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The U.S. Revolution in Military Affairs and Japan: The Case of Japan Acquiring the Joint Direct Attack Munition

Lieutenant Colonel Ryuichi Maruo
Japan Air Self-Defense Force

The revolution in military affairs (RMA) has been discussed since the 1980s in terms of its concept, effectiveness, and causal variables, but few studies have focused on alliances or Japan. This study examines the e relationship between the RMA and the change in Japan's national security policy by focusing on the acquisition of the Joint Direct Attack Munition (JDAM) by the Japan Air Self Defense Force (JASDF) in the early 2000s as a case study to clarify why and how the U.S. RMA in such technologies affected Japan's defense policy.

The findings reveal that the U.S. RMA had a strong impact on Japan's defense policy and capabilities, ultimately leading Japan to adopt the JDAM in a significant departure from its status quo security doctrine. These findings contribute to the understanding of how RMAs transcend borders, particularly through the mechanism of security alliances. The cause and mechanism of the information technology driven RMA (IT-RMA) in the 1990s identified in this study are already beginning to take shape in today's artificial intelligence driven RMA (AI-RMA).

Introduction

The literature on RMAs argues that radical technological innovation and corresponding shifts in doctrine, strategy, and organization can cause revolutionary changes by dramatically improving the combat capability and effectiveness of militaries and fundamentally altering the character and conduct of conflict. Andrew F. Krepinevich argues that military revolutions comprise four elements: technological change, systems development, operational innovation, and organizational adaptation.[1] Further, he highlights that each of these elements are necessary but insufficient for realizing significant benefits in military effectiveness that characterize military revolutions, and that technology alone does not constitute a revolution.[2] Williamson Murray, for example, indicates that military history offers many cases in which forces with inferior technology have won conflicts.[3] The historical record implies that technology has played only one part in these revolutions and that RMAs also frequently combine elements of military organization, culture, and doctrine.[4]

Eliot A. Cohen also explains how superior information technology and precision weapons have vastly enhanced the power of advanced military forces, and argues that one of the problems with the concept of RMA is that it focuses on technology at the expense of the softer aspects of military affairs such as organization, doctrine, manpower.[5] Tsukamoto, on the other hand, focuses on the RMA process and examines the major theories that explain this process, as well as discusses their benefits and limitations. He highlights the need to recognize that military transformation requires changes in software as well as hardware.[6]

Tom Le, one of the few scholars to have studied RMAs in Japan, analyzes the extent to which the seven principles in the Defense Agency's published RMA report have been implemented in the Japan Self Defense Forces from perspectives of technology, doctrine and operations, organization. He indicates that while Japan has successfully implemented certain RMA principles, it also demonstrates the possibility of crafting a unique version reflective of the nation's political, economic, and cultural reality.[7]

Studies have covered many countries and periods, however, there exist at least two glaring omissions in the literature. First, there is a lack of literature that considers the theoretical relationship between RMAs and security alliances. Scholars have sought to explain the occurrence of RMAs using more than a dozen causal variables; however, none have done so in terms of alliances, including how alliances affect RMAs or how RMAs affect alliances. This is even though it is abundantly clear that changes in the security policies and military capabilities of an allied country strongly impact a partner country's behavior, including regarding their own policies and capabilities.[8] Therefore, we may expect, for example, that an RMA in an allied country has a significant effect on its allies. However, the precise nature of this effect and how it transpires have not been carefully examined.

Second, few studies have focused empirically on Japan, and none have done so in the contemporary period. This may be because Japan has not engaged in military combat since World War II, making it difficult to analyze any changes in its military effectiveness, as such measures are typically taken from the field of combat. However, as those familiar with Japanese security studies know well, the country's defense policies and technologies have undergone significant change since the end of the Cold War, including in the same domains of warfare that the literature argues represent RMAs.[9]

To address these gaps, this study examines how the radical innovation in all-weather precision-guided munitions, or "smart bombs," that occurred in the United States during the 1990s came to bear on its close ally Japan, clarifying why and how the U.S. "IT-RMA" affected Japan's defense policy and military capabilities. More specifically, content analysis is conducted inductively about the cause, process, and outcome of the JDAM revolution in the United States on Japan, from the political perspective of implementing a strike capability and the technical perspective of implementing the first precision-guided capability. The factors underlying Japan's selection of the JDAM are considered from four perspectives: alliance management; threat perception and military needs; technical considerations; and political, legal and humanitarian considerations. Consequently, the U.S. RMA prompted a radical change in Japan's defense policy and capabilities. The analysis employs primary sources such as the minutes of Japanese Diet deliberations and meetings, Japan's Defense White Papers, the Japanese defense budget, and the Japan-U.S. Guidelines, as well as secondary sources such as relevant books and media reports.

