EXPERT INSTITUTE AS A TOOL FOR OBJECTIFYING THE MILITARY ACQUISITION PROCESS

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Abstract: The acquisition process of military equipment, technology, material and related services (METMS) is often accompanied by doubts about the economy of the purchase. For this reason, on the one hand, there are delays in the implementation of strategic investments, and on the other hand, there are risks of criminal prosecution of the persons involved. At the same time, the absence of the ability to objectively assess the effectiveness of the entire investment is felt. As a result of the existence of this gap, the project "Znalec" (Expert Witness) was created as a part of the Defense Research Program with the aim of assessing the possibility of creating an expert institute, which could be a professional workplace with the ability to provide an objective view of the value of acquired METMS, create an expert standard for evaluating METMS and design a system of training relevant experts. This paper deals with the first of the goals of the project, when, based on a thorough analysis, it presents a proposal for the parameters of the expert institute, the primary goal of which is to ensure an independent evaluation of the METMS.

Keywords: Expert witness institution, valuation, price, military equipment, combat vehicles

1 Introduction

The acquisition process (procurement process) in military equipment, technology, material and related services (METMS) within the Ministry of Defense of the Czech Republic (MoD) is implemented in accordance with the principles of economical, efficient and effective spending of public resources (MoD, 2015). However, it is often also the subject of political negotiations, and thus also the attention of the media and the public, as part of the public control of the armed forces. Any error or even if only a hint, they are often the subject of investigations by law enforcement authorities.

It is clear, however, that the army needs to ensure continuous renewal, innovation and development of METMS for its effective operation, which is done mainly in the form of an acquisition process (MoD, 2013). The acquisition process can greatly affect not only the technical level of the purchased METMS items, their quality and price, but it can also bring, and unfortunately often brings, a number of risks for MoD and specific parties involved, including personal ones in the form of years-long criminal prosecution or "just" ostracism.

From the above, it follows that the acquisition process or the public contracts that are carried out within it, under the conditions of the MoD, can be considered a highly media sensitive topic (MoD, 2023a). The acquisition process is often accompanied by questioning, and its results are also questioned (Wong et al. 2022a). For this reason, there are significant delays in the implementation of strategic acquisitions, which do not make it possible to use previously prepared resources of the state budget for the acquisition of new military equipment necessary to ensure the required capabilities of the Army of the Czech Republic (ACR) and its development (MoD, 2021).

One of the factors that can help minimize these negative aspects accompanying significant acquisitions in the conditions of the defense departments of the EU member states is the reviewability and provenance of the own valuation of combat equipment and armaments (European Union, 2023). The same applies to the conditions of the Czech MoD. This results in the identified need for valuing METMS in the entire life cycle, which includes past, present and future developments in the economic security of the MoD. The need to examine the parameters of weapon systems is by no means a new approach.

The importance of testing and evaluation in the development of major weapons systems is already discussed more than fifty years by the US General Accounting Office (1972), where the testing of new weapons is a key element in the acquisition process of weapons systems. It mainly deals with engineering testing, acceptance testing and operational suitability testing. The Army Materiel Command (1987) introduces revised version of the handbook for the acquisition process effective management. It contains key material acquisition policies and also focuses on a simplified acquisition process. Trends and challenges in the defense acquisition process are described in a recent RAND Corporation study (Wong et al. 2022b). Also included here are geopolitical changes, globalization, changes in national priorities, and challenges associated with advanced commercial technologies.

The emergence of the "internal debt" of the MoD (MoD, 2022a), the conclusions of the NATO summit in Wales (MoD, 2022b), the unstable security situation and favorable economic conditions resulted in a gradual increase in defense spending, including the budget of the MoD. The target amount of 2% of GDP for defense spending in 2024 is already realistic from today's point of view (MoD, 2023b). The ability to value combat equipment, military equipment and material must be perceived as necessary not only from an economic point of view (obtaining the so-called value for money), but also from a political point of view, when the MoD must be able to prove that the purchases made were realized at an adequate and acceptable price.

Following the effectiveness of Act No. 254/2019 Coll., on experts, expert offices and expert institutes, the need for expert skills was identified primarily for the benefit of the MoD in the fields of: (1) economics; (2) protection, defense and security; (3) pyrotechnics, ammunition and explosives, and (4) weapons and ammunition. For the reasons described above, MoD initiated the creation of a research project called "Znalec", the content of which, after further clarification, was finally approved in the following points:

1. assessment of the possibilities of establishing an expert institute, in the sense of Act No. 254/2019 Coll., in the conditions and primarily for the needs of the MoD, or ACR;
2. development of a methodical procedure for the evaluation of military equipment in the conditions and primarily for the needs of MoD, or ACR;
3. the creation of a proposal for an educational activity, in the sense of Act No. 254/2019 Coll., for the education of experts in the field of Economics, the sector Valuation of combat equipment and military equipment.

This article deals with the summary of the research in the part of solving the first point, i.e. the assessment of the possibilities of establishing an expert institute, in relation to the identification of needs and the focus of its activity. The results of the research in the areas of its organizational support and the legal form of the expert institute, as well as the research focused on the other two points, will be described in other articles.

2 Research goals and methods

The research goals are to perform an analysis of the need for the creation of an expert institute in the sense of Act No. 254/2019 Coll. and analysis to define the strategic framework of its activity. At the same time, we leave the organizational integration and its legal form for further investigation. To conduct the research, the following research questions were set:

1. Is the establishment of an expert institute necessary to improve the transparency of the acquisition process?

2. What are the identifiable opportunities and threats, strengths and weaknesses of the institution under consideration?
3. What should an expert institute ensure and what should it have at its disposal?

To achieve the research goals, strategic analysis methods adapted to the specifics of the research task are used:

1. analytical part;
2. design part;
3. confrontation of the proposal with SWOT (checklist).

The individual parts of the analysis and proposal were processed iteratively, more in a step-by-step manner, as the strategic delimitation of the expert institute changed with the development of research processing and thus the need for breadth and depth of analyses. This means that the process of processing individual parts repeatedly called for the need to expand and supplement already processed parts, see Fig. 1. This fact is induced by the fact that, unlike normal strategic analyses, which usually follow on from the definition of a strategic framework, the strategic framework is only research wanted.

