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Recognition of Initiative in an Infantry Company's Battle Exercise to Support Tactical Overall Analysis

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The scientific goal of this paper is to demonstrate, from the viewpoint of tactical overall analysis, how different quantitative (e.g. distribution analysis) and qualita- tive research (e.g. text analysis) methods could be used to support the traditional ways (tactical maps and event catalogues) of analyzing tactical phenomena — in this case the initiative in a battle — and how different types of instruments could be utilized and developed (e.g. NASA-TLX) for analyzing subjective human factors during the battle — in this case especially the feeling of having initiative. In this paper, as an example, numerical values are calculated to determine whether there is a correlation between the casualty ratio and initiative. The results are verified based on battle space situation pictures. In addition, the analyses of distributions describing the variation of the feeling of one's own force and of the adversary of having the initiative are used to support the results showing which fighting side has the initiative.

Keywords: Military tactics, tactics, infantry, company, attack, initiative

Background and Introduction

The tactical basic research, "Success Factors of Company Attack" (SCA–research), which was carried out in the Finnish Defence Forces (FDF) during the years 2004–2007 forms the empirical background of this paper. The SCA–research focused on analyzing different indi- vidual effects of selected measurements explaining variables. The variables were selected from the areas of tactics, situational awareness, battle task load, human factors, background factors and response variables. During this research, 59 attack exercises by infantry compa- nies were analyzed.

Table 1. shows the extent of the SCA–research. The research material included the results of soldiers' interviews after each attack exercise, questionnaires filled out by the soldiers at seven measurement (progress) levels of the attack, tactical maps, event catalogues and writ- ten reports prepared by the data collectors.

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Qualitative analysis	Quantitative analysis	Integrated tactical analysis
614 written reports	≈ 22000 distribution analyses	≈ 2100 calculated characteris- tics
590 tactical maps	≈ 101 000 correlation calculations	≈ 300 tested classifications of success factors
118 event catalogues	≈ 32 000 mean value analyses	≈ 30 variable groups
		≈ 130 measured variables
		≈ 130 observed factors

Table 1. Extent of the SCA research.

The initial situation of the attack exercise is illustrated in Fig. 1. The blue infantry com- pany is attacking the red regiment's headquarters (see the large ellipse in Fig. 1). The battle task was to beat the red units.

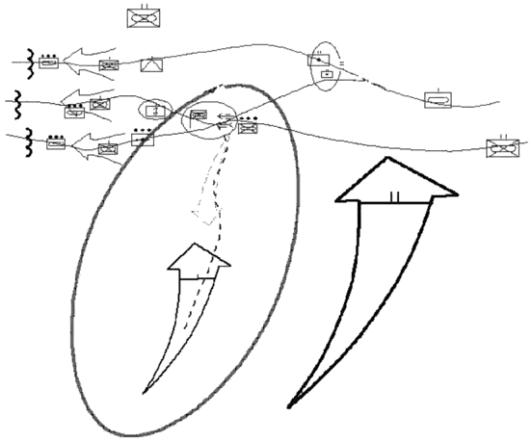

Figure 1. The initial situation of the attack exercise, edited from Sormunen and Eskelinen (2010).

It is necessary to present briefly some key results of the SCA–research to fully understand the scientific approach of this article. Firstly, the questionnaires filled out by the soldiers showed that in the seven most successful attacks, the leaders had a different overall picture of the battle compared to the seven most unsuccessful attacks. The leaders of the successful attacks felt more strongly that they had the initiative, they were less nervous; they assumed that their own forces were more powerful compared to the adversary's forces and they did not feel to be much in a hurry to give their orders and take action. (Sormunen, Eskelinen,
2010) Fig. 2 illustrates the largest differences between the measured variables in successful and unsuccessful attacks. The interesting observation is that both the leaders' and soldiers' answers in the interviews and questionnaires indicate the significant role of initiative in the success of the battle (see the black bars in Fig. 2).

