

Theory of Operational Design Concepts and Their Significance for Higher Military Education

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ABSTRACT Operational art can be understood as a cognitive approach utilized by commanders and staffs, supported by their skills, knowledge, experience, creativity and judgment. It is used to develop campaigns and operations to organize and employ military forces by integrating ends, ways and means. Through the operations planning process, commanders and staffs apply operational design concepts as specific conceptual elements of operational art. This paper discusses the significance of the theory of operational design concepts, based on the perspective of students from the Czech University of Defense, as well as other active and retired military professionals. The research was conducted to determine the importance of the theory. Based on the result, the major importance of the theory was demonstrated and confirmed the overall relevance of the operational art study within the education of military professionals. Findings from the questionnaire survey (QS) among respondents served as the basis for necessary modifications to the course's curriculum.

INTRODUCTION

The basic military doctrinal publication characterizes operational art as “*The employment of forces to attain strategic and/or operational objectives through the design, organization, integration and conduct of strategies, campaigns, major operations and battles*” (AAP-06).

Operational art exploits a wide scale of categories, elements, and tools, whose skillful application helps commanders in successful planning and the conduct of military operations. These tools are most often named as *Operational Design Concepts* (ODCs) and referred to as building blocks of operational art. They can be seen as specific instruments used for analysis of strategic and operational factors and understanding the operational requirements necessary to plan and conduct military operations. The practical utilization of ODCs takes place during the Operations Planning Process (OPP). The Allied Joint Publication AJP-5 (Allied Joint Doctrine for Operational-Level Planning) stipulated and defined Operations Planning as “*The planning of military operations at the strategic, operational and/or tactical levels to design, conduct and sustain campaigns and major operations*” (AJP-5, 1-13). According to AJP-5, there are eight basic steps of the OPP during which the commander and his staff develop the operational plan to conduct a

military operation. (AJP-5, 3-63). Step 1, *Initiation of the planning process* and step 2, *Problem and Mission Analysis* are the most common timeframes during which ODCs are used intensively (Pikner et al. 2013). During these two steps, as a part of the whole planning process, the operational design takes place.

Basics of Operational Design

The operational design is a creative process, during which the commander's basic idea (vision) is created – how the operation will unfold, what military conditions in the operational area must be created to achieve strategic objectives, how those activities should be arranged in time, space and purpose to achieve these conditions and what military capabilities and resources can be used to create these conditions. As mentioned earlier, the core of this operational design process is the creative implementation of the individual ODCs during the first two steps of the OPP. *The output of the operational design is the operational scheme*. The operational design allows commander and staff to observe the situation within the operating environment from many perspectives. It enables creating idea strategy for how to carry out changes in the current situation in terms of achieving the desired end state. According to Lemmons (2012), *the operational*

design is a methodology of applying critical and creative thinking to understand, visualize and describe complex ill-structured problems and to develop possible approaches to their solution.

Operational design is a repeatable methodology for thinking through the transformation of the system “*that exists now*” to the system “*which will be improved*” (Spišák 2013). It is therefore used to develop commander strategies for “*how to overcome this gap.*” In its simplest meaning, operational design is a form of creative thinking to better understand conditions in the operating environment and the interrelationships of the various actors within that environment. The significance of ODCs rests in the fact that, during the OPP, they assist the commander and his/her staff in creating about a concept for the possible course of the operation at a given time, space and purpose.

ODCs contribute to the cognition and understanding of the nature of operating environments, defining existing or causal problems and determining how best to deal with them. They allow schematically to describe and display various activities of military and non-military actors in an operation and to justify their relationship. Doctrines explain and describe the ODCs primarily in connection with the initial steps of the OPP; nevertheless, they can be used during the entire process of planning and conduct of military operations. Application of each of the ODCs depends upon specific conditions in the operating environment, problems identified, objectives set by policy, type or character of the operation and other circumstances.

Specifics of Operational Design Concepts

From a doctrinal point of view, some concepts are more important than the others. This applies particularly for elements such as *End state*, *Center of gravity*, *Decisive points/conditions* and *Lines of operation*.