Threat Perceptions, Technological Capabilities, and Background of JDAM

Threat perception and military needs

North Korea

North Korea had long been suspected of developing nuclear weapons, and in the early 2000s it was believed that their program had likely progressed considerably.[10] In August 1998, a ballistic missile based on the Taepodong-1 was launched over Japan.[11] Japan, subsequently, initiated joint technological research with the United States on ballistic missile defense (BMD), with the decision on development and deployment to be made separately. In 2003, Japan decided to implement BMD system legally and institutionally to counter ballistic missile threats with the cabinet decision "Regarding the development of ballistic missile defense system."[12] In such a threat environment, there was much debate in the Diet about issues related to conducting a potential attack on enemy bases.[13] In the context of the threat of ballistic missiles, the term "enemy base" means a ballistic missile base,[14] and the term "enemy base attack capability" means the capability to accurately attack such ballistic missile bases.[15] In this sense, Japan had an existential military need for precision-guided strike capabilities. However, on the surface, Japan responded to the threat from North Korea in a defensive way, by developing a ballistic missile defense system rather than developing the capabilities to attack an enemy base.[16]

China

China had been pursuing the modernization of its military capabilities, centered on its nuclear and missile technologies, and naval and air forces, and was also modernizing its operations, such as by conducting large-scale military exercises.[17] China's distinctive military transformation centered on information technology and increased activity in the East China Sea and other maritime areas were direct challenges to Japan.[18] Combined with trends observed in its aircraft carrier construction plans and its naval and air force strategies, China's improved capabilities to expand the scope of its maritime operations increased the threat perceptions of Japanese defense planners, especially as the risk of a contingency involving Taiwan increased.[19] Japan assessed the need for an operation to defeat the enemy in case the Japanese islands were occupied,[20] establishing a military requirement for precision-guided attack capabilities that could accurately target the enemy to defend Japan's islands and support the Ground Self-Defense Force.

Defending the Senkaku Islands

In 1992, China enacted the "Law on the Territorial Sea and the Contiguous Zone of the People's Republic of China", which clearly states that the Senkaku Islands, Spratly Islands, Paracel Islands, and other islands are Chinese territory. In 1997, China also enacted the National Defense Law, which clearly states that China will protect its maritime interests, as well as its territorial land, territorial waters, and territorial airspace.[21] In March 2004, seven Chinese activists illegally landed on Uotsuri, a part of the Senkaku Islands.[22] In addition, the Japan Defense Agency perceived that Chinese oceanographic survey vessels appeared to conduct oceanographic surveys and Chinese naval vessels appeared to conduct activities such as oceanographic surveys, military training, and information gathering in the waters near Japan.[23]

The Japan Defense Agency indicated that it believed China's activities were aimed at expanding the space for military operations and strengthening its comprehensive operational capabilities in the waters around China.[24] The new National Defense Program Guideline

formulated in 2004 identified the geographical characteristics of Japan, which has many islands, as a security vulnerability, and assumed an invasion of the islands as one form of armed attack on Japan.[25] Based on this threat perception, Japan reconsidered the defensive operations required to prevent enemy forces from invading the islands, as well as operations to destroy enemy forces if the islands were occupied.[26] Thus, planners decided there was a military need for precision-guided attack capabilities to support operations led by the Ground Self-Defense Force to efficiently destroy enemy forces if the islands were to be occupied while avoiding friendly-fire attack.

Technological considerations

As previously mentioned, the 2004 National Defense Program Guideline assumed two possible scenarios for responding to an invasion of Japan's island territories: a campaign to prevent the enemy from invading, and a campaign to destroy enemy forces if they succeeded in occupying Japanese territory. Japan required technology that would be suitable for achieving these objectives. At the time, based on the technological trends in the United States and its relationship with Japan, Japan had three leading options for introducing precision-guided attack munitions: ballistic missiles, cruise missiles, and JDAMs.