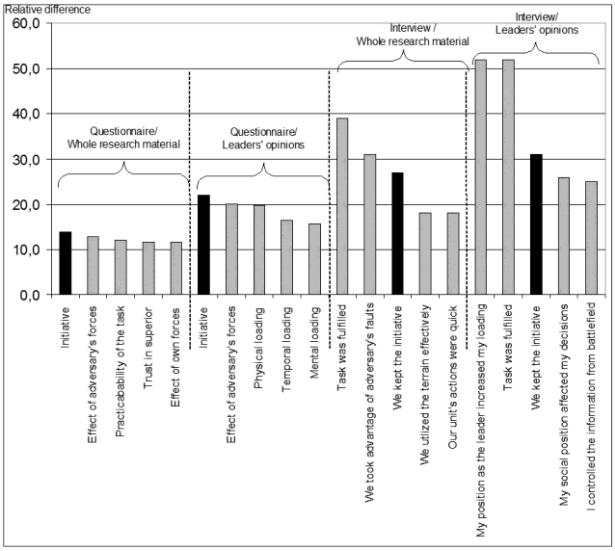

Figure 2. Main results from the background research indicating the significant role of initiative in the success of the battle, results collected from Sormunen and Eskelinen (2010).

This brief review of the SCA–research gives us the justification to study further whether it is possible to recognize the initiative somehow from the battle space and if so, what rela- tionships and connections can be found between different tactical variables and initiative. There are at least three interesting aspects: First, what is the connection between the timing of the tactical actions and initiative? Second, what is the connection between the casualty ratio and initiative? Third, can we just trust the soldiers' feeling of having initiative or do we have to recognize initiative in more objective ways?

The research material used in this paper consists of 590 schematic and illustrated tac- tical maps to describe the situation and 118 event catalogues to describe the actions taken in the battle space. Also 103 written reports and numerical values of 118 measured tactical variables and perceptions of 130 observed factors were utilized to compose this paper (Sor- munen, Eskelinen, 2010).

Tactical Viewpoint and Research Methods

In the literature dealing with tactics, e.g. (Rekkedal, 2006), (Kesseli, 2001) the FDF regula- tions and field manuals, e.g.

(Komppanian taisteluohje, 2008), (Prikaatin taisteluohje, 1984) and in recent tactical research (Huttunen, 2010), initiative is regarded to have an essential impact on the success of a battle. In the literature dealing with tactics (Kuusisto, 2004), in the FDF regulations and field manuals (Komppanian taisteluohje, 2008), (Prikaatin taistelu- ohje, 1984) and in tactical research, e.g. (Huttunen, 2010), (Lind, 1985) situational awareness is also regarded to have an essential impact on the success of a battle. The SCA research showed that the largest differences between the values of measured variables were found in the mean values of initiative in successful and unsuccessful attacks.

To be able to define the critical time windows for the analyzed tactical actions and to recognize initiative, the observation points and verifiable time delays were needed for the state space model. The first observation point was set to the battle engagement moment of the company. The second observation point was set to the start of the weapon effect. Two time in- tervals were determined from the background data between these two observation points. The first time interval covered the time which the leader used to decide and order the actions. The second time interval covered the time used to perform the actions to start the weapon effect. The tactical analysis of initiative produced three types of information about the differences recognized between the initiatives of the infantry company and its adversary:

- Separated or individual actions indicating initiative
- Continuous flow of action indicating initiative
- The feeling of having initiative.

The dependency of initiative on the fulfilment of the battle task and the suffered casualties was defined by establishing probability values of initiative and the corresponding casualty ratio at each measurement level. The next step was to calculate if the advantageous initiative indicates a positive progress of the casualty ratio with a high correlation.

The phenomenon of changes in initiative was studied from the Battle Space Situation Pic- ture (BSP) series of successful and unsuccessful attacks. It was also studied whether the ob- servations from the BSP together with the quantified results from the written reports supported each other. The final step was to compare whether the real initiative led to success in the battle.

Analyzed Written Observations

As the background information from the SCA research has shown, the leaders' and units' initiative greatly affected the performance of the unit. Therefore, it was justified in this paper to collect results which deal with the connection of initiative and the success of an attack. The written reports were analyzed based on the traditional qualitative method illustrated schematically in Fig. 3.

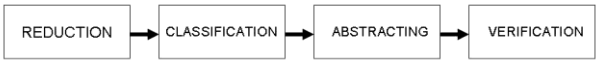

Figure 3. Qualitative method to analyze the written reports

The analyzing method applied produced three types of information about the recognized differences between the initiatives of the infantry company and its adversary:

- The feeling of having initiative
- Separated or individual actions indicating initiative
- Continuous flow of action indicating initiative.

