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3D-Printing Impacts on Türkiye's Defense Industry: A SWOT-Based Approach

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Abstract

Every nation aspires to have a capable national defense that is backed by a robust national defense industry. One of the most important expectations is that the defense industry, like every other sector, should make maximum use of technology for establishing an independent national defense. 3D printing as an emerging technology is widely used in many sectors including mari-time, aerospace, and automotive. It should come as no surprise then, that it is also being increasingly adopted by the defense sector worldwide. This study focuses on the effects of 3D printing technology on Türkiye's defense in-dustry. For this purpose, a three-stage methodology was followed. In the first stage, the positive and negative effects of 3D printers on the defense indus-try were determined via literature. In the second stage, the SWOT analysis of Türkiye's defense industry was examined. In the last stage, the effects of 3D printers on the outputs obtained at the end of SWOT were carried out. The opinions needed during the study were obtained from defense industry companies in Türkiye and academicians working in this field.

Keywords
Defense Industry, 3D Printing, SWOT.

1. Introduction
3D printers, a technology that the defense industry has been actively using for a while, are becoming more and more practical and economical. Although it is preferred primarily in prototype production for now, it is certain that this technology will move to an important position in spare parts or direct production in the near future. 3D printers have the potential to reduce production costs and allow simple parts to be produced quickly. It can make supply chains safer and more cost-effective and contribute to the acceleration of production. 3D printers are a technology that allows a defective piece of equipment to be produced without affecting the entire production line.

In order to observe the effects of 3D printers on the defense industry, SWOT analysis is required. With SWOT Analysis, it is aimed to create a plan and strategy for the future as a result of a detailed comparison of strengths, weaknesses, opportunities and threats. It is necessary to prioritize the items obtained in the SWOT analysis.

2. Literature Review
The main areas of use of additive manufacturing technology in aerospace and defense are to shorten the design and manufacturing process, accelerate the time to market, increase productivity, reduce costs, and provide cost advantages in low-volume production. In light of this information, instead of the existing technology in the aerospace and defense industry, metal parts manufacturing with the AM method comes to the fore. In the study called Metal Part Production with Additive Manufacturing for Aerospace and Defense Industry, the current state of additive manufacturing technology in the aerospace sector has been examined (Ozsoy et al. 2019).

Possibilities and limitations of titanium alloy additive manufacturing; the latest state of an important rapidly developing additive manufacturing technology is reviewed. The article discusses the benefits and limitations of the Medical and Aerospace applications of Additive Manufacturing from Ti alloys. The study also shows and compares the mechanical properties of Ti6Al4V samples produced with different technologies (Agapovichev et al. 2018).

3D-printed metals have great application potential in the aerospace industry. Unfortunately, they suffer from the poor surface finish, high porosity, and high tensile residual stresses, resulting in lower mechanical properties compared to conventional cast or machined metals. The effects of ultrasonic nanocrystal surface modification on the fatigue performance of 3D-printed Ti64 introduced ultrasonic nanocrystal surface modification (UNSM), an innovative method for processing 3D-printed Ti-6Al-4V alloy. The surface quality, microstructure, residual stresses, and mechanical properties of the samples were characterized and compared before and after UNSM treatment (Zhang et al. 2017).

Titled Determining the Optimal Combination of LARG Supply Chain Strategies Using SWOT Analysis, Multi-criteria Decision-making Techniques, and Game Theory focuses on the integration of lean, agile, flexible, and green paradigms into the supply chain and the constraints of SWOT analysis to improve supply chain performance. First, multi-criteria decision-making techniques were used. Next, the SWARA method was used to weight the criteria of the LARG supply chain, and the gray ARAS method to prioritize strategies. At the various levels of the SWOT analysis, strengths and weaknesses, opportunities and threats are identified and the appropriate strategy is chosen. Finally, the fuzzy Shapley value and game theory are used to determine the optimal combination of strategies. (Amiri et al. 2018).