Ballistic missiles

Although ballistic missiles are a type of precision-guided missile, they are not well suited to attacking multiple dynamic targets such as aircraft and ground forces when responding to an invasion of an island. Ballistic missiles can be effective against static targets under certain conditions, such as in the case of an attack on a North Korean ballistic missile base from a ground base, however, if the target is moving and if launched from a transporter erector launcher instead of from a permanent fixed location the targeting challenges are much greater, thus potentially reducing their usefulness. In addition, possessing medium-range ballistic missiles or intercontinental ballistic missiles was fundamentally difficult from the postwar political context in Japan. On the other hand, short-range ballistic missiles such as MGM-140, lacked sufficient range and accuracy. Moreover, the cost per missile is relatively high. Thus, the cost-effectiveness of using them as conventional weapons is low.[27]

Tomahawk cruise missiles

Similarly, the Tomahawk cruise missile would also be unsuitable for attacking multiple dynamic targets. The Tomahawk guidance system is composed of a combination of GPS and inertial navigation that makes it possible to conduct highly accurate strikes on stationary targets, such as fixed ballistic missile bases in North Korea. However, their effectiveness is limited against dynamic targets. Although their range is probably adequate, and their accuracy sufficient, the price per unit is higher than that of ballistic missiles of similar range capabilities. Thus, the cost performance may exceed that of short-range ballistic missiles without contributing adequately to the success of proposed missions. Although the Japanese government has considered acquiring Tomahawks,[28] they were not requested in the budget owing to their operational cost and political considerations over Japan’s traditional cautious stance on weapons acquisition and the prioritizing of ballistic missile defense systems when considering Japanese defense demands.

JDAM

Like ballistic missiles and cruise missiles, JDAMs were also originally designed to strike static targets. Although a high hit rate against multiple dynamic targets can be achieved by JDAMS,

it can be difficult. When targeting a ballistic missile base in North Korea, Japan would need to approach sufficiently close to reach North Korean territorial airspace owing to the short range of the JDAM, increasing the risk of interception. However, in the case of responding to an invasion of Japanese islands, the activity would be conducted on or around Japanese territory, and thus the range of the JDAM would be considered operationally appropriate. The price per unit was also much more reasonable than that of ballistic or Tomahawk cruise missiles. JDAM cost-effectiveness was also significantly higher because it only required a guidance device be attached to the unguided bombs that Japan already possessed. Table 1 summarizes performance across guided munitions as discussed in this section.

	Range	**Accuracy (CEP)**	**Price**
Short Range Ballistic Missile (MGM-140)	140km (75nm)	225m	$0.8 million[29]
Tomahawk (RGM/UGM-109C Block III)	1,125km	6-10m	$2.5 million[30]
JDAM	24 km (13nm)	5m (16ft)	$0.04 ~0.08 million[31]

***Table 1*: Performance of precision-guided munitions[32]**

Alliance management

Changes in U.S. defense policy

In May 1997, the U.S. Department of Defense (DoD) published the Quadrennial Defense Review (QDR) amid rapid changes after the end of the Cold War, emphasizing the importance of reconsidering national defense priorities.[33] The QDR indicated the need to prepare for the future, when hostile countries and those that could become hostile would acquire new capabilities. The plan noted that it was necessary to increase investment in modernization and employ technological innovation to transform the military toward that cited about new future joint force capabilities enabled by information superiority and technological innovation in the document Joint Vision 2010.[34] Significant reorganization was necessary, including personnel reductions,[35] improvements in efficiency to cover those reductions, and base reorganization.[36] The QDR released in 2001 presented more detail and called for "transformation" of the U.S. Joint Force.[37]

In April 2003, the Transformation Planning Guidance was released. In this document, Secretary of Defense Rumsfeld indicated awareness of the need for future preparation by recognizing the many risks that had arisen in the wake of the 9/11 terrorist attacks, and he expressed the view that not only capabilities, but also ways of thinking, training, exercises, and

ways of warfare must be transformed.[38] The Defense Department defined "transformation" as "a process that shapes the changing nature of military competition and cooperation through new combinations of concepts, capabilities, people and organizations that exploit our nation's advantages and protect against our asymmetric vulnerabilities to sustain our strategic position, which helps underpin peace and stability in the world," and this meant a shift in national defense strategy.

