Team Collaboration Experiment (TCX)

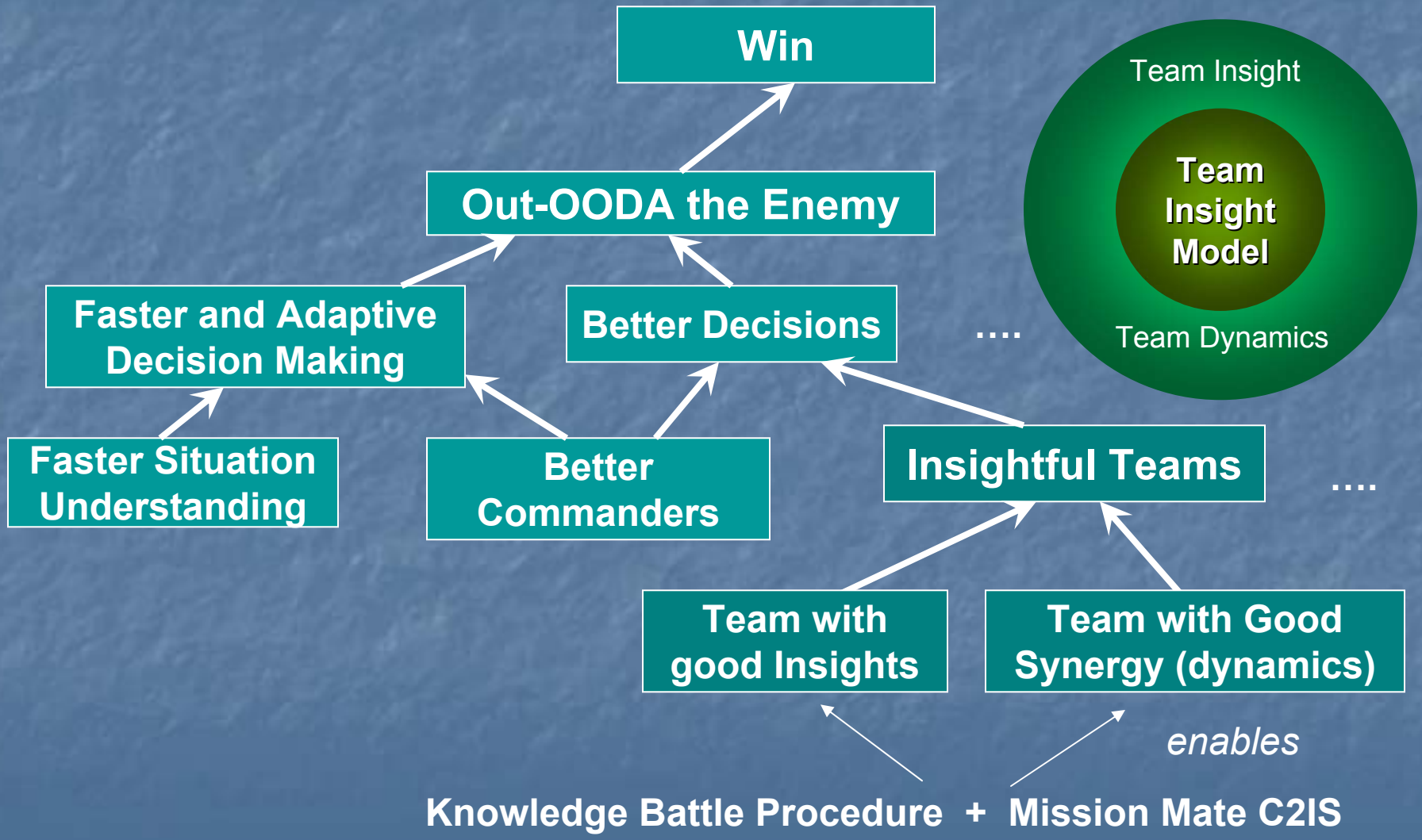
SAF-SwAF

Lock Pin Chew
Head Command Post of the Future,
SAF Centre of Military Experimentation
Division Manger,
Defence Science & Tech Agency

Peter Thunholm, Ph.D
Research Project Manger
National Defence College

SAF
CENTRE FOR
MILITARY
EXPERIMENTATION

Why TCX?