SWOT is often criticized for considering only a qualitative study of environmental factors, not prioritizing various factors and strategies, and not placing uncertainty of factors under uncertainty. In another study, fuzzy TOPSIS (Order Preference for Ideal Solution with Similarity for Technique) integrated with fuzzy AHP (Analytical Hierarchy Process) was used to develop a fuzzy multi-criteria SWOT analysis to overcome these shortcomings. Nuclear power plant location selection, which is a strategic and important issue for Turkey's energy policy, is handled as an application case study showing the applicability of the developed fuzzy SWOT model (Ekmekcioglu et al. 2012).

Strengths, weaknesses, opportunities, and threats (SWOT) analysis is one of the most important analytical tools for defining corporate strategies. Despite its popularity and widespread use, it has many disadvantages, such as the lack of a quantitative basis for determining the most important internal and external factors. In another study, a methodology based on the decision-making trial and evaluation laboratory (DEMATEL) technique, which can address causal relationships between factors, has been proposed to overcome this problem. In addition, intuitive fuzzy sets (IFS) theory is used to embrace the uncertainty of human subjective judgments. Finally, we applied our methodology to one of the Iranian insurance companies to identify the most important components of the SWOT matrix (Nikjoo et al. 2014).

Organizations today face complex environmental factors. The survival and development of organizations depend on careful strategic and effective planning. A study was conducted at Isva Keyfiatpardaz Consulting Engineers company to develop an effective strategy using the SWOT method and fuzzy DEMATEL. This study is a descriptive and applied research type. The information obtained in this study was obtained through surveys, interviews with the managers of this company, and brainstorming techniques. Research findings showed that Isva Keyfiatpardaz Consulting Engineers Company should implement the strategy of "free seminars and briefings for managers, experts, and graduates to develop their vision" for further success (Tavakoli et al. 2016).

In another study, the framework for determining the mapping strategy of Nasb Niroo Company, one of the subsidiaries of the Mapna holding group, was applied. Today, managers have learned that human resources are the main capital of organizations. Nasb Niroo Company aims to use this capital and choose the best strategies for its goals. This research focused on assessing internal and external factors and choosing the best strategies for this company. After the best strategies are selected, the strategy map of the company based on the balanced scorecard is developed. This strategy map can help managers understand the company's strategies and practices. Finally, the relationships in the strategy map were evaluated with the DEMATEL method (Shahsavari et al. 2020).

A study was conducted to identify the opportunities, threats, strengths, and weaknesses of SMEs in the Industry 4.0 transformation journey by using a SWOT analysis of their awareness, activities, and current status. In the analysis of the industry 4.0 transformation process of SMEs, a semi-structured interview method was used to analyze 5 SMEs. It has been determined that although SMEs operating in the Aegean Region in Turkey are aware of the digital transformation process, they are at the very beginning of the process and have more disadvantages than advantages in this process. To be sustainable in the digital age, SMEs should analyze their situation from time to time and always follow the development of the industry. They should incorporate new tools, equipment, and applications within their

control. Finally, this study leads SMEs to gain awareness about Industry 4.0 and manage their situation (Ernur et al. 2022).

The regional economy is often supported by Micro, Small, and Medium Enterprises (MSMEs). One of them is the MSMEs of embroidery. A study was conducted to analyze the application of financial inclusion in embroidery MSMEs. Data were analyzed using SWOT analysis, Internal Factor Analysis Summary (IFAS), and External Factor Analysis Summary (EFAS). According to the results of the Internal External (IE) matrix analysis, the position of the financial inclusion level is IV, which indicates that the internal environment is strong and the external environment is moderately located in the quadrant. This showed that the level of financial participation in embroidery in MSMEs is growing and under construction. The strategy that can be implemented is the Power Opportunity (SO) strategy which maximizes market power and takes market opportunity into account. This strategy needs to be supported by both banks and non-bank financial institutions, which provide capital assistance to SMEs through low-interest costs and the PBC and sales system, followed by intensive training and guidance. Intensive mentoring is necessary not only from a financial standpoint but also from a marketing standpoint (Rasyid 2019).

