



# Command and Control after Contact with the Adversary

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# Outline

- The problem
- Dynamic decision making
- The importance of time in dynamic decision making (and in execution)
- What is difficult in dynamic decision making
- Three empirical studies that address a central problem i dynamic decision making
- Conclusions

# Planning and Execution

- Common distinction at least from Napoleon's time
- A classic formulation is by Moltke: No plan survives contact with the enemy
- There is not much discussion of execution
- Napoleon: "One engages and then one sees"
- In this paper we propose a framework for discussing execution, that of dynamic decision theory

# Starting point

- *Moltke maintained that the operational plan should seek to insure that the first contact between the main bodies occurred under the most favourable circumstances possible, and that “no plan survived contact”. After this it was a matter of responsiveness and opportunism.* (Simpkin, 1985, p. 14)
- This suggests a shift in control from an attempt at *feedforward control* by means of the plan to *feedback control* based on information about the response from the adversary.

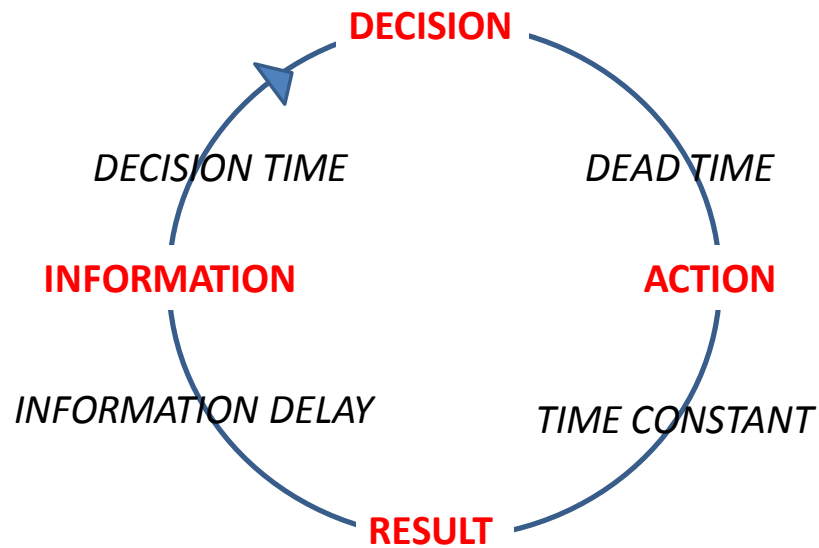
# Dynamic decision making

- Such feedback driven decision making is called dynamic decision making
- Four characteristics of dynamic decision problems
  - They require a series of decisions
  - The decisions are not independent
  - The state of the decision problem changes, both autonomously due to, e.g., initiatives from the adversary, and as a consequence of what actions the decision maker takes
  - Decisions must be made in real time

# The importance of time

- Decisions must be made when they are required by circumstances, not when the decision maker feels good and ready
  - Two tasks in dynamic decision making: To manage the decision problem and make sure that one can make decisions when required
  - It is important to organize C2 so that timely decisions are possible
  - A decision plan that specifies when decision should be made
- We must think of the problem as one of using a process to control another process
  - The characteristics of the control process become important to consider
  - It is useful to think about this problem in terms of the various delays that must be managed

# The Dynamic Decision Loop



# What is required

- We must be clear about the goal
- Observability: We must have information about the state of the system (both the adversary and own forces)
- We must be able to change the state of the system
- We must have a model of the system that tells us what will happen if we do this or that (including if we do nothing)



# The problem for the decision maker

- To develop an adequate model
- To monitor the system to determine whether the model is (still) valid and to change it if it is not
- The extent to which the decision maker will succeed depends of the observability of the system
- There is considerable empirical evidence that developing adequate mental models to handle delays is difficult especially when they have to be inferred and cannot be seen to happen

# What can be done?

- In military circumstances, the plan is the model
- The quality of the plan will determine whether we succeed
- This does not contradict Moltke: Just because the plan does not work perfectly, it does not mean that planning is useless
- A good plan should provide adequate expectations and serve as a guide about what needs to be monitored so as to be able to determine when a new plan is needed in time to handle the various delays that are unavoidable
- *One* of the things that need to be monitored are the assumptions upon which a the plan is built
- Assumptions substitute for lack of observability
- This is , the problem we address in our empirical studies

