



14-16 May 2019  
Stockholmsmässan, Sweden



# Decision Making at the Command Post Level

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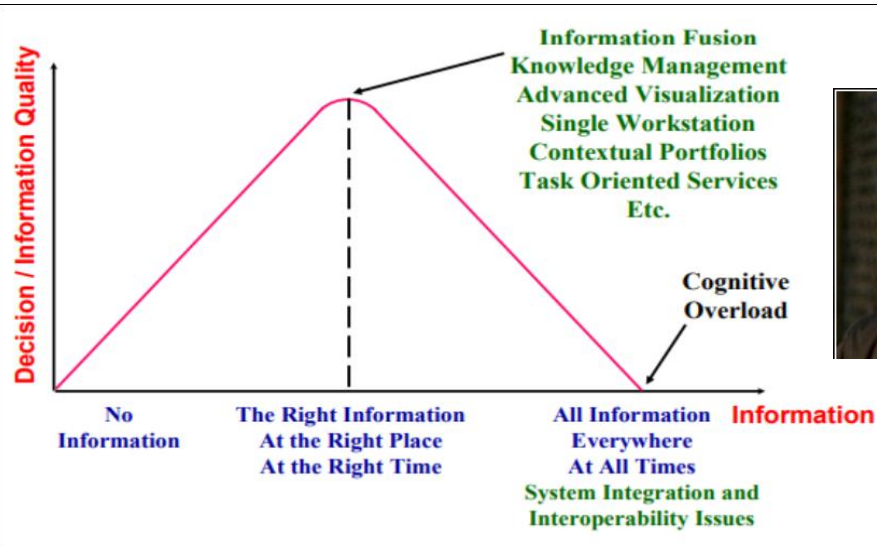


## Information overload at CP level

+1600% : The growth of intelligence gathered since 9/11

“There is information overload at every level of the military — from the general to the soldier on the ground”

Art Kramer, a neuroscientist and director of the Beckman Institute, a research lab at the University of Illinois.

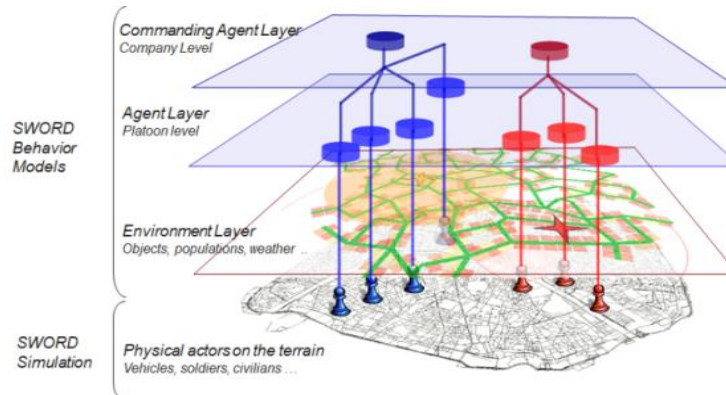


It's not information overload. It's  
filter failure.

— Clay Shirky —

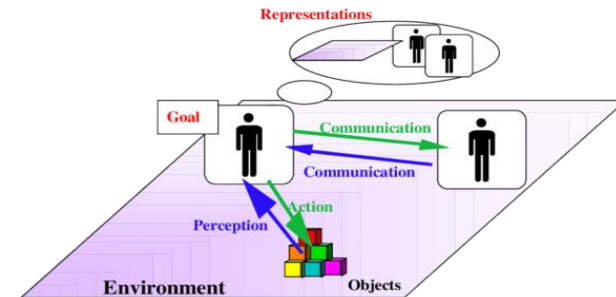
# Avoiding Filter Failure

- ✓ Constructive Simulation → Training and Operations Planning
- ✓ Add Decision Support during military operations
- ✓ Vision smart A.I. simulated units on complex Operational Picture
- ✓ Multi-agent simulation
- ✓ MASA SWORD



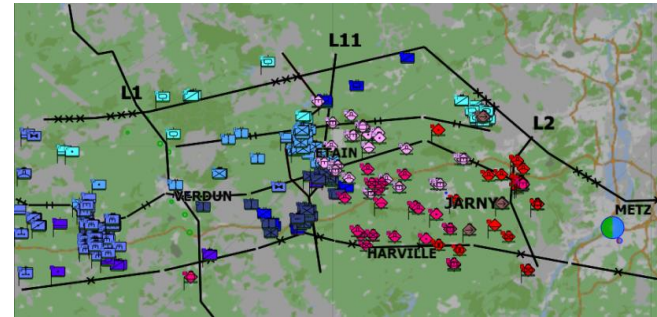
# Smart Intelligent Agent / Units

- ✓ Knowledge of the capabilities of all the units
- ✓ Whereabouts of enemy units
- ✓ Respecting doctrine
- ✓ Much usable information
- ✓ Too much, too complex? Yes!