The authors have conducted a study in which they propose to develop the operational and service activities planning methodology based on the defense planning methodology within the national security system on the basis of opportunities. Capability-based planning will allow better planning of the operational and service activities of the border agency and will enable active cooperation between Ukraine and NATO to achieve the criteria for full membership in the Alliance. A defense survey is conducted to assess the status and readiness of the defense forces to perform tasks related to the defense of Ukraine, the situation of its personnel, and financial, logistical, and other types of support in the current and anticipated conditions of the security environment. The research of the State Border Guard Service of Ukraine was carried out using an analytical method, that is, the analysis of strengths and weaknesses, opportunities and threats (SWOT analysis), which allows proving the main aspects of the Development Strategy of the State Border Guard Service. Increasing the level of planning of operational and service activities within the security and national security system of Ukraine. The State Border Guard Service of Ukraine is a component of the security and defense sector, and the new conditions in which the border agency operates raise the question of improving the methodology for planning operational and service activities (Bratko et al. 2021).

The origins of SWOT analysis have been mysterious until now. Through archival research, expert interviews, and a review of the available literature, this article reconstructed the original SOFT/SWOT approach and made potential implications. In a firm's planning process, all managers are asked to write down 8 to 10 major planning problems their unit faces. Subgroups of executives have various dialogues about these issues, with instructions to include the needs and expectations of all stakeholders of the firm. The decisions or recommendations developed become the input for the executive planning committee to articulate the corporate purpose(s) and strategies. Robert Franklin Stewart, the creator of SWOT, emphasized the critical role creativity plays in the planning process. The SOFT/SWOT approach only precludes top-down strategy formation in favor of strategy harmonization and implementation; As suggested here, introducing digital tools to parts of SWOT's original participatory, long-term planning process can improve the effectiveness of corporate strategy formulation, communication, and learning. Archival research on the deployment of SOFT/SWOT in practice is required (Puty et al. 2023).

3. Methods

SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is one of the oldest and most widely adopted strategy tools worldwide (Puty et al. 2023). The original SWOT analysis, the SOFT approach, was designed as a tool in one of the earliest strategic planning frameworks, the System of Plans (Stewart 1965). SWOT analysis can be material for making strategic planning and for achieving corporate goals more systematically (Rasyid 2019). SWOT analysis is a comprehensive assessment of the strengths, weaknesses, opportunities, and threats of a company. (Kotler et al., 2008) Furthermore, SWOT analysis is the systematic identification of various factors in order to formulate corporate strategies. SWOT analysis is based on the logic that can maximize the strengths and opportunities, but at the same time can minimize the weaknesses and threats (Rangkuti 2015).

Organizations would like to figure out the alterations of the environment of their organizations and examine their situation according to these alterations. SWOT Analyze is one of the methods to analyze an organization's situation according to the environment of the organization (Ernur et al. 2022).

Swot Analyze firstly was mentioned in 'Business Policy' which has been published by Learned in 1960 to be detected the situation of organizations related to strengths, weaknesses, opportunities, and threats (Ernur et al. 2022). SWOT Analyze is an important analysis that is used by organizations to determine an efficient organizational strategy regarding strategic management and strategic planning (Gürel et al. 2017). SWOT Analyze not only helps managers or decision makers to analyze current situations and potentials but also helps in being aware of the organization's environment (Naryanan et al. 1993). SWOT Analyze which reveals strengths, weaknesses, opportunities, and threats of organizations helps researchers, planners, or managers to determine an organization's targets and prioritize them. It also helps to create a competitive and sustainable strategy for decision-makers (Ommani 2011). SWOT analyze used to gather information for organizations that are regarding profitability, product development, sales, and marketing strategy. SWOT analyses are not used only for the business environment. It is also used by individuals to analyze their personal situations (Gökoğlan et al. 2020). In addition to all these aims, SWOT is a valuable analysis of the army and governance strategy (Ernur et al. 2022).