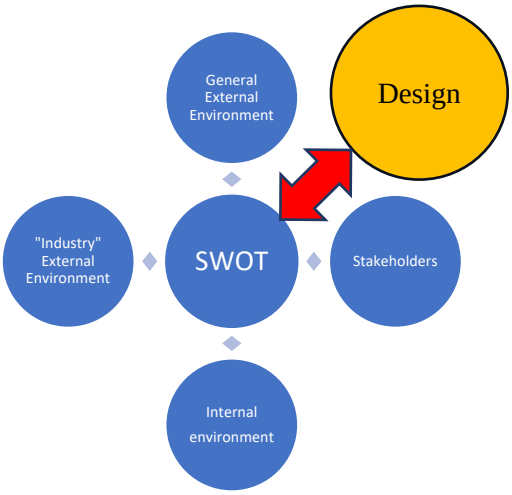

Figure 1. An iterative process of analysis and design

The specificity of the investigated problem lies in the certain interconnectedness of the general and sectoral environment and stakeholders, as the MoD is part of both the government sector, belonging to the general environment, and the sectoral environment, as it is an important, dominant "customer" and one of the most important stakeholders (Retter et al., 2021). This is reflected in the analytical and design part by the perception of its triple role, i.e. in each part with different accents.

2.1 Analytical part

Corresponding with the Fig. 1 the analytical part is divided into sub-analyses as follows:

1. analysis of the general environment;
2. analysis of the industry environment;
3. stakeholder analysis;
4. analysis of the (considered) internal environment.

Tab. 1 clearly shows the structure of the analyses.

Table 1: Structure of the performed analyses

Type of analysis		Selected type of analysis	Output	Summary of analyses
External Factors	General	SLEPT/ MAP	O, T	SWOT
	Industry	Porter's five-factor model		
Stakeholders		Stakeholder analysis	S, W, O, T	
Demand		Product, quantity	S, W	
Internal factors		It is not done in this article, as the internal environment is the subject of the design (some aspects are included in the stakeholder analysis)		

2.1.1 Analysis of the general external environment

The analysis of the general environment was carried out in the SLEPTE structure, similar to the PESTLE analysis (Cawman & Liu, 2020), where the following aspects are analyzed:

- Social;
- Legislative;
- Economic;
- Political;
- Technological and
- Ecological.

The MAPI method (Pospisil & Fric, 2016) was used for the analysis, i.e. Monitor, Analyze, Predicate and Identify. The result of the analysis of the general external environment are opportunities and threats that can significantly influence the activities of the intended expert institute.

2.1.2 Analysis of the industry external environment

Porter's model of forces was chosen for the analysis of the industry environment (Porter, 1996, Paksoy et al., 2023). The model takes in to account the following five forces:

1. Power of Customers,
2. Power of Suppliers,
3. Threat of Substitutes,
4. Barriers to Industry Entry and
5. Industry Rivalry.

The result of the analysis of the industry external environment are opportunities and threats that can significantly influence the activities of the intended expert institute.

2.1.3 Stakeholder analysis

The stakeholders are taken as entities that will have some interest in the expert institute, or the expert institute will have an interest in their interest. Stakeholders and their attitudes can differ significantly in the type of institutional arrangement chosen. They may or may not have ownership stakes or direct influence in it. Stakeholders can be owners, customers, employees, management, media, political parties, etc.

Stakeholder analysis begins with stakeholder identification. For each of them, their expectations and goals are analyzed. The analysis results in the identification of strengths and weaknesses and opportunities and threats. The analysis scheme is shown in Fig. 2.

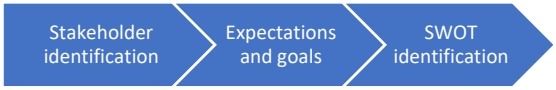

Figure 2: Structure of stakeholder analysis

2.1.4 Demand analysis

The demand analysis was carried out through communication with potential contractors of expert opinions from individual departmental components, both on the basis of a written approach and three conducted workshops. The structure of the analysis is carried out in the manner shown in Fig. 3.

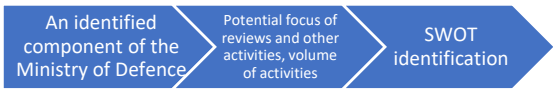

Figure 3: Structure of the analysis of the demand for the expert institute

2.1.5 Analysis of the internal environment

Analysis of the internal environment in the case of the institution does not yet exist, or its sources and status are only the subject of the proposal, it is not presented in this article, although it is outlined in the project outputs.

2.1.6 Summary of the analytical part

The summary of the analytical part is carried out in the project solution in a SWOT table, where individual identified strengths and weaknesses, opportunities and threats are summarized. In this article, the summary is presented only in the "Design" section, where it is confronted with the design of the intended institution.

Identified strengths and weaknesses, opportunities and threats are also confronted in the outputs of the project in accordance with NATO practices using the DOTMLPFI method of developing strategic capabilities (Eaton et al., 2016), where they are assigned according to their relevance to individual points (Correia, 2019):

- Doctrine: doctrinal area, availability of processed regulations and norms;
- Organization: definition of organizational issues;
- Training: opportunities for training and education of personnel;
- Material: availability of material and technical facilities, including logistics services;
- Leadership: possibilities and approaches to the management of the organization;
- Personnel: human resources, suitably prepared, interested in the given organization and given work;
- Facility: sufficiently developed background, for predictable needs and enabling the solution of international projects;
- Interoperability: sharing experiences, approaches and procedures in the processing of expert opinions and evaluation of price and cost of living.

2.3 Design part

The design part is carried out by a modified McKinsey 7S method (Rasiel & Friga, 2001, Pospisil & Fric, 2016), in which the framework of the intended institute is described by a value-based management model (VBM). It describes how a company can be organized holistically and effectively. The model consists of the following seven elements, see Fig. 4:

1. Shared values: the connecting center of McKinsey's model; what the organization stands for and believes, its central beliefs and attitudes;
2. Strategy: plans for allocating a firm's limited resources over time to achieve set goals. Environment, competition, customers;
3. Structure: management method;
4. Systems: procedures, processes and routines that characterize how important work needs to be done: financial systems; recruitment, promotion and performance appraisal systems; Information Systems;
5. Staff / team (employees): in this section, not only employees are considered, but the entire team that will participate in the institute's activities;
6. Style: the cultural style of the organization and how key managers behave in achieving the organization's goals. Management styles; and
7. Skill: characteristic abilities of personnel or the organization as a whole, basic competence.