# Towards a solution.....

- ✓ Complex COP with on top additional information from our units
- ✓ Personalised view information, serving unique specific objective
- ✓ Alerts, when missions become difficult to accomplish
- ✓ Smart synthesis of battlefield situation
- ✓ Vignets / Snapshots

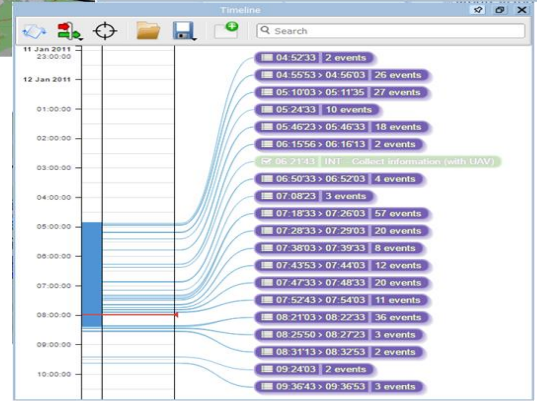
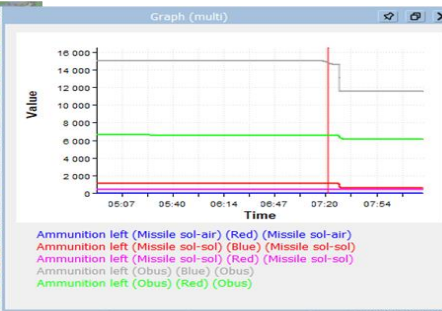
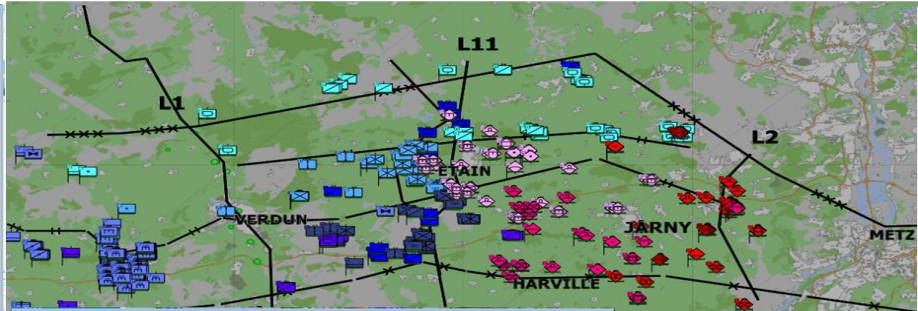






