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0. Introduction

According to some recent articles, the Asia-Pacific region is in the midst of an escalating arms race. Reports claim, that the region sees a progressing trend in its many military spendings, which are also expected to grow in the upcoming years (Ferguson 2014; Leong 2014; Pilling 2014). Considering the vast number of rising players that have some unsettled historical grievances, the right economic performances that stimulate greater expenditures and the ongoing complex national interests that revolve mainly around territorial demands, this may not seem that surprising as all these factors have their fair share of contribution to what is simply a cluster of different individual militarization precautions. Therefore one should maybe opt for the term “bilateral arms races”¹ that can have different connotations as opposed to a vague description of an exploding regional arms race. Other than that, the concern for the region’s security dates further back to the early 1990s when such “arms races” were already set into motion and when newly established organizations like the *ASEAN Regional Forum* (ARF) or the *Council for Security Cooperation in the Asia Pacific* (CSCAP) reflected the desire for a wider security stability (Umbach 2005).

Still, the reality of Asia-Pacific actor’s many military spendings and modernizations is still highly relevant today as it was years ago, if not more. The biggest change in this regard however, is the magnitude of the commonly shared Chinese² threat perception, that really uplifts these single security developments to a more regional spectrum. China’s growing political and economic might brings forth its bold power projection, which sends out signals that may evoke hegemonic ambitions and with them related insecurity. This feeling of insecurity seems to be even immune to the very presence and different regional alliances with the United States, whose spendings on military defense arrangements might be overcome in the following years by China’s own relatively fast growing expenditures. Despite loose figures provided by Beijing, it is believed that in the past two decades, China’s military spendings have risen eightfold, whereby they continue to pile up and grow as we speak (Bitzinger 2013a: 1; Pilling 2014; Seidel 2014).

The upscaling of present-day China’s military capabilities is well reflected in an April 2012 article from *The Economist* entitled “*The Dragon’s New Teeth*”. Not only does the article point out Beijing’s pursuit of achieving an upper hand in all things military, but it also suggests a cumulation of a much bigger undercurrent, which would rather see the United States’ influence be pushed out of the region than the exact opposite (The Economist 2012). It is believed that this strategic acclimatization of the United States, has led China to constant reevaluations, which go as far as to rethink their military stance. Beijing seems to realize that the evolving nature of future warfare doesn’t rely as much on pure quantitative power as it does on its qualitative rendering. This realization is in part due to the fact that the United States have a head-start in their force modernization and operational innovation, what some see as a result of their conceptualized *Revolution in Military Affairs* (RMA). Although innovation is the name of the game, RMA sees modern military capabilities not as separated units, but as an interconnected and complementing structure that can effect both military doctrine and operational concepts

¹ Frank Umbach names a few example pairs like China-Taiwan, China-Japan, North Korea-South Korea or Singapore-Malaysia (Umbach 2005).

² *China* refers to the People's Republic of China.

for the better (Adamsky 2010: 59, 86-87; OSD 2008: 16-17; OSD 2014: i). Seeing how the RMA was embraced by the United States forces, China officially proclaimed to take a similar RMA path that would dispose with what they call “Chinese characteristics” (Ding 2008: 81).

Despite China’s growing military power projection that is fueled by the RMA thinking, one should also take into account its implied use of force. At first sight, official reports like the one issued by the nation’s State Council Information Office titled “*The Diversified Employment of China's Armed Forces*”, picture the *People's Liberation Army* (PLA) as a force that has its focus on peacekeeping and providing aid where it is most needed. Although the defense of the motherland in terms of a complete territorial sovereignty and cohesiveness is still primal, it is being balanced out if not overshadowed by the PLA’s growing contributions to global responsibilities of maintaining world order (SCIO 2013). Still, the same PLA that is showcasing its sense of global peace and security, is at the same time committed to what Beijing calls “*active defense*”. The basic idea behind this, is to use a preemptive strike as a counter attack excuse to prohibit any real opposing threats, both political and militarily aggressive, which would defy or deconstruct the sovereignty of the motherland. This means that although the PLA doesn’t seek to initiate wars, it certainly will take the first initiative if it feels endangered in the previously described manner (OSD 2008: 16-17).

All this brings us to Taiwan³, which despite being a rising middle power is in constant alert towards Beijing’s intent of reunification. While Taiwan is aware of its limitations of how much the mainland can tolerate its current state of being, it doesn’t take any risks in terms of military preparedness either. Due to its situation as well as to the United States’ involvement, Taiwan has also proclaimed the desire to follow the RMA principles of modern warfare (Tan 2011: 86). While Taiwan’s statement is relatively modest against China’s full-fledged RMA vision of force transformation, it shouldn’t be underestimated. As a matter of fact, many observers suggest that the Chinese pursuit of RMA is mostly due to Taiwan itself, who not only has the option to borrow from some of the United States’ RMA capabilities, but has also necessary resources to create an indigenous military force that would complicate a potential Chinese invasion (OSD 2014: 56-57; Seidel 2014; The Economist 2012).

Although some may argue, that top tier military capabilities are mostly the heritage of big global powers, the pursuit of RMA related military capabilities has been constantly diffusing to smaller middle power nations. One of these hotspots for diffusion has been the Asia Pacific, which is quite logical given the strong United States presence. However, the pursuit of an RMA is still a highly individual approach that can go as far as to influence a country’s military doctrine or strategic-political goals. Despite some skepticism⁴, Richard Bitzinger believes that the RMA concept in the Asia-Pacific remains a driving force that stirs up experimentation and which will offer projection for a much broader defense transformation for those who seek it (Bitzinger 2005: 57). With the earlier mentioned spendings on new military capabilities and many occurring interconnected military developments in the region, Frank Umbach also provides an interesting perspective by arguing that the “*Asia-Pacific may well become the world’s largest laboratory for the Revolution in Military Affairs*” (Umbach 2005). The term

³ *Taiwan* refers to the Republic of China.

⁴ Refer to 1.4 for more detail.

“laboratory” is quite adequate, as many of these individual players are still figuring out the RMAs many potentials as well as its limitations (Umbach 2005).

Others like Leslie Eliason, Emily Goldman and Michael Raska even argue, that there isn't enough essential coverage in relation to case specific RMA concepts outside the typical United States' RMA analyses (Goldman and Ross 2003: 402; Raska 2011: 9). Raska even specifically proposes that the possibility of a RMA focused Asia-Pacific be more analyzed and tested, because he believes like Bitzinger and Umbach before him, that many small states and middle powers in this region are more than intrigued with the RMA's modernization aspects. Because of the earlier sketched out character of the Asia-Pacific's military built-up, Raska suggests that the starting point for filling up the void of the Asia-Pacific RMA, would be by approaching more case-specific studies that will focus on a country's RMA character, relevance and implications on the military establishment (Raska 2011: 9).

It is by these suggestions, that this thesis will focus on analyzing both China's pursued RMA and Taiwan's potentially evolving RMA. Despite the fact that Taiwan's *Democratic Progressive Party* (DPP) declared a serious interest in pursuing RMA back in 1999, Andrew Tan warns that there are some hinderances that may turn such intent into a bumpy road. Tan argues, that at the heart of the problem is Taiwan's seclusion from the international political sphere as well as a domestic political disagreement in terms of following a synchronized defense policy. It is not surprising that due to China's influence, Taiwan sees limitations in acquiring armaments from abroad. The domestic scene however, makes matters much more complicated as the two main opposing parties, the *Kuomintang* (KMT)⁵ and the mentioned DPP, are not on the same page neither when it comes to their proceedings with the mainland, nor when it comes to approaching defense related precautions (Tan 2011: 85-86; 88).

In spite of these limitations, the hypothesis of this work suggests, that Taiwan is bound to make progress in its potentially evolving RMA military capabilities, which would pose as a possible counterbalance towards China's own RMA military capabilities. Despite a missing consensus, both the KMT and DPP are expected to keep their officially unannounced sovereignty in check. To do this, they are bound to make at least certain defense measures that are likely to be equivalent counter-measures towards the Chinese exerted RMA capabilities. The role of the United States, although not guaranteed to protect Taiwan at all costs, has also its fair share in providing RMA inputs and many key purchases. To prove this hypothesis right or wrong, the following research question has been constructed:

How has Taiwan responded or is responding to China's pursuit of the Revolution in Military Affairs?

To reach a final conclusion to this research questions the following subquestions should be answered:

1. *What is the Chinese Revolution in Military Affairs?*
2. *What is the applicability of a Revolution in Military Affairs set in Taiwan?*

⁵ Also known as the Chinese Nationalist Party.

3. *What effect does the presence of the United States have on the Chinese and on the potential Taiwanese Revolution in Military Affairs?*
4. *What strategic arrangements benefitting from the Revolution in Military Affairs concept do China and Taiwan have against each other?*
5. *Does Taiwan have counterbalancing assets against China in the primary Revolution in Military Affairs related military capabilities areas?*
6. *Do both countries' assets abet their respective strategic arrangements?*

Although the emphasis of the research question lies on the possibly most current state of China's RMA and Taiwan's potential RMA, the thesis won't restrict itself to a specific time frame, as some questions might require to go as far as to the 1990s, in order to find the necessary empirical evidence. The thesis starts out with an analytical framework, that gives out necessary background information about the RMA concept. This information is then used to explain a more detailed approach and structure, which mark the end of the analytical framework part. The empirical part is basically divided into two segments, where the first segment deals with the RMA character and relevance in the specific context of China and Taiwan, and the second segment deals with their respective RMA related military capabilities. The thesis ends with a conclusion that summarizes the main findings of this work that are derived from the answer to the main research question and its related subquestions.

1. Analytical Framework

1.1 Origin and Evolution

The Military Technical Revolution

The idea behind the *Revolution in Military Affairs* (RMA) started out way back in the twentieth-century Soviet Union, where it was known under its former name *Military Technical Revolution* (MTR). As such, it was mostly a theoretical concept that was created in a response to several emerging occurrences. In general, the scientific sphere saw an influx of new progress and ideas, which also offered new dimensions to the military sphere in terms of scale and methods of then envisioned warfare. What's more, these innovative changes were mostly reflected in Western military initiatives that alarmed the Soviet Union's own military capabilities. Most notable of these were the United State's new approach to their military doctrine known as the *Airland Battle* as well as NATO's (*North Atlantic Treaty Organization*) so called *Follow-on Forces Attack* approach to the possible Soviet threat. Suddenly the quantitative power resulting from the Warsaw Pact was put to test by these new developments. Not only were these initiatives employing more advanced weapon systems, but they also started implementing more sophisticated computing assets capable of gathering and processing a bigger load-out of information, as well as interconnection of different force units, which would be able to carry out more complicated strategic choices and operations. All this suggests, that even though the Military Technical Revolution started out in the Soviet Union, it certainly got its impulse from the West, which in that time went even so far as to concern itself with the idea of unmanned vehicles (OTA 1986: 1,7; Raska 2011: 2; Skinner 1988: 21, 24-25).

As a result, the Soviet front was confronted with the need to start counterbalancing the Western development in military establishment with something more than sheer numbers of its force units and Cold War tactics. Despite the Soviet Union's lack of socioeconomic means, which would prosper the overall technological advancement, there were many theoretical debates that spurred the question of a more efficient and modernized military. Perhaps the biggest proponent that realized the need of the Soviet army's restructuring from a giant force cluster into a more compact and advanced stronghold, was Marshall Nikolai Ogarkov. Ogarkov believed that conventional forces coupled with modernized military assets like for example precision guided missiles and superior sensors would even equal standard nuclear weaponry both in scope and lethality. It was also he who laid down the term *Military Technical Revolution* (Reynolds and Vince 2012; Watts 2011: 1-2).

The ongoing debate about the future of warfare and the adaptability of the Soviet military led to some accurate predicaments. Some of these included the ability of a seamless sharing and processing of information, long-range non-nuclear ballistics or even changes in tactics, which would require new layers of interconnected systems (Krepinevich 2002: 7). For all it was worth, the Soviet Union even tried implementing Ogarkov's ideas into a series of their own initiatives. Worth mentioning is the so called *Reconnaissance-strike Complexes* program, which fused together several components such as automatization, information acquisition and long-reach precision munitions into a single interconnected system entity. At the end of the day however, the MTR still

remained mostly a theoretical concept rather than a full fledged revolution. This was mostly caused by the high costs of the different projects, which were too ambitious and even out of reach given the limited amount of available resources (Krepinevich 2002a: 6; Raska 2011: 3).

The Commencement in the West

Shifting our focus to the Western front, the United States were already investing its energy towards future military planning and development since the earlier Seventies by the means of the specialized *Office of Net Assessment* (ONA). The for-most goal of this office was to analyze at that time the current military scene as well as to deduct sometimes even the unforeseeable future of the military development. All in all, these speculative assessments acted as an assist tool for the Pentagon in order to decide on the most optimal deployment strategies depending on the situation at hand. The tie between the ONA and the soon-to-be RMA was established thanks to the very director of this office, namely Andrew Marshall. During his still active career, Marshall was able to make several correct predicaments like the economic fall of the Soviet Union or the amplification of China's power, which acquired him a following both in the academic sphere as well as political connections . However, one of his more peculiar predicaments are those concerning the development of modern warfare, which were kickstarted by his interest in the almost forgotten concept of the MTR (Maddrell 2003: 3,5; Whitlock 2013).

Together with Andrew Krepinewich, who shared Marshall's sentiment regarding the future of military affairs, they released a report showcasing the viability of the MTR elements. Despite the concept's solid base structure, the sheer focus on technological progress did lack the attention to other relevant operational and organizational aspects of military development. Following this report came the study *Some Thoughts on Military Revolutions* that not only led to the more advanced concept of the RMA, but also stirred the term "*transformation*" into the midsts of defense debates (Krepinevich 2002a: 11; Maddrell 2003: 5). However, the term has been so flexible that it served more as a justification for the defense manufacturers who dictated their produce under this label, which was lacking a specific guideline in terms of defense planning and applicability. Still, it somehow enforced the competition of the defense industry, which tried to come up with the next level of cutting edge weaponry and technology at the right price. Perhaps the biggest breaking point in this period was the first Iraq war in 1991, also known as *Operation Desert Storm*, which was a collaborative effort initiated and led by the United States. This conflict was a good opportunity for the United States to showcase its transforming military progress, which gave the opposing forces little to no room for counter attacks. After this swift and low casualty victory, the transformation trend skyrocketed⁶ on to the upcoming years finding favor and empowerment in the freshly reintroduced RMA debate (Dombrowski and Ross 2008: 15; Finlan 2003: 29, 86-87).

Having a strong foundation from the MTR, the debate around RMA was still figuring out if such things as revolutions can or did occur in the past. Michael Raska

⁶ For demonstration purposes, the first war on Iraq disposed with a rough twenty percentage of "smart" projectiles, which were used sparingly for delicate situations. The Second war on Iraq that started in 2003 had a complete overhaul, switching completely to *Precision Guided Munitions* (PGMs) whose needed deployment decreased almost tenfold compared to the total number of missiles needed in the first conflict (Chapman 2003: 6).

writes that the general consensus at that time viewed the concept of RMA as “*periods of innovation that can change doctrine, tactics, procedures and technology*” (Raska 2011: 5). The concept even showed potential for being an innovative approach to strategic planning for the upcoming future where Cold War mentality lost its momentum. Even then however, there was no single consensus even among the many proponents who saw the RMA concept mostly either as an “external process” with the goal of keeping geostrategic security challenges in check or also as an “internal process” that rather dealt with reorganization, new acquisitions and internal policies (Raska 2011: 5).

Embracing Transformation

The perhaps most turbulent stage of the RMA occurred right at the beginning of the twenty-first century, when the Bush administration had to react to the direct intrusion of *asymmetric warfare*⁷ of the September 11 attacks. The mere fact that these sudden attacks caused more damage and turmoil than the long-going Cold War era, was so alarming that everything from basic military doctrine to budgeting and force structure was questioned and reevaluated. The effort to make a change for the better resonated very well with the proposed idea of *transformation*, which as mentioned earlier was exerted by the likes of Marshall and Krepinewich. Still, what made the big difference in implementing the RMA concept was not only the devastating occasion of September 11, but also the adherents of Marshall himself, which at that time occupied influential posts. The key figure here was undoubtedly the Secretary of Defense Donald Rumsfeld, who did strengthen the RMA's odds by selecting appropriate candidates for posts like the Deputy Secretary of Defense or the Secretary of the Army (Buffaloe 2006: 2-3; Chapman 2003: 3; Raska 2011: 7).

However, because the line between a real revolution and the steady process of modernization was - and still is - hardly measurable, the term *Defense Transformation* has been opted as more suitable both in its meaning and its pursued policy. Krepinewich himself described the term *transformation* in relation to the RMA as a “*process that a defense establishment undertakes if it believes a military revolution is under way, or is potentially under way*” (Krepinewich 2002b). This established association between *transformation* and the RMA was also embedded in Rumsfeld's initiative response to the September 11 attacks, when he commenced the establishment of the *Office of Force Transformation* (OFT). The OFT was basically an open playground to test out many ideas of the RMA concept. These ideas were mostly promoted through the *force transformation* initiative, where aspects like jointness, intelligence processing and evolved war-fighting took center stage. Not only did all this affect the general force structure, but it also fostered new popular concepts like *Network-Centric Warfare* and *Effects-Based Operations* (EBO)⁸ (Bitzinger 2008: 4; DOD 2003: 9-10; O'Rourke 2006: 9-10).

That being said, it was in 2006 that the OFT has been dissolved. As a result, the roles carried out by the OFT have been redistributed among other branches of the

⁷ Defined as: “*Warfare involving surprise attacks by small, simply armed groups on a nation armed with modern high-tech weaponry*” (Oxford Dictionaries).

⁸ Richard Bitzinger hints at how the *Network-Centric Warfare's* technological progress is interlinked with OFT's emphasis on military improvement and innovation. As for the concept of EBO, he describes it as a “*shift away from 'traditional' attrition-based warfare in favor of attacking the enemy so as to achieve certain political-military results*” (Bitzinger 2008: 4).

Department of Defense (O'Rourke 2006: 10). According to Terry Pudas, who was one of the senior officials at the OFT, such redistribution is prone to be positive, as the original OFT was meant to be a *catalyst* that would dissolve its roots of thinking into the more mainstream parts of the Department of Defense (Rogin 2006). This redistribution and fusion into the overall defense policy, could have however impacted the fragmented nature of the concept even more. As Kathleen Hicks has pointed out, the strength of the OFT lied in its cohesive nature, which was overlooked by a united authority⁹ that had a clear understanding of its goals and their implementation (Rogin 2006). Whatever may ring true, the RMA concept has its fair share of ups and downs, as some later paragraphs will show more deeply.

