

Requirement Analysis of Application Development of Blocking Equipment Based on SWOT

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Abstract

With the gradual maturity and development of intelligent technology, the traffic capacity of automobiles, ships and aircrafts has been greatly improved. In modern warfare, the loading capacity and demand for carriers are increasing, and the performance has been greatly improved. Therefore, in order to prevent the hostile carriers from breaking into our administrative office or confidentially, the application of the blocking equipment of various carriers has become a hot research problem. As a special equipment for forcing the carrier to drive, the blocking equipment plays an important role in all kinds of actions. Although the application of blocking equipment has many advantages, how to apply the blocking equipment to the most suitable field, the related demand demonstration research is still few. SWOT is a classic method of strategic objective analysis, which has the characteristics of structure, systematization and clarity. Through SWOT's analysis of blocking equipment, the necessity of its development and the challenges that need to be faced are further clarified.

Keywords

Blocking equipment, SWOT analysis, Application development.

1. BLOCKING EQUIPMENT

In modern warfare, the key to victory lies in the mastery of the right to control the air. At the same time, the ownership of land and maritime sovereignty is also crucial. In order to prevent some illegally carrying invading municipal organs, military sites and prohibiting entry into areas, in order to protect people's property and maintain public order, Blocking equipment has become increasingly prominent in operational applications.

2. SWOT ANALYSIS METHOD

SWOT analysis is a common strategic planning tool. SWOT analysis from McKinsey Consultants is used to analyze the strengths of the enterprise (Strengths), Weaknesses, Opportunities, Threats[1]. Analyze inherent strengths and weaknesses through scientific and reasonable methods and master external opportunities and threats. SWOT analysis facilitates simpler and more efficient evaluation projects and provides basis for relevant decisions. The SWOT method combines qualitative and quantitative analysis, and compares the four factors. According to the ideological logic of exerting advantages, seizing opportunities, dissolving threats and overcoming disadvantages, the SWOT method provides the basis for the development strategy. It is of great significance to apply SWOT analysis to strategic analysis in weapon equipment development strategy environment. Through concrete analysis and

comparison of environment, threat, capability, current situation and demand conception, the core problems to be solved can be drawn.

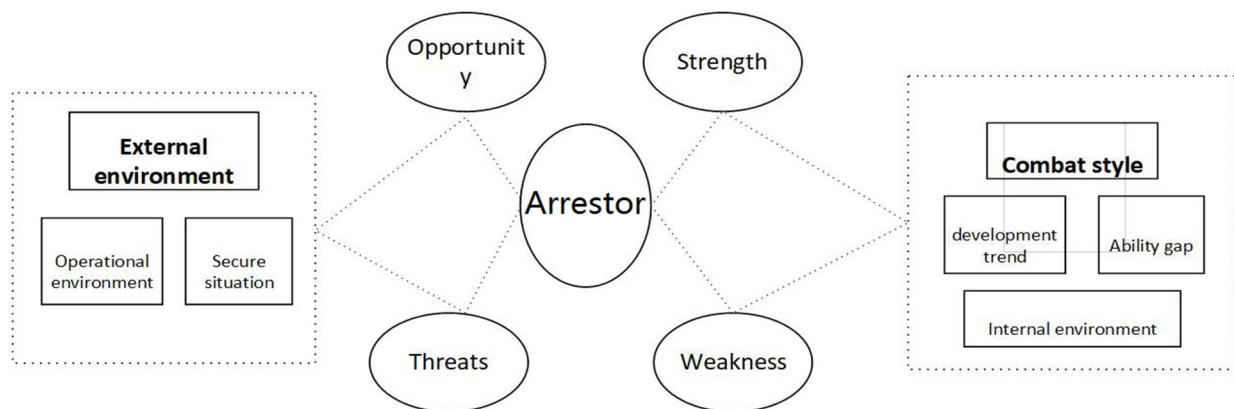


Figure 1. Demand analysis framework

3. SWOT ANALYSIS OF BLOCKING EQUIPMENT APPLICATION DEVELOPMENT

The SWOT is introduced into the demand analysis of the application development of blocking equipment. Through the detailed analysis of its advantages (Strength), Weakness, Opportunity and Threat, we can make accurate decision-making and improve the overall application efficiency of blocking equipment.

3.1. Advantage analysis (to ensure a favourable position in future situation confrontation requires efficient use of resource advantages)

(1) Common blocking equipment is cheap and easy to arrange. For example: sprinkler-type blocking nails, chain blocking nails, etc. This kind of blocking nail is mainly used to block vehicles by spreading a large number of broken tire nails and other destruction devices within a certain area. This kind of equipment is cheap, easy to arrange and has some damage effect.