14-16 May 2019

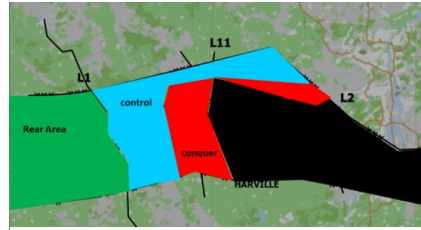
# Understanding a conflict situation



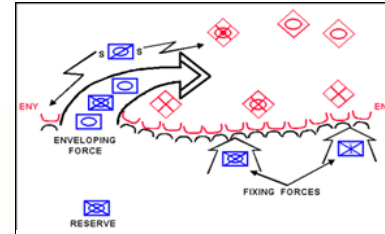
 #ITEC2019



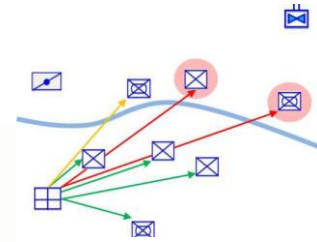
# Smart vignette examples



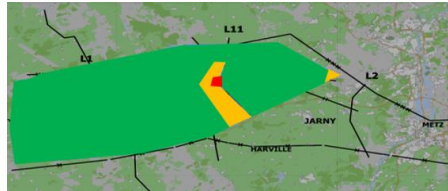
Effect based maneuver synthesis



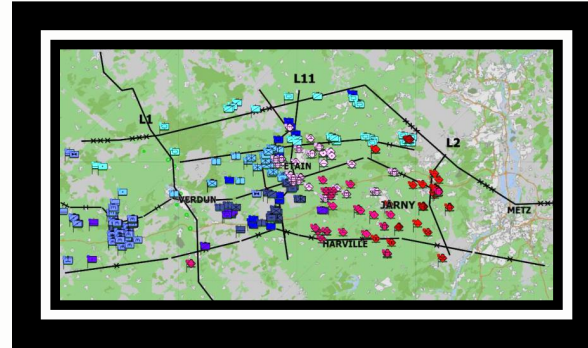
Maneuver synthesis



Geographic sustainment coverage



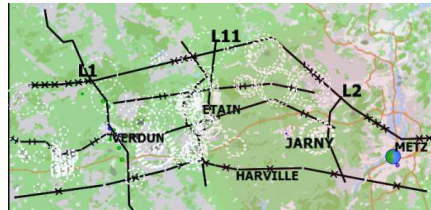
Local force ratio



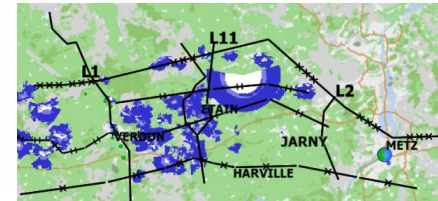
direct fire capabilities



Time to be able to provide fire support

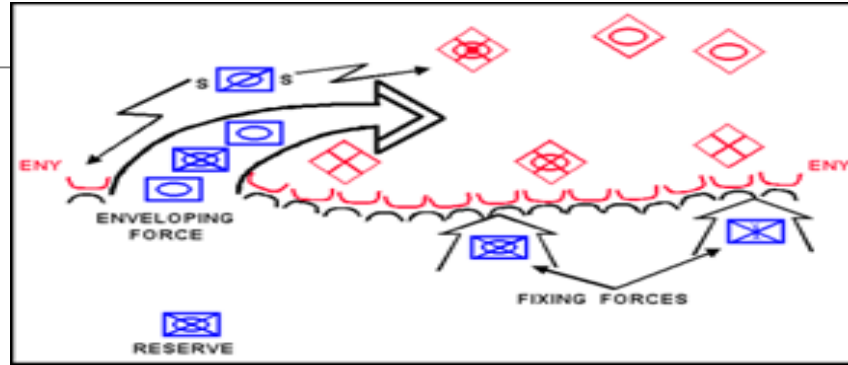


Perception capabilities