1.2 Defining the Concept

As demonstrated, during the RMA's formative years, there was much talk about how to frame and describe the concept's many ideas. And even though definitions and applicable suggestions have been created and approved, the big dilemma of what counts as revolutionary in this contemporary era and what not, is rather conflicting and probably left for future times to tell more precisely. Many argue, that the spoils of the current military progression are evolutionary, rather than revolutionary, because of their earlier debut. Progressions like *Precision Guided Munitions* (PGMs), *Global Positioning System* (GPS) or joint operational concepts were all first introduced in the twentieth century era (Sloan 2002: 32-33). Still, the big picture for the concept is the notion of change. The following is a twentieth century statement made by Marshall, when talking about the essence of the RMA: *"The term 'revolution' is not meant to insist that change will be rapid, but only that the change will be profound, that the new methods of warfare will be far more powerful than the old"* (Sloan 2002: 32).

Till this day, Marshall's emphasis on change has been also embedded to many other definitions of the RMA. For instance, Bernard Loo starts right off the beginning to describe the concept as an idea where *"dramatic changes in any number of variables of war [...] lead to fundamentally and radically different approaches to the entire military structure and its modus operandi"* (Loo 2009: 1). Another definition brought up by Paul Davis goes by a similar route of meaning. He accepts the definition¹⁰ of the concept, according to which the RMA is seen as a *"major change in the nature of warfare brought about by the innovative application of technologies, which, when combined with dramatic changes in military doctrine and operational concepts, fundamentally alters the character and conduct of operations"* (Davis 2001: 425). Despite Loo's definition being more vague than Davis' in its use of plural and unspecified variables, they both handle the RMA concept as a process emphasizing technological change together with doctrinal and operational change.

However, after a closer inspection, the big major difference between Marshall's original interpretation and the two latter interpretations is in the scale of this change. To be more precise, Loo and Davis present the term in a much grander horizon, which may

⁹ Hicks was mainly referring to the deceased head of the OFT, Vice Admiral Arthur Cebrowski. Because of his expertise and clear vision, Cebrowski was regarded as the main moving cog of the OFT (Rogin 2006).

¹⁰ Originally formulated by the United States' Office of the Secretary of Defense (Andrews 1998: 1).

even imply a drastic *transformation*. Marshall on the other hand clearly states that change doesn't have to happen in a flash, in order to bring forth desirable outcomes. What Marshall proposes is more closer to the idea of *Modernization-Plus* than to a swift *transformation*. Richard Bitzinger describes *Modernization-Plus* as a “*sustaining process of innovation*”, that in his opinion puts its focus onto the different weapon systems and technology initiatives of the RMA, rather than on a complete *transformation*, which is expected to also include changes in military doctrine, organization and institution (Bitzinger 2004: 1). To go even further, *Modernization-Plus* should be seen as a *transition* process. Robert Worley explains that changes in the military are confined to have either the characteristic of a *transformation* or a *transition*. While the change of a *transition* is part of a planned process that meets the desired expectations, the change of a *transformation* is more an “*emergence of a new state of being [...] (which) is unknown until it takes shape*” (Worley 2006: 5). Because the *transformative* outcome can't be predicted until it takes form, the *transitive* nature of *Modernization-Plus* could be considered to be a preset process in achieving RMA related change, that could potentially trigger a more bigger revolutionary change along the way.

To end off with a specific example that showcases both the difference and interconnectivity between *transformation* and *Modernization-Plus* in terms of an actual RMA, Timothy Andrews provides a clarifying demonstration. In his research, Andrews mentions how the Naval Revolution lists both the once dominant battleship type known as the dreadnought together with submarines and torpedos as its key components. On one hand he acknowledges the fact that both innovations were a step forward, but on the other hand he also sees them as two completely different magnitudes. Andrews argues that while the dreadnought was a remarkable asset with its improved force projection, it didn't change much in terms of strategy and doctrine, as warships generally still continued to exchange projectiles like in the days of old. With the introduction of the submarine and torpedo, the once clear battlefield front-lines weren't so obvious anymore and large battleships themselves had to look for strategic rearrangements of their fleets in order to stay afloat (Andrews 1998: 3-4). While both these inclusions are regarded as part of the Naval Revolution, their character is certainly different. In the case of the dreadnought, the innovation is more representative of the *Modernization-Plus* side of the RMA. On the other hand, due to the submarine's and torpedo's more far reaching change that spanned so far as to adjust the military doctrine, one would see this innovation clearly as a more *transformative* one. Despite this somewhat bipolar classification, Andrews practically confirms Marshall's point of view by stating how accepted RMAs of the past occurred “*over decades, if not generations, and consisted not of a single defining moment but rather of iterative and frequently interactive development over a period spanning a technology's introduction to its maturation*” (Andrews 1998: 3). So once again, even if the outcome of a specific innovation is more in the lines of *Modernization-Plus*, there is no denying that it still fuels a better probability of a *transformation* outcome in the upcoming future. While there are many more formulations on how to define the RMA process, Andrews' statement and example pretty much summarizes the extent of what the RMA is and how it occurs. As such, this thesis will use his understanding of the RMA concept as a default presetting.

1.3 State of Art

1.3.1 Main Perspectives

Since the conceptualization of the RMA, there have been many ongoing debates, which reflect both high hopes as well as a serious skepticism towards the future of the concept. Most of all, the biggest deviations in the concept's reception lie within the contemporary RMA discussion, because when it comes to military revolutions of the past, the general consensus is pretty much more coherent than the one concerned with the current and future RMA developments (Cooper 1997: 99-100, 123). In this context Worley argues that the RMA is both a historical phenomenon as well as a "*catchall term for any and all so-called transformational efforts*" (Worley 2006: 18). He explains that the military establishment has witnessed many revolutions over the course of many centuries, both in terms of capabilities like for instance with the invention of chariots and longbows, as well as in operational terms like during the Napoleonic Wars, where nationalism was utilized as an effective tool for massive force mobilization against the modest unsuspecting specialized troops of the neighboring monarchs (Worley 2006: 19-20). As for the present day RMA, Worley believes that despite the focus on information and technology, there is no real way of telling how this new RMA would look like (Worley 2006: 9). Perhaps thanks to the temporal setback of the many acknowledged revolutions, it was much easier to evaluate their different developmental outcomes that occurred during their time, as opposed to the contemporary RMA debates that are more future oriented.

These contemporary RMA debates, cover some quite differing perspectives, which not only try to predict the next big revolutionary development or even occurrence, but which even question the validity of the concept itself. The perhaps most optimistic perspective however seems to be that of a needed substantial modernization process, that would ultimately make a breakthrough in the exerted standards of modern warfare. In this regard, James Blaker's opinion on the RMA encompasses many of the proponents' arguments of why RMA is indeed a valuable approach for the modern military scene. First of all, Blaker believes that the RMA is a natural requisite for being able to withstand the new challenges of the rapidly emerging digitized era, which in his opinion needs serious conquering in the military domain of preparedness and adaptability (Blaker 1997: 29). He is also aware, that the RMA is a broad concept, but in its defense he argues, that in order to achieve the mentioned preparedness and adaptability, the advancement has to cover a wide spectrum of areas. This is also due to the very fact that one of the RMA's key elements is interconnectivity which tries to unite this spectrum under one roof. Another thing that Blaker mentions, is the void of an essential threat, which would accelerate the RMA vision to a whole new level. Overall, Blaker together with Richard Hundley believe, that due to the perceived notion of the United States' military superiority, there isn't enough impulse to take bigger challenges or even risks, which would move the RMA at a much steadier and noticeable pace (Blaker 1997: 3, 29-30; Hundley 1999: 85). Yudit Kiss also attests to the RMA's validity, by pointing out that it is a capital-intensive process that has indeed produced a change in terms of war perception. According to her further explanation, this changed perception does not only involve the pure act of waging war, but also the assessment of risks and international security matters (Kiss 2014: 13). To this, Arun Sahgal and Vinod Anand add, that the RMA is not only important for a country's specific military and strategy, but also for a much wider

regional, or even worldwide, development of security structures and policies, because they believe that RMAs can create what they describe as “*politico-military establishments*”, that could ease the handling of any future-related security matters (Sahgal and Anand 2007: 115).

As for the actual method for implementing RMA strategies, Bitzinger describes how some RMA proponents see the concept as an integral part of the overall defense transformation. To be more specific, Bitzinger comments on how some proponents of the concept expect from the industrial sector to undergo a revolutionary change of its own. He thinks that the reason for this lies in the fact, that large traditional defense contractors are mostly reserved to what is called legacy platforms, which include all the typical conventional capabilities from heavy weapon platforms to unguided weapon systems. To satisfy the needs of RMA related projects they would need to commit to a more drastic makeover. To commence such a makeover in the first place, the government would have to have high demands for acquiring RMA related military capabilities. In case this demand exists, there would be a chance to ignite even something as a complete defense transformation (Bitzinger 2008: 7,9).

Another slightly different perspective revolves around the idea of how the RMA is responding to the developing commercial environment itself. Here again, Kiss together with Bitzinger point out, that smaller defense contractors are also a possibility for extinguishing the thirst for RMA related military capabilities. They both have taken notice, that certain key RMA areas like information technologies are better left to smaller, yet more specialized suppliers, or even to commercial suppliers that can offer so-called commercial off-the-shelf (COTS) items and services that tend to have a dual application option fit for several RMA needs. As a result, many companies that are engaged in other sectors like communications, finances or the mentioned IT, are now a vital part of the RMA related markets. What more, they suggest that such a commercial environment is basically a more opened up market, which offers an alternative route to obtaining certain RMA capabilities more easily even from abroad (Bitzinger 2008: 8, Kiss 2014: 12-13).

Moving on, there are the more skeptical views that also present some legitimate uncertainties about the concept. To start off, Jeremy Black expresses the nature of the RMA as a very problematic one. He believes that the concept seems more like a never ending cycle that reacts to something, that he believes is just another standard wave of the unfolding evolution process (Black 2007: 1-2). Following in this skepticism are Peter Dombrowski and Andrew Ross, who even though don't completely reject the possibility of a military revolution and its connotation to transformation; feel as it is rather a rare phenomena. Their biggest gripe with the current RMA proposals lies in the lacking evidence department, which they feel isn't persuasive enough in supporting claims like those touching upon technologies that are ahead of their time. They argue that the focus on rapid technological progress is a self-evident outcome of the Industrial-Information Age transition. They also present their stance on the industrial sector's advised transformation, by arguing that in order to keep the many innovation processes going, existing capabilities are much more sufficient in bringing out desirable results than potentially risk-encompassing new ones (Dombrowski and Ross 2008: 13). They also feel, that the United States' RMA sets a really high bar that builds up more hype than it can sometimes handle. They feel that a wide innovative focus may come out as less effective, due to the mere fact that other enemy forces are constantly becoming quite versatile and adaptive in their own right (Dombrowski and Ross 2008: 37).

All in all, many of these still ongoing RMA debates send out strong implications as to how a potential new military revolution should or even might occur. Other than that, Leslie Eliason and Emily Goldman also underline the need to establish more case-specific RMA debates, that focus on the concept's global diffusion in other country's than the United States, as they both see the RMA concept as an important factor that is capable of shaping regional or even worldwide military balance. They argue that even if the technological innovations may keep on coming, the technological gap of some countries might also decrease to such a level, that it could make way for new RMAs (Eliason and Goldman 2003: 2, 6). At last, built on this line of thought, Goldman together with Andrew Ross imply that the most important perspective at the end of the day, is the one of each specific nation state, which is in one way or the other somehow interested in integrating RMA elements into its own military infrastructure. They suggest that such an integration would differ from case to case as one has to count with factors like different strategical demands, doctrine or even cultural and institutional arrangements (Goldman and Ross 2003: 402).

1.3.2 Main Elements as Categorized by Gary Chapman

While to some the RMA's concept description may at first seem general and dimmish, there are certain borderlines that dictate the main areas of interest. Gary Chapman believes that the concept's main focuses can be summed up in five prevailing elements, which he categorized as the following:

“*Great Advances in Computational Power*”, which nowadays are mostly dominated by the private sector, have a direct impact on the military's technological sphere. Chapman argues, that the current sophisticated development process of commercial assets has led to a situation, where the military is better off infusing the existing know-how, rather than overspending resources on brand new R&D (*Research and Development*), which in some cases could come out as less superior as its commercial counterpart. In comparison to the days of the past¹¹, when computational advancement was aimed at governmental projects¹² regarding mostly intelligence processing and the military, the open market of nowadays provides much better solutions that are easily affordable and adjustable, making it possible to deliver not only qualitative products that utilize such technologies, but also their higher quantity for a potential mass-production (Chapman 2003: 3-4). On the other hand however, Götz Neuneck and Christian Alwardt point out, that the evolving *high-tech* weapon systems opposed to *low-tech* ones will still require more attention in terms of specialized R&D and funding. They argue that this more enclosed and specialized environment makes *high-tech* weapon systems harder to proliferate than the more apparent *low-tech* equivalents (Neuneck and Alwardt 2008: 8). Keeping both these proclamations in check, it is still logical to assume, that a country's competence in military technology would be a lesser challenge, if the general economic-technological sphere is promoted to wield constantly better results.

¹¹ Predating the 1970s.

¹² Like for example the Pentagon in the United States.

“Joint Service Commands and “Data Fusion”” refers to the interconnection of different force assets for a more reliable line of command and control. As Chapman points out, the main goal here is to *“deliver the right weapon at the right time and the right place no matter which service is called upon to deliver it”* (Chapman 2003: 5). Some good examples that revolve around this element include the United State’s initiative called the *Joint Surveillance and Target Attack Radar System* (JSTARS) as well as their collaborative effort with NATO in the form of the *Airborne Warning and Control System* (AWACS). Both JSTARS and AWACS serve as mobile monitoring centers that operate from an airborne position in order to analyze and send out needed information from their surroundings to the command at charge (Sloan 2002: 6-7).

“Elimination of the “Fog of War”” is somewhat related to the previous described element as it also deals with operational intelligence processing. This time around however, the attention is shifted at seeking out as much information about the opponent’s actions as possible. The phrase *“Fog of War”* resembles the confusion and uncertainty of a battle-sphere, where the lack of information makes it difficult to make the most rational decisions. Chapman defines the goal of the RMA in this field as an effort to achieve *“battle-space dominance”* by the means of a *“transparent battlefield”* (Chapman 2003: 5). Although the desire of such transparency is limited due to different counter measures, the advantage of superordinate information is one of the main aspects of tactical warfare. Nowadays the acquirement of superior data isn’t just restricted to obvious methods like for instance those that make use of the GPS, but also to more bold ones like the *Unmanned Aerial Vehicles* (UAVs), which are reportedly quite effective as surveillance bots (Neuneck and Alwardt 2008: 6; Sloan 2002: 63, 71).

“Agile, Lower-Cost Weapon Platforms” take the place of one of the better known elements of the RMA. Yet, it is also a concept that is surrounded with quite some controversy. This controversy revolves around the argument that massive conventional platforms, which host weapon systems are not only hard on the budget, but are also much more prone to vulnerability from enemy aggression, which can take advantage of their poor mobility. Chapman explains that the RMA proponents are far more in favor of much cheaper and mobile platforms, which would count on other RMA’s favorite assets like PGMs or drones (Chapman 2003: 5-6). It can be even argued that here PGMs are a standard basis for an effective application of smaller and more mobile weapon platforms. The reason for this is the sheer destructive power that is complemented by a relatively small size and precision, making it an almost universal tool of destruction that can be applied to many weapon systems (Watts 2013).

“Fast, Deadly, Smaller-Unit Force Structures” are another element that shares the common RMA thought process of smaller is better. Just like the element before, mobility of special force units is considered to have better chances at both engaging the enemy at its weak spot as well as to gather crucial intelligence. Such unit’s expertise to comprehend the RMA’s sophisticated technology and weapon systems is considered a must in comparison to more bigger conventional forces, which as Chapman suggests are not optimal for quick and intense operations or reconnaissance missions in general (Chapman 2003: 6-7).

1.3.3 Schools of Thought

Despite the above reoccurring elements, some followers of the RMA have been leaning into different camps according to the way of how they utilize the concept's ideas into certain goals. Still, William Owens'¹³ so called *System of Systems* (SOS) is considered to be the most influential school of thought of them all, because it entails all of the basic principles of the RMA that were discussed earlier, plus some more. As Rajesh Kapoor notes, the main argument lies in the “*powerful synergy*” of these single principles, which try to bring forth an overall better efficiency through the way of interconnecting each system¹⁴ with each other - thus the name *System of Systems* (Kapoor 2010: 23-24). It is therefore no surprise that one of the more frontal components for this matter is the concept of *Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance* (C4ISR). Although the C4ISR is regarded as a school of thought in itself, it provides no serious restraints that would hinder its implementation into the SOS, as both deal primarily with interconnectivity, just on a different scope. Overall, the C4ISR on its own focuses on how to implement the latest achievements from the electronics world into a defense-technology variant. With the constant progression of computers and supercomputers, the relevance of C4ISR for the SOS has become practically inseparable (O'Hanlon 2001: 297-298).

In a similar manner, the next school of thought known as the *Dominant Battlespace Knowledge* (DBK), also takes great interest in the latest information technologies. Its origin story is tied to the *Dominant Battlefield Awareness*, which was an initiative of the ONA. The aim here was to envision the possibilities of future *Intelligence, Surveillance and Reconnaissance* (ISR) technologies, which could reveal visual information about potential battle environments¹⁵. It later became the DBK, because the focus shifted to not only obtaining information, but also to processing and understanding it (Watts 2011: 33). For some obvious similarities, the DBK highly acknowledges the SOS school and its focus on C4ISR. Still, its emphasis remains on the battlefield and on the ISR technologies in general. One of the most common traits of this school is the reliance on sensors. From gravimetric to vibration sensors¹⁶, they all serve as major tools in the ever-going effort of making a battlefield seem more transparent, if not completely. However as far as a complete transparency is concerned, this over-reliance on sensor technology is something that makes SOS proponents skeptical, as they believe that the dominance of few key aspects is far more inferior compared to the more complete package of the SOS school (Libicki 1995: 6-7; O'Hanlon 2001: 299).

The last main school of thought *Global Reach/Global Power* (GR/GP)¹⁷ is considered to be the one with the biggest ambitious vision. It is a school that is mostly represented by the United States Air Force, which is considered to be the main force structure behind the school's vision. This vision's main goal is world superiority in areas

¹³ As the Vice Chairman of the Joint Chiefs Staff in 1996, he gave foundation to the concept (Raska 2011: 6).

¹⁴ See segment 1.5 for a complete listing.