(2) Domestic barrier equipment is durable and bears large load. For example, domestic lifting piles are made of hydraulic core and stainless steel, with strong anti-collision capability and fast lifting speed.

(3) Domestic road blocking equipment has low noise. For example, lifting piles, turn-over roadblocks, hydraulic barriers, etc., these blocking equipment have no noise during use and are easy to operate.

3.2. Disadvantage analysis (actively changing disadvantaged resources to avoid being passive)

(1) Some domestic blocking equipment has complex structure and difficult maintenance. For example, there are about 6700 single sets of components of blocking network, weighing more than 5t. There are multi-channel control systems of electric appliance, hydraulic pressure and cold gas. In the moment of blocking, each system cannot coordinate and fail.

(2) Domestic blocking equipment has great damage. For example, the rigid blocking equipment on the ground, most of which are connected with metal parts, which will cause certain damage to the carrier after blocking.

(3) Some domestic blocking equipment is susceptible to environmental impact. For example, roadblock equipment is affected by sunshine, sandy sand, rain and snow for a long time, and temperature and humidity changes of the four seasons of the year. However, the barrier seat is

buried deep underground for a long time, which is affected by cold and damp, rainwater immersion, soil acid and alkali etc., which makes it easy to cause roadblock rust.

3.3. Opportunity analysis (take advantage of development trend opportunities to achieve favorable situation in future confrontation)

Blocking equipment is currently developing in the direction of rapid, agile, convenient, economical and reliable, multi-model, multi-level, multi-functional and serialized. From the perspective of the use and development of most developed countries, the blocking form of blocking equipment is developing towards diversification. From the installation form, from fixed type to mobile gradually; From the technical performance index, it is mainly developed in the direction of high performance, large energy and maneuverability. At present and even in the future, the development of blocking equipment focuses on high performance, mobility and universality. Include the following:

(1) Optimizing the blocking effect of the blocking equipment and the control method of the system, improving the dynamic characteristics of the system, making the change of the blocking resistance smaller, thus making the blocking process more stable and improving the correcting ability of the system. [2]

(2) Portable structure is required and self-formed system is required. To the maximum extent not limited by the environment and objective conditions of the site. Further improve the flexibility and mobility of the complete machine, adapt to rapid deployment and transfer, so that the system can be installed, disassembled and transported within the minimum time.

(3) Increase the absorbing capacity of the blocking equipment to the dynamic energy of the vehicle, so that the system can adapt to more types of vehicles, and can reduce the minimum stopping distance of the vehicle when the performance and parameter indexes do not exceed the allowable range. [3]

3.4. Threat Analysis (Challenge threat caused by unfavorable development trends leads to failure)

At present, most of the reference vehicle blocking equipment in China is rigid. Fig. 2-1, Fig. 2-2, Figure 2-3, Fig. 2-4 and Figure 2-5 are some common rigid roadblocks. The research and configuration of flexible blocking equipment, electromagnetic pulse and other blocking equipment are still not mature in China. Therefore, there are few problems such as poor maneuverability, too long installation and activation time, too large static blocking distance and short blocking distance during moving. In addition, many home-made blocking equipment systems cannot be self-independent. After blocking, it is difficult to realize two-way blocking. The cost-effectiveness is not optimal. There is still a lot of room for progress in the future. [4]