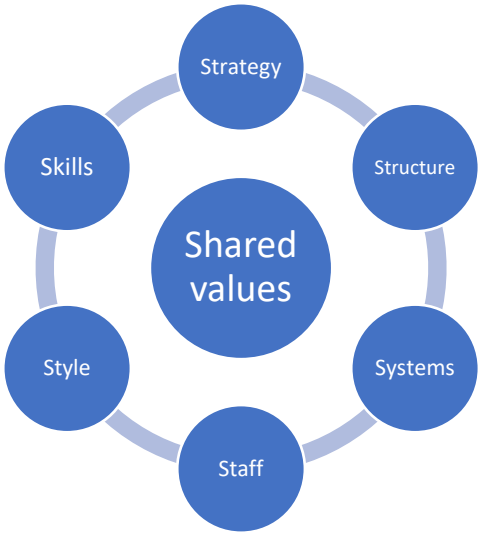

Figure 4. Structure of the design part based on the McKinsey's model

3 Research results – Analytical part

The breakdown of the analytical part corresponds to the structure described in the chapter 2.1.

3.1 Results of the analysis of the general external environment

The results of the SLEPTE analyzes are presented by the MAPI method in Tables 2 to 6.

3.1.1 Social factors

Social factors, i.e. factors characterizing demographic development, age profile, level of health, provided health services or gender factors were not identified as significant from the point of view of establishing the institute. The exception is social factors in the context of job stability and income from expert work. These are listed in Tab. 2.

3.1.2 Legislative factors

The analysis of legislative factors identified a whole range of regulations that must be taken into account when establishing the institute and shaping its strategy. In addition to Act 254/2019 Coll., on experts, expert offices and expert institutes (ZnalZ) and implementing regulations (decrees) following it, these are mainly laws regulating the valuation of METMS.

Table 2: Social factors

M – Monitor	A – Analyze	P – Predict	I - Identify
Job stability	A significant part of the population prefers stable employment with an employer with a clear strategy and growth perspective.	In the long term, this view of employment can be expected to remain unchanged.	T01: Expert institute strategy not providing a clear career development perspective, incl. financial stability and the nature of the work, may cause disinterest to work for such an institution, both initially and over time
The amount and focus of processed expert opinions	According to "Demand analysis" section, it is clear that the need for expert opinions in MoD depts. fluctuates considerably and at the same time their focus changes significantly, which requires very flexible	Fluctuations in the acquisition process can also be expected in the future, and thus greatly changing requirements for the amount and focus of assessments.	T02: Difficulty maintaining a portfolio of experts capable of processing ad hoc assessments in various specialties when their workload is highly variable.

	changes in the team of experts who process the opinions.		
	Suitable experts are not available Reluctance of forensic experts to implement small-scale contracts for determining the usual price	If a systemic solution is not found, the situation will persist and the problem will worsen.	O01: The creation of an expert institute can stabilize the portfolio of experts and the coverage of expert fields for the needs of MoD

The obligation to value METMS results from Act No. 219/2000 Coll., on the property of the Czech Republic and its behavior in legal relations (ZMS) , and also from Act No. 320/2001 Coll., on financial control in public administration (ZFK), Act No. 134/2016 Coll. (ZVZ), on awarding public contracts, Act No. 563/1991 Coll., on accounting, etc.

ZnalZ in § 28 paragraph 5 requires that the expert report be processed in accordance with generally accepted procedures and standards of the given field and industry; these standards for the analyzed area of valuation are not available, therefore it is necessary to create and codify them. The requirements for the standard result from the following regulations and related documents:

- pricing law:
  - Act No. 526/1990 Coll., on prices (ZOC);
  - Act No. 151/1997 Coll., on property valuation (ZOM);
  - Regulation No. 441/2013 Coll., on the implementation of ZOM, so-called Valuation Regulation (VOC);
- related valuation standards:
  - International valuation standards with effect from January 31, 2022. (IVS);
  - KLEDUS, R., M. SEMELA, M. BELÁK and P. MAREŠ. Expert standard No. I/2022: valuation of road and special vehicles. Brno: Akademické nakladatelství CERM, 2021. (ZS No. I/2022);
- others, e.g.:
  - Act No. 219/1999 Coll., on the Armed Forces of the Czech Republic (ZOS);
  - requirements for an expert opinion and the procedure for processing an expert opinion;
  - https://www.mfcr.cz/assets/cs/media/MFCR_2014-09-25_Komentar-k-urcovani-obvykle-ceny_v02.pdf (issued before 1/1/2021, when some ZOM changes took place; some principles described in the commentary, in an amended form, they were directly reflected in the text of the ZOM and its implementing VOM);
  - Opinions on the State Property Act, Ministry of Finance of the Czech Republic, 2021 (mfcr.cz);
  - Methodology 2021: Opinion on dealing with the permanently unnecessary movable property of the state. Ministry of Finance of the Czech Republic (mfcr.cz);
  - Methodology 2021: Methodological opinion on free transfer and sales premium. Ministry of Finance of the Czech Republic (mfcr.cz)
  - RMO No. 66/2012 MoD Bulletin, Activity and Development Planning in MoD;
  - NVMO No. 66/2019 MoD Bulletin, Accounting in MoD;
  - RMO No. 27/2018 MoD Bulletin, Financial control within the scope of MoD;
  - NVMO No. 28/2018 MoD Bulletin, Performance of financial control within the scope of MoD;
  - NVMO No. 67/2014 MoD Bulletin, Life Cycle Management of the Cost Center of MoD;
  - NVMO No. 46/2015 MoD Bulletin, Securing the budget process and the preparation, implementation and evaluation of programs and actions within the competence of MoD;
  - RMO No. 25/2004 MoD Bulletin, Cataloging of assets under the jurisdiction of MoD;
  - RMO No. 48/2013 MoD Bulletin, Management and management of property under the jurisdiction of MoD;
  - NVMO No. 51/2013 MoD Bulletin, Procedures in the management and handling of property under the jurisdiction of MoD;
  - RMO No. 72/2012 Bulletin of the Ministry of Finance, Financial management and financial security;
  - Methodological instruction for entering and evaluating opinions according to Act No. 36/1967 Coll., on experts and interpreters, as amended, in MoD (No. 86-28/2016-8201);
  - NVMO No. 47/2017 MoD Bulletin, Market research for the support of the acquisition process in MoD;
  - RMO No. 55/2017 MoD Bulletin, on the acquisition of property, services and construction works in MoD;
  - NVMO No. 60/2017 MoD Bulletin, on a uniform procedure for the acquisition of property, services and construction works in MoD;
  - A uniform procedure for determining the price at the usual place and time. Prague: Economic Section of the MoD, 2018;
  - NVMO No. 51/2013 MoD Bulletin, procedures for managing and handling property under the jurisdiction of the MoD;
  - Draft NVMO Life Cycle Cost Estimates to support the acquisition process in MoD.