¹⁵ Most specifically North Korea at that time (Bracken 1995: 22-23).

¹⁶ These particular ones gather data by analyzing weight/substance and acoustic/seismic activity respectively.

¹⁷ Also referred to as *Global Vigilance, Reach, and Power*.

like global monitoring, global mobility and almost immediate strike with absolute accuracy (Berg 2008). The endeavor to identify enemy threats across the whole world together with their instant neutralization is by some seen as too far fetched. Still it has led to some elaborative projects that span anywhere from transcontinental munitions to weapons systems that operate from the orbit. Proponents of this school are mostly considered as the most radical-transformation wing of the RMA, that seeks to make beneficial replacements of many of the current military's assets, which might show restraints in the above mentioned monitoring, mobility, and immediate strike (O'Hanlon 2000: 18; O'Hanlon 2001: 308-309).

1.4 The RMA Concept and the Asia-Pacific

Starting off with a disclaimer, it should be noted that although the focus of this thesis is on China and Taiwan, which befit more to the East Asian context, this part discusses the RMA in a much broader Asian-Pacific context as its RMA implications directly carry over to East Asia.

Before delving into the Asia-Pacific territory, it should come as no surprise that the majority of publications focus on the United States' RMA, as they are the ones who practically conceptualized the idea into its current form. Despite some conflicting views and perspectives, the concept provides enough appeal and relevance for it to be also discussed outside the Western spectrum. To this, Saïda Bédar points out several interesting observations. Before anything else, he explains that the United States' power projection, in which the RMA plays a key role, is destined to invoke some response from other global players that may follow a route similar to that of an RMA. Bédar also emphasizes that the real practical sense of the American RMA is in what he describes as a "*capabilities-based strategic framework that leads to over-armament*" (Bédar 2001: 33). What he tries to imply is the changing nature of existing or in the future occurring arms races, which are no longer hostage to a bipolar power balance like in the days of the Cold War, but are scattered among a number of new players. Overall, Bédar is leaning towards the idea that the United States' growing military horizon will not be that deterrent as it will be encouraging for other nations to take pursuit in their own military capability races, both local and more regional ones (Bédar 2001: 27, 33).

To further envision the possibilities of an actual RMA spread in the Asia-Pacific, Sam Tangredi provides some useful inputs, which came out as a result of different separate studies¹⁸ that were concerned with the future military developments in the timeframe from 2001 to 2025. The most relevant propositions for this thesis suggest, that top tier military technologies and capabilities will become widely available outside the United States, and that also other powers will start to follow their own RMA strategies. However, according to these statements, it is also expected that the United States will keep their lead over these other RMAs, and in case a supreme innovation in military capabilities should happen, it will still most likely occur in the United States or in one of their allied partners' military establishment (Tangredi 2001: 28-29). Tangredi continues to explain that the diffusion of advanced military capabilities happens through three identifiable processes which he believes are the very sales of such capabilities, the

¹⁸ A comparative analysis of a total number of 36 studies that generated a general (not an absolute) consensus of 16 likely to happen military developments.

exploitation of so-called “*dual-use-systems*”, which refer to the the earlier mentioned COTS, and lastly each country’s respective developments of indigenous capabilities. Still, the most unclear factor in regard to the perspective of expanding advanced military capabilities lies in the pace of such a diffusion, which he argues will differ from country to country. As for the United States RMA dominance, Tangredi also warns that this is not a certain fact, as some experts suggest that the American RMA is underfunded and may be possibly overstepped by other thriving powers (Tangredi 2001: 35, 37).

However, the question still remains, how does or would an actual RMA fit into the Asia-Pacific context? While there might not be a definitive answer due to the different regional players that are present here, there are many strong suggestions that prove the RMA’s validity in this part of the globe. Sahgal and Anand identify China as the biggest RMA player in the region, which has both the resources and consideration that is due to the fact of the United States’ strong presence in the region, which also affects the Taiwan specific situation (Sahgal and Anand 2007: 113). Still, the RMA discourse doesn’t stop at China, but as Frank Umbach suggests, it starts with it, as the mainland’s both political and economic growing power projection is especially observed by the neighboring states, which in response try to react accordingly (Umbach 2005).

As such, many articles provide hints and evidence of a wide spreading RMA, which is as diverse as its candidates themselves. To demonstrate, one only has to take a look at regional players like Japan, South Korea or even Singapore. While the first one is known for its pacifist stance, the other for being under constant alert from its north neighbor and the last one for being a thriving city-state, they are all reportedly quite knowledgeable and active in terms of RMA. In the case of Japan, David Pilling notices how the once modest defense spender is rethinking its approach, both in regards to their own defense spendings and in terms of interstate mutual cooperation of new armaments (Pilling 2014). As for South Korea, Tae-jun Kang reports how the state’s pursued interest in security strategies and technologies due to being under pressure from North Korean threats, has had a remarkable side effect in both the country’s technological know-how progress and its respective defense related arms exports. Kang also puts to attention, that South Korea’s defense industry is no more a copy cat of the United States’ capabilities, but has its own indigenous production base that ranks among the world’s very best. It is even suggested, that as far as revenue from defense exports is concerned, South Korea will reportedly also eventually¹⁹ surpass the global giant China (Kang 2014). Last but not least, Singapore is argued to be the most sophisticated and capable military establishment in the whole Southeast Asian region. Despite some of the city-states’ obvious limitations in areas like military personal or room for broader operational maneuvers, Tim Huxley describes Singapore as very capable in key RMA fields like C4ISR or precision force. Singapore views the RMA’s approach to innovation, readiness and interconnection as a logical step to take, because despite its lack in size, it has the biggest air force in the neighborhood that together with its other modernized units, even though they are mostly based in foreign domains like the United States, Australia or France, is always expected to react at short notice to any possible threats or direct attacks (Huxley 2004; Pilling 2014; Richardson 2004).

Despite this state of events, Bitzinger warns that the Asia-Pacific RMA diffusion should be taken with a grain of salt and observed very carefully. He argues, that the signs of military spendings and information technology-led military innovations are more often

¹⁹ Kang reports, that this is forecasted to happen by the year 2016.

than not restricted to the *Modernization-Plus* process. He goes into more detail by explaining, that many at first glance growing defense spendings don't necessarily reflect a dramatical increase in RMA capabilities, as conventional legacy platforms are expected to be pretty much at the forefront of such investments. While he doesn't really deny the innovative effort of some of these countries, he still sees some serious obstacles built by the institutional and organizational aspects of their cultures, that in end effect hinder the much bigger transformational changes that are of doctrinal or even institutional character. One such example would be the Confucian values, which Bitzinger suggests also have their place embedded in military hierarchical structures, leaving something as defense decision-making up to groups of elite few "old boys" (Bitzinger 2005: 40; 51-52). Andrew Tan also shares a similar sentiment, as he agrees that the general view on the RMA in the region is to dispatch with top tier military forces in order to tame the many local disputes, by what he calls "*conventional warfare superiority*". Tan argues that while the RMA in this region is a compelling concept, the interested parties should not only handle it as a simple dimension to more efficient means in modernizing their military forces, but should also consider creating a more apparent link between their pursued RMA and political objectives. Tan concludes, that despite the many RMA-related organic developments in the region, it is advised to overcome this in his opinion conventional war posture, by letting the respective RMAs of these countries' go politically deeper, what in end effect could result in the concept's better strategic use towards more specific objectives and capability developments (Tan 2011: 71, 93-94). Lastly, Sung-pyo Hong feels, that the first crucial step in a country's RMA pursuit is to start with a solid base of assets, which will later on dictate the future diffusion and development of a country's pursued RMA. He thinks, that while many advanced countries, like in his example South Korea, are pretty much young cadets of the concept, whose possession of substantial capabilities will enable them to evolve and shape their future RMA postures (Hong 2005: 232-233).

1.5 Approach and Structure

Before carrying on with the empirical part of this thesis, it is mostly important to address some points of the research question and explain how to approach the thesis in relevance to the up till now described RMA. To start at the beginning, here is a recapitulation of the research question, which is as follows:

How has Taiwan responded or is responding to China's pursuit of the Revolution in Military Affairs?

To reach a satisfying conclusion to the main research question, the following essential subquestions have been derived:

1. *What is the Chinese Revolution in Military Affairs?*
2. *What is the applicability of a Revolution in Military Affairs set in Taiwan?*

3. *What effect does the presence of the United States have on the Chinese and on the potential Taiwanese Revolution in Military Affairs?*
4. *What strategic arrangements benefitting from the Revolution in Military Affairs concept do China and Taiwan have against each other?*
5. *Does Taiwan have counterbalancing assets against China in the primary Revolution in Military Affairs related military capabilities areas?*
6. *Do both countries' assets abet their respective strategic arrangements?*

In order to find well rounded answers to these questions, the main empirical part has been divided into two segments, which each deal with a specific area of interest.

The primary role of the first segment is to tie up as many loose ends as possible by recognizing the extent and nature of the RMA concept in China, or in the case of Taiwan the concept's implications and applicability to its military establishment. Despite China's official affirmation of the RMA concept, one still needs to preview its meaning and goal in the context of the country's own military and defense thinking. By reviewing China's stance on their appropriated RMA, one should be able to find out if the RMA concept is based more among the lines of *Modernization-Plus* or if it implies an aim to achieve some rapid *transformation*, which affects or would affect the military doctrine and overall organization. Another step that should shed more light on China's expectations from the RMA is to identify the mainland's original motivation that would mark the ignition of the RMA debate in China. Once these issues are out of the way, it is a good idea to see if China has a specific strategic arrangement towards Taiwan, that would greatly utilize the mainland's desired or obtained RMA capabilities.

The case of Taiwan in this regard is however a little bit tricky. Although Taiwan is a rising middle power that has the potential know-how and resources to shape its own proclaimed RMA into its military functioning, there are limitations both from abroad and within the political scene (Tan 2011: 88). As this work's hypothesis suggests however, there are both Chinese and American impulses, which do imply Taiwan's potential progress in its RMA related capabilities. First off is the assumption that military-wise Taiwan shapes its strategic vision by reflecting on the Chinese military development. As RMA is a substantial part of this development, it should be expected that Taiwan will try to countermeasure China with its own equal military assets. The other factor refers to the RMA giant the United States, which offers Taiwan some valuable inputs, mostly in the form of its indigenous RMA capabilities, which could be argued, have been absorbed into the Taiwanese military establishment.

Still, Taiwan's limitations present a valid obstacle to its potential RMA progress. Therefore, before discussing something as a proposed "Taiwanese RMA", one should attest the overall applicability of the RMA to Taiwan. For this matter, when questioning an RMA's diffusion to a new environment, Raska suggests that there are three key drivers to take into consideration:

1. *"The persisting geopolitical insecurity, regional rivalry, and uncertainty stemming from the emergence of complex types of conflicts and threats of the 21st century that broaden national defense requirements and operational needs."*

2. *“Increased economic growth rates, particularly in Asia and the Middle East, that increase the capacity to purchase cutting-edge weapons systems and accelerate force modernization programs.”*
3. *“The globalization, consolidation, and competition of global arms markets and defense industries that have to diversify their commercial interests through export-oriented strategies and innovation.”*

(Raska 2011: 9)

According to these three points, the thesis will start to analyze Taiwan by evaluating its insecurity towards China, economic affordability to make military based purchases and the actual acquisition of armaments from beyond the borders. Once this applicability has been assessed, the thesis will carry over its focus to discuss the nature of the United States-Taiwan relation in regards to their military cooperation. This part is highly required, because it establishes a fundamental understanding to the above suggested hypothesis that sees the United State’s RMA as an influencing factor. That being said, the United States-China military relation will also be discussed separately, as it is relevant to the United States-Taiwan military relation. Similar as in the Chinese case, the last part concerning Taiwan will attempt to identify a strategic arrangement towards China that would or does take advantage of the suggested RMA. Ultimately the analysis of this first segment should reveal the individual cases’ expectations for using the RMA as an asset to their strategic arrangement, which is needed to further observe their respective RMA based military capabilities.

After having addressed all the above questions and concerns, it is possible to concentrate on the actual military capabilities of the two cases, in regard to the RMA’s principles²⁰. In this regard, it should be put to attention, that former *Communist Party of China’s* (CPC) general secretary Hu Jintao, confirmed the SOS’s derived military capabilities as a forefront to a successful Chinese RMA (Thomas 2012; Twomey 2014: 152). It is because of this official stance, that this thesis will use the SOS’s generalization of the RMA related military capabilities, which are as follows:

1. *“Intelligence, Surveillance and Reconnaissance (ISR)”*
2. *“Computers, Control, Communications, Intelligence Processing (C4I)”*
3. *“Precision force”*
4. *“Stealth technologies”*
5. *“Lightweight, lower-cost, agile weapons platforms”*
6. *“Information warfare”*
7. *“Space weapons”*
8. *“Missile defense”*
9. *“Operations other than war”²¹*

(Chapman 2003: 11)

Although, the SOS school of thought is regarded as perhaps the most prestigious in terms of addressing RMA related topics and issues; its dissection of the 21st century generation

²⁰ Refer back to 1.3.2.

²¹ These deal with a wide range of operations, that span anywhere from humanitarian aid to hostage rescue missions (Chapman 2003: 13).

RMA capabilities is still too far overwhelming for this thesis. However, if one goes a step backwards from this listing, it could be argued that the core areas of interest are or were derived from *information processing*, *military platforms* and *precision force*. In order to stay as much coherent and relevant as possible, the second segment will use these three areas of interest as its basis for evaluating the existing military assets of both China and Taiwan. These three categories should cover just enough variety for which the RMA is in some regards infamous for, while at the same time, they also seem as the most viable options for implementing RMA assets into military establishments. After all, a scenario where interconnected and data processing weapon platforms work in synchronization with a central command system and are capable of using precision force for both offensive and defensive means, is what the SOS school of thought pretty much resembles.

What follows is a brief overview of the extent of capabilities that each of these areas represent:

1. The SOS school of thought is a high proponent of interconnectivity that utilizes all the other systems'd strengths into a single organic unit. For this reason, *information processing* is a must, because it glues this operational structure together. The capabilities here refer primarily to the C4I and ISR systems, which serve as a major component not only for managing data, but also for their spontaneous distribution among other linked military assets. Although C4I and ISR are sometimes handled as separate aspects, most contemporary developments tend to merge them together into what is simply known as the C4ISR. As such, this part will try to identify any coherent C4ISR structures that serve the RMA's aim of interconnection, monitoring and data distribution among other complementary assets.
2. The category of *military platforms* will be focusing on military assets that seem to be the most interrelated with each case's prior discussed strategic arrangements. The aim is to asses the state of these strategically required platforms and to see how much beneficial they are in their present condition.
3. The subject of *precision force* is another important aspect of the present-day RMA debate. Not only is *precision force* highly regarded for its sheer destructive power, but also for its high reliability in the context of quickly acquiring and reaching its target goal. In this regard, different PGMs are the main staple. It can also be argued that a country's possession of a high variety of PGMs is considered more positive, as some PGMs are more efficient in tracking and hitting a certain target than others. Due to such options to react to a certain operational maneuver more accordingly, this thesis will regard a more distinctive PGMs arsenal as more balanced in terms of *precision force* capabilities. Also, because Taiwan is clearly on the receiving end of the PLA's precision strike, the assessment will also consider the island's passive missile defenses, which are perhaps even more critical for Taipei, as it first must repel any enemy missile deployment or aggression before it can employ a responsive force of its own.

Where the first segment's role was to create a base for the hypothesis, the second segment's analysis aims to provide the building blocks to this base, which try to prove or disprove Taiwan's own potential RMA in a more practical sense. The analysis will judge

if Taiwan has exerted military capabilities in the above specified key RMA areas, that would act as a counterbalance to China's own RMA military establishment. It will also pay attention to the source of any of these capabilities, meaning that it will try to test the hypothesis' claim, which suggests that "Taiwan's RMA" consists of a mixture of both its own indigenous efforts and the United States' infused RMA capabilities. Potentially, the composition of this mixture might also reveal if Taiwan is placing its bets on a better representation of its indigenous military capabilities or if it is opting more towards the United States' military inputs. It should be however noted, that this segment won't attempt to decide upon the inferiority and superiority of Taiwan's and China's respective RMA capabilities. The assessment of such inferiority and superiority would call for a more radical approach like the RMA-related EBO, which even then would benefit from an already settled conflict, from which one would be more able to analyze each capability's role, operational success and effectiveness in opposition to the other side.

With all this in mind, it is now possible to commence onto the empirical part of this thesis.

2. RMA in the Context of China and Taiwan

2.1 The Case of China

2.1.1 Character of the Chinese RMA

Incentive to Pursue the RMA

Before trying to understand the nature and scope of the Chinese proclaimed RMA, one should also examine the defining moments, that led to such a decision in the first place. These breaking points are encompassed by two major foreign power projections, that left Beijing insecure towards its seemingly deteriorating military capabilities. These events are the 1991 Gulf War and the 1999 bombardment of Yugoslavia, which both have occupied the minds of many *People's Liberation Army's* (PLA) think tank since their initial occurrences (OSD 2008: 20).

Starting off with the first Gulf War, it is important to envision, that the Chinese PLA at that time was nothing like its current day counterpart. It didn't possess neither the operational complexity to establish a blockade upon the Taiwanese domain, nor the needed capabilities to exercise an assured invasion (Fisher 2008a: 219). The United States on the other hand demonstrated its progressing military capabilities to the whole world, when they as the leading head of the allied forces, overmatched the Iraqi forces. It could be argued, that this demonstration of power was all the more relevant for China, than it was perhaps for the United States themselves. In a sense, it was a defeat of the Soviet military mentality, under which the opposing Iraqi forces have conducted their waging of war both in terms of operational maneuverability and military equipment. This mentality was humbled by the fresh integration of capabilities that focused among others on C4I, PGMs and joint forces cooperation. Not only were these modernized forces more capable of inflicting damage on actual opposing armed forces, but they were also more successful in targeting their strategic decision centers, which dispatched command over them (Cooper 1997: 124, 133).