By quantifying the written observations collected by the data collectors during the SCA research, three main results were achieved. Approximately 39% of observations dealt with such aspects as "initiative was taken", "was kept", "was developed" or any other "positive" phenomenon connected with initiative. A typical observation was "The attacker aimed to take and keep the initiative and succeeded well in this". Roughly 41% of observations dealt with such aspects as "initiative was lost", "was not utilized", "was wasted" or any other "negative" phenomenon connected with initiative. A typical observation was "Now the initiative was

given to the defender and the defender was able to stop the adversary's attack with a small amount of soldiers". In approximately 20% of observations, it could not be established which fighting side had the initiative. A typical observation is "The initiative alternates significantly between the yellow and blue side".

Aspects Dealing with Time and Timing

To integrate the quantitative data and the previous qualitative background information to sup- port the evaluations made in this paper, we had to determine the most important aspects deal- ing with time, timing or speed connected to the initiative based on the written reports by the data collectors. The principle is illustrated in Fig. 4. We must take into account the entity and the time window in which the action should be carried out: tactically justified action in the battlefield based on initiative requires exact timing and enough speed to succeed in the battle.

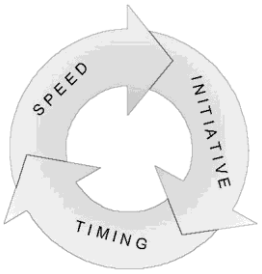

Figure 4. Connection between initiative, timing and speed.

During the qualitative analysis, the following question was discussed: What words and expressions were used to describe time aspects, timing, relative speed and initiative? Based on the written reports of the analyzed attack exercises, some examples of expressions dealing with time, timing and speed are presented in Tables 2 and 3.

Timing type	Examples of collected observations during the research
Type 1	"Indirect fire was received at the right time"
Type 2	"At these positions, the culmination of the battle is reached by utilizing well-timed and appropriate situational evaluation of the adversary and one's own forces"
Type 3	"The battle plan of the COY is determined based on the accuracy and real timing of the reconnaissance information"
Type 4	"In an attack where timing was linked to zero hour, time was wasted in waiting at the footing and initial attack position levels"
Type 5	"In the attack, the (trained) manoeuvre was quick, but the manoeuvre was carried out too late"
Type 6	"In a battle where tactics were selected freely (tactics C), the delay in command and control led to a delay in the main part of the unit manoeuvre"
Type 7	"PLTs did not take action until the adversary had acted, and even then the PLTs reacted slowly"

Table 2. Examples of expressions dealing with time and timing.

Speed type	Examples of collected observations during the research
Type 1	"The STPs, together with the leader's insufficient orders, reduced the speed of advance"
Type 2	"Surprise together with high situational speed was emphasized in our own actions because the purpose was not to lose the advantage gained"
Type 3	"It should be possible to adjust the speed of action flexibly during an attack"
Type 4	"The option of utilizing the tactical speed of tanks was not utilized properly"
Type 5	"The FCC and COYCOM evaluated the speed of advance of the COY in the (current) terrain"

Table 3. Examples of expressions dealing with speed.

From the entire research material, seven types of timing dealing with battle situations of analyzed attacks could be found. In addition to this, the classification of the qualitative analysis produced five types of speed which are relevant for analyzing different tactical phe- nomena connected with the time window in which the tactical action should be carried out to lead to success in the battle.

Based on the results, the seven different types of timing are as follows:

- Type 1: Well-timed actions
- Type 2: Timing of situational evaluation (Well-timed evaluation)
- Type 3: Knowledge-based timing of actions (Acting in real-time)
- Type 4: Ineffectiveness in timing (Time is wasted on secondary actions)
- Type 5: Timing or time ratio dealing with trained and unexpected situations
- Type 6: Timing (time delays) of command and control chains
- Type 7: Timing of action of one's own force which is forced due to the adversary's actions.

The five types of speed which are relevant for analyzing different tactical phenomena are

as follows:

- Type 1: Absolute (max./min.) value of the action
- Type 2: Speed of the action combined with the surprise effect
- Type 3: Adjustable speed or flexible speed adjustment based on the battle situation
- Type 4: Tactical motion speed
- Type 5: Estimated speed for a manoeuvre or an action.