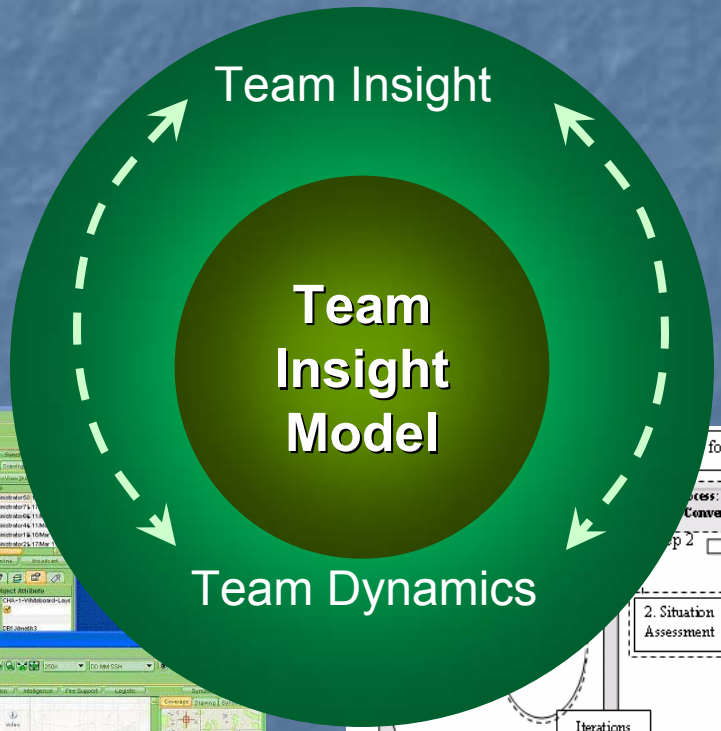

Win
Out-OODA the Enemy
Faster and Adaptive Decision Making
Better Decisions
....
Faster Situation Understanding
Better Commanders
Insightful Teams
....
Team with good Insights
Team with Good Synergy (dynamics)
enables
Knowledge Battle Procedure + Mission Mate C2IS
Team Insight
Team Insight Model
Team Dynamics