Becoming more independent

From late 1990s, the Japan-U.S. alliance was recognized in Japan and the U.S. as being important not only for ensuring Japan's security, but also for maintaining peace and stability in the Asia-Pacific region. In 1997, the Japan-U.S. Guidelines were revised to clearly state this importance, and Japan-U.S. cooperation guidelines, including in peacetime, were also significantly revised.[39] The Japan-U.S. Security Consultative Committee (the "2+2") released the document "Japan-U.S. Alliance: Transformation and Realignment for the Future,"[40] toward strengthening the alliance. In the document, the roles of Japan and the United States were clearly stated, including that "Japan provides additional and complementary capabilities to the capabilities provided by United States forces while playing a leading role in its own defense."[41]

In 2004, Japan formulated the new National Defense Program Guidelines that focused on "multifunctional, flexible, and effective defense capabilities," intending to break away from the long-held Basic Defense Force concept.[42] Based on this, Japan began to adopt measures to improve its own defense capabilities by developing a ballistic missile defense system and modernizing existing equipment to respond proactively to the rise of China and the missile threat from North Korea. Simultaneously, efforts to improve interoperability with the United States increased.[43] From the late 1990s to the mid-2000s, action was taken on items set out in the "2+2" and the Japan-U.S. Guidelines. These actions included strengthening posture for bilateral security and defense cooperation such as enhancing information sharing and intelligence cooperation, improving interoperability, expanding training opportunities in Japan and the United States, and bilateral coordination mechanism for operations. This was a significant departure from Japan's previous approach of excessive dependence on the United States.

Political, legal, and humanitarian considerations

Interpretation of Article 9

Article 9 of the Japanese Constitution stipulates that Japan will never maintain land, sea, or air forces, or any other war potential. Anything beyond the minimum necessary for self-defense is interpreted as having war potential, and possession of such capabilities is prohibited.[44] However, government witnesses subsequently also stated that the minimum necessary capability will be assessed on a case-by-case basis depending on the situation at the time.[45] Article 9 of the Constitution has remained unchanged since it was enacted after World War II until the present day, although its interpretations have transformed over time.

Exclusively defensive defense

The term "exclusively defensive defense" (*senshubouei*) was first used in a 1955 Diet response by Kota Sugihara, who was then serving as Director General of the Defense Agency.[46] Later, in 1981, the Defense Agency defined the term in its annual white paper "Defense of Japan" as "a passive defense strategy in accordance with the spirit of the Constitution, in which defense

capabilities are only used when first attacked by an enemy, and the use of force is limited to the minimum necessary for self-defense, and the defense capabilities possessed are also limited to the minimum necessary for self-defense." The term has consistently been explained in this way since.[47]

In 1956, then Prime Minister Ichiro Hatoyama, stated that "we cannot believe that the intention of the Constitution is [for Japan] to sit back and wait for our own destruction, and in such cases, taking the minimum necessary measures to prevent such attacks, such as striking bases for guided missiles, etc., to defend against attacks by guided missiles, etc., should be considered to be within the scope of self-defense and possible, as long as it is recognized that there are no other means available."[48] This has since been maintained as the government's view. Japan has not acquired attack capabilities that fall outside the scope of exclusively defensive defense from a legal perspective. This is owing to a combination of factors, such as the clarification of the roles of Japan and the United States based on the Japan-U.S. Security Treaty (the relationship between shield and sword), and the likelihood of strong criticism from the public owing to post-war pacifism and anti-war thinking.[49]

Humanitarian issues

Humanitarian issues were discussed extensively in the Japanese Diet due to the U.S. military killing and injuring non-combatants in the Iraq War.[50] In 2003, the "Act on Measures to Deal with Armed Attack Situations" was enacted for the first time in Japan. Article 21, Paragraph 2 of the Act stipulated that "Situational Response Legislation must ensure the proper implementation of international humanitarian law as applied in international armed conflicts."[51] In 2004, as part of the development of the legislation for dealing with situations, domestic laws were developed, such as the "Act on Punishment of Violations of International Humanitarian Law," which is necessary for the proper implementation of international humanitarian law, including the Geneva Conventions.[52] This was a period when Japan actively developed domestic laws to comply with international law.