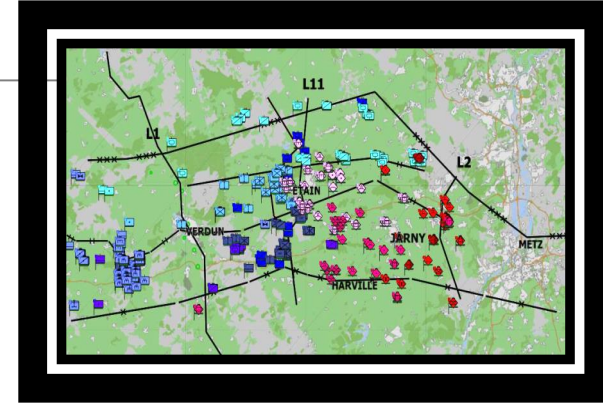




# Automatic Generation of Battle Lines



Maneuver synthesis



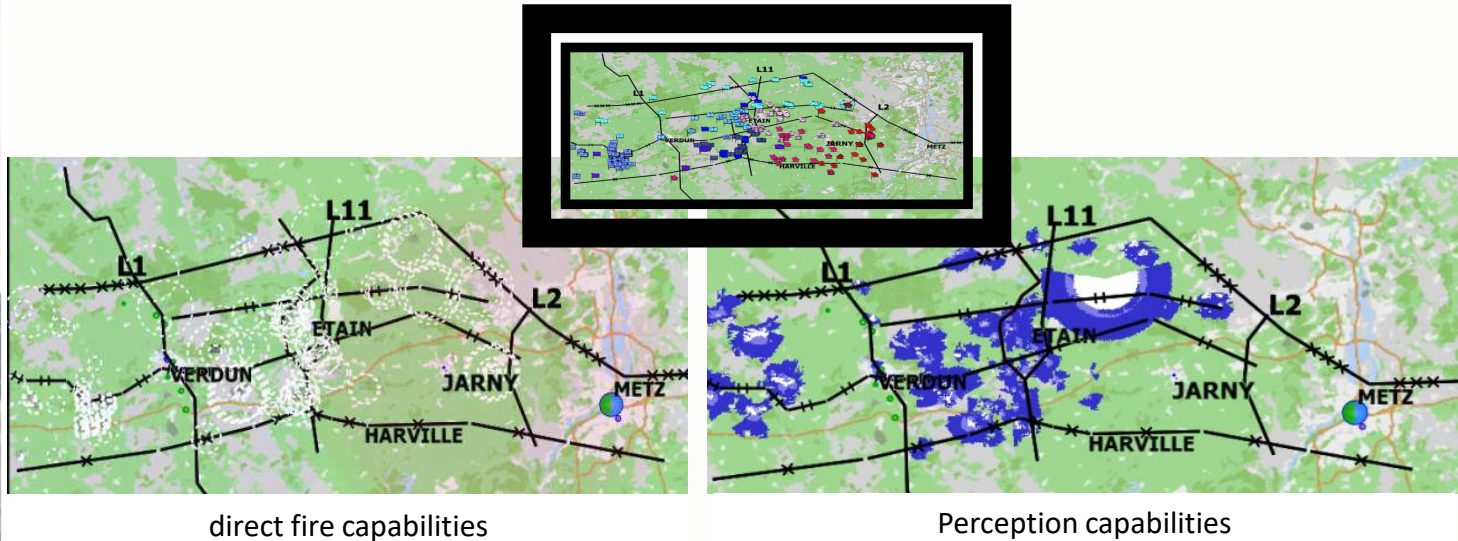
✓ Synthesis of position of own troops and OPFOR:

- ☐ FLOT (Forward Lines of own troops)
- ☐ LOA (Lines of Advance, non-recon)
- ☐ LC (Lines of Contact)
- ☐ Forward Lines of OPFOR

✓ Graphical representation of missions and movements



# Automatic Generation of Direct Fire and Sensors

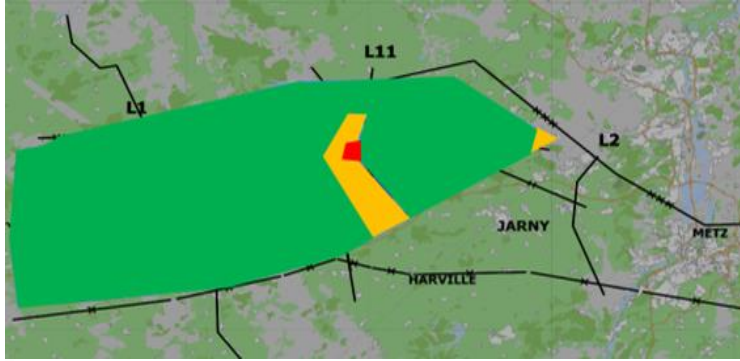


- ✓ Movement has impact on these capabilities
- ✓ Same for the current missions of the units
- ✓ As in real life to make sense (to base decisions on)