Team Collaboration Experiment

TIGER Link

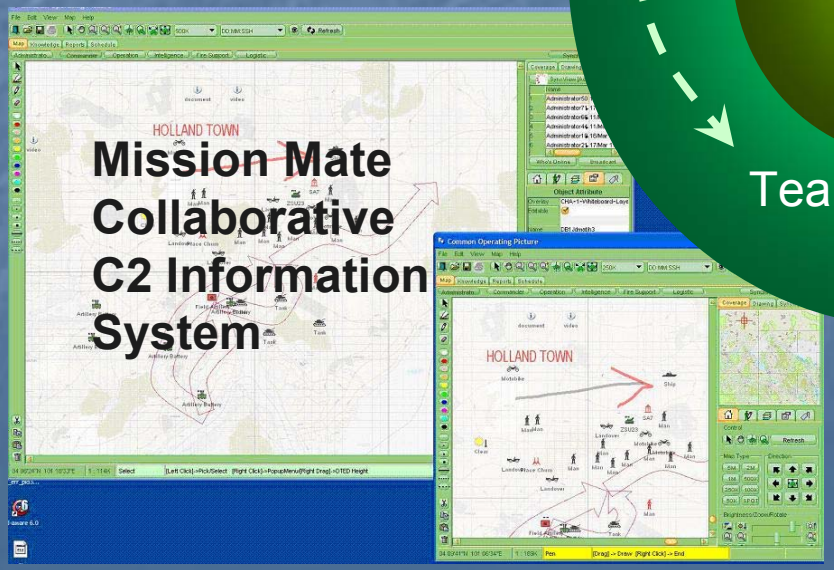
SCME. Defence Science Technology Agency

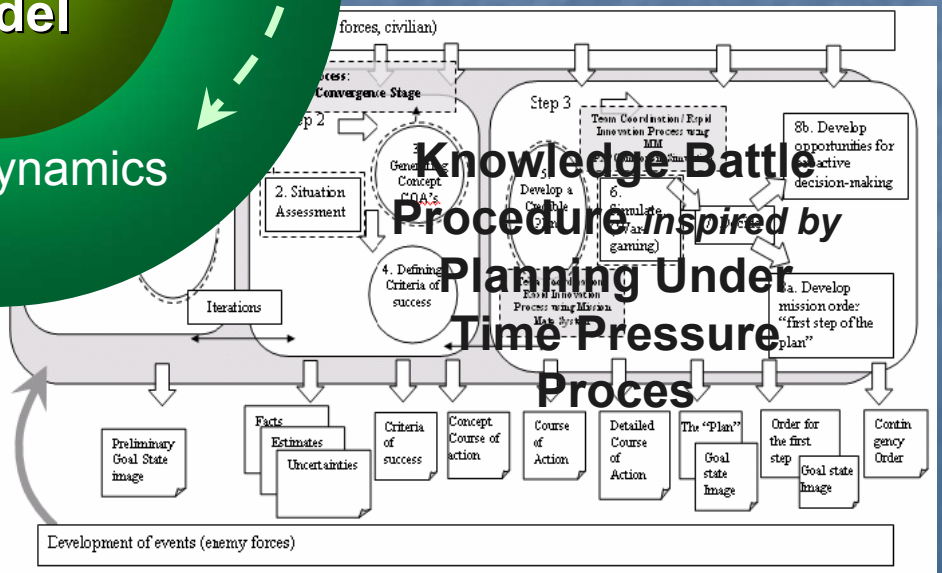
C2 System Insight Modules



Swedish National Defence Collage. LedsystT, LedsystM Programmes

Team Process Experiment Measurements

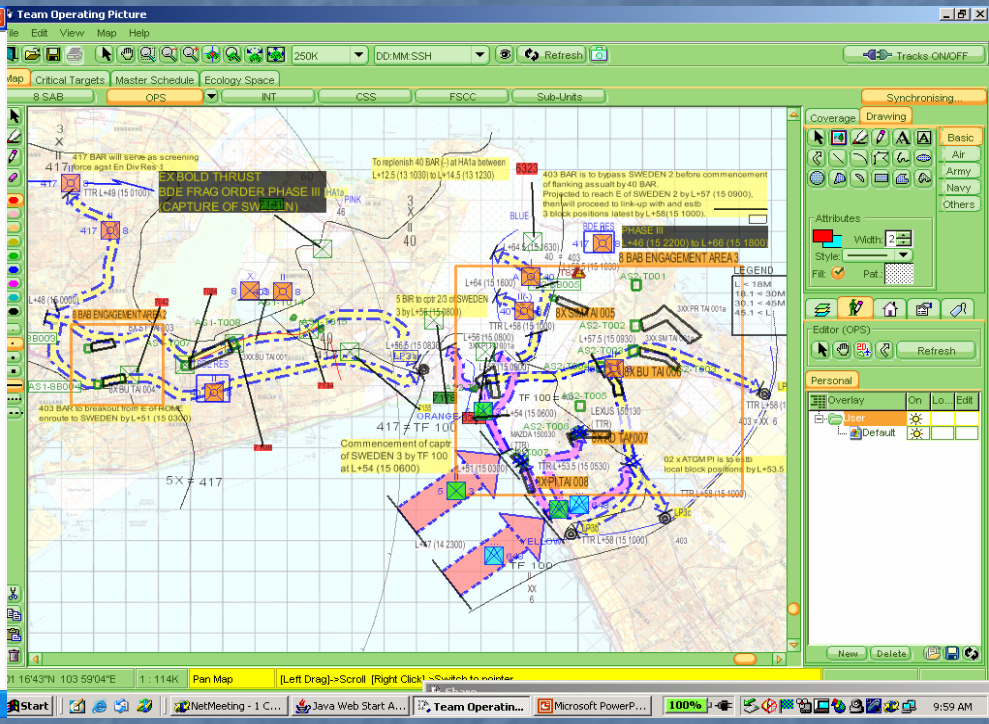




Mission Mate Team-Sight

Video Conferencing Screen Display

Mission Mate Team Ops Picture



Team Sight

Naturalistic Decision Making

- From many studies (Gary Klein, Thunholm et al) established need for military decision-making model that is:
  - Faster in order to deal with time-pressure
  - Involves the commander more into the process
  - Involve a small group of experienced planners to develop initial concept with commander;
  - Allow for a more natural problem solving strategy;
  - Use wargaming as a means for learning more about the battle and communicate intent;
  - Reduce the need for transitions between different teams of planners and executors.

Current SAF Doctrine vs KBP

- Traditional
  - Receipt of Warning Orders
  - Prelim Planning – Terrain Analysis
  - Receipt of Orders
  - Prep for Mission Analysis
  - Mission Analysis
  - Prep for CAOS
  - CAOS
    - Terrain Possibilities
    - Terrain and RCP Possibilities
    - ECA and OCA
    - Sub-Task
    - Selection of OCA
    - Finalisation of Spt Plans
  - AOP
  - Prep for Orders
  - Orders
  - Contingency Planning
  - AOP of Sub-Commands
  - Wargaming
  - Final Co-ord
  - Execution

Knowledge Battle Procedure

- Receipt of Warning Order from HHQ
- Preliminary Planning - Terrain Analysis
- Receipt of Orders from HHQ
- Mission Analysis
- Develop a Plan
  - ECA,
  - 1 Ops Plan and Spt Plans