Legislative factors are summarized in Tab. 3.

Table 3. Legislative factors

M – Monitor	A – Analyze	P – Predict	I - Identify
Expert law: Act 254/2019 Coll., on experts, expert offices and expert institutes (ZnalZ)	The division of fields, sectors and the binding nature of specializations cause complications. Lack of clarity in this direction causes uncertainty and threats in terms of sanctions. The law requires expert institutes of the standard type to carry out research activities.	A "technical" amendment to the law will soon be prepared, to which the MoD can contribute in the comments procedure with its proposals for changes, thereby removing or better solving a number of ambiguities or problematic points from the law.	O02: Possibility to initiate a change to ZnalZ in favor of its greater functionality. O03: The requirement to carry out the institute's own research activity can expand the portfolio of its activities. T03: The lack of clarity of the industry and specializations can lead to risks in the performance of expert work
The legal position of the expert institute in relation to the Public Procurement Act (ZVZ) and potential conflict of interests	The ZVZ and European competition law foresee the awarding of public contracts, i.e. expert opinions, through public tenders.	Although competition law will probably be regulated in more detail in relation to in-house contracts, or in the field of vertical or horizontal cooperation, risks from the changing legal environment will persist.	T04: An incorrectly chosen legal form of an expert institute can make it impossible for MoD to commission the processing of expert opinions "directly" T05: The direct subordination of an expert institute can lead to suspicion of a conflict of interests, a threat to professional independence and thus a threat to the authority of the opinions being processed.
Expert standard	An expert	An expert	O04: ČOS is now

for METMS valuation	standard for the valuation of METMS does not yet exist, there are quite a lot of regulations regulating the given issue and they are mutually inconsistent.	standard in the form of the Czech Defense Standard (ČOS) for evaluating METMS is being prepared as part of the "Znalec" project	in preparation and could become a platform for covering the relevant regulations governing the issue of METMS valuation

3.1.3 Economic factors

Following the sent-out questionnaires, the difficulty of processing individual required expert opinions was specified. Due to the great diversity, it is very difficult to determine the time required for their processing. E.g. in the field of real estate valuation, there is no standard or specification of the estimation of the time required to process the valuation of individual types of buildings. In the case of real estate valuation, the character of the real estate being valued plays an important role, as well as whether the expert is only required to set the decree price or to determine both prices, i.e. the decree price and the customary price.

In terms of initial investments, it is necessary to take into account the following costs:

- office space: renting or purchasing office space suitable for business, including workstations, meeting rooms and common areas;
- equipment and technology: investments in computers, software licenses, valuation tools, databases and other necessary technology to support your valuation activities;
- personnel: allocation of funds for the recruitment of qualified professionals such as appraisers, economists, market analysts, researchers and administrative staff (e.g. salaries, benefits and training costs, etc.);
- valuation sector research and its ongoing monitoring: conducting thorough market research, to understand the dynamics of the defense sector, market trends and potential demand for valuation services and expert-level expertise (e.g. expenditure on data acquisition, market reports and research tools, etc.);
- certifications and licenses: obtaining any required certifications, licenses or permits related to the valuation of assets in the defense sector, which may include professional development fees and costs;
- marketing and building the institute's reputation (its brand): allocating a budget for marketing and advertising activities, including website development, branding, content creation, social media campaigns and participation in industry events;
- legal and regulatory compliance: consulting with legal counsel to ensure compliance with applicable laws and regulations, which may include legal fees, registration costs and compliance-related expenses.
- infrastructure and security: investing in appropriate security measures, data protection systems and physical infrastructure to ensure the confidentiality and integrity of client information.
- insurance: obtaining the necessary insurance coverage, such as professional indemnity insurance, to mitigate potential risks associated with valuation activities;
- other expenses: e.g. accounting services, office supplies, utilities, telecommunications and other miscellaneous costs associated with the operation of the institute.

The analysis of the economic factors of the establishment of the institute is summarized in Tab. 4.

Table 4: Economic factors

M – Monitor	A – Analyze	P – Predict	I - Identify
Variability of expert activity costs	Reviews in the area of interest are highly variable in terms of the expertise required and the time required.	Due to the nature of the matter, variability in the scope and needs of individual expertise can be assumed in the future too.	T06: A potential expert institute will have relatively difficult to predict costs for expert work.
Costs of monitoring developments and trends in areas of potential acquisitions	They are not systematically monitored for the purposes of expert and expert activities, even though there are formally departments of MoD that are supposed to carry out this activity.	If there is no systemic change, a permanent state is assumed in the future	T07: If developments and trends in the area o anticipated acquisitions are no systematically monitored, there may not be enough data to process assessments. T08: Due to the lack of information on the state of knowledge, a technique is often ordered in the form of "research", which is more expensive than a typical solution. Components from different systems are often put together, the compatibility of which is problematic.
The costs of establishing and operating the institute	The establishment of the expert institute was indeed initiated by the Ministry of Defense on the basis of needs formulated by it, but without a clear idea of the impact on the budget, systemized jobs and other costs.	The conclusions of the solution of the POV Znalec project will define the expected scope and volume of activities of the expected expert institute and the associated necessary capacities of personnel, material and others, e.g. communication, organizational, etc.	T09: Operating expenses are often the subject of cuts in the preparation of the state budget and are rarely opposed by savings in investment funds and savings on the costs of possible legal disputes.
Savings in the acquisition cycle	the SAO, the procurement of equipment and the provision of service for the army are not effective. As a result, arming takes longer and becomes more expensive than planned	If there is no systemic change, a permanent state is assumed in the future	O05: Appropriate savings can be achieved by changing the system of preparation and monitoring of the acquisition process

3.1.4 Political factors

The analysis of the political factors of the establishment of the institute is summarized in Tab. 5.