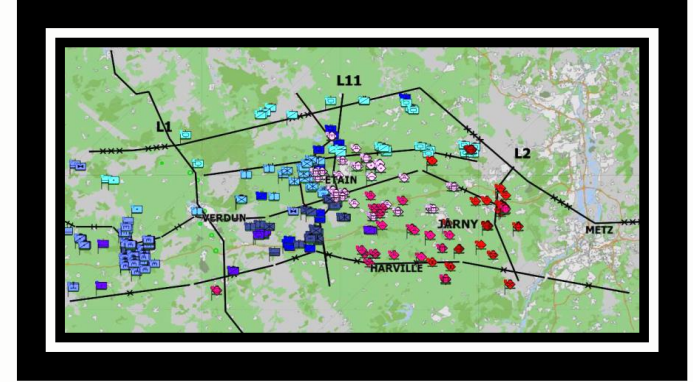




# Translation by AI layer into Force Ratio



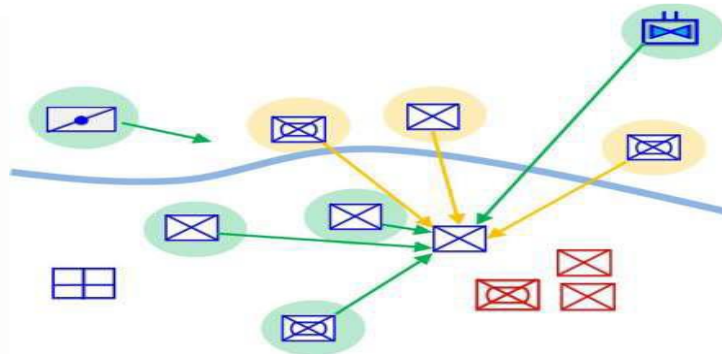
Local force ratio



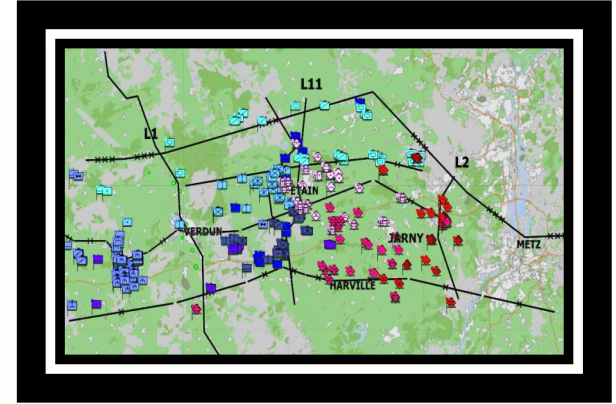
- ✓ From complex simulated situation to understandable situation.
- ✓ Force Ratio
- ✓ Red is less favorable with probability that missions cannot be accomplished



# Support to complete mission



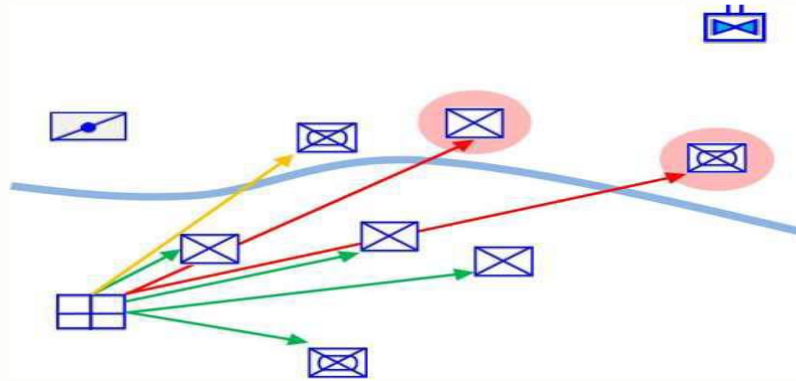
Fire support duration calculation for a unit



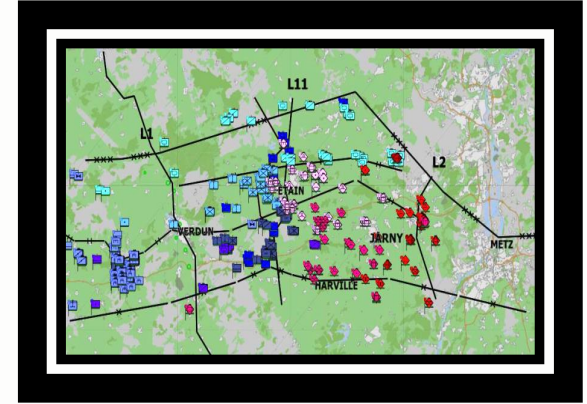
- ✓ Who is able to help out?
- ✓ Based on real timing and available logistics
- ✓ Starting point is dynamic environment / evolution of tactical environment
  - ❑ State of bridges and roads
  - ❑ Detected mined areas
  - ❑ Newly detected enemies



# Support to complete mission



Support duration for supported units



- ✓ Real time calculations allow to take other support actions
- ✓ If a bridge is taken out, analysis will be made which impact on units
- ✓ An alert will go out to supporting units
- ✓ This allows for other courses of action