  - Wargaming
  - Finalisation of Plan
- Wargaming with HHQ
- Prep for Orders to LHQ
- Orders to LHQ
- Wargaming with LHQ
- Final Co-ord
- Execution

Key Differences

- Shorter BP
  - Bde planning 24 hrs → 12 hrs (50% reduction)
  - Bn planning 10 hrs → 4 hrs (60% reduction)
- Use of Team-Sight
  - Bn can listen-in to Bde planning and discussions
  - Collaborate in planning and execution
  - Conduct virtual conferences, and peer-to-peer meetings
- Only 1 OCA is developed. Support & contingency Plans were developed together.
- Wargaming was used to clarify command intent.
- Traditional process built around meetings. KBP built around problem-solving. Less meetings.

Possible Reasons for better C2

- Better Tempo (Shorter Time)
  - Better team situation awareness leads to easier and hence faster decisions.
  - Less communications because of clearer understanding of situation and command intent
  - Products developed faster because of parallelism
  - Getting into execution quicker
  - More prepared – decide faster
- Better Shared Situation Awareness
  - Better awareness between planning team members (horizontal)
  - Better awareness between hierarchical levels (vertical)
  - Better execution because of better self-synchronization.

Possible Reasons for better C2

- Better Plan.
  - More done, i.e. more options considered → Better Quality Plan.
  - Likely to observe more communications, part of knowledge sharing to produce better plans.
- Better Preparedness.
  - During execution, better preparedness to handle new situations because
    - More options were explored. Better mental preparedness to deal with a variety of enemy actions.
    - More time spent on mental simulation.