Table 5: Political factors

M – Monitor	A – Analyze	P – Predict	I - Identify
Transparency of the acquisition process	Recently, there has been growing political pressure to increase the transparency of the acquisition process.	In general, the trend of increasing transparency can be assumed for the future as well	O06: The pressure to increase the transparency of the acquisition process may increase the need for both the amount and scope of expertise O07: The subject of the expert examination will not be only the purchase price, but a comprehensive assessment, incl. necessity, adequacy, life cycle costs.
Uncertain foreign policy situation	Recently, there has been a worsening of the international situation with implications for the strengthening of defense capabilities - an increase in defense resources and thus an increase in the number of acquisitions.	The trend is difficult to predict, but it can be assumed that the period of stability is not near.	O08: An increase in acquisition activities may imply an increased demand for expert opinions

3.1.5 Technological factors

The emergence of a potential expert institute will not be influenced by any specific or significant technological factors, i.e., no threats have been identified in this area, except economic ones (costs for the acquisition and operation of technologies), which are mentioned in the framework of economic factors in the relevant part of this analysis. However, the creation of an institute can support the acquisition and ongoing maintenance of know-how how about the development and current trends of METMS, which is identified as an opportunity in Tab. 6.

Table 6: Technological factors

M – Monitor	A – Analyze	P – Predict	I - Identify
Monitoring technological development trends	Technological development trends are not yet systematically monitored	If there is no systemic change, a deviation from the current state cannot be assumed	O09: The establishment of an expert institute can create an expert base for the objectification of tender documentation of acquisitions in terms of the parameters requested by METMS

3.1.6 Ecological factors

The creation of a potential expert institute will not bring any significant ecological impacts, as it will be a normal workplace that will comply with valid ecological standards. From the point of view of the acquisition process, the establishment of the institute can contribute to the objectification of ecological requirements for acquisitions. However, these are part of the parameters as such and have already been identified as opportunities and threats in previous parts of this analysis.

3.2 Analysis of the industry environment

As stated in chapter 2, the analysis of the industry environment is carried out by applying Porter's five-factor model (the five forces model).

3.2.1 Power of Customers

It is assumed that the largest contracting "customer" of the expert institute will be MoD, with which the expert institute will have to be connected in some way so that expert opinions can be directly commissioned without the need to hold time-consuming selection procedures. This results in a relatively significant "negotiating" power of this customer, which can lead to a threat to the independence of the expert institute, both real and imagined (criticism by competitors, political opposition, media, etc.). This fact has been identified as a threat to be addressed in the proposal.

Other customers outside MoD are unlikely to have significant bargaining power and therefore do not represent any significant threat, so they are more of an opportunity for developing the competences of the expert institute.

The opportunity and threat coming from the power of customers are summarized in Tab. 7.

Table 7: Power of customers

M – Monitor	A – Analyze	P – Predict	I - Identify
Ministry of Defense	A key potential client, a source of funding, even potentially a functional superior.	Without systemic treatment, the operation of MoD can seriously threaten the independence and economy of the expert institute.	T10: A strong client can affect the independence and financial stability of an expert institute.
Other contractors	Other contractors do not have significant bargaining power for the expert institute, unless they are linked with the MoD.	No change is expected	O10: Work for other contractors can contribute to the financial stability of the expert institute

3.2.2 Power of Suppliers

It is not assumed that the expert institute should have any standard external suppliers in the form of legal entities. Its "suppliers" will be its employees or otherwise bound natural persons, whose reliability, expertise and performance will depend on the expertise of the expert institute. It can be assumed that their number will be limited. It follows that their power can be significant. This is related to the economic and social aspects already identified in the part of the analysis focused on the general environment.

The opportunity and threat coming from the power of suppliers are summarized in Tab. 8.

Table 8: Power of suppliers

M – Monitor	A – Analyze	P – Predict	I - Identify
Employees/ cooperating natural persons	They are practically not on the labor market, they will have to be trained. Their workload for the institute's activities will be highly variable (if they only do assessments), there will be a problem with their retention and motivation. In MoD and dependent organizations and outside there are experts who would be able in short time to ensure the activities of the institute.	Without systematic treatment, the shortage or turnover of employees can seriously threaten or even completely paralyze the activity of the institute.	T 11: Unmotivated employees. O11: With the appropriate setting of the remuneration system and activities complementary to one's own expertise, it is possible to recruit and train suitable employees.

3.2.3 Threat of substitutes

A substitute in the case of an expert institute can be both experts standing outside the expert institute, but also the replacement of the need to "have an opinion" by other means of acquisitions than the form of public contracts, e.g. "G to G" type contracts (government - government). The opportunity and threat arising from the threat of substitutes are summarized in Tab. 9.

Table 9: The threat of substitutes

M – Monitor	A – Analyze	P – Predict	I - Identify
Apart from standing experts, expert offices and expert institutes	They are practically not in the required fields, they are not significant yet	The development depends on the attitude of MoD, whether and in what way it will allow access to the industry for commercial entities.	T12: Outside experts can be substitutes O12: There are practically no external experts yet.

3.2.4 Barriers to entry into the industry

There are basically two barriers to entering the industry: the acquisition of very specific knowledge, both professional and departmental organizational, and access to often classified information. However, these barriers are very relative, as overcoming them depends on the "attractiveness" of entering the industry, which is in the power of the Ministry of Defense in particular. Opportunities and threats arising from barriers to entry into the industry are summarized in Tab. 10.