There are some critical factors when applying SWOT analysis. These critical factors are listed below (AI-Rousan et al. 2009):

- Determination of most important factors and find why these factors are important out,
- Being proactive about important factors in the future and taking action for them.
- All forecasts about SWOT should be listed based on issues.
- Another major factor is regarding the implementor of SWOT. On the side of evaluation of their competitors, implementers have to be realistic and honest themselves while they analyze their situation and be aware of that.

Firstly, apart from the critical factors which are listed, Implementers have to decide the main aim of SWOT before analyzing their conditions. By reason of having aims and targets before analyzing helps organizations to gather a focusing specific strategy and that is another significant subject. Secondly, Implementers of SWOT have to check and research their markets, sectors, and business to compare their competitors and list their strengths, weaknesses, potential opportunities, and threats. Finally, with reference to the output of SWOT organizations deduce about their state and They should determine their priority and develop new strategies to carry on their activities (Namugenyi, 2019).

SWOT is an analysis technique that focuses on an organization's internal and external environment. While Swot focuses on an organization's internal and external environment, it tries to determine the strengths, weaknesses, opportunities, and threats of organizations (Ernur et al. 2022). To analyze SWOT more deeply, it is necessary to view the external and internal factors as important parts of SWOT analysis as follows:

- **External Factor:** This factor influences the formation of opportunities and threats (O and T) which is related to the conditions that occur outside the company that affects its decision-making. This factor includes the industrial environment, economy, politics, law, technology, demography, and socio-culture.
- **Internal factor:** This factor affects the formation of strengths and weaknesses (S and W) which concerns on the conditions that occur in the company, and this also affects the formation of the company's decision-making. This internal factor includes all functional management: marketing, finance, operations, human resources, research and development, management information system, and corporate culture (Rasyid, 2019).

SWOT matrix is used to develop the strategies of an organization or company; it clearly illustrates the opportunities and threats faced by the organization/company, so that the strategies can be adjusted to its strengths and weaknesses. This matrix generates four alternative strategies, namely the S-O strategy, the W-O strategy, the S-T strategy, and the W-T strategy (Rangkuti. 2015). The internal environment of SWOT, which is also named as a micro-environment that has strengths and weaknesses, analyzes workers, strategic location, production capacity, product and product services, and financial situation of organizations. The other part of SWOT is about the external environment which is also called the macro-environment. The external environment is related out of the organization's control like the competitive and technological environment. This environment brings some opportunities and threats for organizations and focuses on the political, economic, and social environment (Dyson, 2002). The data collected through interviews and observations are mapped into categories, internal and external factors, and then analyzed using the SWOT matrix and the External-Internal matrix. The matrix created with the obtained information is given in Figure 1.

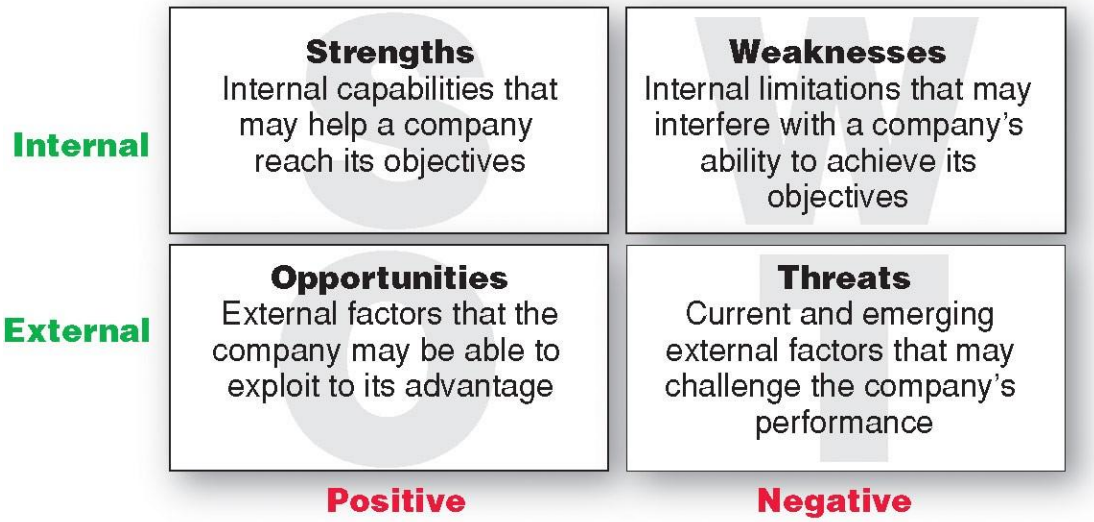

Figure 1. SWOT and the External-Internal matrix (Chegg, 2023)

