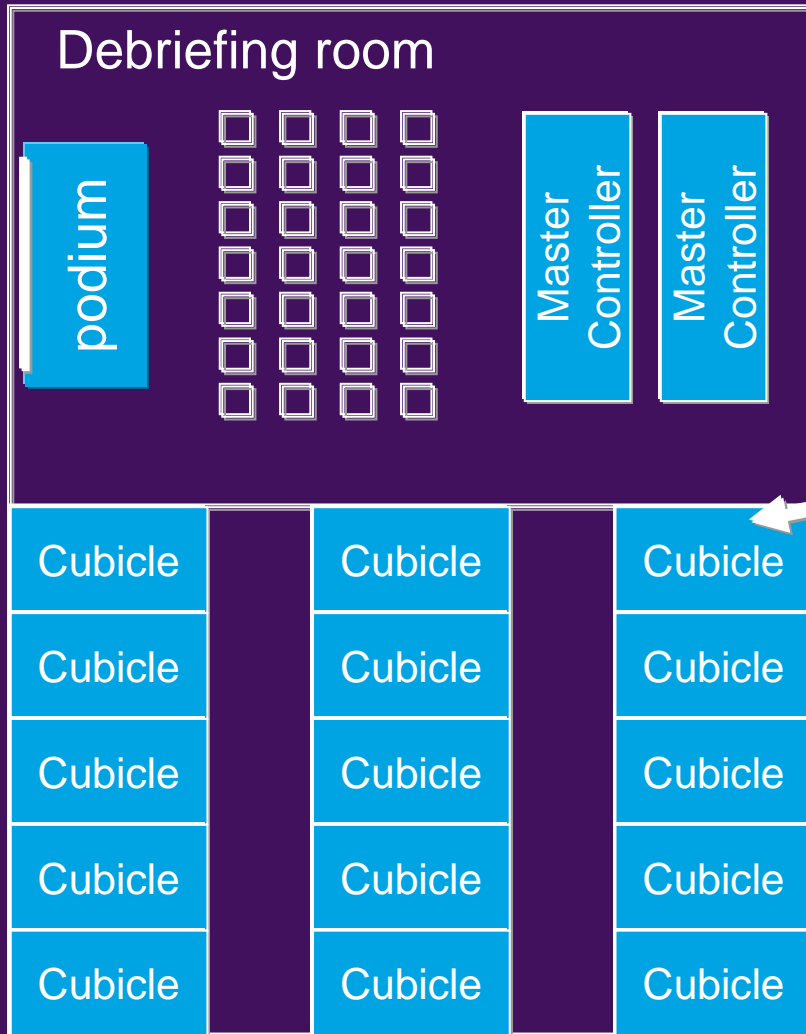
Steel Beasts:

- Virtual, PC-based COTS product
- Royal Netherlands Army (& other armies)

Mobile Combat Training Centre (MCTC):