Table 10: Barriers to entry into the industry

M – Monitor	A – Analyze	P – Predict	I - Identify
Information Sources	The acquisition process takes place separately and in a closed environment	No change is expected.	O13: As part of its activity, an expert institute can define the type and scope of information that should be provided during the acquisition process so that there is enough information to process the

			assessment
Specific knowledge	They are often subject to secrecy	No change is expected.	O14: Current MoD employees who should be considered for the institute often have appropriate security clearances.
Specialized education	In order to carry out expert work in a given field, it is necessary to complete additional education	No change is expected. A four-semester education is assumed.	O15: Necessity of specialized education
MoD attitude	With its unilateral decision, MoD can increase the attractiveness of the industry and thereby largely eliminate the influence of the identified barriers.	With the free setting of the codification of the institute, it is impossible to predict.	T13: MoD can increase the attractiveness of entry into the industry or organizationally adjust processes and thus make entry barriers low

3.2.5 Industry Rivalry

Rivalry in an industry that is not yet significantly occupied is not significant and is covered by the opportunity and threat identified in the threat analysis of substitutes.

3.3 Stakeholder analysis

The stakeholder analysis is summarized in Tab. 11.

3.4 Demand analysis

In accordance with the primary purpose, requests within the MoD were analyzed. To identify the real need for valuation, or the processing of expert opinions aimed at determining or verifying the price, under the conditions of MoD, were approached by selected entities dealing with the acquisition of property or services, most often in connection with the management of real estate infrastructure when determining the established, customary, or statutory price. Tab. 12 identifies weaknesses and strengths, opportunities and threats resulting from the demand analysis.

Table 11: Stakeholder analysis

Stakeholders	Relationship to the expert institute (substantive)	Power / Motivation	S, W, O, T
MoD	founder/ co-founder, key contractor	big / medium	O16: Founder can ensure the firm position of the institute and access to resources (informational and financial) T14: Founder may exert organizational, financial pressure, threaten independence T15: Simple lack of interest of the founder can threaten the very existence of the institute
University of Defense (UNOB)	possible source of experts	big / big	S01: There are a number of synergies between the activities of UNOB and the institute under consideration, which can prevent the building of duplicative capacities and demands for funding S02: A significant number of UNOB employees can acquire the expertise of an expert as part of their continuing education
ACR	customer, end user of acquisitions	big / big	S03: AČR has a large background for feedback on acquired property O17: The possibility of creating a feedback system for the evaluation and quality assessment process
Department of Justice	expertise manager	medium / medium	O18: Possibility of cooperation with SMEs to define expert sectors T16: Unforeseeable changes in expert law
Ministry of Foreign Affairs	manager of relations with foreign countries	medium / medium	O19: Linkage with the export/import of military equipment may occur through the MoH
Government agencies	industry support	small / small	O20: Government agencies can enable the institute to be involved in supporting the implementation of the government strategy
Arms industry and investors	customer / conflict of interest	big / medium	T17: The arms industry and investors can influence the independence of the institute through media or lobbying
Expert community	cooperation, competition	medium / medium	O21: The possibility of connecting and sharing capacities with experts in other areas O22: Possibility of expert training T18: Experts can lobby for weakening the institute's position for competitive reasons
International professional community	cooperation, competition	medium / small	O23: Possibility of exchanging experience with foreign workplaces T19: Possible impact of external influences from foreign non-independent experts disrupting the success of acquisition processes
Public	public control	medium / small	T20: The possibility of negative influence on the process of valuation and acquisitions by the media and the public
Media		big / small	
SAO	public control	medium / medium	O24: The possibility of converging opinions on the issue of valuation of acquired property
Parliament of the Czech Republic	public control	medium / medium	O25: Appropriate communication with the parliament can explain the issue of valuation and thereby reduce the pressure on the acquisition process
Employees of the institute	internal supplier	big / big	O26: Quality employees can gain a high reputation for the institute in a short period of time T21: Incorrectly selected, low-quality and unmotivated employees can threaten the functionality of the institute

Table 12: SWOT resulting from demand analysis

S04: There are departments in the MoD that routinely use expert opinions	W01: There are no processes set up in MoD for systematic use of expert opinions
O27: Fields of expert activity were identified, the need for which was not part of the content of the Znalec project and which expand the scope of the required activity of the expert institute	T22: The focus of expert opinions is very heterogeneous, the volume in one industry is relatively small

4 Research results – design part

In accordance with Chapter 2.2, the design part is processed using a modified 7 S method.

4.1 Strategy of the expert institute

The strategy of the institute is a key and rather extensive document, the scope of which greatly exceeds the possibilities of a scientific article. For this reason, the basic principles of the strategy of the intended expert institute are described here.

4.1.1 Founder of the expert institute

From the point of view of the assignment of the "Znalec" project, the expert institute should be a MoD expert institute. At the same time, threats were identified in the analytical part in relation to the threat to the independence of the institute and the associated threat to the credibility of the outputs of its work. These threats arise precisely from the MoD's possible interventions in the institute's activities, either directly or indirectly through financial, personnel, administrative or other similar instruments. At the same time, due to the possibility of direct input of assessments and other activities, a connection to MoD is necessary.

Considering the described limitations and conditions, a proposal for the establishment of an expert institute was discussed and evaluated positively by two public founders, namely the Czech Republic represented by the MoD and the Brno University of Technology (BUT), a public university. The details of the legal form and arrangement of relations between the institute and the founder will be the subject of another article.

4.1.2 Products and activities of the expert institute

In the analytical part, it was identified that the originally considered focus of the expert institute as an institution focused exclusively on the valuation of METMS is problematic, as a standard expert institute must carry out research activities. The analysis also shows that there is a demand in MoD for other types of expertise and expert activity. At the same time, a lack of systematic activity in the field of monitoring trends in the development of METMS was identified. Concretely, the analysis results in the following portfolio of activities (products) of the expert institute as shown in Tab. 13.