The Gulf War made China come to a realization, that it needs to act fast and accordingly, if it wants to prove its military worth to the rest of the world. As a result, the then general secretary of the CPC Jiang Zemin, issued first steps to even out the gap of China's obsolete military force. Because of the cast economic sanctions as well as ordered arm embargoes from the West, which were all consequences of the earlier CPC's violent handling of the 1989 Tiananmen Square protests, Jiang found that the best course of action would be to consolidate a dialogue with the north neighboring Soviet Union (Cabestan 2011: 197; Wu 2011: 226). This consolidation started within two months after the Gulf War's end with Jiang's visit to Moscow, where he expressed his high hopes for a common future Sino-Soviet bond, which won him the much needed cooperation in regards to a military-technical market as well as new opportunities for R&D in this department. Within the same year, the Soviet Union accommodated several Chinese defense companies' offices across its territory. Even after the Soviet Union's soon occurred breakdown, the cooperative military bond stayed untouched, whereby the PLA's research on all things RMA continued to grow without abruption (Nemets 2004). It even turned out, that the bilateral exchange between Moscow and Beijing outgrew even more

and eventually led to an official 1996 “strategic partnership”, which was justified as a natural response to a changing geostrategic space, in which NATO and the United States expanded their role and influence (Bin 2005: 233).

However, Beijing was stunned once more, when after the bombardment of Kosovo it came to a conclusion, that it had much more work ahead of itself before it could put its PLA on equal terms with the NATO and United States’ military forces. What the war in Kosovo demonstrated was a well synchronized joint air strike, which with the help of PGMs decimated the opposing forces not only in a quick succession, but also with finesse and almost²² no losses on the employed aircraft (Chapman 2003: 6). What followed, was another reworded declaration made by Jiang, which sent out a new strong sense of urgency to not only modernize the PLA’s military armaments, but also to form a new knowledgeable military personnel. As a result, the War in Kosovo sprouted two main concerns, around which the PLA would built its evolving RMA perception. The first dilemma revolved around speculations of how well would the PLA in its current state hold up against a highly advanced air force strike like the one seen in Yugoslavia. The other one was to figure out the best possible solution for a short-term military development, that would boost up the PLA’s chances against the top tier capabilities of the West (Nemets 2004).

All in all, Chinese military experts analyzed both the Gulf War and the War in Kosovo all the way through, whereby they identified several key factors that made the difference between just winning the wars and completely overwhelming the enemy forces. Some highlights of these key factors included successful assault attempts on command and control headquarters, rapid intrusions of both enemy and public communications or a space-achieved information superiority, which when coupled with remote missile strikes, aided in the destruction of key enemy strategic points. A topic of its own was also the topnotch air force, which in the case of the United States could launch an air strike right from its homeland anywhere on the globe, given the the advancement of in-flight refueling options. Not to mention that it was pretty much the only needed component to win the whole War in Kosovo, China knew that it would have to make some radical changes to its mostly land-based PLA forces (Shambaugh 2002: 85). Overall, it can be argued that with the RMA’s Soviet Union origins and the United States’ further conceptualization and following demonstrations, it was predestined for the Chinese PLA to take serious notice of the concept sooner or later.

Official Directions to Realize the Chinese RMA

It took much effort, but the PLA’s abrupt jump to a modernized military thinking over the past two decades has shown some visible results. Because of its initial military gap with the West, Beijing not only resolved to a more modern RMA approach in terms of future military goals and indigenous development, but it also opted for bigger defense spendings, that led to imports of many foreign top tier military assets. Due to these foreign military imports, Beijing was able to speed up its own RMA progress in military capabilities, by purchasing and researching foreign technologies. In just 2013, China announced that its overall annual military budget saw an almost six percent increase,

²² Reportedly only one aircraft was lost during this operation, whereby its personal was later safely retrieved (Chapman 2003: 6).

whereby different analyses report an average nine percent annual increase since the year 2004. It is however believed, that these spendings reach a higher number, as Beijing is known for not declaring some of its other major military-related expenditures. As for the future, it is estimated that due to the mainland's financial affordability and ongoing political ambitions to be a growing global power, this trend of military spendings will probably remain for many years to come (Kelly 2006: 61; OSD 2014: 43).

What is interesting about the year 2004, is its *de facto* first major proposition of official directions on how to achieve a desired RMA implementation within a specific time frame. These directions were introduced in that year's report on national defense, which had a major section dedicated to the Chinese RMA that stood in the forefront of the document (Kelly 2006: 62-63). The document touches on two main aspects that are believed to expand the Chinese RMA to satisfactory results. These two aspects are labeled as equipment-based "mechanization" and information technology-focused "informationization". Jiang himself proclaimed, that these two elements are interconnected with each other and that one cannot succeed without the other. He goes into further detail by explaining that while informationization is an effective way to refine mechanization, one must also first develop that mechanization to such a capable level, where it could reap the benefits of the accompanying informationization (Ding 2008: 84; Panda 2007: 23; SCIO 2004). It is also worth mentioning, that even though the report mostly teases the innovational aspects of its envisioned RMA, it also doesn't shy away from the subject of a more efficient force structure. It seems that for the meantime, the way that Beijing tackles its challenges of a massive and to some still under-qualified military personnel is not by changes done to the military hierarchy and organizational command structure, but rather by force reductions, which should result in a more capable personnel both in standard military and higher officer ranks. This approach was already executed in the 1990s, when the PLA went through two major force reductions. Most of the personnel reductions occurred within the ground forces ranks, which at some points (1997-2000) were as huge as twenty percent. As a result, the amount of highly educated officers saw an immense increase as did the average education level of other lower standing personnel (Ding 2008: 81; Nemets 2004; SCIO 2004).

Moving on, in accordance with the 2004 proposal, the 2006 defense report went even further by introducing a long term three-step process for reaching the desired Chinese RMA through the solid base of mechanization and the driving power of informationization. Step one sees 2010 as the first benchmark of the PLA's modernization. By this time, the PLA should have built up an arsenal that correspond's to the world standards and is capable of embracing cutting edge technological systems. Step two sets another benchmark for 2020, by which the fusion of military equipment and the corresponding technology should be absolved from major lags and imperfections. Step three expresses the desire of obtaining the ability to wage informationization-based warfare by the middle of the 21st century, from which the fully modernized PLA forces should come out victorious (SCIO 2006). These stages are all basically representative of the 2004's core idea of an initial mechanization and a following semi-mechanization, which should ultimately boom into a complete informationization, where IT-inspired military technology should prove most effective in a world that is constantly more engulfed in a growing information age (SCIO 2004).

Having already crossed the first 2010 benchmark, it is interesting to observe how Beijing has indeed obtained much more confidence in its military capabilities. This is clearly reflected in the more recent 2013 defense report released under the CPC's current

general secretary Xi Jinping, where one of the main premises is to highlight the PLA's contributions as a globally responsible and active force, which even though opts for peace and prosperity, is also ready to protect the integrity of its motherland at all costs (Gupta 2013). In this context, the report sustains its goals of informationization and mechanization, commenting that their development has seen a steady acceleration. The report claims that PLA's military ranks are better than ever, having smaller more compact troops, which are becoming more digitalized and multi-functional at the same time. The emphasis around these troops is further embedded in the context of readiness, which triggered the importance of practicing jointness among these different units, mostly under scenarios that simulate informationized circumstances. As far as actual weapon systems are concerned, the report argues that their fusion with information systems has also seen a clear improvement (SCIO 2013).

To summarize, it seems that China is on a good start to become an independent global force, which is becoming more capable of relying on an indigenous military output. Ever since 2000, its military diplomacy with most European nations has stabilized and even improved. What more, despite its assorted sound relations²³, China starts seeing foreign defense industries more as means to new military subsystems, rather than providers of complete weapon system packages. The PLA believes, that by now it is capable enough to utilize such subsystems into its own domestic R&D endeavors (Medeiros 2009: 124-125). After all, Beijing's vision of its RMA is mostly one that seeks a complete IT-interface implementation, both in standalone terms and in a combination with more traditional military assets. However, the PLA is also aware that despite some major progress over the past few years, it is still a rather inferior force that will constantly have to adapt to the even so advancing and leading United States's force assets. Despite its slower start, the PLA assumes that this gap can be overcome by simply embracing asymmetric military strategies, through which together with their envisioned and fully evolved RMA, they would be able to outbalance the United States' head start (Ding 2008: 83).

The "Chinese Characteristics"

Another important aspect of the PLA's pursued RMA are its indicated, but at first glance opaque "Chinese characteristics". Even the above described defense reports, referred to the pursued RMA as to one with such characteristics, whereby at the same time, they did little in terms of making distinct clarifications. Due to such opacities, there is much guessing involved, which sometimes even takes the form of skepticism. When it comes to the Chinese military modernization approach, such skepticism may in some cases even resembles an outright criticism. Although there is proof that China has a strong military production, there are doubts about what is to come next. In a traditional RMA view, modern capabilities are seen just as a common starting point for an RMA that would eventually lead to more differentiated and broad reforms. As it is with China, some argue that other than not providing clear data for its RMA or modernization developments as such, the PLA authorities themselves are suspect of not being that much deliberate in the actual subject of high-technology led modern warfare, which as a matter of fact is driven

²³ For the most part at least. For instance, the Russian defense industries have voiced their concerns towards a future cooperation, due to China's replications of their military innovations (Medeiros 2009: 107).

by diverse capital incentives and a decentralized command and control architecture. Others add up, that even with its opened-up thriving economy, the Chinese industrial sector is still a vertical one, meaning that due to many non-transparent requirements of the market, there is also little space for different integrations or competition for that matter. Other than that, this overall embedded vertical approach is also believed to be a hinderance for the respective forces, because the most efficient way to exploit data from an informationization-based war zone, would be through horizontally integrated force structures (Godement 2013: 2; Hasim 1998; Kelly 2006: 59; Puig 2013: 3-4).

While these remarks are well substantiated, one should be aware of Beijing's priorities, which are also reflected in its RMA pursuit that has its Chinese characteristics for a reason. First off, it is necessary to point out that these priorities revolve around the state and its assurance of a safeguarded regime. And this is no secret even in terms of formal Chinese RMA proclamations. For instance, Jiang himself declared to delegates, that even though the face of warfare has changed, China will not. He went into further detail by expressing the need to adapt to this new global challenge, but not to get succumbed by it. He explicitly stated, that China needs to embark on a "*gradual upgrading*" of its weapon and operational means. Slogans like "*science and technology strengthens the army*" or "*each serviceman should transform into the scientist*" were quite common and accepted (Nemets 2004). Even the essential 2004 defense report put emphasis on the process as being one that follows transition and not an unforeseen transformation, by writing that "*the PLA shall gradually achieve the transition from mechanization and semi-mechanization to informationalization*" (SCIO 2004). Therefore it could be argued that China prefers to test new waters, rather than jump head first into a possibly destabilizing current. This is further evident from the 2004 defense report's statement, which describes the relation between the PLA and the leadership in the following way: "*The PLA [...] adheres to the fundamental principle and system of the Party's absolute leadership over the armed forces, puts ideological and political work first, innovates political work in its content, approaches, means as well as mechanism to give full play to the support and combat functions of political work*" (SCIO 2004). Even the recent 2013 report has many implications which reveal that the focus on transition produced carefully planned reforms, which serve to broaden the regime's vision, not to replace it or change it extensively. Although the report uses the word new quite a few times, it is mostly in the context of improving or adjusting existing policies or concepts (SCIO 2013). This attention to regime security is present all over the place. For instance, one can also very well observe this on China's economical development, which despite its welcomed progress and openness had no real effect on the mainland's authoritarian rule, which has remained unshaken, leaving subjects like political plurality or even greater civil liberty in a state of limbo (Chow 2008: 5).

What makes China's RMA Chinese in this context is therefore a link to the mainland's own cultural legacy. To demonstrate, even an influential reformist like Deng Xiaoping saw such cultural legacy as an important asset to many of his attempts at modernization. It can be argued that the current-day effort to modernize the PLA military capabilities is an actual extension of Deng's initiated "four modernizations", of which the military force together with science and technology were both essential parts²⁴ (Panda 2007: 28). During his modernization efforts of the military, Deng even insisted that high PLA representatives should always refer to the classical Chinese military literature, as he

²⁴ The other two modernization areas involved industrial and agricultural progress (Fisher 2008b: 23).

was convinced that the diverse military developments of the new age were not that different from the Warring States period (c. 450–221 BC), from which many of these classics originated²⁵. Even till this day, there is still a serious ongoing effort to project the lessons learned from these past historical classics into modern military developments, as many of the PLA's military think tank consists of experts on traditional military, whereby they are also active in contributing to subjects relating to the department of strategy itself (Newmyer 2010: 491; Sawyer 2007: 7-8). Within this classical thinking, there have been many transitive makeovers surrounding the PLA, which were considered “creative developments”, that simply built upon a firm ideological base and its lineage. Going back to Jiang, he also committed himself to a transitive doctrinal refinement, through which he updated the concept of winning local wars into “*local wars under modern, high-tech conditions*”, which again evolved into what is now referred to as “*local wars under informationalized conditions*” (Cheng 2011; Huang 2001: 135, 138).

One may however still wonder, how this cultural legacy complements the Chinese RMA's future goal of developing full fledged informationization capabilities. A possible answer to this lies in the mainland's own traditional strategic perception, which among other things relies heavily on agendas that are shrouded with secrecy and patient observation. The emphasis on secrecy would very well explain the opacity of provided data by the Chinese leadership. While Beijing isn't necessarily afraid to reveal its potentials or even give a glimpse of its military status, it also evenly leaves its competition in the dark by providing just enough uncertainty, which is a very close relative of secrecy (Newmyer 2010: 494, 500). Because the CPC, PLA and the central government share tight inseparable bonds, it is relatively easy to manage wanted data output, as the highly centralized bureaucratic system works as a single interconnected unit (Ding 2008: 86; Kelly 2006: 61). In terms of informationization, Beijing is capable of exercising its respective capabilities not only during peacetime, but also in a relatively safe and undisturbed environment, that is hidden away from the sights of its adversaries. Furthermore, similar to a nuclear weapons umbrella, the sought out superiority of information technologies could serve as a maybe even more relevant deterrent in a world that is predicted to become more digitized and technology-driven (Newmyer 2010: 488). The affection towards this informationization's lies therefore not only in its promising prospects, but also in their likelihood of keeping a low profile, what at the end of the day corresponds with China's transitive approach that makes things more manageable and under control.

All this suggests, that in order to better understand the Chinese approach to the RMA concept, one should put on a lens, that deliberates about a traditional Chinese military culture and thinking, through which many contemporary PLA representatives are expected to justify and shape their modern views on new advancing military trends (Thomas 2012). It could be therefore assumed, that without this approach that resembles the Chinese characteristics, there probably would be no RMA that would please the always cautious authoritative regime, as the Chinese RMA is purely an enclosed military objective that has consciously set borders (Kelly 2006: 66).

²⁵ The arguably most influential out of these classics is Sun Tzu's *Art of War*, which provided many strategic outlooks that are valued by the PLA till this very day (Newmyer 2010: 491).

2.1.2 China-United States Military Relations

Taking a quick look back at the Chinese RMA's essential year of 2004, it was also around this period that Beijing stressed out its desire for a peaceful development, which was aimed at relieving tensions that were rooted in the mainland's extensive rise in power. This proclamation sent a strong message, that was welcomed by the United States, which added that the best course of action for Beijing is to be a "*responsible stakeholder*" of an United States-driven international environment, in which China was able to progress forward in the first place (Lai and Kamphausen 2014: 14-15). Although an expression of good will can be interpreted as a well proceeding relationship, the case of China and the United States is a much more complicated case of two global powers, which would naturally try to outrun the rest of the competition so that they could remain in the lead and thereby could continue to dictate conditions that are in end effect most beneficial for their own national interests. It is therefore important for China to keep strategically functioning ties with the United States, which go as far as military related relations, that enable to keep a closer eye on each other. The gravity of the United States-China military relation is even more important for the current General Secretary Xi Jinping, as it is under his tenure that Beijing should complete its second phase of its pursued RMA modernization plan (Lai and Kamphausen 2014: 15-16).

More than that, despite China's own growing military might and expenditures, the United States are still the leading spender of military related expenses, while also having the progressive edge over high technological procurements. It is estimated that the United State's military expenditures exceed the combined total amount of forty-something followed up entries of other nations. However at the same time, the United States don't take their posture for granted as they suspect a shift of global strategic focus, which is gaining more relevance in the Asia-Pacific region. According to the so-called 2011 "Obama Doctrine", mainland China is openly being pointed at to be taking the center stage in this perceivably more dynamic strategic region, in which simultaneously the United States sees itself as befitting to lend a helping hand in clearly specified issues like the disputes in the South China Sea or the provision of an overall secure maritime environment. According to his speech, president Barack Obama also made clear that most of the future endeavors in the nation's military spendings and capabilities will be directed into this part of the globe to project an unmatched power that will contribute to the region's peacekeeping (Engdahl 2012).

With their mutual rhetoric of a peaceful development, it is not that surprising that despite their rivalry, China and the United States are more often than not open for talks that could enable a more transparent future coordination in the Asia-Pacific region. As such, the year 2013 saw the first immediate personal meeting²⁶ of president Obama and the commencing General Secretary Xi. One of the more interesting highlights of this summit was the emphasis on a new approach to a mutually benefitting military relationship, which should not focus on competition, but rather on a constructive communicative exchange, that would help eliminate unnecessary tensions and accumulation of uncertainty in the Asia-Pacific (OSD 2014: 59-60). This new military relationship posture was even more specified by the United States' Secretary of Defense Chuck Hagel, who during his 2014 visit to China highlighted three key areas of interest, which should prove useful in building such a new relationship. Bluntly put, the first step

²⁶ Referred to as the 2013 Sunnylands Summit, which took place in California (Whyte 2013).

should be to maintain an ongoing dialogue, which would enforce the second step of finding shared goals and visions, which are expected to be dealt with in a cooperative manner. The third, and arguably most difficult step would be to keep differing perspectives and an overall notion of competition under a manageable level, so that the first two steps could evolve and not get needlessly abandoned (Cordesman 2014: 16, 18). In accordance with this view, China's own military progress is seen as a good opportunity to lend a helping hand in shared interests like for instance counter-piracy monitoring, search and rescue operations or even disaster relief cooperation. As far as actual joint military operations and exchanges are concerned, the United States and China keep them at a pretty much steady level for most of the time. While many of these are standard drills at best, it is interesting to note, that there are occasional efforts to deepen this military exchange. A good example would be the very first invitation for China to the 2014 *Rim of the Pacific* (RIMPAC) joint military exercises²⁷, which are regarded as the biggest naval multinational military event of all time. In this regard it could be argued, that the United States' diplomatic military strategy towards China is one that evokes engagement through cooperation and talks, rather than containment and unwillingness to hear out the other side (McClure 2013).