There are a wide variety of these elements. Table 1 depicts these concepts, as they are incorporated into the last edition of the NATO doctrine AJP-5 (2013). It is not possible to clearly designate whether any of the ODCs is more or less important than any other element. Moreover, there is no rule under which these elements would be sorted into specific groups or files. However, each of them has its own importance

Table 1: The list of operational design concepts

<i>Operational design concepts listed in AJP-5</i>	
Termination	Synchronization
Military end state	Simultaneity and depth
Objectives	Leverage
Effects	Balance
Center of gravity	Sequencing and Phases
Decisive points	Culmination
Decisive conditions	Operational pause
Lines of operation	Operational geometry
Direct / indirect approach	Transition
Maneuver	Branches and Sequels
Operational tempo	

and depends more upon circumstances and conditions in the operating environment and the extent to which these elements will be applied. According to unwritten rules, ODCs can be categorized as:

- ODCs that define the problem and formulate a strategic context (for example Objective, End state, the Center of gravity);
- ODCs that express the main idea determining how the operation may unfold (for example an approach to the Center of gravity, Lines of operation, Decisive points);
- ODCs that relate to an ongoing course of the operation, to what extent they affect the operation; whether they slow or accelerate it, for example culmination, operational reach, contingency plans – branches and sequels, etc. (Spišák 2013).

To emphasize the first point above, it is worthy to mention that at the strategic level of war it is very difficult to determinate clear and militarily achievable objectives, as well as the end state. From a military point of view, there is no problem to win decisive battles against the adversary and fulfill the main military objectives of the operation. The biggest difficulties have been identified in achieving the political objectives of war.

Such tasks, of determining real and unambiguous objectives and end states at both the strategic and the operational level of war cannot be determined only by the armed forces (Pikner et al. 2015). It is usually and very often the responsibility of politicians and strategic planners.

Operational Scheme development

As stated, the ODCs are essential for the development of an operational scheme. Commanders, through these elements, can compre-

hensively portray and describe varied activities of the armed forces as a whole, individual services as well as their complex relationship to other actors in the operation. Therefore, the primary purpose of the operational scheme is to illustrate (visualize) this dependence. Individual concepts and the operational scheme closely relate in both meaning and content, as well as within the theory of operational art and cannot be separated one from the other. The simplest and most accurate way to illustrate the relationship between ODCs in the operational scheme is by graphical display. It is not a matter of their depiction on a particular map or designated area. Rather, as is apparent from Spišák (2013), they are portrayed in operational documents in the form of graphic symbols or signs (possibly with a description) into a more complex graphic structure; the operational scheme. The location of ODCs in the scheme purposefully expresses a possible course of operation within the framework of its various phases. For those who work on development of operational scheme, it is necessary to find and study military doctrines. Spišák (2013) warns that the most relevant part of such information rests in military doctrine AJP-5.

Although the operational scheme essentially expresses the activities and interactions of various actors at a given time, space, and purpose, it cannot be said that this is a constant or static document with which the commander is no longer working. On the contrary, this document is continuously evaluated, updated and adapted to the progress and development of the ongoing operation. This scheme can also be understood as a kind of mental abstraction of what may occur during the operation. The operational scheme is therefore continually adapted to the character and conditions in the operating environment and to the mutual interaction of various military and non-military actors. Understanding all of these aforementioned statements is significant for every military professional during his/her study at the University of Defense. There they are confronted with the theory of ODCs and its practical application during the OPP.

METHODOLOGY

The issue of ODCs is a relatively new area that has recently come into the teaching of military art in career and special courses at the University of Defense in the Czech Republic. To

ensure a certain interaction between the significance of the theory and opinion of military professionals over its meaning, it was and is necessary to know their notions and views.

The QS was implemented to confirm the importance of this theory. The goal of the questionnaire was to determine the views of a representative sample of respondents on the importance of ODC theory and to obtain primary information to confirm or refute the basic research questions (hypothesis) for further educational use. The QS included nine basic statements (claims) to which respondents would answer by selecting their level of agreement or disagreement, according to the prescribed scale. The 10th question was included only to obtain some general views on the importance of the theory. The scale defined five basic statements:

- a) Strongly agree
- b) Agree
- c) Neither agree nor disagree
- d) Disagree
- e) Strongly disagree

Confirmation or refusal of an importance of ODC theory depended on the hypothesis: *Is it necessary to develop and teach the theory of ODCs to increase the competence of commanders and staffs planning military operations?*