Table 13: Proposed portfolio of activities and products of the intended institute

Activity	Product
1. expert activity in the field of METMS valuation 2. expert activity in other fields and sectors, e.g. valuation of real estate, related services, current assets and services 3. expert activity in the field of METMS	a) expert opinions
4. systematic activity to monitor METMS development trends (so-called follow-up research) 5. methodological activity in relation to the development of standards for obtaining information from potential suppliers during the acquisition process 6. research activity in the fields of METMS and their evaluation	b) supporting documents to initiate the acquisition process c) valuation standards in the area of interest d) standards for assessing METMS performance and effectiveness e) communication with the Ministry of Justice and the Ministry of Foreign Affairs about the specifics of METMS f) ordinary publication activity connected with research
7. educational activity	g) preparation of connoisseurs and experts h) provision of teaching materials
8. organizational and administrative activity	i) documents of an administrative nature

4.1.3 Financing the activities of the expert institute

Following the proposed activities of the institute, see Tab. 13, multi-source financing is assumed, which is proposed in the following structure:

1. expert activity (activities 1 to 3): paid on a case-by-case basis according to the level of difficulty according to the hourly rate;
2. research activity (activities 4 to 6): institutional / targeted research support;
3. educational activity (activity 7): activity paid by the applicant or his employer;
4. administrative costs (activity 8): overhead costs, paid by the contribution of MoD.

4.2 Structure, method of management, system measures and location of the expert institute

The analyzes carried out show considerable heterogeneity in the field and volume of assessments processed in the past, as well as the assumption of this heterogeneity in the future. Even though MoD did not make a final decision on which of the activities the expert institute should provide, because in contrast to the assignment, broader needs for activities were identified in the analytical part, even so it is clear that it is practically impossible and at the same time inefficient to build a stable team of people in "stone" expert institute.

4.2.1 Structure

A suitable solution to the described problem appears to be the building of a matrix structure within MoD with an overlap outside it covered by a small coordination team. The matrix structure, known from many functioning multinational corporations, is to ensure the optimal use of all activities of the institute with the mime of newly created jobs, with the effective prevention of duplication of activities and costs.

The proposal envisages the use of MoD capacities, in particular the University of Defense, and other professionally suitably profiled entities such as the Military Research Institute or the Military Technical Institute etc. and one non-MoD component to ensure activities for which MoD does not have adequate competences, i.e. Institute of Forensic Engineering of BUT.

From the above and the "founder issue" explained in the paragraph 4.1.1, the proposal of the organizational structure of the expert institute as shown in Fig. 5 follows.

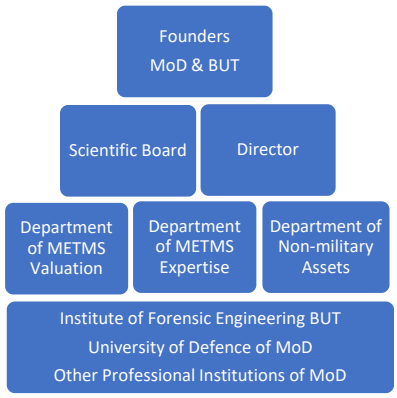

Figure 5. Structure of the proposed institute

Regarding the number of permanent staff at the expert institute (the small coordination team mentioned), the following positions should be involved:

- director;
- administrative worker and
- 3 guarantors of the activities of trade unions.

The numbers and competences of individual workers involved in the "matrix" are still being analyzed. In the event of an increase in the number of personnel, there could be an increase in the ability of so-called follow-up research for the purpose of collecting and verifying data, including the preparation of analytical documents for individual teams led by guarantors of the activities of professional unions.

4.2.2 Method of management

In the founding document, but also in other MoD documents, it is necessary to ensure that the founders cannot directly enter into the management of the institute and directly influence its activities, and that the results of the institute's activities are respected by the competent departments of MoD. This approach is captured in the following points:

1. appointment of the director of the expert institute on the basis of a selection procedure before the scientific council;
2. a defined term of office for the director (e.g. 5 years) with the possibility of serving a maximum of two consecutive terms of office;
3. the possibility of dismissing the director only if clearly defined and verifiable conditions are met;
4. establishment of the scientific council based on the appointment of the founders, establishment of the supervisory board based on the appointment of MoD;
5. setting up sustainable financing while respecting the portfolio of activities;
6. appointment of guarantors on behalf of the director after approval of his proposal by the scientific council;
7. the MoD will define the needs of search research at least once a year, see activity 4 in Tab. 13;
8. setting the principle of internal opposition of the results of analytical, methodical and research activities paid for from institutional funds;
9. the requirement to set up communication with other ministries, especially Ministry of Finance and Ministry of Health , government agencies such as CzechInvest and CzechTrade and other relevant workplaces, incl. foreign.

4.2.3 System measures

In order for the expert institute to become an integral part of MoD and its activity to be effective, the following systemic measures must be taken:

1. MoD will adjust the professional scope of the expert institute - in the analytical part, the fields and their sectors where the need was identified were identified; however, the final delimitation must be made by MoD;
2. MoD will ensure that the results of the analytical activity (search research) and methodological activity (activities 4 and 5 in Tab. 13) are respected in the acquisition process;
3. MoD will ensure that the submission of expert opinions is systematic - it will describe the cases when it is necessary to submit them and assign them to individual components;
4. securing the financing of the expert institute, see points 2 and 4 of paragraph 4.1.3.

4.2.4 Needs for placement of the expert institute

The proposal envisages five regular employees, i.e. five offices. Facilities, e.g. meeting room, day room, etc., can be shared.

4.3 Systems – Procedures, processes and routines

The systems will be set up after specifying the activities of the expert institute based on the founder's decision. An important process for ensuring the good functionality of the institute will be the process of communication with matrix-connected team members, both from MoD and from the Institute of Forensic Engineering BUT. Here, a system of internal grants thematically derived from the requirements of MoD, supplemented by a scientific council and continuously controlled by the guarantor of the MoD under whose purview the project will fall, is assumed.

4.4 Team, Style, Skills

It follows from the design of the organizational structure that a team of matrix-connected experts is expected, who will be coordinated by the core team of the expert institute. While the composition of the coordination team is clear, the composition of external collaborators will depend on the final decision of MoD on the required scope of activities of the expert institute.