The U.S. RMA and Japan's selection of JDAM

<u>JDAM as a precision-guided capability</u>

Alliance management

In the original version of the Japan-U.S. Guidelines, the operations for response to a landing invasion were recognized to be the responsibility of the Air Self-Defense Force,[53] however, in the 1997 Guidelines, this was revised to consist of joint operations between Japan and the United States. [54] To conduct effective joint operations between Japan and the U.S., which has overwhelming technological superiority, interoperability is essential, and technical compatibility between both countries needed to fit together. Thus, the acquisition of the JDAM from the U.S. was an efficient way to rapidly improve interoperability, in addition to contributing to Japan playing a more central role in its own self-defense. At the time, the dynamics of warfare were considered to be changing in accordance with technological progress, and the Defense Agency was aware that if it could not keep pace with technological advancements, Japan's defense would suffer.[55] In 2000, the Defense Agency released the documents "Information RMA" and "Outline for Comprehensive Programs by the Defense Agency and the SDF to Adopt to the Information Technology Revolution" that demonstrated an awareness of the importance for Japan to actively

employ the technological advances caused by the information and communications technology revolution and Japan's need to keep pace with the technological advances made by the United States.[56] The emerging and critical technological growth of the United States military had a direct impact on the introduction of precision guidance capabilities in Japan.

Threat perception and military needs

Prior to consideration of the JDAM, the Self-Defense Forces did not possess the precision-guided capability to pinpoint and attack enemy ground targets from the air. The concept of "operations to respond to landing invasion" in the *Defense of Japan 1999* was that the Air Self-Defense Force would conduct maritime anti-ship attacks, and not anti-land attacks.[57] The mission of the Air Self-Defense Force was to prevent enemy invasion and support the Ground Self-Defense Force and Maritime Self-Defense Force. Thus, there was originally no plan to attack the enemy after they had landed, and the Air Self-Defense Force had not developed the capability to do so. In the *Defense of Japan 2005*, "responding to an invasion of islands" began to be emphasized and the term "remote islands" began to be used frequently.[58] This later became the basis for operations to recapture invaded territory. The change in the operational concept (to destroy enemy bases after landing on the islands in Japan) that accompanied the change in threat perception was significant in introducing the capability to precisely attacking ground targets. A precision-strike capability became increasingly important in terms of both striking enemy forces that had landed on Japanese territory, as well as a desire to minimize possible collateral damage to Japanese civilians and property.

Technological considerations

In 2003, the Air Self-Defense Force requested JDAM to be included in the 2004 budget. The Defense Agency explained that the acquisition of JDAM would (1) prevent damage to Japanese civilian facilities and civilians in the vicinity of the target; (2) prevent damage to Japanese ground forces in the vicinity of the target; and (3) protect JASDF aircraft from being shot down by the enemy by enabling them to drop JDAM munitions from outside the range of the enemy's surface-to-air weapons.[59] To achieve these objectives, greater precision capabilities would have been required than the JASDF possessed at the time , and the technological accuracy of JDAM was higher than that of other precision-guided munitions, making it suitable for meeting these requirements. Moreover, from the fiscal perspective of defense budget requests, it was easy to explain the high cost-effectiveness of the JDAM as a reasonable kit adaptation to provide precision-guided capability to the 500lb bombs that Japan already possessed. The fact that the budget request was officially made under the name "introduction of precision-guided systems for bombs" and did not directly express "precision-guided strike munitions" suggests that the intention was to keep it low-profile in the Defense Agency. As mentioned previously, ballistic missiles and Tomahawk cruise missiles were too advanced for the proposed missions and were relatively less cost-effective. Thus, the acquisition of JDAM was justified in the form of incorporating technological innovation in the Medium-Term Defense Program,[60] and the Air Self-Defense Force was able to make a new request in fiscal 2004 with almost no barriers. The technical specifications of JDAM were significant in explaining its high cost-effectiveness and high military utility.

Political, legal, and humanitarian considerations

In response to the high number of non-combatant casualties in the Afghan and Iraq wars, a humanitarian perspective was also considered. In Japan, there was some consensus regarding the

legitimacy of acquiring and maintaining a precision-guided capability.[61] However, more work was needed to build greater acceptance and support as evidenced by the limited discussion about the acquisition of JDAM, and that it was implemented on the premise that it was within the scope of Japan's exclusive defense posture. This need was further suggested by the following statement made by Mr. Terada in the Diet: "The introduction of precision air-to-surface munitions to Japan was actually very important specification changes for Japan. I don't know how much information was released to the Diet members. But there have been important meanings for Japan, so I would like you to provide sufficient explanation." [62] The humanitarian considerations of the international situation at the time, such as the Afghan and Iraq wars, played an important role in the introduction of precision-guided capability for Japan.