Still, as hinted before, the relationship between these two great powers is far from optimal or even granted to stay normalized for that matter. Despite chances to ignite or renew dialogues on cooperative efforts, the occurrences of disputes and mistrust are on a regular schedule, making the United States-China military relations move at a slow pace. Even the recent first-ever Chinese participation in an event like RIMPAC has proven to be a victim of this trend, where Beijing has sent out a non-approved surveillance ship, for which it was extensively criticized, not to mention threatened to have denied access to future RIMPAC exercises. In its self-defense, China instantly pointed out, that it didn't necessarily break any international rules, whereby it deliberately hinted at the United States's past intrusive attempts, which despite several complaints saw an ongoing maritime presence in a close proximity to the mainland's own shore line in the South China Sea, which is regarded by Beijing's authorities to be an "exclusive economic zone" (LaGrone 2014).

Given also the background of Obama's and Xi's initial agreement on the subject of improving cyber-security issues in 2013, it might seem that there is a missing link on how to cement a firm long-term cooperation (OSD 2014: 61; Whyte 2013). However, such proclamations can also be argued to be just a part of a much bigger strategic ambiguity, where it is desired to play along, but not necessarily required to abide to all the rules at all times in order to come out victorious. A good example to showcase this, is by simply looking at the Shangri-La Dialogues²⁸, which are an initiative to gather preferably as many ministers of defense or other high ranking officials for talks, and provide constructive dialogues for security issues in the Asia-Pacific. While this initiative first started in 2002, it wasn't until 2007 when China as the perhaps most relevant actor decided to step in and make its own contributions to the talks. Even then, it took four more years till Beijing sent their actual minister of defense, who however backed off for the following years and was substituted by a high PLA representative (Kan 2014a: 5-6).

²⁷ Held every two years and supervised by the United States, more than twenty nations take part in diverse maritime scenarios and drills (LaGrone 2014).

²⁸ Set annually in Singapore's hotel Shangri-La and hosted by the International Institute for Strategic Studies (Kan 2014a: 5).

Still, looking at the most recent Shangri-La Dialogue of 2014, it is evident that China is not willing to make any concession any time soon. To be more precise, Chinese Lieutenant General Wang Guanzhong expressed his dissatisfaction with this kind of meetings, which he implied are deliberately aimed at cornering China. Wang commented, that especially the United States and Japan have set up a barrier to these dialogues, because instead of providing justifiable solutions to a viable security architecture, they rather feel the need to provocatively discredit the mainland's contribution (Wang 2014a). While Japan's Prime Minister Shinzō Abe put emphasis on military transparency and on the need of a more present and powerful international defense force, America's Hagel went even further by declaring the need of strengthening both the United States' own regional military capabilities as well as those of its allies, whereby he also condemned any regional acts that send out a message of intimidation and dominance (Abe 2014; Hagel 2014). Coupled with a worldwide media exposure, China has expressed great dissatisfaction and mistrust, which might result in their absence in the next year's summit (Wang 2014b).

From all the above, it is therefore questionable how much is Beijing willing to loosen up on a military-related level. Given the before mentioned emphasis on regime security, which in terms of military behavior is enforced by secrecy and patient observation of the competition, it is unlikely that the Chinese military stance towards the United States will bring forth some major compromises, which would surpass the more formal than practical dialogues.

2.1.3 Strategic Arrangements Benefitting from the RMA

Before touching on the actual strategic arrangements, it is necessary to clarify under what circumstances the PLA will or possibly would use an actual projection of military force. The most complete answer can be found in Beijing's concept of *active defense*, which is directly linked to the means of the earlier described approach of *local wars under informationalized conditions*, that complements the prior defensive thinking with strategic capabilities that implement the pursued RMA dimension in a beneficial and unobstructed way, so that it supports the cause of the *active defense*. This *active defense* serves as a main guiding principle for the entire PLA military entity, because it dictates a very specific yet flexible approach to project military force on its adversaries. While Beijing states that it won't be the first one to commence an *unprovoked attack* in a potential conflict, it doesn't exclude the possibility of a first *preemptive attack* either, but rather it enforces it. In order to sustain national security and integrity, the approach sees a preemptive strike as an appropriate tactical step to end an emerging conflict swiftly before it would take root and cause much more harm and additional damage. As for the flexibility of this concept, it consists in the applicability of such a preemptive strike towards a threat, which doesn't only have to be directly aggressive, but also politically challenging or strategically destabilizing to the sovereign Chinese realm (Cordesman 2014: 124).

In a more practical understanding, the main difference of China's current *active defense* lies in a clearly expressed retraction from past operational approaches, where waging war was more among the lines of a "total war" mindset, which would seek out a complete annihilation of the enemy forces preferably by mass force implementation and hardly with any joint force coordination. Instead, China shifted to a mindset of winning

“local wars”, which has due to various transitive implementations over the years reached an asymmetric character. These *local wars under informationalized conditions* have a lot of RMA reminiscent flair to them. First off all, they don’t seek the complete destruction of their opposing adversaries, but they focus on specific political achievements, that don’t require mass force implementation but rather sudden and well planned out force strikes at key target areas. This Chinese asymmetric warfare strategy also seeks to keep the armed conflicts as far away from its center as possible and end them in a quick succession with the combination of jointness, informationization and lethal weapon capabilities (Chen 2008: 7; Cordesman 2014: 124-125; Finkelstein 1999: 127-129).

As such, this defensive thinking is also directly transmitted to specific RMA related strategic arrangements, that are encompassed in the so-called *Anti-Access/Area Denial* (A2/AD) initiatives, which in the case of China lay their central focus on key areas that are information, maritime and air space domination. While the Chinese A2/AD also targets Taiwan as a major obstacle, its utilization is aimed at a much broader goal of weakening the United States’ forces by obstructing their access, maneuverability and operability in the resource rich peripheral and even more far reaching regional waters of the Asia-Pacific. As far as the ability to do so, China is seen as very successful in the exploitation of its developed COTS technologies, that are also being successfully applied into top tier information capabilities revolving mostly around advanced targeting, which could be argued lays down the basis for Beijing’s other A2/AD initiatives, that originate from a missile-centric warfare posture. As a result, China was able to improve the overall scope of its information acquisition capabilities and satellites’ efficiency, which now reportedly have a better potential and overall chance to find, target and reach United States’ military assets not only by the means of using conventional force tactics, but also by the use of more unconventional ones like cyber attacks (Gompert 2014: 1; Tan 2011: 73, 94). In addition to a more precise and lethal earth-bound targeting, China is also believed to have made progress in its anti-satellite military capabilities, which enable it to conduct strikes at orbital United States’ assets. While it is not certain if the current state of such capabilities is ready for a successful orbital engagement, it is estimated that in case it is not, it probably should be by 2020, when taking into regards the general estimated development pace of China’s other more observable A2/AD capabilities (Cheng 2014a; McCarthy 2010: 4; Talent 2014).

As far as the two other main aspects of the Chinese A2/AD are concerned, they are a direct counter-response to the United States’ own take on a possible regional intervention, which is summed up in the so-called “Air-Sea Battle” concept. In a sense, it is a three-step procedure, which would start with a disruption of China’s C4ISR network, followed by a quick initiative to consequently annihilate the PLA’s main weapon platforms; concluded by a suppression of a following residual military response. Interestingly enough, this approach is very reminiscent of China’s own *active defense* posture, as it heavily relies on an initial preemptive strike ahead of China’s own. In this case, the reason for the United States to strike first is strategically vital, because many of Beijing’s tactical military centers, like C4ISR establishments or missile sites, are directly located within the mainland’s territory, which despite being possible to be engaged by the means of air, sea or information warfare, would most likely withstand an awaited confrontation (Gompert 2014: 2-3).

It is also for this very reason that China seeks to stretch out its A2/AD capabilities by another layer, that would operate from the mainland’s periphery and further outwards as both an early warning and resistance beacon. Some argue that the key factor here is

China's obvious predisposition to rely on *Anti-Ship Ballistic Missiles* (ASBMs), which are even capable of destroying the United States aircraft carriers. The reasoning behind this reliance on ASBMs also lies in their accessibility, as one such missile would cost Beijing a few millions, opposed to the several billions that are required for a single operational aircraft carrier²⁹ (Talent 2014; Tan 2011: 86). However, this Chinese peripheral A2/AD layer equally relies on the support of maritime and air weapon platforms, which beside a strong missile force do indeed show an interest in such accompanying military capabilities like the PLA's own, even though pricey, aircraft carriers. Despite China's possession of just a single aircraft carrier, there are supposedly serious implications to not only produce more of these in the future, but to also develop new indigenous types (Cordesman 2014: 438; O'Rourke 2014: 18). Regarding Beijing's strong concern with the United State's air force, whose effectiveness was well showcased in the earlier described 1999 bombardment of Yugoslavia, this is not that hard to believe. Other recent developments suggesting the diffusion of Chinese aircraft carriers would be the 2013 declaration of an *Air Defense Identification Zone* (ADIZ) in the disputed East China Sea. While the excuse of this ADIZ was presented as a way to provide better security balance in the area, it certainly also presents Beijing's subtle operational expansion, as it even intersects with South Korea's and Japan's own ADIZ³⁰ (Cordesman 2014: 143; Osawa 2013). It is still thinkable though, that despite the fact that aircraft carriers are not really representative of the RMA's ideals that prefer smaller and more agile weapon platforms, they do provide Beijing with a solution for a broader RMA related A2/AD concept, where such weapon platforms can enforce the Chinese ADIZ with a more strategically accessible air strike.

Overall, these strategic arrangements present a further affirmation of what could be described as Beijing's application of pursued or even some already achieved RMA capabilities into both its strategic and defensive thinking. Other than that, the importance of these arrangements for Beijing are also crucial in terms of observation and a consequent adaptation, as they receive many responses and impulses from the concerned nations and actors in the region, that could either hinder, alter or even hasten the mainland's strategic based decisions aimed at the outside of its own domain. Whatever the response however, Beijing is highly unlikely to change its core defense policy or its strategic demands and for that matter, it is evenly so unlikely that it would also abandon its already to some degree established RMA capabilities, which are essential for carrying out these arrangements. An inconspicuous hint to this could be also seen with the 2011 establishment of the so-called *Strategic Planning Department* (SPD), which also blends in with the commencement of China's second phase of the RMA modernization. The SPD's foremost role is to oversee the ongoing process of an "army construction", which should be molded by the institution's recommendations, that reportedly takes into consideration both the ongoing indigenous RMA developments side by side the strategic security environment issues that as demonstrated above clearly unfold around maritime disputes and a broader regional influence. Although the SPD's role is argued to be solely complementary, its function still implies the buildup of a modern military readiness and

²⁹ An aircraft carrier would require roughly 13 billion USD, whereby an ASBM capable of sinking it would only require around 10 million USD (Talent 2014).

³⁰ Even with its tactical edge, from the legal perspective of international law, such proclaimed ADIZ has no justification on territorial claims, like in this case the disputed Senkaku/Diaoyu islands, whose air space is basically included in this ADIZ (Drifte 2014: 1, 16).

with it a consolidation for the described strategic arrangements (Mattis 2011). As Jen-Shuai Chen put it concisely: “[...] its (China’s) combat philosophy has changed from a defensive “active defense” to an offensive “active defense” that operates outside theatre, and emphasizes pre-emption” (Chen 2008: 7).

2.2 The Case of Taiwan

2.2.1 Applicability of the RMA to Taiwan

Taiwan’s Insecurity Towards China

It is evident, that during the past few years the relation between mainland China and Taiwan has seen some instances of positive progress. The inception of this development could be traced back to the year 2008, when the candidate of the *Kuomintang* (KMT), Ma Ying-jeou, won the presidency campaign and replaced the mainland repulsive Chen Shui-bian of the *Democratic Progressive Party* (DPP). Thanks to Ma’s presidential tenure³¹, the two sides renewed their institutionalized negotiation debates, which have already resulted in several collaborative efforts that have opened up a path to a possibly continuing trend of further mutual exchanges (Jacobs 2012; Yang 2011). The perhaps most prominent cooperative effort out of them all would have to be the *Economic Cooperation Framework Agreement* (ECFA), which has established a more solid cross-strait economic link, by cutting or completely demolishing tariffs for a wide range of Taiwanese and Chinese goods (MOFA 2013).

Despite this seemingly positive progress, there is no real guarantee that things will always continue to work out in favor for both these players as they do right now. Together with opportunities that could remedy the cross-strait relations, there is still a lot of uncertainty that is clouded by future developments. The arguably most crucial of these developments would be the domestic political rivalry between the main opposing camps of the DPP and the currently in power KMT. While both parties share the same sentiment of a sovereign Taiwan, they differ in their attitude and proceedings with the mainland Chinese government. This is mostly evident from each party’s individual stance towards what is called the “One China Principle”. The idea behind this principle lies in the acknowledgment, that both the mainland government and the Taiwanese government are part of a single China. Despite this acknowledgment however, both sides hint at their respective government as the real legitimate representative of this envisioned one China (Stockton 2008: 106; TAO and SCIO 2000; Zhao 2008: 204). But the issue complicates itself, because while the mainland and the KMT acknowledge the fact of originating from a common background, the DPP does not adhere to the same line of thinking. What the DPP proclaims instead, is a stronger sense of a sovereign Taiwanese identity that represents its own entity. While the KMT’s adherence to the “One China Principle” builds up a basis for common talks, DPP’s general stance is simply too assertive for Beijing’s own mentality and regime security. Some of the DPP’s members even made the proclamation, that Taiwan has already achieved the operational state of independence,

³¹ In 2012 Ma Ying-jeou has been reelected as president. Next presidential elections are scheduled for 2016 (Jacobs 2012).

and is therefore not bound to make a formal declaration that would affirm its sovereignty (Clark 2008: 90-91).

Should the DPP therefore come out as a victor in the 2016 presidential and legislative elections, Beijing's stance towards Taiwan would most likely reset to its more menacing roots, which would continue to built up tension that would possibly involve different acts of deterrence. One only needs to look back at the year 1996, when Taiwan witnessed its first democratic elections. This occasion was preceded by Beijing's attempt at deterrence, which gambled on firing unarmed missiles into the Taiwan Strait. This was a strong message signaling the mainland's disapproval of the KMT's Lee Teng-hui, who despite his political roots was born as a native Taiwanese, who would come to advocate a more independent and peculiar identity for his homeland. Lee was criticized for his conflicting ideals and later ultimately broke up with the party. While he didn't deny the mainland's rich historical context, he saw Taiwan as a leading example of an evolving Chinese culture, that could serve as a compass for the mainland in regards to taking a new step into the modern age, which calls for adaptation (Bush 2005: 170; Chan 2014; The Economist 2014; Tsai 2005: 25, 213). However, Beijing's plan to strike terror backfired, as Lee's then democratic reelection showcased the island's continuing defiance, which was also reflected in an increasingly stronger emphasis on precautions against the mainland's growing military threat. Reports like the 1999 defense White Paper started implying the importance of improved military capabilities that would gain from aspects like information dominance or interconnectivity provided by key RMA assets like the C4ISR. The preparedness against Beijing's forces continued to unfold with Chen's presidency period, in which the following defense White Paper took the situation to a further level by rethinking the island's military strategy and openly proclaiming, that the Taiwan military forces need to embrace the RMA concept, in order to provide security and maximum efficiency from Taipei's limited military capabilities (Tan 2011: 86-87; The Economist 2014; Tsai 2005: 205).

For the above stated reasons, one can argue that the RMA's relevance for Taiwan has already started to sink in throughout Lee's second presidency tenure, during which in 1999 he even proclaimed, that the Beijing-Taiwan relations are "state-to-state" relations. Such a bold statement would explain, why the 1999 defense White Paper started to make strong RMA implications, which would push Taipei's strategic security into a forward direction. As for Chen's following tenure, the need for RMA oriented capabilities was pretty much a given, as the DPP has even included the achievement of independency in their official charter. The mainland's natural reaction was the decision to buff up its military even more, shaping Taipei's RMA proclamations not into an option but into a necessary countermeasure (Bush 2005: 176). It was not till the mentioned 2008, that the relationship started to gain some sense of normalization again. Either way, the mere fact that mainland China has not till this day shown a serious tendency to abandon or relax its standby military force fixation, leaves no room for Taiwan to take its chances. Even the 2013 defense White Paper issued under the administration of the now more cooperant KMT stresses out, how the mainland's growing military assets, both in terms of quantity and quality, are becoming more severe than ever before. The document warns, that despite some relationship improvements between the two governments, the stance of Beijing's unchanged attitude in the department of its force projection right across the Taiwan Strait is most unsettling and not to be underestimated at any costs (MND 2013: 4, 7; Phipps 2013). This alarming stance is very reminiscent of the DPP's Chen's proclamation, in which he feared that China has reached such a sophisticated military

force, which by 2015 would possess all favorable odds for winning a potential all-out conflict (Fisher 2008a: 219). It is therefore unavoidable, that despite their fair share of differences, both the KMT and the DPP must take a serious stance towards the growing mainland's force assets, which are only a command away from showcasing their military might.

Economic Affordability to Make Military Based Purchases

Despite the mainland China's prevailing pressures that deny Taiwan a free access to the world of many statehood-required international institutions, which could enforce its free trade and overall economic partnerships, there is no doubt that Taipei's economic development marks a strong presence in the region. Within its limitations, Taiwan has learned to adapt over the course of time, whereby it became one of the wealthiest economical powers in its neighborhood. Given the island's unfavorable conditions of harvesting agricultural goods that must be imported, Taipei's economic focus has been marked by a solid industrial sector, which is complemented by a wide range of services and a high-technology development sector, which enables the potential distribution of possible COTS items and systems if ever needed. Especially Taiwan's informational and technological knowledge has a very strong economic base, as till this day it provides more than ninety percent of the world market's demanded mother boards, not to mention other delicate technological components and assets³². Even though Taiwan has established a functioning economic link with the outside world by providing a satisfying level of economic freedom³³ and focusing on international trade, it is still hindered by Beijing's global influence, which despite having agreed on a better cross-strait economic exchange under the now presiding KMT, keeps Taipei's economic flow advancing in a better motion as well as unfulfilled towards its true potential at the same time. This is mainly because of the two sides of the same coin of their economic cooperation, through which Beijing seeks to pull Taiwan's economy into the mainland's own center, whereby Taipei longs for negotiating its economic liberty in the sense of further expanding into the remaining Asia-Pacific region (Meltzer 2013; Southerland 2014: 4; The Heritage Foundation 2014: 415).

As far as the affordability in making military based purchases is concerned, in terms of Taiwan's solid economic revenues as well as China's own growing military expenditures, which are mostly aimed at a potential cross-strait conflict, one would expect that domestic defense spendings would see a rising trend or at least maintain a steady inflow from the government's annual budget. While Taiwan is acknowledged to have made visible progress in its military capabilities in the past few years, its defense numbers suggest that its leadership might be opting more towards sustaining these military capabilities rather than pushing them higher up. When comparing Taiwan's defense budgets in relation with their respective annual gross domestic product (GDP) values, the 1990s expenditures showed that military spendings kept their range above a

³² Taiwan is also the host of *Computex Taipei*, which is considered to be the second biggest information technology event in the world (Jennings 2011).