The evaluation criteria are constructed from the previous twelve items for analyzing as- pects which deal with time, timing, the speed of actions and initiative. The literature deal- ing with tactics contains qualitative results that support these observations. For example, Rekkedal (2006) has proposed a connection between the leader's will to take initiative and its effects on the timing aspects of a battle.

Soldiers' Feelings of Having Initiative

In the SCA research, soldiers' feelings of having initiative were measured by questionnaires and interviews. The results showed that the distributions of the results, which indicated that the soldiers on both fighting sides had feelings of initiative, partly overlapped (National De- fence University, 2009). It is therefore interesting to study if the quantified results from the qualitative analysis of the written reports from the SCA–research support this finding of overlapping distributions.

In the background research, the soldiers of both fighting sides were asked to evaluate their own feeling of having initiative at each measurement level of an attack by marking a point on a line 100 millimetres long indicating the strength of their feeling (see Fig. 5). With this measurement arrangement, quantified data was collected continuously. This way to produce quantified and scaled data made it possible to carry out the mathematical analysis dealing with the feeling of having initiative.

Figure 5. Measuring and quantifying the data dealing with the soldiers' feeling of having initiative.

The NASA Task Load Index (NASA–TLX), presented originally by Hart and Staveland (1988), is a subjective, multidimensional assessment tool that rates perceived workload on six different subscales: Mental Demand, Physical Demand, Temporal Demand, Performance, Effort, and Frustration. Twenty-step bipolar scales are used to obtain ratings for these dimen- sions. A score from 0 to 100 (rounded to the nearest five) is obtained on each scale. A weight- ing procedure is used to combine the six individual scale ratings into a global score; this pro- cedure requires a paired comparison prior to the workload assessments. Paired comparisons require the operator to choose which dimension is more relevant to the workload across all pairs of the six dimensions. The number of times a dimension is chosen as more relevant is the weighting of that dimension for a given task for that operator. A workload score from 0 to 100 is obtained for each rated task by multiplying the weight by the individual dimension scale score, summing across scales, and dividing by 15, which is the total number of paired comparisons. (Rubio et al., 2004) Based on the observations of one of the developers of NASA–TLX (Finomore et al., 2009), the use of NASA–TLX has spread far beyond its origi- nal application area and focus during the past 20 years. In this paper, just the principle of mea- suring the level of the feeling of having initiative is adopted from the NASA–TLX method.

A number of tools for the evaluation and prediction of mental workload exist. Most of these methods fall into the three following categories: performance-based measures, subjec- tive measures, and physiological measures. The performance–based measures are grounded on the assumption that any increase in task difficulty will lead to an increase in demands, which will decrease performance. Subjective procedures assume that an increased power expense is linked to the perceived effort and can be appropriately assessed by individuals. Physiological indexes assume that the mental workload can be measured by means of the level of physiological activation. (Rubio et al., 2004)

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Different types of instruments could be utilized for analyzing subjective human factors, e.g. vigilance under different workloads. For example, Finomore et al. (2009) have com- pared the output of the Multiple Resources Questionnaire (MRQ) and NASA–TLX in differ- ent task types and operating environments. In this comparison, the MRQ indicated that the workload was greater when observers operated in a multi-task environment as compared to a single–task environment, a dimension to which the NASA–TLX was not sensitive. In this paper, only the NASA–TLX principle to measure the feeling of having initiative has been utilized, and therefore, all of the evaluation criteria of the original NASA–TLX method must be adjusted. These types of restrictions must be understood when evaluating the observations presented in this paper.

For tactical analysis, it is necessary to establish which fighting side has the initiative at each moment of the attack

and how strong the initiative is. This is carried out by calculating the size of the overlapping area of the two distributions at each measurement (progress) level of an attack describing the variation of the feeling of having the initiative of one's own force and of the adversary (see Fig. 6). The probability that both sides feel they have the initiative is calculated.