SWOT factors analyze how to maximize the strengths and opportunities as well as minimize the weaknesses and threats, and plan the strategies that should be taken in the future (Rangkuti, 2015). SWOT analysis is a comprehensive assessment of the strengths, weaknesses, opportunities, and threats of a company (Kotler et al. 2008). SWOT analysis is an important support tool for decision-making and is commonly used as a tool for systematic analysis of the internal and external environments of the organization (Stewart et al. 2002; Kurttila et al, 2000; Kotler, 1988). SWOT analysis summarizes the major internal and external organization factors and introduces strategic factors influencing the future of the organization (Kangas et al., 2003) and based on this regular information, a matrix is formed (Ulgen & Mirze, 2004). Four different combinations of opportunity, threat, strength, and weakness in this matrix are used to determine organizational strategies in long term (Dincer, 2004). Each of the possible strategy groups can be explained as follows (Tavakoli et al. 2016):

1. **Offensive strategy (SO):** In the framework of these strategies, an organization using internal strengths points tries to exploit external opportunities.
2. **Conservative strategies (WO):** The aim of these strategies is that organizations taking advantage of the opportunities outside the environment try to improve internal weaknesses.
3. **Competitive strategies (ST):** companies in the implementation of these strategies try to use their strengths and reduce the effects of available threats in the external environment or eliminate them.
4. **Defensive strategies (WT):** Organizations that implement these strategies take a defensive state and their goal is to reduce internal weaknesses points and avoid threats posed by the external environment.

For the analysis of internal and external factors simultaneously, a tool called an internal and external matrix is used. This matrix is used to determine the position of the organization and can be provided in the two forms of nine and four cells (Tavakoli et al. 2016). Given that, four strategies (SO, ST, WO, WT) for the organization are determined based on the SWOT matrix and the obtained place in internal and external matrix specify the emphasized area within the strategies in the SWOT framework; thus, it is worth this matrix is drawn in a way that reflects the four main cell and subsequently recommends four main strategies. The External Factors Evaluation matrix on the Company is initially recognized and then in the terms of opportunities and threats is evaluated and measured. It is shown in Table 1.

Table 1. External Factors Evaluation Matrix (EFE)

Row	Opportunities(O)	Important Factor (%)	Rank	Final Score
O1	Being close to the Middle East market (Geopolitical importance)	0.07	4	0,28
O2	Scarcity of young HR in Europe	0.05	4	0,2
O3	Development potential in the industry	0.10	4	0,4
O4	Collaboration possibilities	0.05	4	0,2
O5	Remaining qualified resource through projects	0.05	4	0,2
O6	Having human resources in software	0.08	3	0,24
O7	Support of domestic production by the state	0.10	3	0,3
O8	Training potential of experienced human resources	0.08	3	0,24
O9	Original design products (Export opportunity)	0.05	4	0,2
O10	Having TUBITAK Research Centers (Marmara)	0.05	3	0,15
O11	Having the infrastructure	0.04	4	0,16
O12	Supporting R&D Centers	0.05	4	0,2
O13	Increasing number of SMEs in the Defense Industry	0.05	3	0,15
O14	Potential economic developments in the USA and Europe	0.05	4	0,2
O15	Foundation subsidiaries	0.03	2	0,06
TOTAL				**X= 3,18**
Row	**Threats(T)**	**Important Factor (%)**	**Rank**	**Final Score**
T1	Lack of continuity	0.05	4	0,2
T2	Unable to prevent brain drain (Domestic-Overseas)	0.07	4	0,28
T3	Not benefiting from reverse brain drain	0.04	4	0,16
T4	Decreasing number of students in basic sciences financial concerns	0.06	3	0,18
T5	Inappropriateness of research environments	0.06	4	0,24
T6	Failure to integrate outputs	0.03	3	0,09
T7	Making outside purchases	0.03	3	0,09
T8	Lack of HR supply compared to industry demand	0.03	2	0,06
T9	Not promoting doctoral subjects society away from space	0.07	3	0,21
T10	High HR potential in the software field	0.08	2	0,16
T11	Academicians are far from industry	0.07	3	0,21
TOTAL		**1**		**Y=1,88**