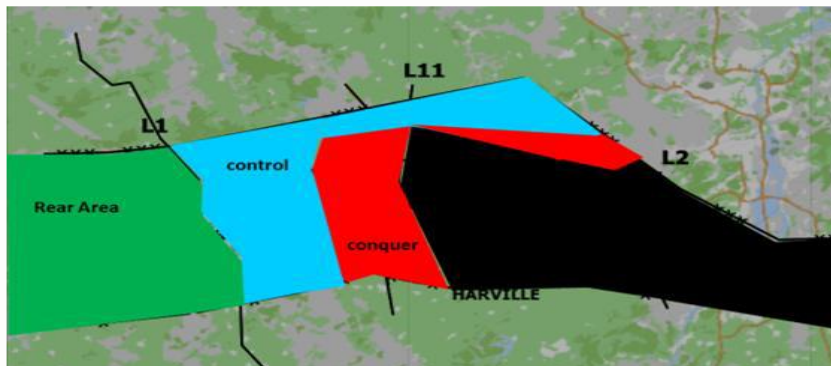


# Synthesis of current and performed missions

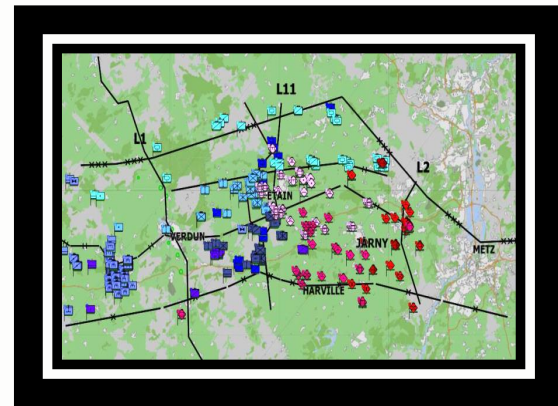


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Expected effect summary



- ✓ Value is only added if information is put in context:
- ✓ This example is about presence of enemies in different zones
- ☐ Black: To reconnoiter. No forward movements yet. High probability OPFOR
- ☒ Red: To conquer. An increase of enemies could mean reinforcements
- ☒ Blue: To be secured. enemies should not circle in this area
- ☒ Green: Secured. enemies in this area should result in serious alert





# What if analysis and wargaming

- ✓ Evaluate the current plan using the current knowledge of the enemy or simulating alternative options (“What-if”)
- ✓ Future Maneuvers  
Elaborate future maneuvers by creating alternative plausible options:
  - Changing the order of battle
  - Modifying the position and state of units
  - Adjusting enemy scenario
- ✓ Alerts for certain conditions

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Command and control system



Headquarter

World data

SITREP, missions, etc

Battlefield  
representation

Real world



Battlefield

# Exercise Direction Tools



## Smart data visualization tools

- Warning
- Terrain occupation
- Force ratio
- ...



## Smart data exploration tools

- What if
- Mission feasibility check
- Time/duration indicators
- ...

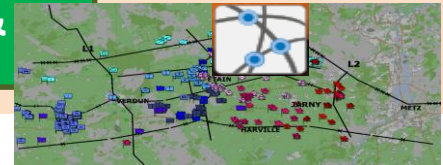


Battlefield representation

Simulation data

Simulated world  
(AI & algorithms & simulation)

Battlefield



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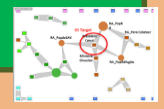


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# Command and control system

## Smart data visualization tools

- Warning
- Terrain occupation
- Force ratio
- ...



## Smart data exploitation tools

- What if
- Mission feasibility check
- Time/operation indicator
- ...



Headquarter

Battlefield representation

Battlefield

## World data

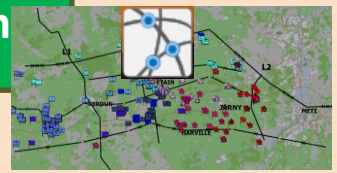
SITREP, missions , etc

## Simulation data

## Real world



## Simulated world (AI & algorithm & simulation)





# Conclusion

- ✓ The digitization of the army will impact decision processes at every level and officers will need next-generation tools to enhance their situation awareness
- ✓ The use of the low-level AI layer and constructive simulation (combined with enhanced equipment and unit databases) connected to real data directly from the field can produce innovative information and help officers in their jobs
- ✓ This new SWORD tool can provide a smart synthesis of the tactical situation, smart alerts according to the context and the current maneuver, smart calculations of realistic timeframes and geographic scope capacities, etc.
- ✓ Simulations can be used during all phases:

