Kompendium

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Indhold:
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Summary Diagram
The Nature of Warfare

- Ressources
- Leadership
- Supplies - Logistics
- Technology
- Doctrine, Strategy, Tactics
- Morale, Public opinion
- The composition of armed forces

Fra:
Onsdag den 20. maj 1969:

“Dear Maxie,

(...) There is a club which has cold beer and cokes if you get there first. There is also a PX that doesn't have much more than cigarettes. The guys don't get anything and have a pretty hard time out there. It's a hot, dirty, mean war; and Marines get hurt, and some get killed. Seems like an awful place to die - halfway around the world from home, but I guess it has to be done.”

Fredag den 22. maj 1969:

“(…) I had a busy day and spent last night in Dong Ha. I failed to get a truck but did bump into a man who used to be in Lima company, so I stayed in his place. The mess hall up there has 100% better food and even has native women to pick up your plate when you leave it (don't worry, they were all ugly). I also saw "In the Heat of the Night" again. It was good. He's got it made up there--good food, indoor movie, an ice chest with beer in it right next to his bed, etc. etc. The only thing is that it's still Dong Ha, and they still have incoming up there so I don't mind staying here (…)”

Søndag den 6. juni 1969:

“(…) The new buildings we're in are pretty nice, but there's still a lot of work to be done. There are nice lights up here but no electricity yet. There's not a mess hall yet so we'll be eating C's for awhile. (…)”

Onsdag den 9. juni 1969:

“(…) Going to the bathroom is still a major undertaking - especially at night - because we only have one now, and it's about 100 yards away. I sure will be glad to get some electricity, but no telling when that will be. I think that if I do go on R&R, I'll just lie in a hot bath for a couple of days. All we have here is cold water, and it's pretty hard to get really clean. There is a better PX here (…)”

En fredag, 1969:

“(…) I just got back from a good hot shower and do feel a little better. The shower is about a mile away, and we all go down in a group on a little vehicle called a mule (…)”
Kildetekst 1 (fortsat):

En torsdag, 1970:
“(...) Being in DaNang was quite an experience. It is a place of distinct contrasts. There are great big PXs there and the most horrible slums you've ever seen within half a mile of each other. The whole place is much busier than here, and they even have traffic jams. The place has much more to offer as far as entertainment and food goes, but I think I like the quiet here a little better. It's a little easier to live without a few things than be constantly reminded that you are living well while someone else is starving. It hurts to see something like that. Paved streets, ice cream, and poverty in the same breath; it's hard to take.”

En onsdag, 1970:
“(…) Have been talking to some of the guys that have been down to DaNang. They live like kings down there. It's almost like being in the states there. They have air conditioning, ice cream, good chow, no incoming, and decent living quarters - and even USO shows. They're afraid to come up here, I guess. Anyway, I haven't seen one up here or even heard of one. Guess it's hard being away, anywhere a person is. It still seems unfair for some people - our people out in the bush - to do all the fighting and for others to do nothing and still bitch. Guess it's just the way it goes.”
Den 20. oktober 1968:

“Dear everybody,

Well it's another rainy day in Vietnam. When they say its been known to rain 40 days and nights you can believe it. (...) The food ain't been too bad but the only thing is that supplies are hard to come by so there is only two meals a day. (…)

Love, Paul”

Den 23. oktober 1968:

“Hi everybody,

Well, I'm sorry I haven't written in the last two days but I had to get resupplied with writing material; that is, run down to the PX and buy it. (...) Would you believe I bought a case of "RC Cola" today? It only cost me $2.40 or $.10 a can. Over here it don't matter whether it's hot or cold, but unfortunately it's hot. When ya open the can it blows over so much you almost loose your head. Plus I bought a carton of cigarettes for $1.20. That's pretty cheap. I wish you could see me because ever since I left Mass. I've been growing a mustache. Don't tell me where it's coming from but ya can definitely see it. Oh, no big thing, but I finally got to take a shower after a week. Boy, did I stink. The dirt must have been a 1/4" thick. (…) 

Love, Paul”

Den 3. november 1968:

“Hi everybody,

(...) Do you think you could send me a package of goodies as I really starve over here. I like some oreos, vanilla wafers, some fritos, malted milk balls, reading materials, and an old pair of drumsticks, plus anything else ya think I might like, OK? And one more thing--Funny books. I'm serious. (...) Take care, and please send a package. OK?

Love, Paul”
Den 29. november 1968:

“Hi everyone,

(...) I'm gonna ask you to send me something, and I don't want ya to be surprised as I'm pretty well grown-up now. You've got to be over here. Could you send me a 5th of Vodka? Don't worry; they don't care if you get stuff like that through the mail. Everybody is gonna have a bottle for Christmas, as we are gonna be in An Hoa. I'd be happy if you did; and don't worry, I wouldn't drink it all in one night. Well got to go for now because we are using candles to write, and they have got to go out because of snipers.

Love, Paul”

Den 10. december 1968:

“Hi everybody!!!

I've been receiving your mail pretty regularly now as they have finished the air strip at An Hoa. I received a package yesterday from some VFW in Dorchester. The package was bought at Jordan Marsh and was called, "Chow Hound." The price tag was $8.00. It had two things of sardines packed in sherry wine, mackerel packed in port wine, a salami, a box of cream cookies, and expensive candies like butterscotch, plus more. (...) You said ya sent a package. I'm keeping my eyes open for it. I got a feeling it's coming today. Well people, got to go; but I'll write later on.

Love, Paul”

Den 19. juni 1969:

“Dear family!!!

Received the package from you and Ma and Grandpa's, too, on the 12th. They came in handy, as after eating C-Rations for awhile, stateside chow comes in real nice. I'm 19 now; but, after being over here, I feel 25. I sure hope that next year I can be home for my birthday. (...) 

Love, Paul”

Den 17. juli 1969:

“Dear Family!!!

(...) 

Love, Paul

PS. I'd love some more booze!!!”
Validering af Lanchesters kvadratiske model: Simulering af Iwo Jima i Modellus

Mathematical Model

\[
\begin{align*}
\frac{dx}{dt} &= x \cdot r + g + h + j \\
\frac{dr}{dt} &= -d \cdot r
\end{align*}
\]

\[i = 0.0544, \quad d = 0.0122, \quad j = 6000, \quad 0 < r, t < 1, \quad h = 6000, \quad 2 < r, t < 3, \quad i = 13000, \quad 5 < i, j < 10\]

Virkelig situation
Initialstyrke:
- USA: 73,000  
- Japan: 22,060

Ukampdygtige efter 36 dage:
- USA: 25,038  
- Japan: 21,844

Simulering
Kampdygtige efter 36 dage:
- USA: 45,500  
- Japan: 277
Et udtryk, der viser sammenhængen mellem de to operative enheder til enhver tid, opstilles.

Først divideres de to differentialligninger (i Lanchesters kvadratiske model) med hinanden:

\[
\frac{B'(t)}{R'(t)} = \frac{-rR(t)}{-bB(t)}
\]

Dernæst krydsganges der, og der ganges med 2 på begge sider:

\[
2rR(t)R'(t) = 2bB(t)B'(t)
\]

Udtrykket \(2bB(t)B'(t)\) trækkes fra begge sider:

\[
2rR(t)R'(t) - 2bB(t)B'(t) = 0 \quad (*)
\]

Der ses nu på de sammensatte funktioner:

\[
y = r\left(R(t)\right)^2 \quad og \quad y = b\left(B(t)\right)^2
\]

Da følgende er en regneregel for differentiation

\[
f(g(x))' = f'(g(x)) \cdot g'(x)
\]

Fås nedenstående, når de sammensatte funktioner differentieres:

\[
y' = 2rR(t)R'(t) \quad og \quad y' = 2bB(t)B'(t)
\]

Derved kan ligningen (*) omskrives til:

\[
\left(r\left(R(t)\right)^2 - b\left(B(t)\right)^2\right) = 0
\]

Dette udtryk differentieres nu, og da funktionen har den afledede 0, må den være konstant:

\[
r\left(R(t)\right)^2 - b\left(B(t)\right)^2 = K
\]

hvor K er en konstant. Ved at indsætte begyndelsesbetingelserne, fås følgende udtryk:

\[
K = rR_0^2 - bB_0^2 \quad (**)
\]

Dette udtryk kan betragtes som et sejrkriterium. Sejr skal her forstås som den styrke, der har operative enheder tilbage, når alle fjendtlige enheder er nedkæmpet. \(bB_0^2\) og \(rR_0^2\) kan opfattes som enhedernes styrketal. Det viser sig, at den styrke, der har det største styrketal, vil vinde. Hvis K > 0, vil rød styrke vinde. Hvis K < 0, vil blå styrke vinde. Hvis K = 0, vil de to styrke udrydde hinanden.

Denne iagttagelse kommer til udtryk, hvis (***) omskrives til følgende, ved at dividere med K:

\[
\frac{rR_0^2}{K} - \frac{bB_0^2}{K} = 1 \quad \iff \quad \frac{R_0^2}{K/r} - \frac{B_0^2}{K/b} = 1
\]

Dette udtryk kan omskrives til en ligning for en hyperbel:

\[
\frac{R_0^2}{\alpha^2} - \frac{B_0^2}{\beta^2} = 1 \quad \text{og} \quad \alpha = \sqrt{\frac{K}{r}} \quad \text{og} \quad \beta = \sqrt{\frac{K}{b}}
\]
Hyperblens udseende afhænger af konstanterne \( r \), \( b \) og \( K \). Og hvilken vej, grenene vender, afhænger af fortegnet for \( K \). Hvis \( K \) er positiv, skærer hyperbelgrenen i 1. kvadrant \( x=R \)-aksen. Hvis \( K \) er negativ, skærer hyperbelgrenen i 1. kvadrant \( y=B \)-aksen.

Ydermere ses det i sejrskriteriet, at initialantallet af de to styrker optræder kvadratisk – det står i anden portens. Denne iagttagelse kommer til udtryk ved at behandle (***) yderligere og antage, at \( K = 0 \).

\[
0 = rR_0^2 - bB_0^2 \iff bB_0^2 = rR_0^2 \iff B_0^2 = \frac{rR_0^2}{b} \iff B_0 = \sqrt{\frac{r}{b}R_0^2}
\]

Det bemærkes, at hvis antallet af blå enheder er tre gange så mange som antallet i rød styrke, skal ødelæggelsesintensiteten ikke blot være tre gange så stor, før styrketallet bliver uændret. I stedet skal den være ni gange så stor – rød styrke skal være ni gange så effektive. Dette er interessant, da det giver kvantitet en væsentlig større betydning end kvalitet: en lille ændring i initialstyrken kan medføre betydelige ændringer i kampens udfald.
Uddrag af: ”War Plans and Politics”

Logistiske problemer

”Already in April there were signs of hastening deterioration in the northern provinces, prompting speculation that American divisions would have to intervene much sooner than expected, much sooner, in other words, than bases would be ready to receive and properly sustain them. The problem remained theoretical for the moment at least, but no one was taking short odds against the possibility – the fact that it was beginning to look increasingly as though combat troops would come ashore with their logistical units, or even ahead of them, the worst of nightmares, and build their support base on the fly”.

”The ports offered one of the more formidable obstacles to the first requirement of a successful intervention, which has to feed in troops and materiel at a rate higher than the enemy’s.”

”… the capacity of the road system was entirely inadequate to sustain more than limited traffic, especially in the rainy season.”

Optimeringsmuligheder

”In one estimate, the critical link on Highway 14 from Ban Me Thout to Pleiku had a wet season capacity of only 200 tons a day, far below the wet season capacities of the road sections immediately to the south. Given the critical importance of expanding the highways as early as possible…”

”A cargo ship at 15 knots required nineteen days to make the voyage of 6,900 nautical miles from San Francisco to Saigon, while a round trip by air from the west coast took some forty hours, depending on the kind of aircraft flown.”
Uddrag af: ”War Plans and Politics” (fortsat)

Gen. Frank A. Osmanski og Forsvarsminister Robert S. McNamara

"As late as the summer of 1964, Osmanski’s proposal was being dismissed by many (…) Secretary of Defense Robert S. McNamara worked up another proposed course of military action, Operation Plan 37-64 (…). There was nothing in the 37 Plan, or in the administration’s policies generally, to suggest that a strategic buildup might be desirable in South Vietnam."

USA’s bevidsthed om de logistiske problemer

Gen. Wilieam C. Westmoreland:

"In the words of the commander of American forces in Vietnam, Gen. William C. Westmoreland, the increase in advisers, aircraft, and support units, and the ensuing surge in construction for messes, billets, motor pools, and medical facilities, as well as maintenance hangers and parking areas at nine major airfields from Soc Trang to Da Nang, became 'the straw that broke the camel’s back' of an already overburdened and diffuse structure of logistical support."

Adm. Ulysses S.G. Sharp:

"… he was one of the few high ranking officials who had unhesitatingly advocated a continuing buildup in the western Pacific, including troops, ships, aircraft, and logistical resources, in order to maintain a credible threat and keep the leadership in Hanoi in doubt as to American intentions. (…) Convinced that intervention was approaching and that an efficient support base must be introduced well ahead of time, he had no sooner received the Osmanski draft study than he expanded it and sharpened it for the coming war."

Westmoreland og Sharp:

"Within days of the start of air attacks, Sharp and Westmoreland began raising storm warnings about the vulnerability of Vietnam’s ports, highways, and airfields to Viet Cong interference.”
Løsning af LP-problem ved simplexmetoden

Et køretøj skal fragte en kombination af C-rations og Fried Chicken fra en havn i Vietnam til en deling soldater i felter, så de opnår den største kampeffekt. Køretøjet kan fragte 2 tons C-rations og Fried Chicken (en pakke C-rations vejer 30 kg og en pakke Fried Chicken vejer 10 kg). Af økonomiske årsager må køretøjet læses med 750 pakker C-rations og ingen Fried Chicken eller 375 pakker Fried Chicken og ingen C-rationer (dvs. en Fried Chicken pakke koster det samme som to pakker C-rations). For at undgå, at havnen går i stå, må lastningen højst vare 300 sekunder. Det tager 1 sekund at pakke en pakke C-rations og 5 sekunder at pakke en pakke Fried Chicken. Kampeffekt af en pakke Fried Chicken er vurderet til at være tre gange så stor som effekten af en pakke C-rations.

Disse oplysninger giver følgende standard Lineær-Programmerings-problem, hvor \( x_1 \) er antallet af pakker C-rations, og \( x_2 \) er antallet af pakker Fried Chicken:

Maksimer kampeffekten: \[ K(x_1, x_2) = x_1 + 3x_2 \]

Når \[ 30x_1 + 10x_2 \leq 2000 \]

Og \[ x_1 + 2x_2 \leq 750 \]
\[ x_1 + 5x_2 \leq 300 \]
\[ x_1 \geq 0, \quad x_2 \geq 0 \]

Positiviteten er indlysende, da antal C-rations og Fried Chicken ikke kan være negative.

Ulighedssystemet omformer til et ligningssystem ved at indføre restvariablene \( y_1, y_2 \) og \( y_3 \):

Maksimer kampeffekten: \[ K(x_1, x_2) = x_1 + 3x_2 \]

Når \[ 30x_1 + 10x_2 + y_1 = 2000 \]
\[ x_1 + 2x_2 + y_2 = 750 \]
\[ x_1 + 5x_2 + y_3 = 300 \]

Og \[ x_1, x_2, y_1, y_2, y_3 \geq 0 \]

\( y_1 \) er vægtkapaciteten, der ikke udnyttes, når der lastes \( x_1 \) C-rations og \( x_2 \) Fried Chicken. Tilsvarende gælder for \( y_2 \) og \( y_3 \). Ved denne fortolkning af restvariablene, gælder positivitetsbetingelsen også for \( y_1, y_2 \) og \( y_3 \).
Nu ønskes den optimale løsning fundet. Da opgaven er at maksimere kampeffekten, skal de værdier af \( x_1 \) og \( x_2 \), der forøger kampeffekten, findes. Først holdes \( x_1 = 0 \) og \( x_2 \) øges. Dette gøres, da \( x_2 \) har den største koefficient i kriteriefunktionen. For at undersøge hvor meget \( x_2 \) kan øges med, ses der på lignonssystemet.

Af den første ligning ses det, at \( x_2 \) maksimalt kan øges til 200 uden at \( y_1 \) bliver negativ. Af den anden ligning ses det, at \( x_2 \) maksimalt kan øges til 375 uden at \( y_2 \) bliver negativ. Og af den trejde ligning ses det, at \( x_2 \) højst kan øges til 60. Altså har den tredje ligning den stærkeste begrænsning for, hvor meget \( x_2 \) kan øges. Når \((x_1, x_2) = (0,60)\) indsættes i lignonssystemet, fås følgende:

Maksimer kampeffekten: \[ K(0,60) = 0 + 3\cdot 60 = 120 \]

\[ 10\cdot 60 + 1400 = 2000 \]

Når \[ 2\cdot 60 + 630 = 750 \]
\[ 5\cdot 60 = 300 \]

Nu skiftes der basis, således at lignonerne i lignonssystemet ændres. Nu udtrykkes de tre variable \( x_2 \), \( y_1 \) og \( y_2 \) ved hjælp af de to variable, der er nul – nemlig \( x_1 \) og \( y_3 \). Lignonssystemet fremkommer ved at dividere \( x_2 \) i den 3. ligning i lignonssystem (1):

\[ x_1 + 5x_2 + y_3 = 300 \iff x_2 = 60 - \frac{1}{5} x_1 - \frac{1}{5} y_3 \]

og derefter indsætte dette udtryk for \( x_2 \) i 1. – og 2. ligning. Derved fås følgende lignonssystem:

\[ y_1 = 1400 - 28x_1 + 2y_3 \iff 28x_1 + y_1 - 2y_3 = 1400 \]
\[ y_2 = 630 - \frac{3}{5} x_1 + \frac{2}{5} y_3 \iff \frac{3}{5} x_1 - y_2 - \frac{2}{5} y_3 = 630 \]
\[ y_3 = 60 - \frac{1}{5} x_1 - \frac{1}{5} y_3 \iff \frac{1}{5} x_1 - y_2 - \frac{1}{5} y_3 = 60 \] \( (2) \)

Kriteriefunktionen:

\[ K(x_1,y_3) = 180 + 0,4x_1 - 0,6y_3 \]

Fra ovenstående kriteriefunktion ses det, at \( x_1 \) skal øges, for at forøge kampeffekten yderligere. En forøgelse af \( y_3 \) vil blot formindske kriteriefunktionen. Proceduren gentages, men nu undersøges det, hvor meget \( x_1 \) kan øges.
Ligningssystem (2) betragtes nu. Af ligning 1 ses det, at $x_1$ ikke må blive større end $1400/28 = 50$, hvis $y_3$ skal være lig 0. I den anden ligning begrænses $x_1$ til 1050, og i ligning 3, må $x_1$ ikke blive større end 300. $x_1$ kan altså maksimalt øges til 50 uden at gøre $y_2$ negativ. Følgende indsættes nu i ligningssystem (2): $(x_1, y_3) = (50, 0)$:

$$
y_1 = 1400 - 28 \cdot 50 = 0
$$
$$
y_2 = 630 - \frac{3}{5} \cdot 50 = 600
$$
$$
x_2 = 60 - \frac{1}{5} \cdot 50 = 50
$$

Det ses, at $x_2$ bliver 50 ved $x_1 = 50$. Den maksimale værdi, som kriteriefunktion kan antage, er bestemt:

$$K(50,50) = 50 + 3 \cdot 50 = 200$$

Svaret på problemet er altså, at den største kampeffekt opnås, ved at laste køretøjet med 50 pakker C-rations og 50 pakker Fried Chicken. Med denne kombination bliver kampeffekten 200.

$$30 \cdot 50 + 10 \cdot 50 = 200$$
$$50 + 2 \cdot 50 + 600 = 750$$

$$K(x_1, y_3) = 180 + 0,4 \cdot x_1 - 0,6 \cdot y_3$$

$$50 + 5 \cdot 50 = 300$$

Det ses yderligere, at vægtkapaciteten udnyttes fuldt ud, og at lastningstiden udnyttes fuldt ud. Det kommer ikke til at koste 750$, så der er oven i købet penge at spare, ved at laste køretøjet med denne kombination af C-rations og Fried Chicken.