- Total Opportunities and Threats=X+Y=5,06

The matrix of internal factors that affect the firm is defined and then their importance is evaluated and measured in terms of strengths and weaknesses. It is shown in Table 2.

Table 2. Internal Factors Evaluation Matrix (IFE)

Row	Strengths (S)	Important Factor (%)	Rank	Final Score
S1	High potential young employee	0.08	4	0,32
S2	Profit margin ready customer	0.06	4	0,24
S3	The government gives priority to this sector	0.07	3	0,21
S4	Trained manpower	0.06	4	0,24
S5	Opportunity to work with advanced technology	0.07	4	0,28
S6	Having clear and specific goals	0.05	2	0,1
S7	Sustainable growth geopolitical location	0.06	3	0,18
S8	Increase in localization projects	0.05	2	0,1
S9	Clustering policy	0.04	3	0,12
S10	Training and development opportunities	0.06	4	0,24
S11	Not affected by the economic crisis	0.05	3	0,15
S12	Passion for Defense and Aviation	0.05	3	0,15
S13	Projects in sight	0.05	3	0,15
S14	Positive political awareness	0.04	3	0,12
TOTAL				Z=2,6
Row	**Weaknesses (W)**	**Important Factor (%)**	**Rank**	**Final Score**
W1	Dependence on public capital	0.05	4	0,2
W2	Dependence on government policies	0.06	4	0,24
W3	Capital strength relative to abroad	0.05	4	0,2
W4	Relatively small size of industry players	0.04	4	0,16

W5	Flexible workforce requirement (periodic)	0.04	3	0,12
W6	Lack of know-how	0.05	3	0,15
W7	Failure to retain intellectual capital	0.04	4	0,16
W8	Insufficient training institutions for qualified HR	0.05	3	0,15
W9	Lack of a 20-year strategic plan future uncertainty	0.04	4	0,16
W10	Lack of depth in fields such as chemistry, medicine	0.04	3	0,12
W11	Concentration in Ankara	0.04	3	0,12
W12	Inconsistency with the expectations of the new generation due to dynamics	0.05	2	0,1
W13	Factors hindering private sector interest	0.04	2	0,08
W14	Working conditions for experienced people	0.04	3	0,12
W15	Lack of opportunities	0.04	3	0,12
W16	Failure to adapt the project to education	0.04	2	0,08
TOTAL		1		T=2,28

- Total strengths and weaknesses =Z+T=4,88

A SWOT matrix is created regarding the Internal and External metrics presented in Tables 1 and 2, respectively. The generated SWOT matrix is given in Table 3.