Japan's response to armed attack scenarios was legally established in 2003 and 2004, therefore, the Self-Defense Force (SDF) needed to adapt its operational capabilities. Specifically, while "the use of force, deployment of units, and other actions taken by the SDF as necessary to eliminate armed attacks"[63] were stipulated, the SDF did not have the capability to conduct ground attacks to eliminate enemy forces that land on remote islands. Thus, there was a gap between the law and the actual operational capabilities of the SDF. Considering this gap and the international situation toward minimizing death and injury of non-combatants, the legitimacy for acquiring precision-guided munitions as equipment that satisfied both requirements was strengthened. The gap between the law and the capabilities of the SDF was an important factor in the introduction of JDAM.

JDAM as a strike capability

Alliance management

As mentioned previously, the Japan-U.S. alliance was significantly strengthened from the late 1990s to the mid-2000s. It was believed that Japan needed an attack capability to play a leading role in its own defense and provide additional and complementary capabilities to the U.S. military's "sword" while maintaining a policy of exclusively defensive defense. Therefore, Director General of the Defense Agency Shigeru Ishiba revised the National Defense Program Guideline for the first time in nine years and revised the policy from the Basic Defense Force Concept to multifunctional, flexible, and effective defense capabilities that focused on response. The revision was not only about technology transfer from the U.S., but also about encouraging a systematic change in Japan's defense. This included cautious deviation from the long-maintained policy of exclusively defensive defense in Japan. Japan needed to have strike capabilities to conduct effective joint operations with the United States and its own national self-defense. The strengthening of the Japan-U.S. alliance and the redefinition of the roles between Japan and the U.S. were important factors in the introduction of strike capabilities.

Although Japan had been aware of the need to change since the 1990s,[64] it had been unable to break away from the "Basic Defense Force Concept" it maintained for decades. However, from the late 1990s to the mid-2000s, Japan's threat perceptions, operational concepts, domestic laws, and the Japan-U.S. relationship changed. Notably, the United States conducted a major change in its national security policy. Specifically, this was a national security policy of transformation characterized by the United States' overwhelming technological superiority. Then-Director General of the Defense Agency Ishiba stated that "if the United States is changing, then as an ally Japan must also change," [65] and formulated the 2004 National Defense Program Guideline that aimed to shift away from the Basic Defense Force Concept. It would have been difficult to respond

to these changes and introduce JDAM under the Basic Defense Force Concept. This signified a systematic change in Japan's defense. The U.S. transformation had such a significant impact on Japan, a partner country, that it changed its previous cautious basic stance (to have the capability to attack for self-defense), and this was extremely important for Japan to introduce its own strike capabilities.

Threat perception and military needs

During the early 2000s, Japan's perception of threats also changed, and the front line of operations began to shift from the north to the southwest with North Korea's nuclear development, its ballistic missile launches, and China's military modernization. As mentioned previously, there was a defined military need for precision-guided strike capabilities. Moreover, discussion within Japan regarding the possession of the capability to attack enemy bases increased. Ishiba made statements hinting at the possession of the capability to attack enemy bases, such as "it is worthwhile to consider the possession of an attack capability. It is not the stance that a responsible government should take to fall into a state of thoughtlessness." [66] Sugio Takahashi argues that, while the possession of attack capabilities is legally permitted, the decision on whether or not to develop the capability to attack enemy bases within the context of a policy of exclusively defensive defense should be made after careful calculation of the benefits and costs involved.[67] Thus, introducing the JDAM was assessed to be beneficial as a result of calculating both the military benefits and political costs. At the time, the capability to attack enemy bases was introduced as a defensive capability to be used in the case of islands being occupied, rather than as a capability to be used in the case of Japan initiating attacks. The cautious change in stance in accordance with the change in threat perception was extremely important in introducing the capability to attack.

Technological considerations

The chief focus of the technological considerations was to clarify whether the equipment to be introduced exceeded the scope of exclusively defensive defense use or the extent to which it was offensive. The Defense Agency explained the three objectives of introducing JDAM,[68] and this means that the technology must meet these objectives and not exceed them.