Measurement model SwAF-SAF Team Collaboration Experiment

”Independent variable”:

X1: TIM

Note:

Defined staff procedures

General profile of staff members

Confounding variables

Z1: System failure

Z2: Scenario realism

Dependent variables

Y1 Team Creativity

- Y1:1 Generated options
- Y1:2 Communicated ideas
- Y1:3: □ of ideas and options
- Y1:4: Openess
- Y1:5: Dominant member
- Y1:6: Dominace from leader

Y2 Quality of decision

- Y2:1 Quality of critical decisions and plan.
- Y2:2 Situation awareness

Y3 Decision tempo

- Y3:1 Completion of COA
- Y3:2: Completion of process

Y4 Process

- Y4:1 Deviations from the KBP formal process
- Y4:2: Use of systems (MM TeamSight)

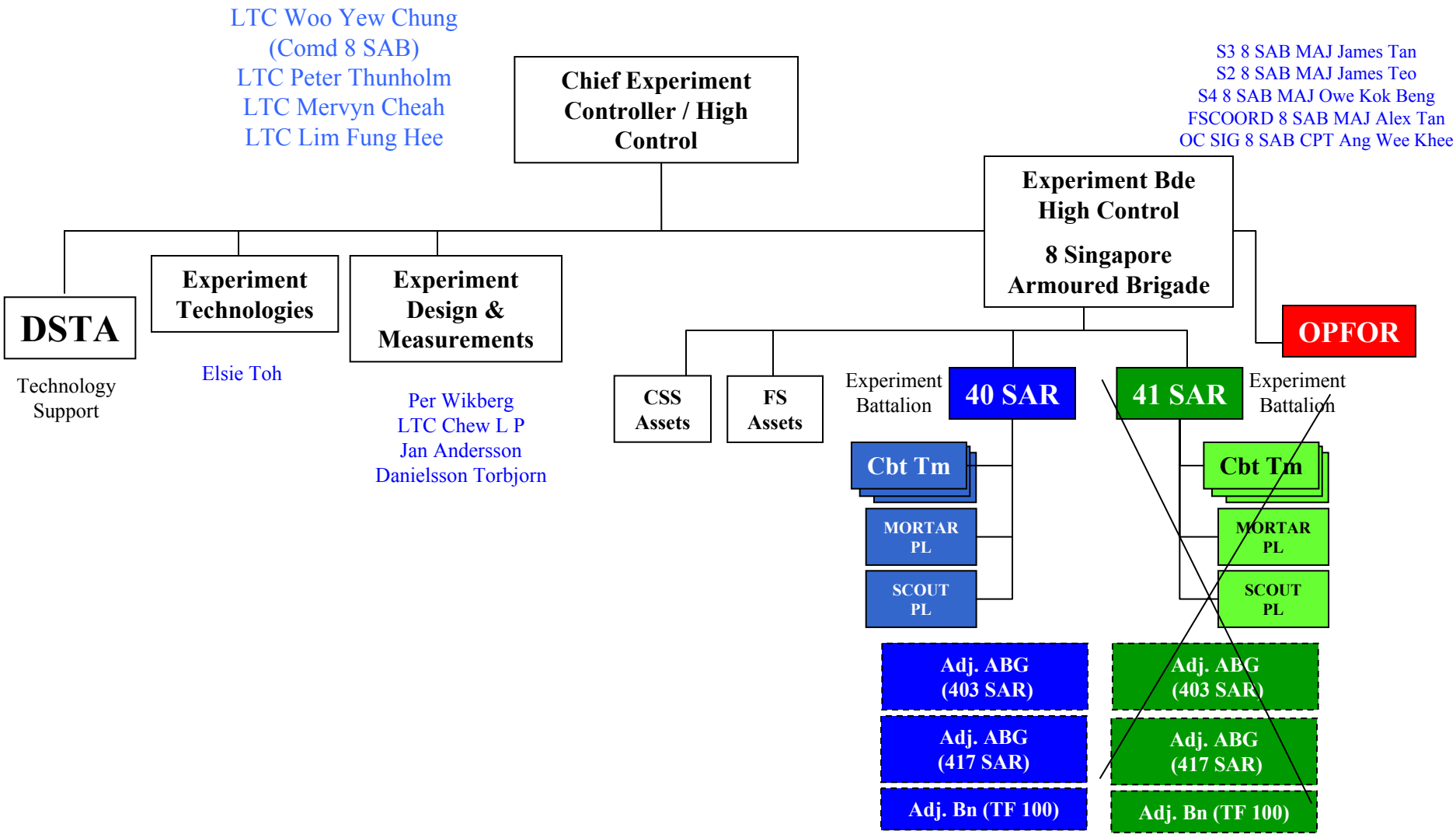
Expectation 1: TIM increases team creativity