The rule was stipulated for this hypothesis that the theory of operational design concepts is necessary to increase the competence of commanders and staffs to plan military operations if a “strong agreement” or “agreement” for each of the questions is expressed by at least 75 percent of the respondents. This value, according to the opinion of military experts from the University of Defense, provided sufficient assurance for a decision to include the ODC theory into curriculum programs. Forty-five respondents participated in the questionnaire survey from military institutions and facilities within the CR and from abroad. The respondents from the CR were 35 graduates of the General Staff Course, the Senior Officers Course, the Operational Planning Course and active lecturers from the University of Defense. This entire group covered a wide range of individuals from different departments and facilities, of different ages and length of service and experience from operations or services within international military structures. Respondents from abroad included 10 members of military institutions, for example the Joint Doctrine Division Support DDJ7/Joint and Coalition Warfighting in

Suffolk, the USA, Joint and Combined Warfighting School/Joint Forces Staff College/National Defense University in Norfolk, the USA, and Allied Joint Force Command in Brunssum, the Netherlands. The assumptions were that the views of these individuals may differ from those respondents from the CR.

RESULTS

There were no correct or wrong answers in the questionnaire. They were only able to express the view of the respondents as they saw the importance of the theory of ODCs in terms of their necessity and creative their application to be utilized during planning and conduct of operations. Result of the question 1 shows that opinion of the respondents confirms a general view that if a person knows the theory, he/she can better and more skillfully apply it during the planning process, which then becomes more efficient.

In responses to question 2 was concluded that the issue of operations planning and related applications of ODCs is less widely known; in many cases even underestimated. Respondents do not consider this area to be overly important. It may be inferred that, if the process is not being practiced by the staff (as derived from different views in question 10). It is likely that respondents cannot objectively assess the importance of the theory of ODCs.

Opinions from question 3 mean that studying this theory is particularly important in order to obtain the necessary knowledge and skills for further practice in military service. It is desirable that the issue will be a permanent part of the syllabus of the courses. Increasing the number of hours for theoretical and practical training may cause a higher degree of applicability of ODCs and improvement of theoretical and practical preparedness for planners. This may also fulfill the assumption of a higher quality and realism of operational documents. The findings obtained from participants in courses from question 4 are that the theory of ODCs is not yet a common part of commander and staff training at military units. The theory is applied only in rare cases, when planning documents are processed for participation in operations. Since the issue is not continuously practiced, the resulting operational documents cannot reach the required level of quality; they contain mistakes in terms of form and content. The fulfillment of this requirement

– to incorporate the issue into training – must be perceived as a general measure. Thus it may create desirable status – officers and staffs knowing the theory and the ability to apply it with excellence.

Positive opinion in question 5 confirmed 76 percent of respondents. Contrary to this relatively high number (24 percent) adopted a more vague opinion. This relatively contradictory conclusion might arise from the fact that a large majority of respondents are not at sufficiently responsible positions to be able to objectively assess the importance of the theory. On the other hand, three-quarters of respondents fully agree with the assertion that the successful planning and conduct of operations is possible only with personnel and knowledgeable related theory. The high percentage of positive opinions was reached in question 6 (82 percent). Based on the question, the importance of the theory can also be confirmed from this perspective: Service within international staff is very responsible, especially if linked to military operations planning. Necessity of the ODC's theory treated in scientific articles was discussed in question 7. A relatively favorable outcome (80 percent of positive answers) shows desire for future development of the theory published in scientific papers and articles with close relation to the education of military professionals.

Whether ODC's theory should be included in military doctrines respondents answered in question 8. The result of answers is surprising, relatively low, though partly anticipated (71 percent). Experience shows that the vast majority of students enter the courses with a low level of knowledge of national military doctrines and their significance. The only exceptions are individuals who previously worked in international staffs or otherwise had the opportunity to become familiar with these doctrines. The result of respondent claims calls for the adoption of measures to raise awareness concerning the importance of doctrinal publications. It follows that a decision related to inclusion of the ODCs into the new doctrine seems entirely justified.