³³ According to *The Heritage Foundation's* latest assessment (ten criteria ranging anywhere from property rights to investment freedom), Taiwan ranks as the seventeenth best worldwide economy in terms of economic freedom and as fifth best from a regional perspective (The Heritage Foundation 2014: 415-416).

three percent GDP value. As for the 21st century, these expenditures dropped below the three percentage GDP values, whereby as of late they are nearing to go below the two percent borderline. A similar trend can also be observed in regards to the actual annual governmental budget, where in the 1990s the expenditures took as much as twenty-four percent of the budget, and in the past few years as little as sixteen percent. Bottom line, Taiwan has opted to focus its budgetary spending more on areas that seek to improve its citizens' social welfare status, a better education level and even higher pensions (Mazza 2014; Murray 2013: 2; TRO 2013: 1-2).

While the future trend of these spendings and their sufficiency is open to debate, it can be expected that the current Taiwanese leadership under Ma, will most probably stick with its stagnant approach to such defense spendings, even though Ma himself pledged at the beginning of his tenure in 2008, that he will retain previous efforts to bring these spendings back up to at least three percents of the GDP values. However, this effort became totally absent in the 2013 *Quadrennial Defense Review*, as its achievement was according to president Ma hard to realize due to a rapidly growing rate of Taiwan's GDP, with which these defense expenditures would have to keep up. Although one might argue that the main reason for this stagnancy is due to the leadership's mentioned aim to boost up areas like economic development and social welfare rather than a defensive deterrence, there is more to the issue than meets the eye. For instance, in the period between 2009 and 2011, Taiwan's defense ministry had an accumulation of disaster relief operations, which cost the ministry millions³⁴ without refunds from local or even national government authorities. When coupled with the growing expenditures for an envisioned professional army, which would consist of a dedicated volunteer personnel instead of compulsorily conscripted individuals, it is no surprise that both operational maintenance of existing capabilities and procurements of new ones take cuts in their military budget funding. As such, even the goal of obtaining an "all-volunteer force" by the end of 2015 has been prolonged to reach its realization by 2017. This is not only due to demographic limitations marked by weak birth rates, but also because of the much higher costs of retaining such a dedicated volunteer force, whose monthly income has been raised in order to provide a stronger incentive for a long-lasting military career. Therefore, these measures have motivated the current leadership to follow a policy of reducing the capacity of its active military forces, so that a better equilibrium between military readiness and its budget expenditures could be reached and maintained. It is estimated that 0,8 percent of the total Taiwanese population should be plenty enough in order to provide national defense needs (Chang 2014; Cole 2014; Kan 2014b: 38-39; Murray 2013: 3).

All in all, there is no doubt that Taiwan has the necessary economic drive to foster evolving military capabilities. What is however even so critical is the leadership's own priorities towards the investment of such capabilities, which although can't surpass the sheer volume of the mainland's spendings, should still provide enough resistance, so that a viable United States' intervention could take place. While leaning towards a more sustaining model of military capabilities might not be that big of a deal for most middle powers, in the long run China's own rising military capabilities could quickly turn into a bigger gap than was initially expected. This could then trigger a greater imbalance in regards to cross-strait military negotiations, whereby the CPC would possibly go even

³⁴ More specifically, around 44 million USD (Kan 2014b: 39).

further in pushing the envelope of its reunification policy and overall territorial claims (Kan 2014b: 36; Lowther 2013).

Acquisition of Armaments from Beyond the Borders

It is undeniable, that during China's own pursuit of top-tier military acquisitions from abroad during the 1990s, Taiwan was following a similar path of acquiring foreign based capabilities for the sake of counterbalance (Fisher 2008a: 219). As back then, Taiwan's main supply of modern military capabilities remains to come from the United States, as they are the most entitled power to do so, mostly because of their *Taiwan Relations Act* (TRA), that enables the provision of arms to Taiwan, despite an official recognition of the mainland China's legitimacy to be the true government of the Chinese people. Even though the United States don't recognize or promote the sovereignty of Taiwan officially, they display a strong strategic ambiguity, which concentrates on keeping unofficial ties with Taipei, in order to help keep Beijing at bay and thus provide a better leverage to control power balance in the region. Even with the 1982 Joint Communiqué, according to which the United States would limit their provision of military capabilities to Taiwan and settle it definitely at some point, Beijing is being left out in the dark, as this agreement is pretty much overruled by the so-called "Six Assurances", that were issued within the very year of 1982 under the same administration of Ronald Reagan, in order to create flexibility in the United States' involvement in the cross-strait developments. Due to these still valid assurances, the United States are fully entitled to monitor Taiwan's defensive needs and provide the necessary capabilities without implementing a direct Chinese consideration, whereby they are also not bound to set a specific date for ending their supply partnership either (DOS 2014; Kan 2014b: 1; Shiquan 2012).

It should be stressed out however, that for the sake of maintaining this strategic ambiguity, a too extensive compliance in any regard to Taiwan could still prove to become more complicated than desired. Even though the United States are free to provide Taiwan with modern military capabilities on their own behalf, Beijing doesn't take this approach as something acceptable, mostly when it comes to the unceasing nature of these arms sales. As a result, there have been some cosmetic changes regarding Taiwan's military procurements from the United States. The most noticeable one aimed at easing Beijing's aggravation was discontinuing formal annual talks with Taiwan, that were held since 1983 till 2001, in order to discuss adequate weapon procurements (Mazza 2014). Although the talks ceased to be, Taipei's door to weapon procurements did not, as these procurements just happen more irregularly, still under the supervision of the United States, which established even a greater communication link in the form of the so-called Defense Review Talks (DRT), that commenced in the very year of 2001. As a result however, several occasions of such weapon provisions ended up with Beijing stepping out from an effort to deepen military-based relations with the United States. Such lockups included mostly abortions of planned military exchanges, that consisted mostly of official visits, but also from some joint military cooperation. Cases where mainland China for instance prohibited military port access to Hong Kong or even set up sanctions towards manufacture firms from which Taiwan received their military shipments, are all clear messages that demonstrate the CPC's still ongoing protest to this issue (Capaccio 2010; Chen 2012: 222; Kan 2014a: 39-40).

Other than that, the United States are also quite outspoken about their allegedly limited military involvement with Taipei. While they have the desire to continue with their military provisions, they also try to evoke Taipei's own consideration to step up their efforts in developing a stronger indigenous military output, which would make the United States' involvement less obvious and not so much conflicting in the eyes of Beijing. In this manner, the United States constantly stress out their limitations in safeguarding Taiwan both in terms of provisions and an actual intervention, mostly due to their worries that stem out from the previously described defense spendings, which according to Washington are not only waning, but are also focusing on less needed priorities in regards to approbating the right military capabilities. Unsurprisingly, the decisive factor to all this lies in the domestic political scene's involvement, which as mentioned earlier is marked by the rivalry between the KMT and DPP. To demonstrate, one of the biggest dilemmatic weapon procurements would have been those of the 2001, when the Bush administration gave a green light to a hefty weapons package that would be acquired under the conditions of a special defense budget. Because this defense budget was a part of then presiding Chen Shui-bian's military-political reform pursued by his DPP administration, the KMT dominated legislature politicized the issue and ultimately prohibited the special budget from seeing the light of day (Fisher 2008a: 218; Kan 2014b: 28; Tunsjø 2008: 95).

With the currently ruling KMT, one should keep in mind, that despite their distancing from an overly United States' reliance, they still value the TRA agreement as well as arms provisions from Washington. Ma himself openly declared, that while he embraces the need to purchase military capabilities from Washington, he won't ask for actual help from the United States to intervene in case Taiwan would find itself in an emerged conflict. While such formulation does not necessarily prohibit the United States from intervening, it sends out a clear reaffirmation towards his pursued policy, which says no to reunification, independence and most of all to war (Hu 2014: 4; Kan 2014b: 29; Tiezzi 2014). As far as the Obama administration is concerned, it can be argued that Washington still retains a strong interest in Taiwan's security, despite some of its implications of confinement in terms of providing assistance. One only has to take into consideration both Obama's official stance towards the arms provision policy as well as the present official outlook towards the TRA. Starting off with the arms provision policy, Washington states that it adapts it accordingly, so that regional security and political stability of targeted regions will be retained. Also, these arms provisions are aimed at the United States' allies, which are eligible to promote such retention alongside Washington. With guarantees like political stability and legitimacy to promote peace and order, one would believe that Taipei is being relinquished in favor of Beijing's accepted legitimacy. In reality however, Washington prefers a non-unilateral development, as its arms sales to Taiwan are considered to be fully justified in context with its arms provision policy. As a reassurance to this partnership, the United States have in 2014 confirmed their unchanged stance towards the TRA agreement, which they consider as crucial in order to keep the region stable and secure. This reassurance was met with open arms both by the more independent minded DPP as well as by Beijing's more favored KMT president Ma (Kimball 2012; Morley 2014; Tiezzi 2014).

In conclusion, despite the fact that the United States' commitment to arms sales to Taiwan is perhaps one of the biggest offenders in the relationship with China, it is also a crucial step that symbolizes a sort of credibility to the rest of the regional allies, which wouldn't interpret an actual cross-strait conflict lightly, if it was also accompanied by America's own lack of interference and interest (Shiquan 2012). Still, the other half of the

commitment will always lie upon the governing Taipei authorities themselves. To this, Michael Mazza provides a thoughtful interpretation, where he argues that while the current president Ma acknowledges the need as well as the possession of adequate defense capabilities, the real focus lies on his cooperative policy accomplishments with the mainland, what has led his administration into a situation, where this seemingly advancing policy is being overemphasized, while the needs of the defensive policy are underemphasized, as they don't go hand in hand with Ma's "signature" policy. Mazza finds this problematic, as Beijing's policy towards Taiwan is still unchanged in its threat perception. With Beijing's firm approach and Taiwan's shift in policy emphasis, there is a risk of starting a defensive unawareness (Mazza 2014). Elaborating even further, from a public point of view there are even demonstrative responses, which are outright mistrustful towards Ma's cooperative approach, putting his popularity rank quite low. Many believe, that shifting the attention to a tight economic cooperation with the mainland will not only entrap Taiwan's economy even more, but that it could sprout a bigger risk as far as reunification is concerned (Southerland 2014: 5-6). All in all, there is no real guarantee that Taiwan will retain its current approach in the long term, as the not so far away 2016 elections provide a possibility to start out with a clean plate and reemphasize the defense situation.

2.2.2 Taiwan-United States Military Relations

Other than the described procurement of armaments, the United States and Taiwan share a peculiar military relationship, that stresses coordination over joint cooperation. What this means, is that an effort to carry out actual exercises and joint practices between the two militaries would certainly escalate tensions in ways that could bring forth unwanted risks and miscalculations (Chase 2005: 178-179). Although the possibility of a joint military cooperation is not crossed out entirely, it is minimal to say the least. While the United States already carried out some exercises, like for instance with Taiwanese pilots in Arizona, so that they would get them better acquainted with their benchmark aircrafts³⁵, they didn't end up being an affirmed staple of their mutual military relations (Cole 2006: 182). On the other hand, the possibility of establishing joint exercises and drills has not been entirely dismissed either. The main incentive comes from the Taiwanese side, which has continuously attempted to get approval for taking part in such United States supervised exercises like RIMPAC. While without guarantees, these constant request have quite a number of supporters among the United States' congressmen and other high officials, which at least for what its worth don't leave Taiwan out of the equation of a more daring military relation (Hou 2014a; Shih 2014a).

Moving on to the coordinative aspect of their military relations, Washington provides a wide array of guidance for Taipei in the form of neutral observations and assessments, what enables the maintenance of a military oversight over Taiwanese forces without causing too big of an aggravation for Beijing to object to. The increased interest for a better supervision of Taiwan's forces began to shape undoubtedly after the mainland's 1996 missile launches, which justified the commencement of Washington's and Taipei's so-called Monterey Talks, whose original primary aim was to deal with strategic concepts and suggestions for future military developments. Although the

³⁵ Mostly the *F-16* series, which Taiwan utilizes (see 3.2.2 for more detail).

military subjects of these talks became slightly more diffuse with the addition of a wide variety of participating officials and ministers since 2006³⁶, their resulting military implications are still being carried over to the later followed up DRT, where these conclusions are further coordinated together with the representatives from Pentagon as well as with Washington-based think tanks into an applicable and operational context. Overall, the DRT present a unique window of opportunity, which doesn't only provide a chance for Taiwan to get directions or feedback, but which also presents itself as an official platform to seal military-based agreements and cooperation efforts (Chen 2012: 221-222, Huang 2010).

It can be argued, that this coordinative nature also translates to Taiwan's very own annual military exercises, which are referred to as the *Han Kuang* (HK) exercises³⁷. With the means of several observational visits and neutral assessments, the United States was able to provide the Taiwan forces with specific guidelines, which among other things pointed at the exploitation of many RMA related elements like a better operational jointness of forces, C4ISR and overall force modernization. These expert inputs even assisted in the construction of a virtually simulated war-game system, that has become an inseparable part of the 21st century HK exercises, which also consist of live military drills that take into consideration the results of these virtual testings. This observant approach and passing of know-how is also encompassed in other subtle initiatives that range from established educational exchanges of Taiwanese military personnel into the United States to an actual presence of retired American military officials that are stationed directly in Taiwan³⁸, where they can give out evaluative reports and thus potentially useful feedback (Chase 2005: 177, 179; Cole 2006: 182; Hickey 2006: 55; Mei 2010)

Speaking of feedback, the HK exercises are perhaps the most reliable indicator for Washington to assess the state of Taiwan's military defense capabilities and combat readiness. Even though they don't participate in the exercises directly, the United States can draw solid conclusions regarding Taiwan's use of both accessible domestic and procured weapon capabilities, which in case of showing some sort of drawback or inconsistency in performance, can help effect future decisions of better weapon provisions or even the bestowal of other military assistance initiatives, despite Beijing's expected denial. Such decisions could be further backed up by a sort of security validity, as the HK exercises also display considerable amount of authentic value, where many of these drills revolve primarily around simulated scenarios that are openly aimed at withstanding a possible Chinese invasion³⁹. What more, these scenarios take into account the mainland's own state of the art military capabilities and simulate their effectiveness against the Taiwanese counter capabilities. For instance, the 2014 HK exercises are along a routine invasion scenario shifting their primary focus at Beijing's aircraft carrier, which Taipei believes has reached a needed operational effectiveness to seriously complicate the island's defense maneuverability (Chang 2014; Keck 2014a).

³⁶ Many additional officials and representatives from the Coast Guard, Ministry of Finance or from the Ministry of Foreign Affairs to name a few, joined the roster (Chen 2012: 222).

³⁷ Means "Han [dynasty] glory" (Mei 2010).

³⁸ Mostly being sent out to the *American Institute in Taiwan*, which serves as an unofficial major institution of the United States in Taipei (Cole 2006: 182).

³⁹ Another substantial part of the HK exercises are disaster relief drills (Stokes and Ma 2011: 12).

All this further suggests, that it is in the United States' interest to help Taiwan's military readiness to prosper in case an unjustified Chinese invasion should indeed occur. Even with this mindset however, Taiwan realizes that it also needs to continue working on its indigenous self-sufficient capabilities, as a potential intervention from the United States could take as much as a month to be fully mobilized, mostly due to Taiwan's outlying accessibility. It is even possible to assume, that with the United States' intent to intervene in the best way possible, nations like Australia, Japan or South Korea would also in some degree lend a helping hand. Even though these nations didn't establish any formal mutual military agreement with Taipei and don't even recognize Taiwan as a sovereign state for that matter, they are obliged to cooperate with Washington on a military level, due to their respective defense treaties. Thus their potentially requested intervention could work in a framework where they would serve as a prolonged hand of Washington's own intervention attempt (Cole 2006: 180-181, 185). It is therefore logical to affirm, that the most viable option for Taiwan in this regard is to keep both its own military merits as well as its military cooperation efforts with the United States in check.

2.2.3 Strategic Arrangements Benefitting from the RMA

When discussing Taiwan's overall strategic arrangements, one has to derive the necessary precautions from the PLA's main threat opportunities to the island and its surrounding territories. The perhaps main element of these threats is China's precision force, which due to the PLA's growing naval and air superiority is not only being concentrated on the mainland's shoreline, but also in the more far-reaching waters and air space; making Taiwan only a step away. Even without its outgoing weapon platforms, China has a sufficient amount of mainland-based long-range missiles, which together with their established ISR could not only engage Taiwan's naval and air targets, but also key ground targets like military bases or infrastructure points of the main island. However, an equally disruptive threat lies also in the PLA's possible success of cutting Taiwan off from its outside surroundings, which are essential for the government's viability (Yang 2011). Would China succeed in quickly overtaking Taiwan without foreign intervention, its desire of achieving control over its envisioned "first island chain"⁴⁰ would be critically enforced; and possibly even more encouraging to shift greater attention on the following "second island chain", which goes as far as Australia, Indonesia or even the United States's strategic military outpost in Guam (Cordesman 2014: 141; Hsiao 2010).

Being aware of these facts, there are two main defense initiatives in Taiwan, which despite being both strategically beneficial in their own right, are also conflicted in terms of their scope of necessity for maintaining a secure environment within the previously described budgetary confinements regarding military needs. These two initiatives can be described as *passive defense*, which concentrates more on a central ground protection of the island; and as *active defense*, which is more targeted at an outward air and maritime security, but opposed to China's own case of *active defense* can't implement an offensive preemptive strike first, as such action would discredit Taiwan's safeguarding non-conflicted foundation in the strait. In order to present Taiwan with an integral security environment, both of these defense initiatives are pretty much prevalent. However, when

⁴⁰ Incorporating an area from Aleutian islands in the Northern Pacific and reaching down to the Philippines; also including Japan's Okinawa island (Cordesman 2014: 141).

it comes to their insistence towards the formal defense policy, their formulated necessity differs. In accordance with his appeasing policy towards the mainland, president Ma advocates *passive defense*, while many other current defense and military authorities still prefer the dominance of an *active defense* effort, which was also at the center of defense thinking in previous administrations pre-dating Ma. The overall relation between president Ma and the military could also be described as under-average. Not only is his emphasized defense approach deflective; Ma's basic ties with the military are both minimal and critical, as he not only avoided attendance at many military initiatives such as the HK exercises, but he also criticized the military publicly for supposed corruption and lack of discipline (Chen 2009; Hong 2005: 229; Mei 2010). As such, there is much debate on how much military pressure from Beijing could Taipei handle under Ma's current administration and defense tactics. To demonstrate, even talks from the domestic political scene indicate notable divergences, mostly regarding the period of withstanding an invasion without foreign help. While the estimated periods from the opposing DPP talk of a maximum of about two weeks based on their past administrative insight, the KMT is more optimistic in its proposed evaluation of a one month minimum resistance capability, which they reportedly concluded from the HK's virtual warfare testings. In between are also some military representative estimates that take a middle path by suggesting a three to four weeks period (Mizokami 2014; Shih 2014b).