The range of JDAM is approximately 15 nautical miles,[69] and it is more appropriate to consider it as a defensive counter-strike capability after the enemy has landed in Japan, rather than as a clear attack capability similar to a stand-off missile, making it more consistent with Japan's defensive legal and political stances. In 1988, the Director General of the Defense Agency stated that it would not be permissible for the SDF to possess intercontinental ballistic missiles or aircraft carriers.[70] Further, Hiyoshi replied in the Diet that because an aircraft carrier could be used exclusively for catastrophic attacks against the territory of an enemy country, it would not be permitted to be possessed under the constitution.[71] Moreover, acquisition of JDAM was not intended to cause catastrophic destruction in the territory of an enemy country, and it therefore did not exceed the scope of exclusively defensive defense as a strike capability to achieve the three aforementioned objectives. The technical performance capabilities of JDAM were therefore important as they perfectly fit the three objectives for its acquisition.

Political, legal, and humanitarian considerations

The strong leadership of then-Director General of the Defense Agency Shigeru Ishiba at the time of the budget request for JDAM is believed to have contributed to the acquisition of this precision-attack capability. In the Diet, Ishiba stated, "I think it is necessary to consider this from

various angles. At the very least, if we were to fall into a state of brain freeze, that would not be responsible for the country, peace and independence. I do not think that not thinking about it at all is the way it should be." [72] This suggests he likely considered it as having caused a significant stir. [73] As mentioned previously, there was a gap between the law and the actual operational capabilities of the SDF, therefore, Japan needed to fill this gap. However, the Constitution, the basic stance of exclusively defensive defense, and the government's position on strike capabilities had not changed. Thus, to fill this gap, it was necessary to change the long-standing "cautious stance" that although legally it was possible to have strike capabilities, they had not yet been adopted. As mentioned, Japan's introduction of the JDAM maintained consistency with its constitution and policy of exclusively defensive defense. The net effect was that the previously over-cautious stance regarding the possession of strike capabilities was "disrupted." Japan's intention to maintain its constitution and policy of exclusively defensive defense had not changed, and explaining the acquisition of strike capabilities in this context allowed Japan to change its stance on strike capabilities. Therefore, it was possible to introduce JDAM. The strong leadership of Shigeru Ishiba encouraged disrupting Japan's previous cautious stance and influenced the introduction of strike capability.

One final factor is worthy of mention. Due to international humanitarian criticism of the Afghan and Iraq wars, the possession of cluster munitions had also begun to be discussed in the Diet. [74] It is only natural under international law that non-combatants must not be attacked, and the targets of attack must be combatants. Therefore, the asymmetry of cluster munitions, originally acquired in preparation for a large-scale invasion by the former Soviet Union during the Cold War, began a trend that would force Japan to abandon cluster munitions in favor of alternative precision-strike capabilities. [75] At the time, the fact that Japan had the capability to attack indiscriminately with cluster munitions may have had an important effect on the introduction of JDAM.

Conclusion

Findings

The U.S. RMA had a significant impact on Japan's defense policy and capabilities, ultimately influencing Japan's decision to adopt JDAM in a significant departure from its long-standing status quo defensive security doctrine. This was not simply a case of technology transfer between allies, but rather a systemic shift in Japan's own military affairs. Among the leading factors behind these changes were Japan's will to break away from its excessive dependence on its ally the United States and the significant changes in the U.S.'s own national defense policy and capabilities.

The factors underlying the introduction of the JDAM were examined from four perspectives: alliance management, threat perception and military needs, technical considerations, and political, legal, and humanitarian considerations. Each of these factors had two important aspects: precision-guided capability and strike capability. Both characteristics played an important part in Japan's acquisition of JDAM. These findings are summarized in Table 2. The process occurred through two interactions: first, the domestic technical, political, legal, and humanitarian considerations in response to changes in Japan's threat perception in accordance with changes in the strategic environment; and second, the application of changes in the national security policy of the United States, an ally having overwhelming technological superiority. Japan achieved a major shift without changing its basic posture of exclusively defensive defense. In this sense, Japan experienced a "second order RMA," as the revolution in the United States transformed Japan's defense doctrine (deviation from a policy of exclusively defensive defense), strategy (a shift from

the basic defense force concept to a defense force concept with multiple functions, flexibility, and effectiveness), organization (changes to an organization suited to joint operations), and technology (adoption of JDAM).