The claim emerging from question 9 is one of the most important in the QS in terms of confirmation or refutation of the hypothesis. Strong agreement or agreement was reached by 89 percent of respondents. Their opinions objectively confirm the importance of the ODCs theory, a need for its development and further need to be

Table 2: Results of the questionnaire survey

<i>Question no.</i>	<i>The results of responses</i>
1. Creative application of operational art is based on good knowledge of the ODC's theory.	Strong agreement or agreement with the statement expressed 85 percent of respondents.
2. Knowledge of the ODC's theory is essential for the Operational Planning Process.	Strong agreement or agreement with the statement was expressed by 78 percent of respondents.
3. Education of the ODC's theory should be a part of the curriculum in career courses and specialized courses (e.g. operational planning course).	Strong agreement or agreement with the statement expressed 95 percent of respondents.
4. Study of the ODC's theory should serve to prepare commanders and staffs for operations.	Strong agreement or agreement with the statement expressed 91 percent of respondents.
5. Commanders and staffs, who know the ODC's theory, have better prerequisites for successful planning and conducting military operations.	Strong agreement or agreement with the statement was expressed by 76 percent of respondents.
6. Knowledge of ODC theory is necessary for planners working in multinational staffs.	Strong agreement or agreement with the statement was expressed by 82 percent of respondents.
7. It is necessary to treat the ODC's theory in military scientific articles and papers.	80 percent of respondents strongly agreed or agreed with the statement.
8. The ODC's theory should be included in military doctrines.	71 percent of respondents strongly agreed or agreed with this claim.
9. The ODC's theory is necessary to be continuously developed and practiced for successful planning and conducting of military operations.	Strong agreement or agreement was reached by 89% of respondents. This claim is one of the most important in the QS in terms of confirmation or refutation of the research question.
10. What importance of the ODC's theory can you see? Provide your experience, opinion, and recommendations for the development of this theory.	This question served only to obtain general views from the respondents on the importance of theory.

comprehensively applied in the planning and conduct of military operations. The last question in the QS served only to obtain general views on the importance of theory. Information gained from this question served for a specific analysis about the importance of operational art within the officers' military education.

DISCUSSION

The overall average of responses with positive value (strongly agree or agree) covered 83 percent of the total. Based on the stipulated rule, it was found and confirmed that the theory of ODCs is necessary to increase the competence of commanders and staffs to plan military operations. Overall, 13 percent of respondents expressed neither agreement nor disagreement with submitted claims. It can be assumed that if a group of respondents would be given more information about the theory, the number of responses with a positive value (strongly agree or agree) would be greater. Table 2 points to the

percentage of research results from the all specific responses.

The results of the above-discussed survey were evaluated in depth and became the primary basis for confirming the necessity of the theory. Because the theory of operational art in terms of ODCs was not a part of the syllabuses for the officers' career courses in the past, findings from the survey were noted as a necessary component for implementation of the theory into the education of officers. This intent was utilized in the development of curriculum programs for military professionals in career courses in the study block "The Operational Art" since 2015. The findings of the QS revealed an evident value of the theory and its considerable importance for the operational planning process conducted by military commanders and their staffs.

CONCLUSION

The theory of ODCs is an integral part of the operational art. Teacher perceptions concerning

the value of the theory have one common statement: For a sound application of these elements it is necessary to have profound knowledge regarding their character, content and purpose, as well as an understanding of other key factors entering into the OPP. Based on the findings, results of respondents' claims called for the adoption of necessary measures to raise awareness concerning the importance of doctrinal publications that include this theory of ODCs. The first step was made when the theory of ODCs was finally included into the Czech capstone military doctrine as the very basis for the study and application matters of operational art.

RECOMMENDATIONS

To promote a more effective military educational system, it was recommended to prepare an exercise with specific attention to ODCs theory. Such an exercise should be applied for students from both the General Staff Course, and the Higher Officer's Course. To reach the full understanding of the ODCs theory the basic goals of such an exercise should be stated as follows:

- To understand the strategic context and possible means of crisis resolution in the relevant environment.
- To understand the role of the military instrument during the tackling of crises.
- To use mental abilities in the development of the "vision" on methods to resolve problems.
- To improve critical thinking and the abilities of students during the operating environment analysis.
- To understand and properly apply the theory of ODCs.

To reach these goals, students should study the OPP in detail and the principles of the operational scheme development in connection with the applied ODCs. The role, meaning and objective of the most significant ODCs (End state, Objectives, Centre of gravity, Lines of operations,

Decisive points/conditions, Phases and Timing) should be emphasized during the exercise. A valuable part of the final presentation, done by students at the conclusion of the exercise should test their clear decision and explanation of the methods by which the relevant ODCs were utilized. The integration of such an exercise in the curriculum may contribute to increasing the capabilities, knowledge and skills of military officers to properly apply the theory of operational art in practice.

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