While these resistance period estimates are not by any means something that can be taken for granted, it sends forth a sense of uncertainty, which doesn't completely exclude the need for neither a strong outward air and maritime defense posture, nor the currently more preferred centric ground defense. As a result, Taiwan is conducting steps to fortify its defenses through preparedness for a wide range of case scenarios. Starting with its ground defense preparedness, the key aspect of keeping the main island secure is by "hardening" its infrastructure and key facilities like power plants or military bases, so that they would remain resistant and operational despite the PLA's decapitation efforts. One tactical disadvantage in this regard is however Taiwan's topography, which makes it easier for the PLA to focus its strikes. This limitation has also contributed to the approach of a more flexible readiness, as the Taiwanese forces have invested a great deal in many repair oriented military capabilities as well as some dual-purpose highways suited for aircraft takeoffs. It is estimated, that Taipei's forces are in possession of more than three hundred repair capabilities, mostly represented by the so-called *Rapid Runway Repair* (RRR) tools and materials. Having these military capabilities that are able to remedy such inflicted damage are for Taiwan as much crucial, if not more, than actual offensive means (Cole 2006: 178; Mei 2010). As a matter of fact, Taiwan has through its many regular drills fostered some one of a kind RRR response teams, which are deemed as the perhaps most knowledgeable and coordinated units for quick airfield repair worldwide (Easton 2014: 52).

But just as "hardening" and capabilities like the RRR are crucial for *passive defense*, the success of its *active defense* counterpart is heavily just as dependent on fast, mobile weapon platforms and interconnected weapon systems, that would be able to keep an overwhelming damage output on a hold, or even make a dent in the PLA's own operational maneuverability once it has struck the first blow. Despite the KMT's favoring of a *passive defense* posture, the mere fact that the controversial 2013 Chinese ADIZ has reduced the Taiwanese military air patrol reportedly by as much as half, is most unsettling for the already handicapped Taiwanese forces. As a result of this Chinese ADIZ, the shortest distance between Beijing's and Taipei's air zones has been reduced to a mere

thirty kilometers (Wang 2013). As a result, Taiwan is still implying its will to rebalance its military readiness also to its outer domain. A clear demonstration of this would be the recent 2014 military exercises, that aimed at the goal of reclaiming Taiwan's outlying island Taiping⁴¹ in case it would be overtaken. Despite of various different claims over the island's territory of the likes of China or Vietnam, Taiwan's recent military drill is quite profound, given that the last similar drill that was executed in this location was back in 2000 (Keck 2014b; Lin 2008). Other than that, Taiwan's military doctrine is built up around the idea of keeping a potential confrontation as long and as far away from its populated center as possible. It is therefore understandable, that despite their differing political affections, both defense postures practically bolster up each other in the same goal of withstanding a constant force output as long as possible (Mizokami 2014).

To sum up, it can be argued that Taipei's strategic arrangements would be mostly in the need of such RMA elements like a secure C4ISR system and force jointness, as Taiwan's challenges are more intensive on operational stability, that cannot afford to be marked by wrong decisions, which could prove fatal in case of tactical miscalculations coupled with a poor adaptability of the respective force units to a possibly changing situation. While more offensive oriented elements like PGMs and up to date damage inflicting weapon systems are obviously still highly required, they cannot compete with the PLA quantitatively. What Taiwan must accomplish in a possible Chinese attack scenario, is the initial withstanding of these attacks, after which a fully authorized force response, which would ideally focus on destabilizing Beijing's A2/AD efforts, would be able to unfold. If Taiwan could indeed withstand such an initial Chinese attack, it would prove problematic for the PLA's desired outcome of taking the island over quickly with minimal international interruption. Therefore a favorable course of action for Taiwan would be to sustain its "smart power" asymmetric approach, where the interoperability of weapon systems should be as much flexible and adjustable as possible, so that they could be more easily applied to the overall operational jointness of the armed forces, which are needed to safeguard Taiwan's peripheral space as much as the island itself (Yang 2008: 201; Yang 2011).

2.3 Analysis

Having reached the end of the first segment, it is now possible to reflect on the main findings by trying to respond to the first four subquestions, which should not only reveal the respective extent or even the viability of China's and Taiwan's RMA, but also its overall character.

To start off chronologically, the first subquestion puts to attention the very nature of the proposed Chinese RMA. As was demonstrated both in the first segment and partially even in the methodological framework; it was not a question of "if" China will ever embrace the RMA concept, but rather a question of "when" and "how" it will embrace it. This argument is not so much built on the core base of the concept's original socialist narrative that started as the MTR (although it had a certain degree of impact when it comes to the initial Sino-Soviet bond regarding all things military-technical), but more among the lines of the United State's own conceptualization of the idea and its quite

⁴¹ Also referred to as the Itu Aba, the island is located about 1,600 kilometers away from Taiwan in the Spratly island chain (Lin 2008).

successful implementation in actual combat intense scenarios. The two most renowned conflicts in this sense, the 1991 Gulf War and the 1999 bombardment of Yugoslavia, made China come to a realization that in order to compete with the strong United States' presence in the Asia Pacific, it would have to project its military capability in a similar RMA fashion. And as it turned out, it decided to do so. Considering the escalating defense spendings and an overall military approach to strategy where by this point the PLA's reorientation from a mainly conventional land-based power to a more beneficial maritime and air force one is pretty much what one would expect given Beijing's political goals of its many territorial claims and a China-centric regional security.

Despite good reasons and an availability of a necessary allocation of resources, some still may continue to argue, that the CPC's incontestable tight control takes its toll on the PLA's inflexibility to act on a horizontal and thus on a more open RMA level, which should enable a greater interoperability in terms of force applicability and would also quite well benefit in terms of a bigger freedom and a better transparency exchange in other complementary aspects like the competitiveness of the weapons procurement market. However, one should also consider the real profound meaning behind the Chinese RMA as a means to Beijing's firm priorities of its regime security and territorial integrity; and not just as a duplicate form of response to the United States's own established RMA. Another thing to realize is the approach to this nonstandard RMA, which carries the subtext of what the authorities in Beijing call "Chinese characteristics". These characteristics in their most basic intent promote a transitive approach for reaching the desired RMA status, instead of a more grand, rapid and potentially destabilizing transformation initiative. As such, in reference to China's military cultural legacy, observation and a conscious strategic opacity that at the same time demonstrates and protects a clear military potential, are well respected elements that promote the transitive approach for carrying out the pursued RMA; making it more adjustable and manageable at the same time. This transitive character is further elaborated in China's envisioned long-term RMA realization process, which in the time of this writing is continuing forward in its second phase of semi-mechanization, that should be completed as soon as 2020. Altogether, the officially stated end goal is to reach a state where the PLA can forge a fully realizable information warfare by the middle of this century; what in end effect could serve as a potentially ultimate type of a military deterrent in the constantly evolving information age. While the so-called informationization represents the fulfillment of the Chinese RMA, the currently ongoing semi-mechanization should be seen as adequately important, considering that a possibility of a direct military confrontation is here to stay; more so given Beijing's somewhat unipolar stance in the region.

In this whole regard it is evident, that Beijing's pursuit of RMA as it is now falls clearly into the category of *Modernization-Plus*. This is not only due to the steady transitive nature of China's ongoing RMA process, but also due to the many constraints, which fit Bitzinger's description of "cultural obstacles", that hinder the very much avoided transformational changes. On the other side however, there are also instances that hint towards an openness of a greater operational efficiency, which deals with force size, personnel proficiency and with them connected jointness that should enforce the PLA's effort for more asymmetric options regarding combat-ready preparation. While these instances are not that exceptional to disprove the restricted *Modernization-Plus* classification of China's RMA, they might amass to more profound future decisions that might alter this current character. In regard to China's *Modernization-Plus*, it is also necessary to point out that despite the CPC's regulation of transparency, competition and

overall RMA supervision, China has reportedly become quite self-sufficient in its indigenous weapons procurement and with it the related R&D. According to this belief, instead of relying on outside inputs, China is believed to focus more on indigenous RMA developments, which regard foreign weapon imports purely as subsystems to their own main capabilities. While such statement is not easy to attest, the next segment might throw more light on the state of China's indigenous RMA sufficiency and thus the composition of its *Modernization-Plus*.

In contrast to identifying the character of China's RMA, the second subquestion's aim was to consider the possibilities of Taiwan's own applicability to such a concept. Although Taiwan did declare an intent to follow its own RMA path during Chen Shui-bian's tenure, the sequential KMT administration under Ma Ying-jeou saw (and apparently still sees) much less need to articulate a full fledged RMA initiative like Beijing did. Despite the absence of clear cut official RMA directions, this segment has shown that the applicability of the RMA concept for Taiwan is viable and well justifiable for several reasons. First off is the fact, that despite the KMT's normalization efforts mostly characterized by economic cooperation and an overall aim at a peaceful development in the strait, Beijing is left unaffected in regards to its still firm military preparedness to take Taiwan by force if necessary. With China's unchanged stance towards Taiwan as well as its steadily escalating military power, many responses both from within Taiwan as well as from the United States ring the alarm bell for adequate countermeasures. The response by the current KMT leadership is to say the least headstrong, as it argues that while Taiwan's military defense capabilities are a vital matter, their budgetary sustaining at present level should prove appropriate to withhold the PLA's potential attacks at least for the needed period of one month. Because an official Taiwanese RMA posture might send out a secluding message signaling a direct denial of in China's eyes inevitable unification, it could be argued that a distinct declaration of a seemingly deterring RMA concept from Taiwan is best left unspoken the same way as its very own open proclamation of sovereignty. As such however, even the waning effort from the KMT to embrace a stronger military posture in the name of defense, the basic notion of a military readiness is still alive among all the present parties, making the acceptance of high caliber military means ongoing, even despite its domestic political inconsistency and the foreign United States' weapon provision regulation.

Going further in, the assumption of an unofficially functioning RMA is indeed plausible, given that Taiwan proves positive in Raska's all three categories, which showcase besides an existing and unchanged insecurity also its economic resourcefulness and connectivity to outer United States' RMA assets. When looking past the budgetary constraints, Taiwan has not only the economic affordability to carry out a sizable RMA initiative, but also the advantage of its technological industry, which might prove quite useful in designing various potential indigenous RMA capabilities; mostly those that are information based like the C4ISR. On the other hand, the United States' authority to assist Taiwan's defense military capabilities, offers resource and time saving opportunities to implement some of its more accessible RMA assets. But as is the case with China, it is up to the second segment to try to narrow down the composition aspect of this Taiwan's hypothetically suggested "covert" RMA. By now however, the possibility of Taiwan molding its own RMA path, by both its indigenous efforts and by bandwagoning with the United States, seems as a viable option. If one were to compare Taiwan's RMA (even if only feasible) with China's own, it would appear to be also more among the lines of *Modernization-Plus*. However, it should be also noted that while

Modernization-Plus is a logical starting point for an RMA diffusion, Taiwan under a more RMA favorable political administration could be most probably less limited in exploiting more rapid and even transformational changes in its military along the line, as its military balance against China's own doesn't have the luxury to bide its time and hope for the best.

The encouragement for Taiwan to act in an RMA appropriate way is further observable when looking at its military based interaction with the United States, whose impact on Taiwan's and China's notion of RMA was the aim of the third subquestion. In the case of Taiwan, the United States' coordinative approach in military cooperation can be argued to be directly interrelated to Taipei's notion of RMA. Despite not having a bold cooperative set up based on direct military exchange that could enforce mutual force boosterism, there is enough compensation to be found in the United States' oversight, which is clearly more active than passive when considering its effect on Taiwan's actual military choices and awareness. This active oversight creates relevant assessments and feedback that respond to Taiwan's ability to handle its individual containment of threatening combat situations. The weight of these observations is believed to be more often than not carried over to actual or future military implementations, which are in end effect not only shaped after domestic opinions of military development trends, but also by normalization efforts from Washington's own involvement in providing the right amount of assets and guidance for the Taiwanese forces to withstand the constantly evolving Chinese RMA threat.

From this, it is instantly clear that the United States' military relations with China are not at all intended to provide the PLA with inputs to boost the mainland's RMA, which is designed to work against Taiwan. As such, a purely contributing intent to affect the Chinese RMA should be considered null. As is the case with most expected standard military relations, the United States seeks to maintain in touch with the Chinese forces for the sake of transparency and thus a clearer anticipation of its actions and developments, which naturally also involve the RMA side of things. In all its secretive efforts and ambiguity, the Chinese are well aware that although a certain level of formal military relationship is indeed mutually beneficial in regards to some shared objectives and collaborations, it is not in their interest to let a big competitor in on their more inner military progress and developments, thus further explaining the opacity of Beijing's many military initiatives in the first place. As is also for example evident from the mainland's declaration of its ADIZ, the Chinese seem to give priority to a more introvert military relation, which leaves them with more flexibility to slowly act out their objectives with as little attention and interference as possible. As of right now, the state between Washington's and Beijing's military relation will most probably resume being purely professional, with the main aim to maintain communications, which one way or another still get interrupted to mainly express the mainland's dissatisfaction of how it is being depicted or handled with in the Asia-Pacific region.

Arriving at the last subquestion, the segment also took a look at both cases' strategic arrangements that seem to employ RMA reminiscent thinking. In the Chinese case the role of information superiority, precision force, air and maritime assets seems to be in the forefront of the mainland's adopted anti-access strategy towards Taiwan. Not only is the mainland intrigued with the idea of cutting Taiwan off from its surroundings, but it is also assuming the right of a preemptive *active defense*, which grants the PLA with an opportunity to enforce its successful overtaking of the island even more if a befitting situation should occur. Taiwan on the other hand is handicapped by having to

out-wait an initial PLA attack, only after which it would be authorized to use legitimate force that would be supported by its American benefactor. Either way, the authorities in Taipei present both a *passive defense* and an *active defense* approach, where the former is more inward based and where the latter specializes more on the territorial outskirts. Given Taiwan's tactical disadvantage, both approaches are rightfully essential, as in the bigger scheme of things the *active defense* is needed to help alert, mobilize and enforce the inner layer passive defense. It can be therefore suggested that Taiwan's strategic preparedness would highly benefit from the outer needed air and maritime defense assets as well as from an inner based missile defense. As in terms of precision force, it is a shared key element for both sides, whose effectiveness could however be put into even a greater use by a correct exploitation by the air and maritime service units. Last but not least, Taiwan should also be in principle able to make better use of its C4ISR capacities than the PLA, as the close vicinity of the battlefield towards the island would make it more accessible and reliable.

3. RMA Related Military Capabilities

3.1 The Case of China

3.1.1 Information Processing

As was clearly established earlier, China has developed a strong sense for RMA information technologies under the concept of its long-term informationization process. Such choice is not that hard to grasp, as Beijing became long aware that information superiority equals for better force multiplicity towards opposing enemy forces. Even some of the RMA's utilization that is reminiscent of goals like the DBK or even the ambitious GR/GP communicate the need for a strong established information capabilities architecture, which Beijing all the more considers as the main driving force in terms of using the full potential of other RMA capabilities. As such, there is little surprise that the authorities are shifting their attention on developing superior cyber warfare capabilities to be able to take over the virtual battlefield, through which the PLA would not only retain its internal information flow, but would also extract the one from the opposition and thus placing it at a serious disadvantage (Housworth 2007). Cyber warfare as a pure single entity has and most likely will keep its high place on the CPC's military priority agenda. Still, in regard to China's ongoing second RMA phase of semi-mechanization, it should not be too much overestimated over the cluster of versatile C4ISR information processing capabilities, that enable an RMA based military to link both the virtual and physical plateaus of battlefield. This is very true when it comes to the exploitation of information not only for a virtual attack, but also for an actual physical force deployment through another important RMA element which is precision force. As will be showcased later⁴², China's booming precision force calls for a necessary C4ISR structure, which should not only identify and locate far reach and mobile targets, but also keep on their tail in real time evolving situations, what requires not only a great deal of diverse surveillance capabilities, but also an actual command and control that can process the information most efficiently and with unnecessary delay (Mahnken 2013: 20-21).

Because of the C4ISR's strategic prospects, there has been an emergence of a commercial C4ISR market, that provides different solutions in this area. Many renowned contractors in the defense industry have embarked to provide their own C4ISR capabilities. Some among these include names like *Lockheed Martin*, *Boeing* or *General Dynamics*. The catch with China is however its indigenous approach in constructing its own independent C4ISR system (21AAR 2014; Defense Systems 2014). China's fixed idea of a strong C4ISR is also evident from the fostering of specialized recruits and military personnel, that don't adapt to the complex nature of the system on the go, but are solely brought up for its utilization from the very beginning. This is quite an interesting if not direct approach to not only establish an indigenous C4ISR network by the means of physical and technical construct, but also by the means of highly educated human resources that know their way around handling the systems full potential. Although the opposition has also qualified human resources that can handle the complexity of such a system, the difference is reportedly in the sheer magnitude of Beijing's initiative to

⁴² Refer to 3.1.3.

support cyber and information centric career paths in big numbers for the mainland's growing military power projection (C4ISR Conference 2014).

On the side of actual technological capabilities, China's C4ISR has a strong coverage of means to create a clear information canvas for the commanding forces to use at their will. One of the most essential areas in this regard is Beijing's space related focus, which is well constructed considering that the CPC promotes a strong Chinese space presence as a national level priority (Bilsborough 2013). As such there are more than sixty active Chinese satellites orbiting the planet surface, from which at least twenty are identified to serve a purely military purpose of providing the military with necessary recon (Yang 2011). There is however one aspect of the Chinese C4ISR space program that indirectly hints at greater possibilities that could overcome a more confined DBK approach into far more exceeding GR/GP tendencies. The matter in question is the initiative of China's very own satellite navigation system called the *BeiDou Satellite Navigation System* (BDSNS), which by 2020 should launch its remainder of satellites into orbit and improve its accuracy for a fully functioning navigation on a global level. While the BDSNS services are open to foreign partnerships and are also versatile in their utilization from providing different monitoring opportunities like for instance in the areas of disaster relief assistance; their Chinese origin⁴³ also symbolizes an equivalent to the United States' own invented GPS, meaning that Beijing is becoming more capable of operating on equal terms with its global adversary (Fyodorov 2013; McCauley 2014; Xinhua News 2013). As of not so long ago, China has also publicly confirmed that it is proceeding with the development of the next phase of its BDSNS, whose accuracy would account for two and a half meters, making use of the foreign GPS variant within the mainland all the more minimalistic in opposition to an indigenous and thus more secure replacement. Although not openly marketed as a tool for military implementation, there is no doubt in believing that the PLA heavily integrates BDSNS into its established C4ISR network, as its pinpointing and monitoring qualities are not only top notch, but also evenly more enclosed from outside intervention (McCauley 2014).