The probability of the different opinions between the two fighting sides about having the initiative is calculated by applying the simple Eq. 1.

$$z_p = \left| - \frac{\mu_b - \mu_r}{\sqrt{\sigma_b^2 + \sigma_s^2}} \right| \tag{1}$$

where

z_p = Normal distribution coefficient
μ_b = Mean value (own side)
μ_r = Mean value (adversary)
σ_b = Standard deviation (own side)
σ_r = Standard deviation (adversary).

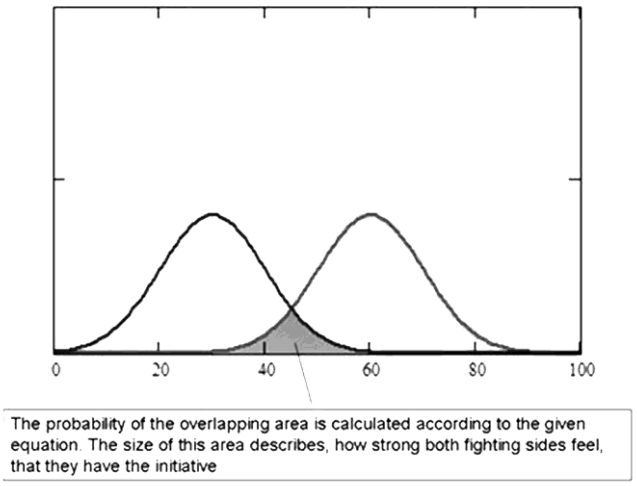

Figure 6. The overlapping area of the two distributions describing the variation of the feeling of having the initiative.

The required numerical data for initiative analysis is compressed in Tables 4 and 5. The measurement level describes the progress of an attack exercise. The soldiers' feelings and opinions dealing with initiative were measured at all seven levels with the previously de- scribed relative range of 0…100 mm.

	BLUE COMPANY			**ADVERSARY**		
MEASUREMENT LEVEL	Initiative		Cumulative casualties [%] on average	Initiative		Cumulative casualties [%] on average
	Mean μ_b	SD σ_b		Mean μ_r	SD σ_r	
1 Deployment area	80.64	15.71	0.00	50.93	33.90	1.14
2 Footing	83.71	14.19	3.86	48.64	35.96	9.14
3 Initial attack position	83.21	13.87	3.86	48.57	35.94	9.43
4 Battle engagement of the unit	81.93	12.17	5.86	46.62	36.28	21.29
5 Battle engagement of the soldier	81.00	14.39	10.86	47.46	37.26	30.43
6 Battle in adversary's position	80.86	11.99	15.00	27.33	26.47	47.00
7 Attack objective	78.50	20.40	20.14	32.00	32.53	58.57

Table 4. Soldiers' feeling of having the initiative in successful attacks.

MEASUREMENT LEVEL	Initiative		Cumulative casualties [%] on average	Initiative		Cumulative casualties [%] on average
	Mean μ_b	SD σ_b		Mean μ_r	SD σ_r	
1 Deployment area	68.07	30.77	0.00	67.64	28.50	0.00
2 Footing	66.00	25.70	3.29	65.17	32.31	3.29
3 Initial attack position	68.00	24.80	3.57	62.92	31.78	3.43
4 Battle engagement of the unit	70.57	20.88	6.86	57.93	31.55	5.43
5 Battle engagement of the soldier	54.42	19.31	23.14	53.17	30.82	23.57
6 Battle in adversary's position	53.15	24.47	31.29	50.57	29.07	28.43
7 Attack objective	39.55	25.35	38.86	65.55	26.37	35.43

Table 5. Soldiers' feeling of having the initiative in unsuccessful attacks.

When we calculate from Eq. 1 the overlapping areas of the distributions describing the differences of soldiers' feelings of having the initiative on both fighting sides at each mea- surement level, we are able to draw interesting conclusions: The comparison between the overlapping areas of the measured feelings of having the initiative in successful and un- successful attacks shows that in unsuccessful attacks, the results of one's own and one's adversary's overlapping areas are 1.7 to 2.3 times larger at levels 1–5 and 7. A larger range of critical distances at different levels also indicates that the shape and the sharpness (standard variation) varies greatly in unsuccessful attacks at the most important measurement levels af- fecting the success of the battle. On an average, the calculated risk P of contradiction between who has the initiative is 2.1 to 2.7 times higher in unsuccessful attacks at levels 1–5 and 7. It is noticeable that at measurement level 6 the risk P in successful attacks is only 0.03. Further- more, the overlapping area at level 6 in unsuccessful attacks is up to 6.6 times larger. These results show that at measurement levels 3, 4, 6 and 7, the feelings of having the initiative in successful attacks differ enough to justify the continued comparison between unsuccessful and successful attacks to recognize the other possible characteristics describing initiative.

According to the calculated results, in successful attacks, the correlation between the remainder of feelings of having the initiative at both fighting sides and the casualty ratio is remarkable, $|r| = 0.694$. However, the coefficient of determination as a percentage is only
48%. In unsuccessful attacks, this correlation is only $|r| = 0.430$. The corresponding prin- ciple shapes of the correlation curves are presented in Fig.7.

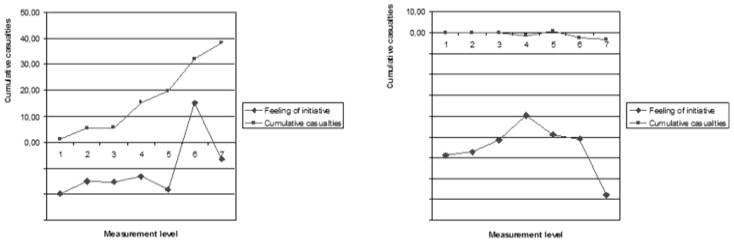

Figure 7. Cumulative casualties and the feeling of having the initiative: successful attacks (left) and unsuccessful attacks (right). The shape of the curves illustrates the connection between the casualty ratio and feeling of having the initiative.

Although the analyzed results of initiative indicate a remarkable difference between suc- cessful and unsuccessful attacks, these results only deal with the feeling of having the initia- tive. Therefore, more weight is given to the results gained from the tactical maps to find out how initiative affects the result of an attack. Two practical case examples are presented in Fig. 9 and Fig. 10.

The presented Eq. 1 is valid only when both distributions describing the feeling of initia- tive of the fighting sides follows a normal distribution curve. In this case, the normality of the analyzed curves has been checked both near the mean value (Kolmogorov-Smirnov) and at the ends of the distribution curves (Anderson-Darling). If needed, e.g. the combination of normal distribution and Weibull distribution is available to calculate the probability of the overlapping area. (Kapur, Lamberson, 1977)

Observations from Tactical Maps and Event Catalogues

When recognizing and analyzing initiative, tactical maps and event catalogues are in a key role. Items to be recognized

and their possible indicators are presented in Table 1. The prin- cipal flowchart (see Fig. 8), which includes feedback loops to check also the right timing of each tactical action together with situation evaluation, is formulated to model recognized tactical phenomena.

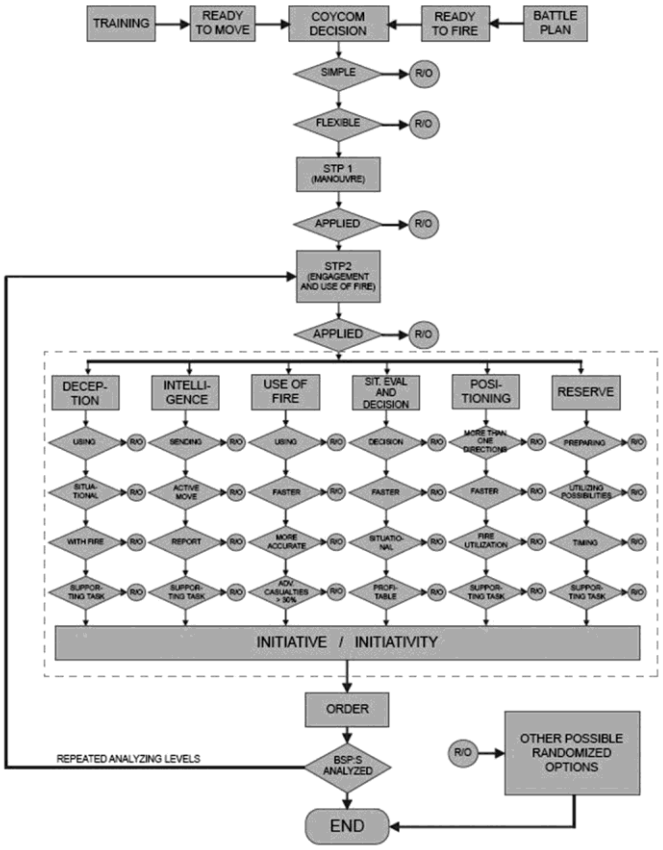

Figure 8. Flowchart for analyzing attacks
(notice also the right timing of actions and situation evaluation).

When analyzing, it is sometimes impossible to express the items presented in Table 1 with the absolute answers "no" or "yes" within the flowchart.

Tactical phenomenon	Tactical maps		Event catalogues	
	Item	Probable indicator	Item	Probable indicator (note)
Changes in initiative	Readiness to manoeuvre	Positioning related to terrain and adversary	Readiness to manoeuvre	High/low
	Readiness to use fire	Positions of mortars, anti-tank and light weapons	Readiness to use fire	Sign/order Preparations Signal links
	Decision making	Action/no action Action according to decision	Decision making	Decision/no decision Content and pursuit
	Deception	Patrol/subunit manoeuvre Use of fire	Deception	Sign/order and timing Content and pursuit
	Manoeuvre	Battle pull	Manoeuvre	Sign/order
	Use of fire	Casualties	Use of fire	Timing

	Reserve	Subunit position	Reserve	Order/sign Subunit readiness

Table 6. List of items to be recognized (dealing with initiative) and their possible indicators.

Let us present a simplified example of the utilization of Table 1. During the background research, tactical maps were drawn at each measurement level of an attack and in every situ- ation a remarkable or unexpected tactical phenomenon took place. Therefore, it is relatively simple to analyze the unit's positioning related to the terrain and adversary and see if it en- ables initiative and if some other positioning of the unit might have been even more advanta- geous. At the same time, the data collectors made notes to describe and evaluate the readiness of the unit for the planed manoeuvre. By recognizing these indicators from tactical maps and event catalogues, it is possible to start analysing whether the initiative was utilized or not.

By combining these aspects with the presented flowchart in Fig. 8, we realize that the relevance, importance, right sequential order and timing of the followed items change con- stantly with the situation. The evaluation of these features is possible either relatively or qualitatively in a specified situation. This enables the expression of the differences between one's own forces and the adversary using the terms "more" or "less" and "faster" or "slower" corresponding to the simplified values of "yes" and "no".

The first example presented on the map (see Fig. 9) shows that initiative could be recog- nized in this battle according to the following criteria:

- The dotted lines show the trained, planned and prepared manoeuvres of platoons or other elements, which are planned for use in fulfilling the battle task "beat".
- The tactical symbols show how the leader has planned to utilize trained, planned and prepared reconnaissance to support situation evaluation and decision making. It is es- sential to notice that unlike in unsuccessful attacks, in this case the leader has used his initiative to carry out reconnaissance processes actively and early enough.
- The tactical symbol shows that the leader has shown his initiative in combining the plans of trained manoeuvres with the timely and justified use of indirect fire.

To shed more light on the use of tactical maps, a second example is presented in Fig 10. It shows that initiative is recognized according to the following criteria:

The maneuver of the deception patrol is identified with an arrowed dotted line.

The purpose of the use of the deception patrol was to mislead the adversary's attention to the unit's left flank for the time needed to carry out the blue company's main maneuver.

In addition to this, the initiative and the brave use of the deception patrol resulted in re- markable casualties for the adversary, yet keeping one's own casualties relatively low (after the maneuver, the casualty ratio was 76%/23%).

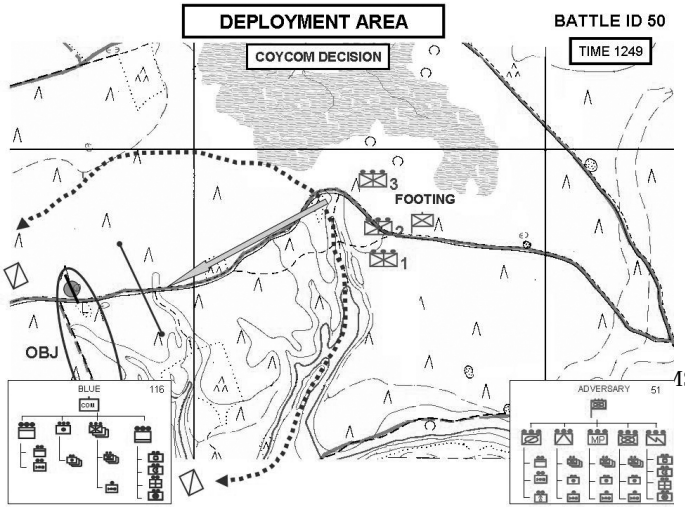

Figure 9. An analyzed example of how initiative had an effect on the leader's decision-making in the deployment area in one of the successful attacks.

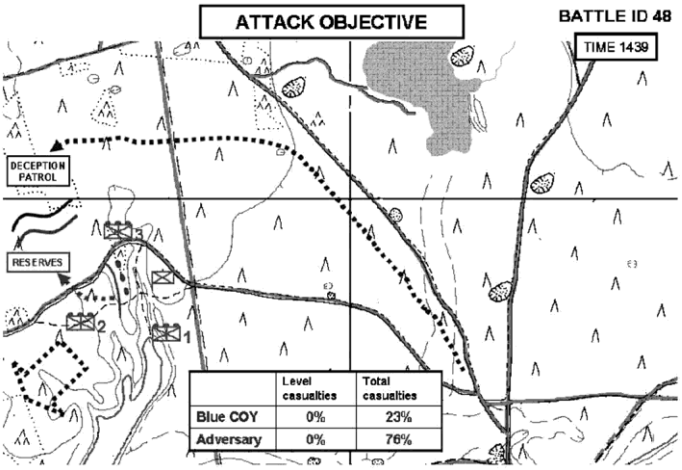

Figure 10. An analyzed example of how initiative has shown and has been utilized in the battle before reaching the attack objective in one of the successful attacks.

By applying the previous flowchart model, it is possible even to calculate the number of observed characteristics indicating initiative. When analyzing the source material from the background research, the results showed that the number of positive replies to the questions in the flowchart was on average 2.3 times higher in the seven most successful attacks com- pared with the seven most unsuccessful attacks.

Conclusions

This paper has shown that initiative has a key role when analyzing the aspects affecting the success of an attack. Different qualitative and quantitative tools were utilized to verify the results dealing with initiative. During this verification process, we noticed that to form a reli- able overall picture of tactical phenomena, it is advantageous to integrate different analyzing methods and collect enough data and information of different types from the battle field. Sometimes there is a chance to utilize distribution analysis to illustrate the possible differ- ences between the fighting sides.

When summarizing the results of the qualitative analysis of the attack exercises especial- ly in terms of initiative, it was shown that an almost equal amount of positive and negative observations about having the initiative were recorded. Approximately 39% of positive ob- servations and approximately 41% of negative observations of initiative were directly con- nected with timing or a time window. The utilization of initiative requires exact timing and enough speed to lead to success in the battle. This means that the reasons for either the failure or success of an attack are connected with initiative, and furthermore, with time and timing.

The main result of comparing successful and unsuccessful attacks was that the dominant phenomena causing failure are found from aspects dealing with initiative. On the other hand, the primary aspect which unfavourably affected the result of the attacks was that the leaders had lost their freedom of action by giving the initiative to the adversary, making it impossible to affect the adversary in creative ways. In literature dealing with tactics, these aspects have

been emphasized e.g. Liddell Hart (1954). In addition to this, the leader has not been open to looking for new possibilities to take initiative. These types of aspects have also been noticed by General Tynkkynen (1996). Hannah et al. (2010) have identified the importance of the leader's character, but they also integrate the leader's skills, knowledge and competences with different types of roles which the leader might have in the battlefield.

The quantitative analysis conducted in this research has shown that there is a positive correlation between one's own strengthened initiative and an advantageous casualty ratio together with the fulfilled battle task. Based on the analyzed situational maps of different at- tacks, this paper has shown how strongly the initiative of one's own force affects the success of an attack and how initiative or actions of initiative can be observed in the situational maps. According to the results, a larger number of observations of one's own initiative indicated better success in battle. In addition, the analyzed numerical values have indicated that leaders seem to have a strong feeling of initiative in successful attacks.

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