Expectation 2: TIM increases quality of decision

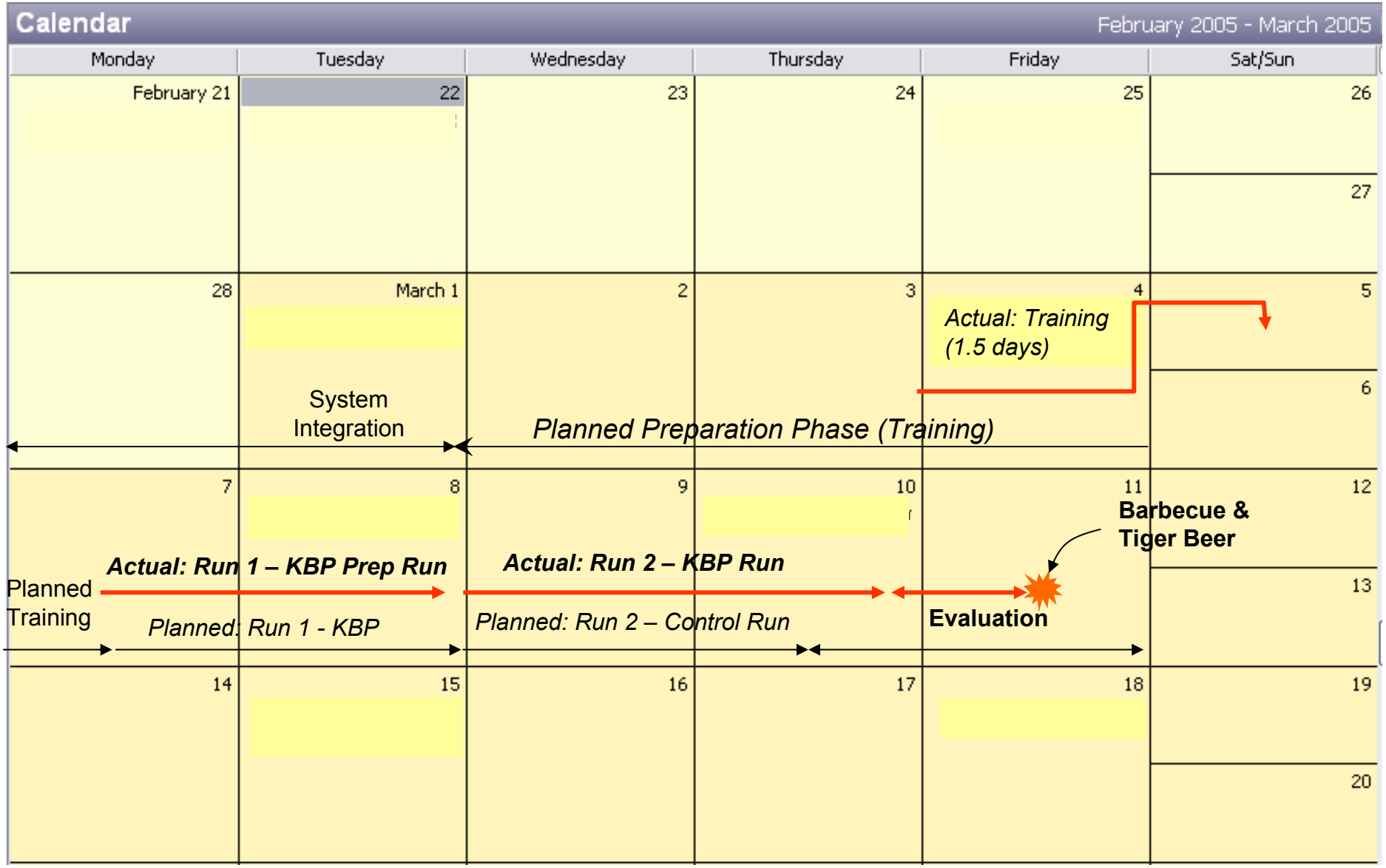
Expectation 3: TIM decreases time for making a decision