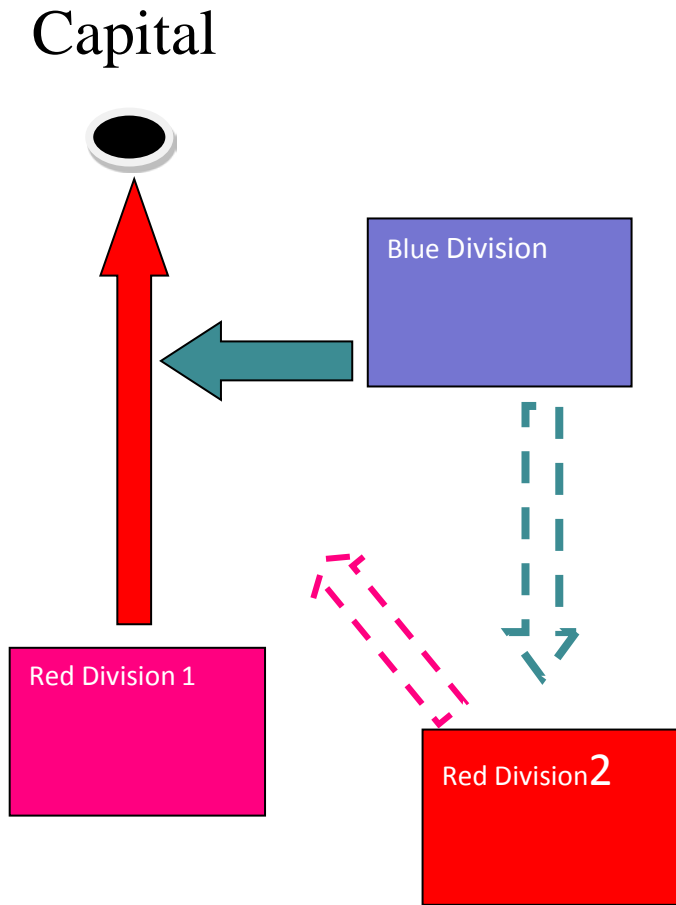
# Empirical demonstrations

- We used exercises at our college for experimentation
- The exercises involved careful reconnaissance and planning and an execution stage lasting three days
- Observations are based on reduced staffs, perhaps better seen as command groups
- The teams planned on the basis of a mission given from higher HQ which included the assumptions made by that HQ about enemy capabilities and plans

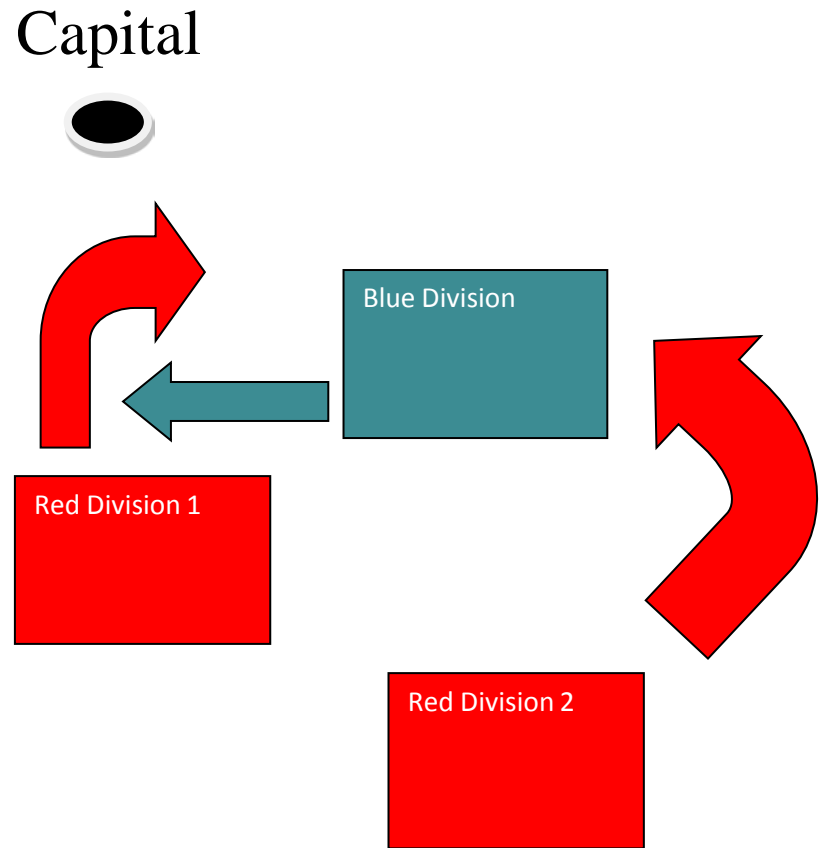
# Study 1

- Command groupd from our Staff Program (Captains who are to become majors)

# What Blue assumes



# What Red actually plans



# Study 1: Results

- All teams but one (7 out of 8) failed to counter the attack from the second red division
- They issued their orders to their subordinate battalions too late (i.e., without due consideration of the dead time involved)
- Conclusions
  - The plans did not provide adequate expectations
  - They did not look actively for indicators that their plans were inadequate because the assumptions upon which they had based it were wrong
  - As a consequence their decisions came too late for a timely counter attack

# Study 2

- A possible explanation for the results of Study 1 is that the participants (Army Captains) were not qualified to handle the problem they faced
- In Study 2 we used larger staffs (command groups) each headed by Army Colonel
- The results were the same: Decisions came too late

# Study 3

- In this study we trained the participants for their task
- This training involved
  - focusing their attention on stated and unstated assumptions in orders from higher HQ and to look for indicators that the assumptions were wrong
  - conduction war gaming with a adequate time horizon (three days into the future) to practice looking for useful indicators that the assumptions were wrong
- The results showed that the intelligence cell of the LCC managed to alert their commander in time to take decisions that prevented the escalation observed in the earlier studies



# Summary

- Dynamic decision theory provides a rich source of ideas and the studies reported here is only a first attempt to use this framework
- The framework leads us to identify sources of problems in execution, especially the need to develop a model (plan) that provides adequate expectations and to find indicators to monitor these expectations
- Our studies, albeit limited in scope, have addressed the central problems of
  - developing a model
  - monitoring the system
  - changing the model if it is invalid
- We have found that this is hard but we have also found one thing that may help: monitoring the assumptions

# Conclusion

- The dynamic decision making perspective may not tell us something that is really unknown or new, to it brings many of the problems offered by execution together in a general concept
- That should at least make it easier to think about the problems of execution

Thank you for your  
attention

Questions and comments?