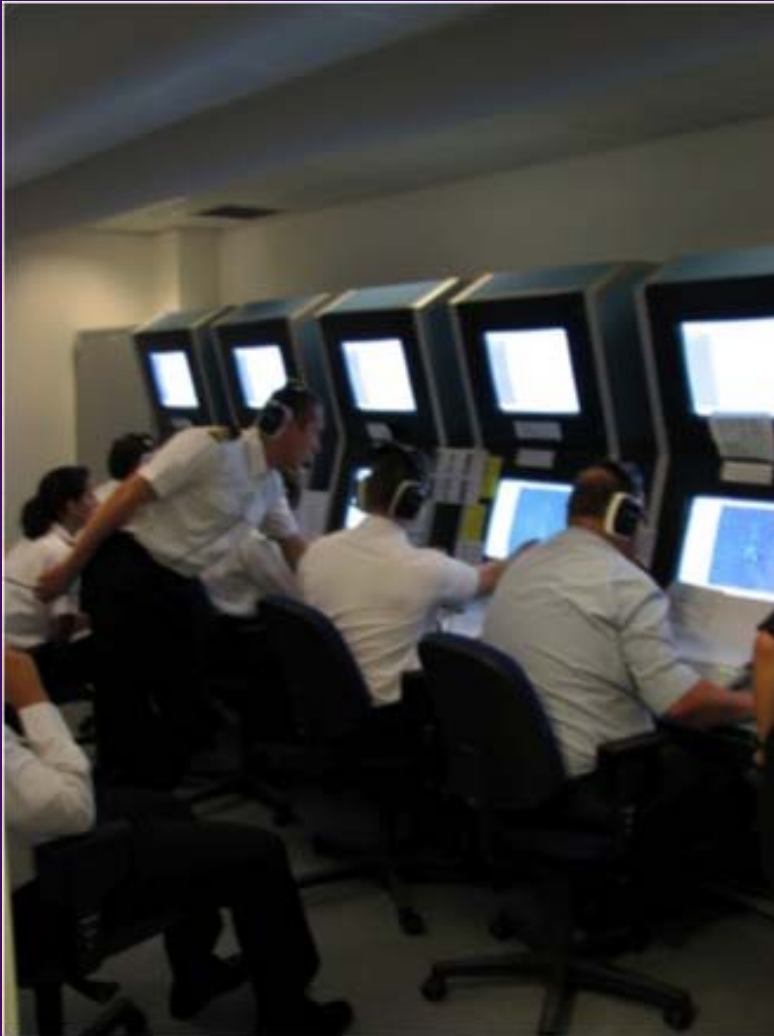
- Live / duel, during large-scale training exercise
- Royal Netherlands Army

Design logic in ASTT (1)



Cubicle

Design logic in ASTT (2)



Cubicle in use

Common Operational Picture



Design logic in ASTT (3)



Debriefing room

Design logic in ASTT (4)

Instructor: “The students obviously react to the games based on the teaching and the practice they have been told. The debriefings range from tactics played in best practice that was not followed by them to areas where there is not a right and a wrong option, but we may lead them to a different conclusion that is different from what they did in the game. The debriefings are very valuable and we are in the distinguished position of having **god’s picture in the kitchen**. So we know what is going to happen and we know what they should consider and what they actually consider. And **we will know duteously every bit of information** that has been passed. And in their own set cubicles, they have an idea what they want to achieve. Certain cubicles will have been passed different pieces of information, but all makes the jigsaw come together. So we will know, whether or not they have information to make the right decision. And in the debrief we talk with everybody about that scenario, from all the different cubicles, to **give them the full picture** that we had all the time.” (respondent 1)

Design logic in ASTT (5)

Instructor: “The objective is to focus them and **allow them to develop**. A lot of the scenarios that we have, have incidents in them they will encounter further down the line in a more complex environment. So because they have a single threat game initially and we will refine procedural things, we can also **try develop their traits of thought** to a more tactical aspect. And then it develops to a dual threat game, hopefully they have retained some of the single threat to become instinctive. So that they will be able to develop themselves in the dual threat. And ultimately when we go to the multi threat itself, they have got to be at a stage where **some things are instinctive**, because **you can't remember everything or try to recall everything**. Things have to be instinctive. So the ultimate goal of these debriefs is to **give them some instinctive things**. They don't have to retain everything, things will happen. And it will allow them more capacity to deal with the more complex scenarios.” (respondent 1)

Design logic in ASTT (6)

Interim results:

- Training simulators integrate totally:
 - Human & non-human components
 - Virtual & real viewpoints
- Vocabulary of computer games:
 - “God’s view”
 - “Second life policy”
 - “Master gun”
 - “Fire markers”
 - “They cheat”
 - “We need action”
 - “Win or lose”
- “Train as you fight, fight as you train”:
 - Very realistic experience; WYSIWYG
 - Vulnerability models sophisticated & influential
- Instructor *is* god

Conclusions

Development of military training simulators is not only rational-technical process, but social one

Military training simulators become complex black-boxes with deeply embedded assumptions ('deep structure') about warfare, training, & team communication

Developers keen on building 'best' (technical) system, but also – consciously & unconsciously – influence users

Transfer of knowledge from development phase to utilization (training) phase is imperfect:

- Mismatch in developers' & users' 'deep structures'

Further research

Maarten's research plan:

- Deeper study of MCTC
- Write PhD thesis

Further research question:

- Could this approach shed light on DCMOTP factors?

Any questions?