The financing of the team of external collaborators is proposed through internal grants in order to ensure the opposition and the effectiveness of the funds spent. It is not recommended to pay with a lump sum contribution.

Part of the “Znalec” project is also a proposal for an educational system for experts in the field of METMS. All external collaborators are expected to go through this system.

4.5 Shared Values

The central goal of the expert institute is to provide independent expertise to MoD, to become a respected workplace with professional quality results. These goals create common values that are respected in the draft constitution.

5 Discussion and verification

The verification of the coherence of the analytical and design parts is carried out in accordance with the description in chapter 2 by comparing S, W, O , T identified in chapter 3 with the proposed procedures described in chapter 4. The summary of this verification is carried out in Tab. 14.

Table 14: Verification of the design part

Identified S, W, O, T, see Tabs. 2-12	Reflection in the design part
S01:	The proposal envisages the involvement of the University of Defense in the institute's activities, see paragraph 4.2.1 and Fig. 5
S02:	A part of the “Znalec” project is also the design of an educational system for experts in the field of METMS. All external collaborators will go through this system, see ch. 4.4
S03:	The proposal envisages close cooperation between the MoD and the expert institute, see e.g. paragraph 4.2.2
S04:	Justification of the need for the creation of an expert institute
W01:	These processes need to be set up, see paragraph 4.2.3, point 3
O01, O06:	The proposal envisages the identification of the branch of expertise and expert activity of the institute and the related capacity of experts, see paragraph 4.2.3, point 1
O02, O18, O19:	Tab. 13 in paragraph 4.1.2 assumes in activity e) the institute's communication with Ministries of Justice and Foreign Affairs about the specifics of METMS
O03:	Reflected in Tab. 13 in paragraph 4.1.2
O04:	It will be used in the processing of expert opinions and the training of experts
O05:	The entire design part and the proposed expansion of the portfolio of activities are aimed at this, see Tab. 13 in paragraph 4.1.2
O07, O09:	See the proposed expansion of the portfolio of activities, see Tab. 13 in paragraph 4.1.2
O08, O12:	Justification of the need for the creation of an expert institute
O10:	The expert institute will cooperate with all entities that will request its activities
O11:	Internal grants with verifiable outputs are expected for the benefit of participating collaborators, see chap. 4.4
O13:	See methodical activity of the institute in Tab. 13 paragraph 4.1.2
O14:	Easier start-up of the institute
O15, O22:	Design of educational system is a part of the “Znalec” project solution
O16:	The proposal for financing the institute is contained in the proposal part, see paragraph 4.2.3, point 4
O17:	Ensured by the establishment of the scientific council of the institute, whose members are appointed by the founder, see paragraph 4.2.2, point 4
O20:	The management of the expert institute must work with this opportunity, see paragraph 4.2.2, point 9
O21:	Secured by a matrix structure, see paragraph 4.2.1 and Fig. 5
O23, O25:	The management of the expert institute must work with this opportunity, see paragraph 4.2.2, point 9
O24:	Ensured by the establishment of the scientific council of the institute, whose members are appointed by the founder, see paragraph 4.2.2, point 4
O26:	It is related to shared values, see ch. 4.5
O27:	These fields will be consulted with MoD, which will define the activities of the expert institute, see paragraph 4.2.3, point 1
T01, T11:	The career and motivational system in the form of internal grants should ensure the stability of the team while maintaining the flexibility of change and addition
T02:	For this reason, a broader portfolio of activities than just expert activity is proposed, see Tab. 13 in paragraph 4.1.2
T03:	Tab. 13 in paragraph 4.1.2 assumes in activity e) the institute's communication with Ministry of Justice about the specifics of METMS

T04:	The legal form of an expert institute is also dealt with by "Znalec" project, the results of this research will be contained in a separate article
T05:	The introduction of two founders, a scientific council and other instruments should ensure maximum independence of the institute
T06:	For this reason, the proposal envisages multi-component fixed and variable financing, see paragraph 4.1.3
T07, T08:	The portfolio of activities listed in Tab. 13 in paragraph 4.1.2, point 4 includes systematic activity to monitor trends
T09, T14:	MoD must systematically ensure the funding of the institute, see paragraph 4.2.3, point 4
T10, T14:	The introduction of two founders, a scientific council and other instruments should ensure maximum independence of the institute
T12:	System of direct procurement eliminates it
T13, T15, T16:	These risks are outside the institution
T17-T20:	Systematic assurance of professional and financial independence can significantly mitigate this risk
T21:	The coordination team of the expert institute and the scientific council of the institute must mitigate the importance of this threat
T22:	This will be taken into account by the MoD when defining the institute's activities

6 Conclusion

In this article, the partial conclusions of the research carried out as part of the Expert project were presented in an abbreviated form with the aim of identifying the need for the establishment of an expert institute and at the same time determining the portfolio of its activities. From the analytical part, the need for the establishment of an expert institute in a scope significantly wider than the initial intention of the contracting authority is obvious.

The representatives of the contracting authority were continuously introduced to the research conclusions during the workshops that took place, and individual topics were discussed with them. The results of these discussions were incorporated into the analytical and design parts. It is obvious that a strategic decision by MoD is needed to put the results of the project into practice. Only after this can an implementation plan be drawn up, which establishes a specific description and timing of the individual implementation steps.

From the perspective of the research questions posed in the introduction of chapter 2, the research conclusions proved the following:

1. The creation of an expert institute is necessary to improve the transparency of the acquisition process, but in its wider scope as envisaged by the draft part, i.e. the expert institute should also be a methodical place for the acquisition process in relation to the selected required information, at the same time also a place where it is collected information on trends in the field of METMS, as well as a strong entity to communicate with Ministry of Justice, Ministry of Foreign Affairs, government agencies and other relevant institutions and workplaces;
2. In total, dozens of opportunities and threats, strengths and weaknesses of the institute were identified and reflected in the proposal,
3. The activities that the expert institute should perform were identified. These are then reflected in the design part.

Separate articles will present research results, i.e. results in the field of legal aspects of the institute's statute, the Czech defense standard for evaluating METMS and the system of training experts and experts for the purposes of the MoD.

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Primary Paper Section: K

Secondary Paper Section: KA, AE, JY, JQ