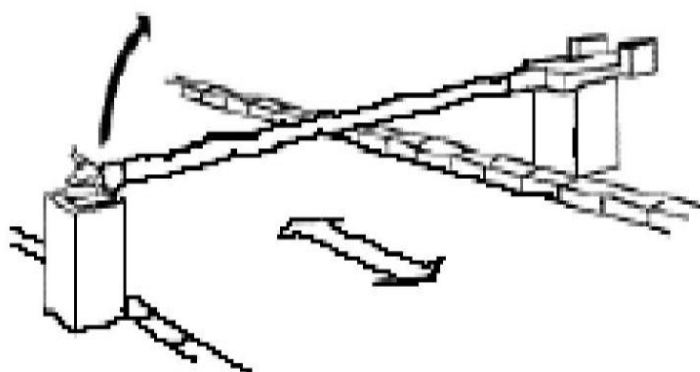


Figure 2-1. Bar Block Barrier

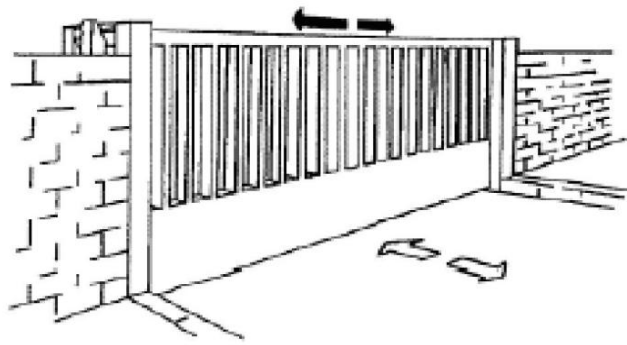


Figure 2-2. Door-type Automobile Barrier

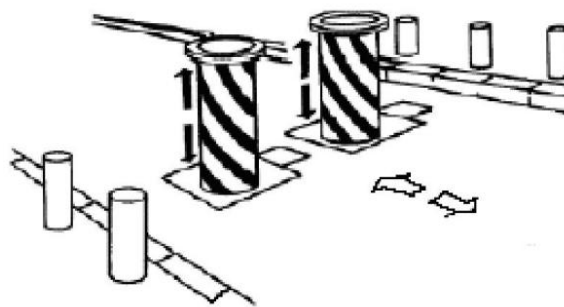


Figure 2-3. Retractable Vehicle Barrier

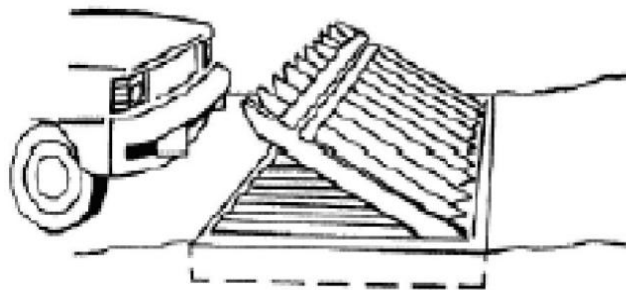


Figure 2-4. Barriers for Grid Vehicles



Figure 2-5. Rotating plate type vehicle barrier

<p>Advantages Low price and easy layout 2.Rugged and durable, large load 3.Low noise</p>	S	W	<p>Disadvantage 1. Complex structure and difficult maintenance 2. Large blockage damage 3. Vulnerability to environmental impact</p>
<p>Opportunity 1.Optimized control methods 2.Portable structure, self-formed system 3.Increase the absorption capacity of vehicle kinetic energy</p>	O	T	<p>Threat Research on flexible, electromagnetic pulse and other blocking equipment is not mature enough, and cannot be self-independence, and there is much room for progress.</p>

Figure 3. SWOT Analysis

4. NEXT DEVELOPMENT TREND OF BLOCKING EQUIPMENT

Synthesizing four key factor indexes S, W, O and T, cross analysis is conducted to form strategic analysis of OS, OW, TS and TW, and corresponding SWOT countermeasures are generated to provide basis and decision-making for developing direction and key points of blocking equipment in the next step.

4.1 According to the strategic analysis of TS, many traditional domestic blocking equipment are simple to set, but from the perspective of long-term development, the current and future development of blocking equipment focuses on three aspects of universality, mobility and high energy, and there is still a big gap with developed countries.

4.2 According to the strategic analysis of OW, although our country starts late in the research and development of blocking equipment, it may lag behind other developed countries, but with the country's efforts to invest human resources and financial resources, the gap is shortened continuously. For example, the U.S. Navy chose its relatively mature water turbine as the main energy absorbing component in the technical scheme of blocking equipment. Even so, problems occurred frequently in the development process and the design was improved repeatedly. The mechanical technology level of our country is relatively lagging behind the advanced level of foreign countries, but the level of electrical technology is comparable with that of foreign countries. Therefore, in the later design, induction motor can be considered as the main energy absorbing component technical scheme. [5]

4.3 From the analysis of OS strategy, in order to seize the existing advantages and opportunities, the dynamic analysis software has been optimized for the vehicle blocking process. The blocking technology is also changing rapidly. Many domestic blocking equipment has advantages of high efficiency and low cost, and it has a good development prospect in the future.

4.4 From the analysis of TW strategy, the negative impact caused by the immaturity of the existing technology and the security threat of the strategic environment cannot be neglected. The developed countries have developed a variety of blocking equipment according to different blocking technology principles, while the domestic blocking technology still stays at a relatively single stage, such as domestic vehicle blocking equipment. There is also poor maneuverability, Difficult arrangement, It is easy to cause casualties and other defects, It is also necessary to further explore the blocking technique from various factors in the actual driving process of the vehicle. [6]

5. CONCLUSION

This paper analyzes the current situation and development trend of blocking equipment. Through SWOT analysis method, the four factors of the development of blocking equipment are analyzed and summarized, which include technical development, combat mode, development direction and problems, which clearly expresses the necessity of the development and application of blocking equipment. With the development of emerging technologies, blocking equipment will become one of the important requirements of combat missions.

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