The most important factor was alliance management. Although Japan's threat perception had shifted toward North Korea and China, the rapid development of its defense capabilities had been in the form of a ballistic missile defense system. If a real crisis were to arise, it might have been expected that Japan would develop offensive capabilities. Instead, however, Japan responded in a defensive way. Moreover, even if Japan's perception of threats had changed, considering Japan's long-standing cautious posture toward introducing strike capabilities, it is difficult to explain why JDAM was introduced at this time. The culminating reason for introducing JDAM at this time was because it would be a Japanese adaptation to the U.S. transformation. The RMA based on the U.S.'s technological superiority, and efforts to strengthen the Japan-U.S. alliance, were the most important factors in introducing JDAM.

	Precision-guided capability	**Strike capability**
Alliance management	The overwhelming technological superiority of the US	1. Strengthening the Japan-U.S. Alliance and redefining the roles of Japan and the U.S. 2. Transformation of the U.S.
Threat perception and military needs	The change in the operational concept that accompanied the change in threat perception	Change in cautious stance owing to change in threat perception (not having the capability to attack, although it could have it legally)
Technological considerations	The high cost-effectiveness and high military utility of JDAM for Japan	The technical performance of the JDAM perfectly matched the purpose of the introduction in the context of exclusively defensive defense
Political, legal, and humanitarian considerations	1. The humanitarian international situation at the time, such as the Afghan and Iraq wars 2. The gap between the law and the actual capabilities of the SDF	1. The strong leadership of Shigeru Ishiba 2. Japan's possession of the capability to indiscriminately attack with cluster munitions

***Table 2*: Relative importance of four factors and two meanings**

Implications for theory

Theoretically, this study contributes to the understanding of how RMAs transcend borders, particularly through the mechanism of security alliances. Further, while literature has tended to cast RMAs as a race between rivals for military supremacy, this study demonstrates that such a race is also cooperative in nature, where allies support each other and collectively benefit from

collaboration. This suggests that for some countries, the causal variable for pursuing an RMA could be alliances.

The phenomenon of "adaptation" to its ally was arguably the single leading cause for Japan to adopt JDAM. This may be a characteristic of alliances in the existing international order. Therefore, future studies focusing on alliances and comparing the diffusion of the RMA in the U.S. "hub and spoke" security network in East Asia and the U.S. collective security system in Europe (NATO) would contribute to an in-depth understanding of the mechanisms of RMA transfer.

Implications for policy

The findings have direct policy implications for the prospects of an artificial intelligence RMA in general and how it relates to the U.S.-Japan Alliance in particular. The cause and mechanism of the IT-RMA in the 1990s identified in this study are already beginning to take shape in today's AI-RMA, with United States serving as the first mover, and Japan following closely, while directly contributing in certain critical ways. In 2021, Japan attempted to purchase the Long Range Anti-Ship Missile (LRASM) equipped with AI from the United States (in the end, budget constraints preventd this acquisition).[76] This indicates that the policies of modern Japan are similar to the causes and mechanisms of the IT-RMA described by this paper in the 2000s. Furthermore, the cooperative nature mentioned earlier in this study is even stronger today. Japan is actively involved in joint AI research and development with the U.S. and other like-minded countries.[77] It is truly a case of joint adaptation.

In 2022, Russia's invasion of Ukraine caused Japan to significantly change its perception of the threat and begin to acquire counterstrike capabilities that exceeded JDAM in terms of strike capabilities. This further disrupted the cautious stance on strike capabilities that had been in place since the early 2000s. One factor that may have contributed to this disruption was the strong leadership of Prime Minister Kishida, as in the 2000s. Teraoka argues that this major shift in Japan was a matter of Kishida's survival as a politician, and that it could not have been achieved by anyone other than Kishida.[78] In addition, currently, Japan has purchased precision-guided strike missile for counterstrike capabilities, not only from its ally the United States, but also from like-minded country Norway.[79] Today, the collaborative nature observed in the IT-RMA in 2000s is not limited to allies, but is also expanding to include like-minded countries. This trend will continue in the future, not only among allied countries, but also among countries that share the same values.

Opinions, conclusions, and recommendations expressed or implied within are solely those of the author and do not necessarily represent the views of the Air University, the Department of the Air Force, the Department of Defense, any other U.S. government agency, the JASDF, or the Japanese government. Cleared for public release: distribution unlimited.

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