Table 3. SWOT Matrix

Strengths (S)	**Weaknesses (W)**
High potential young employee Profit margin ready customer The government gives priority to this sector Trained manpower Opportunity to work with advanced technology Having clear and specific goals Sustainable growth geopolitical location Increase in localization projects Clustering policy Training and development opportunities Not affected by the economic crisis Passion for Defense and Aviation Projects in sight Positive political awareness	Dependence on public capital Dependence on government policies Capital strength relative to abroad Relatively small size of industry players Flexible workforce requirement (periodic) Lack of know-how Failure to retain intellectual capital Insufficient training institutions for qualified HR Lack of a 20-year strategic plan future uncertainty Lack of depth in fields such as chemistry, medicine Concentration in Ankara Inconsistency with the expectations of the new generation due to dynamics Factors hindering private sector interest Working conditions for experienced people Lack of opportunities Failure to adapt the project to education
Opportunities (O)	**Threats (T)**
Being close to the Middle East market (Geopolitical importance) Scarcity of young HR in Europe Development potential in the industry Collaboration possibilities Remaining qualified resource through projects Having human resources in software Support of domestic production by the state Training potential of experienced human resources Original design products (Export opportunity) Having TUBITAK Research Centers (Marmara) Having the infrastructure Supporting R&D Centers Increasing number of SMEs in the Defense Industry Potential economic developments in the USA and Europe Foundation subsidiaries	Lack of continuity Unable to prevent brain drain (Domestic-Overseas) Not benefiting from reverse brain drain Decreasing number of students in basic sciences financial concerns Inappropriateness of research environments Failure to integrate outputs Making outside purchases Lack of HR supply compared to industry demand Not promoting doctoral subjects society away from space High HR potential in the software field Academicians are far from industry

With regard to the four strategies in the SWOT matrix and given the location of the company in the internal and external matrix, those strategies are selected for an assessment relating to the designated area in the internal and external four cells matrix (Tavakoli et al. 2016).

3D Technology on Defense Industry

Positive effects:

- Rapid prototyping and manufacturing: 3D printers can quickly prototype complex parts and go into mass production. This saves time and cost for the development and testing of new weapon systems in the defense industry.

- Flexibility and customization: 3D printers provide great flexibility in the design and manufacture of parts. This facilitates the production of parts suitable for special needs and different platforms in the defense industry. Customized parts can improve performance and make military systems more effective.

- Logistic advantages: 3D printers enable the production of parts even in remote locations such as military bases and operational zones. This can reduce dependency in the supply chain and have a positive impact on logistics costs and times.

Negative effects:

- Security risks: 3D printers allow sensitive military parts to be copied and used for malicious purposes. This can threaten the security of military systems and eliminate strategic advantages due to duplication risks.

- Quality and reliability issues: 3D printers may have some limitations in material and workmanship quality compared to traditional manufacturing methods. Therefore, there may be concerns about the reliability and durability of manufactured parts. Malfunctions or faulty parts in military systems can have serious consequences.

- Technology limitations: Current 3D printing technologies can make it difficult or impossible to manufacture some large and complex parts. Traditional methods may still be needed for the production of some large-scale systems used in the defense industry.

4. Results and Discussion

While 3D printers offer opportunities to strengthen the SWOT analysis of the Turkish defense industry, they can also bring weaknesses and threats. 3D printers can speed up processes and reduce costs in the defense industry by offering rapid prototyping and production. This could increase Turkey's potential to complete defense industry projects on time and gain competitive advantage. 3D printers can be used to localize parts production and strengthen the domestic supply chain. It provides an opportunity to reduce foreign dependency by increasing the locality rate in Turkey's defense industry. 3D printers can potentially pose security risks. The production of sensitive military parts or weapons using 3D printers can pose challenges in technology and information security. Turkey needs to manage these threats and improve safeguards.

5. Conclusion

There are reasons for the rapid popularization of additive manufacturing tech-nologies in the defense industry. With a 3D printer, the problems posed by the supply chain are largely solved. With additive manufacturing, products can be personalized according to needs. In this way, weapons and vehicles that do not produce spare parts can remain in service longer, and long and costly processes such as designing UAVs according to mission characteristics can be eliminated. Especially in cross-border operations, carrying inventory brings along logistics problems. Additive manufacturing technologies allow the dimensions and weight of the transported material to be significantly reduced in this area, and enable solutions that were not possible before. In order to analyze these effects of 3D printers on the defense industry and more, SWOT analysis has been made. SWOT analysis is a strategic technique used to determine the strengths and weaknesses of the effects, and to determine the opportunities and threats arising from the internal and external environment. After this study, analyzes can be made using different multi-criteria decision making methods.

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