Expectation 4: TIM will lead to a more efficient process

TCX PARTICIPANTS



TCX Schedule – Plan vs Actual



Bn Command Post

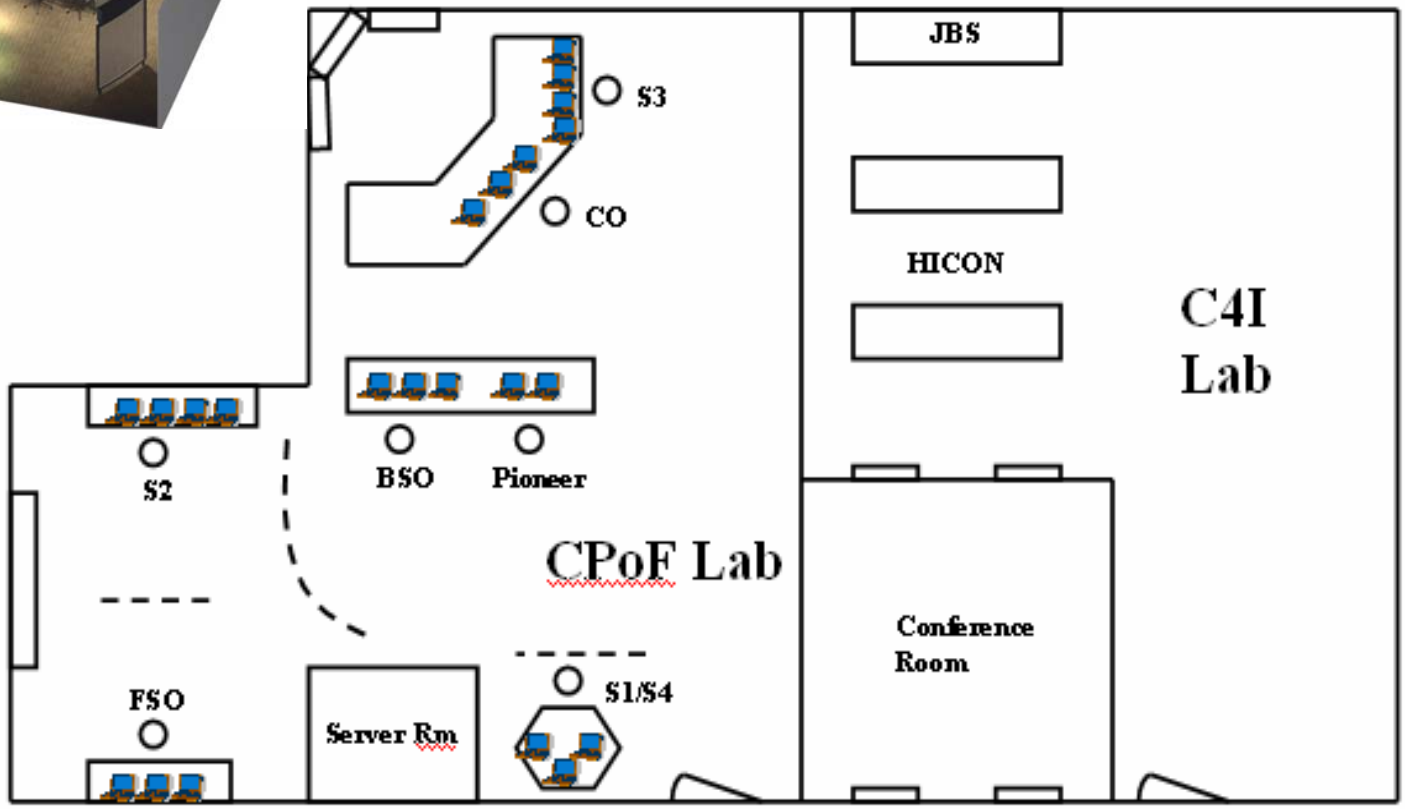
Simulation

Discuss

Produce

Execute

Process



Results: Manipulation Check

- **The manipulation worked. The scenario was perceived as realistic enough concerning:**
- **the story,**
- **the level of uncertainty,**
- **the amount of information provided and**
- **amount of planning time in relation to the task (M's 3.7 – 4.2 on a 6-step scale)**

Results: Decision Quality

- **High quality according to SME raters. Tactical content = 4.7; Completeness of OpsO = 5.0; Clarity of OpsO = 5.3 (6-step scale)**

- **Fairly high level of decision confidence felt by the participants themselves (M's 4.0 – 4.7) concerning: level of satisfaction, completeness, feasibility, necessity of a plan exactly like the one produced, and concerning how easy it would be to convince a subordinate CO that the plan will work.**

Results: Shared situation Awareness

- **High mutual understanding of the situation among participants concerning threat perception of injects and prediction of impact of injects.**
- **No significant differences in rating of importance of injects between SME's and participants**

Results: Decision speed

- **The BnCO decided on a COA very early in the Bgd/Bn planning process (after 215 minutes from the starting point of the Bde, compared to the prescribed time of 690 minutes)**

- **The Battalion used the 4 hours allotted to them in the KBP template to produce the complete OpsO after receiving final Bde orders**

- **Thus, time gain in the early process did not result in shorter overall planning time.**

Results: Team Creativity

- Perceived to be fairly normal concerning idea generation and idea sharing within the team
- Only a few of the participants took part in the actual COA generation phase. The CO was dominant and also S2 and S3.
- The CO immediately started to work out a COA without any option generation.
- The smartboard was used as a tool to create and visualize a COA

Results: Decision process

- The Knowledge Battle Procedure worked well, although it wasn't followed 100% strictly.
- Only minor changes were suggested by the participants, (i.e. Finalize support plans before battalion war gaming).
- The Bn listened in to the Bde process only until they could find out what they needed in order to start their own planning.
- Formal plan approval could be substituted with the Bde listening in to the Bn WG. Also, no need for formal OpsO brief from Bde to Bn
- The Bn CO made use of all of the allotted time in order to really work through the details of the OpsO.
- The MM and TeamSight tools were frequently used, resulting in a significant drop in voice communication

Discussion: Will TIM result in higher plan and execution Q?

- **The KBP process combined with the ability to listen in and participate in the planning process between levels should result in better overall understanding of the mission and situation and also result in a better integrated and tested plan compared to the traditional MDMP way of planning.**

- **This conclusion is supported by the findings on high decision quality, shared situation awareness and early identification of own COA**

Discussion: Will TIM result in a faster planning process?

- **The KBP process aims at early identification of a viable COA that will be corroborated through wargaming. It should be possible to have a quicker planning process without loosing in plan quality**

- **This conclusion is supported by the findings on early COA identification (although the Bn CO decided to use the extra time to enhance plan quality).**

Discussion: Will TIM result in higher team creativity? (more original ideas generated)

- **The results does not indicate a higher level of creativity compared to "normality".**

- **Idea generation may not be correlated to process and tools but to other things?**

Discussion: How about the validity of the results?

- **The claim is that TIM should enable enhanced decision speed and decision quality, through simplifications and improvements of the planning process and improvements of collaboration tools.**

- **Because the participants the scenario and the task were representative, the results should be valid!**

Overall conclusion from TCX 1

The C2 planning and execution process can benefit from new methods and new information technology.

We can go further than this but we need to change some organizational demands on the need for written orders and formal briefings.

Discussion: Future Research

- **The joint experimentation on C2 teams between Sweden & Singapore will continue.**

- **Next studie, TCX 2, will take place in Sweden and concern communication of intent between levels.**

- **Next study will include at least three command levels and include an experimental comparison on different ways to communicate intent and the use of Parallel Planning**

Questions

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