Moving on, Beijing also pays attention that its space C4ISR assets are in conjunction with the PLA's terrestrial C4ISR capabilities, which in accordance with China's strategic arrangements have their eyes laid on scanning and patrolling the maritime and air space territories as far as the "second island chain". The key element in achieving maximum detection of uninvited weapon platforms or deployed missiles lies in the PLA's heavy density of fully interconnected *Over the Horizon Radars* (OTHRs), which are mostly scattered along the mainland's coastline, providing a massive coverage of the far-reaching maritime waters together with their air space. Another aspect of these OTHR's is their low frequency capability option, which opposed to a sole high frequency one provides a very likely chance to detect even stealth operating aircraft or other similar platforms within the frequency's range (Pakistan Defence Forums 2014; Yang 2011). To further enhance the potential of the PLA's monitoring capabilities, Beijing has also invested in many mobile monitoring options that could be seen as a direct response to the United States own AWACS and UAV's monitoring capabilities. The most prominent of these are the PLA's own variants of airborne monitoring platforms, some of which possess radar technology estimated to have better utilization than the competition. To demonstrate, the PLA's *KJ-2000* model as the top representative aircraft monitoring

⁴³ In terms of global navigation, there are three other major players not counting China: GPS from the United States, *Galileo* from the European Union and *GLONASS* from Russia (Xinhua News 2013).

station was in time of its 2010 deployment considered to be two whole generations ahead of its United States's AWACS counterpart in terms of utilized radar capability. As for the UAVs department, the PLA's efforts are in comparison to the Western accomplishments catching up fairly quickly in their capability to serve as effective ISR agents, as they are constantly being experimented on and expected to rise in their efficiency to serve as complementary components of the already established C4ISR structure. As such, China has reportedly developed UAVs that are not only fully operational, but also deployable for long periods of time that can go on for as much as forty hours straight without disconnecting (Bilsborough 2013; Kopp 2010a; Kopp 2010b). While China's UAV capabilities are among the more novice concepts, it is also here that one can still distinctively observe the mainland's signature process of acquiring foreign assets in order to be able to make own indigenous progress along the way. As a result of such an approach, the PLA is confirmed to be in possession of at least twenty-five different prototypes of their own altered UAVs, which are believed to become gradually more accompanied by additional unmanned underwater vehicle types, that would be similarly capable of carrying out ISR objectives (Erickson and Chase 2011: 259)

Last but not least, it is also interesting to point out, that despite having a solid base in actual technical capabilities and knowledgable human resources to back these up, the operational aspect of the PLA's individual conventional force units is also believed to be lacking behind in terms of exploiting such potentially obtained C4ISR information inputs. There are two main arguments that consolidate this claim. The first one suggests that the PLA authorities don't possess a firm first hand experience of the tactical scale of demands that an actual information-centric war involves. Beijing's actual record of its fairly new C4ISR deployment in real combat scenarios is by some observants deemed practically thin in opposition to someone like the United States, which through their several combat experiences over the recent years were able to construct unbiased feedback in favor of shaping their C4ISR system for a better operational clarity on future battlefields. On the other side, the previously made claim⁴⁴ of an "information umbrella" serves as a reasonable counterargument, because it sees the practicing of these capabilities in peace times as unobstructed and thus highly favorable for improvised experimentation (Lai 2010: 25; Newmyer 2010: 488).

The second argument however touches on the very jointness of the PLA's armed services, which are believed to be disconnected among each other, making even potentially better C4ISR technological capabilities in some regards futile. The main limitation in the concept of force jointness in the PLA ranks is believed to come from focusing more on strong transparency and communication links between singular subordinate and superior units of a particular armed service rather than on actual inter-service connections themselves. Yet, even with a better inner-service connection, even here there are reportedly many setbacks due to the usage of many outdated and incompatible assets, that in many cases make interoperability with modern C4ISR capabilities quite problematic if not impossible at all (Bilsborough 2013; Lai 2010: 25-26). With China's transitive approach and a pretty late recognition of an official notion of jointness, which occurred in 1999, this ought to be expected. To conclude, China's transition from a more inner-service jointness to a more C4ISR benefiting inter-service one may seem inactive in a short time perspective, but should not be underestimated in the long time run either. After all, the PLA itself is at least aware of this, as it admits that

⁴⁴ Refer to 2.1.1.

while it has achieved success in obtaining sufficient C4ISR capabilities, it still struggles with their seamless integration into functional joint operational conducts (Pollpeter 2010: 194, 206).

In summary, these arguments don't necessarily discredit China's formidability of using its C4ISR in a potential near future conflict effectively; however the doubtfulness comes from the second argument, whose point is perhaps a direct result of the first one's less tangible PLA inexperience, which leaves the greater importance of PLA jointness practically unattested and seemingly lower on Beijing's to do list. Either way, China's C4ISR is not to be taken lightly, but rather the opposite. Given that it was able to mobilize from the PLA's not so long ago conventional military thinking, which undeniably has left its mark on the operational side of things, it is also progressing at a steady pace to what should be seen as a still evolving future prospect of this C4ISR and all the other capabilities it tries to interconnect. This is all the more expectable given the fact that in terms of technological and military innovation, what made it possible for the mainland to leap-frog the initial gap with its competition in the first place was China's long succumbing to absorb foreign developments and trends, thus enabling it to be more creative and daring in its current indigenous undertakings of which C4ISR capabilities are no exception (Kopp 2010a; Pollpeter 2010: 201).

3.1.2 Military Platforms

From discussing China's A2/AD strategic outlook, it is evident that if China really wants to be able to lock in the area surrounding Taiwan, it will also need the assistance of primarily air and both surface and undersea maritime platforms. Not only are these particular platforms a key element of their own, but they are also expected to supplement each other out in the grand scheme of the PLA's A2/AD operational success. This is mostly due to the environmental nature of where the mainland seeks to implant its A2/AD strategy. On one side there are the shallow waters that stretch far away from the mainland's shore, what creates a situation where bad acoustics and limited operational maneuverability of undersea military assets would make the environment much more less manageable were it not regulated by the nearby and centered aircraft presence. On the other side, the further the PLA would approach its envisioned "second island chain", the more it would have to depend on its naval assets; especially undersea ones, which due to a shift to deep waters could grasp the opportunity of becoming irreplaceable frontiers balancing the more out in the open surface and air platforms (Cote 2011: 8-9).

Beginning with the PLA's air force, it is a very exemplar service showcasing the PLA's *Modernization-Plus* efforts by rapidly bringing new generation aircraft to the table, while also upgrading some of its older models to a standard where they can be used as a supplementary force. Current prospects show that the PLA will be able to double its current modern aircraft capacity by the end of 2020. The upgrading aspect can be seen as a temporal solution for maximizing China's substantial air force by equipping fairly outdated platforms with a much more easily produced lethal missile force. This is mostly true for the PLA's not so very RMA-like bomber fleet, which although hasn't been upgraded since the 1950s, still presents a vital role by carrying cruise missiles capable of destroying large air and naval targets. The move to a more compact modern air force was as one would expect preceded by direct purchases from Russia, which were later on followed by several licensing agreements that in end effect paved the path to Beijing's

current day mainstay domestic production of much more robust RMA reminiscent air assets ranging from light stealth aircraft to sturdy AWACS aircraft (Grant 2013: 34-36; Shen 2012: 261, 264). China's air force rise has also strongly benefited from the mainland's more cost efficient manufacturing assistance, making it a suitable partner that would take part in the production process of foreign commercial flight platforms for such names like *Airbus*, *Eurocopter* or even *Boeing*. Such involvement proves very beneficial for the PLA, as the gained access to foreign commercial aircraft production reveals many dual-use technologies from which Beijing can learn a thing or two. As such, China's combined absorbed foreign knowledge threw its aerospace industry into a whole new category, as the mainland is recognized as self-sufficient in developing its own fifth generation⁴⁵ aircraft fighters that showcase the industry's serious potential of becoming a top candidate for aerospace innovation in the near future (Menon 2014).

Moving on are the PLA's maritime platforms, which could be regarded as the mainland's main expansion tool for displaying influence far beyond its shore waters. The reality is however that similarly to its air force counterpart, the PLA's maritime surface platforms are mostly constricted to the water domain near its mainland in terms of their effectiveness. This is not because they are insufficient in their build, but merely because of the fact that there is no real remote safeguarding frontier where these platforms would be able to resupply or avoid a geographical vulnerability of being left out in the open for too long. The logistical support for the PLA's distant operating military platforms wouldn't suffice just based on a few small contested island groups either (Erickson 2013a). It is also for this reason that the modernization of the PLA's navy is not only limited to an overly one-sided investment of standard offensive assets like frigates or destroyers, but also encouraged to bet on more complementary tactical variants like underway replenishment ships, different communication and monitoring enforcement ships and even amphibious ships that are meant for a quick ground force deployment. All these together are as much capable of strengthening the PLA's maneuverability in outside waters, as they are dreadful in their strategic use in a potential rapid storming of Taiwan by naval means (O'Rourke 2014: 2-3).

Another critical aspect on the list are the PLA's undersea military platforms that are represented by both refurbished and completely new high standard submarine types, which due to their ability to slip even into highly contested waters of the South China Sea are getting as much military attention as they can right now get. Much according to a standard RMA approach, China's conventional quantitative submarine strength has shrunk quite a bit over the years in exchange for accommodating a greater qualitative built-up. The present day PLA submarines are believed to have been trimmed down almost by a third when compared with the situation in 1990. Although the United States has the upper hand by utilizing nuclear type submarines that are reported to be more faster and better equipped than those of China, the PLA is also hard at work at making its own rapid progress with which it could catch up to Washington sooner than originally expected. The PLA's majority of silent diesel based submarines are not only getting more difficult to detect, but are also being upgraded with more lethal strike capabilities in the form of modern long-reach ballistic and anti-ship cruise missiles⁴⁶, which by 2020 should

⁴⁵ The currently most advanced ongoing generation of top-tier aircraft models.

⁴⁶ The main difference between ballistic and cruise missiles lies in the way they maneuver. Ballistic missiles are high-altitude missiles fired in a top-down manner as rockets, whereby cruise missiles are low-altitude missiles equipped with wings thus functioning more like jets (Brahmos Aerospace).

be available to roughly seventy-five percent of these submarines; not to mention the PLA's handful of nuclear based submarines to whom such arsenal will pretty much come as a default prerequisite based on current assumptions (Erickson 2013b; Schreer 2014). The most prolific progress could be however assigned to these nuclear submarines, which acquired operational sophistication for distant missions such as in the Indian Ocean or even in close United States' vicinity. What more, this operational capacity is expected to rise steadily, as Beijing has issued the expansion of its nuclear submarines by at least four new and enhanced variation types (Benson 2014).

Still, one defining aspect that could be regarded as a hindering obstacle for both the PLA's undersea operability and its surface fleets is the lack of deeply established *Anti-Submarine Warfare* (ASW) capabilities. The importance of a solid ASW coverage is the more vital for the PLA the more its maritime based military platforms excel. This is due to the simple fact, that having such costly surface assets without paying attention to the ASW can leave the PLA exposed to the opposition's equally capable submarine force that could easily gain the upper hand in striking some unsuspecting enemy assets. But to give credit where credit is due, Beijing has been lately more keen in addressing its past shortcomings in ASW related issues, by equipping many of its surface assets with supposedly reliable submarine locating sensors or just by deploying specifically designed patrol ships and aircraft for the sole purpose of detecting these silent threats. Despite this whole effort however, the effectiveness of the PLA's ASW capabilities relies on a close proximity to the mainland. But if China's A2/AD strategy should serve as an indication, one could expect that progress in long-range ASW will follow sooner or later, if it already isn't being worked on as we speak (Farley 2014; Lin and Singer 2014).

To conclude, it is fair to say that China's statement of using foreign technology as complementary subsystems might prove to become more true as time passes by. While it is undeniable that China ignited a more active domestic R&D and with it related military production, the fact still remains that a fair share of these indigenous efforts are at their core foreign advancements that are being adjusted and occasionally improved for the PLA's best possible utilization. Still, these leap-frog improvements show a tendency for Beijing to indeed broaden its unique indigenous production in the future even more, as it has become relatively clear that as a whole, the mainland is step by step discarding its outdated assets for modern counterparts that are especially keen on far distance power projection (Shen 2012: 268; Weitz 2014). Speaking of far distance power projection, it also seems that the ongoing diversified modernization in the described military platforms suggests a noticeable capacity to shift the PLA's military concentration from a "near coast defense" to a "near seas defense". While the far seas are still an uncertain endeavor, the near sea extension can be interpreted as a step forward to enforce Beijing's A2/AD strategy, which by now should have enough reach to try conceal Taiwan from an outside assistance attempt (Li 2011: 133-134).

3.1.3 Precision Force

The final and perhaps most apparent factor in China's A2/AD strategy is its precision force capability. The thought of having a robust and versatile missile force arsenal pointed at the Taiwan Strait began to already shape at least in the yearly 1970s, when the mainland was convinced that instead of investing in a strong naval force, it could substitute its outer force projection simply by focusing on the development of a solid

precision strike (Mahnken 2013: 22). While the posture on naval capabilities has since then taken pursuit of being revamped, this initial prioritization of a missile force clearly suggest that by now China should be long past its earlier conceptualization phase and in the possession of a strong *Second Artillery Force* (SAF). As a matter of fact, Beijing has already in its mid-1980s possessed capabilities such as intercontinental nuclear missiles. By this day, the SAF has had enough time to reach a fully operational medium range precision force, which consist primarily of the supposedly largest ballistic based missile inventory in the whole world, as well as from various land, air and sea based cruise missiles. Due to this expansion, the PLA is able to formidably intervene with its missiles in an estimated radius of roughly 1,500 kilometers from the mainland's shore. Other than that, Beijing is also developing intermediate range ballistic missiles, which could travel as far as 5,000 kilometers. While a far-reaching missile coverage that fully encompasses the "second island chain" and even waters beyond it is still represented among the SAF's capabilities, there are solid assumptions that China is rebalancing its focus with a more attainable short and medium range missile coverage, as the efficiency of far-reaching missiles is even more dependent on a dominant radar and satellite communication interconnectivity, which enable missiles at such a long range to reach at least a near precision capability in the first place (Cordesman 2014: 290-291; Talent 2014). Other than that, reports indicate that since the inauguration of precision technology into SAF, the rate of missile launchers that are suited for a far-reach nuclear delivery decreased from a once hundred percent ratio to a rough forty percent one in 2012. What more, at least sixty percent of the contemporary SAF inventory is believed to posses the necessary means to be used in a non-nuclear local conflict, which would play out under informationized conditions near the mainland's vicinity. And lastly, it is estimated that opposed to a once again initial hundred percent ratio of SAF's capabilities to reach as far as the United States' base in Guam; in 2012 supposedly only about fifteen percent have had such a potential ability (Cordesman 2014: 297).

This is not to suggest however, that Beijing is not investing time and resources to acquire better intermediate and long-reach precision capabilities. While the SAF's short and medium range force strike should undoubtedly be more than sufficient to present Taiwan together with a possible foreign intervention with enough challenge on their own; the effort to master a long-reach precision strike has sprouted perhaps the biggest RMA reminiscent initiative for China in terms of precision force to date. To elaborate, one of the SAF's most renowned conventional ballistic missile types known as the *DF-21D*, has been remodeled to serve as a hard to detect low altitude maneuverable ASBM, which could be used to target far-away moving enemy vessels (Huiss 2012: 17-18; O'Rourke 2014: 5). However, this initiative provided quite some challenge, as such a missile would need constant near real-time readjustment to shrink down the field of its moving target. While the PLA has held several successful missile strike exercises, these are suspected to have been carried out against fully stationary targets that don't require higher demands on timing, navigation or positioning. Even despite China's C4ISR and in it embedded BDSNS, there is still quite some room for inaccuracy and error, given the opposition's own anti-missile measures and high speed maneuverability. It can be argued that this supported the adoption of two tactical countermeasures. The first one is aimed at boosting the hit rate by applying an asymmetric "soft kill" approach, which seeks to make the target non-operational as opposed to being utterly destroyed. An effective and probably highly implemented way by the mainland of achieving such a result is by having warheads that can release a large number of smaller missiles that would saturate a wide

surface area (Blasko 2013: 81-82; Chandrashekar et al. 2011: 26-27; Watts 2013). While a highly saturated missile load-out was already common in the days of the past, the mainland's sophisticated possession and progress in cost declining PGMs creates a "quantitative quality", where the opposition's missile defenses would be tested with hoards of in succession arriving missiles (Maine 2014).

The other more recently observable countermeasure is the mentioned RMA reminiscent initiative, which is the mainland's domestic development of *Hypersonic Glide Vehicles* (HGVs). These HGVs present an even greater threat perception, as they are much more faster, precise and hard to deflect; making them a superior candidate for the evolution of the SAF's maneuverable ASBMs. According to recent observations describing Beijing's drill launch, the mainland's HGV was successfully propelled into space from which it re-entered the earth's atmosphere, where it was able to retain precise maneuverability under an average Mach 10⁴⁷ speed level. As a result, it is expected that Beijing will keep prioritizing the HGV development even further, as even contemporary defense systems are supposed to be highly vulnerable to such an unpredictable threat. If Taiwan happened to be targeted by such an HGV force, the only way it could more certainly prevent its strike would be through laser weapons or rail guns, which are for the island simply unobtainable, as even the United States are believed to have trouble obtaining such a technology for themselves. Some even suggest that a successful development of HGVs could be the next real RMA breakthrough since the invention of atomic warfare, making Beijing a serious candidate for being somewhere in the top of the RMA's future "food chain" (Gertz 2014; Lowther 2014; O'Rourke 2014: 6).

As for the representation of medium and short range missile precision capabilities, China has a big variety of both older upgraded as well as newly developed precision missiles, which are just a step away from Taiwan's many stationary target outposts. Regarding the upgrades, many short range missiles aimed at decapitating Taiwan's air assets got equipped with precision strike technology, which amplified their successful destruction probability by at least five times in comparison with the standard version. As a result, China's overall implementation of precision capabilities is creating a situation, where the SAF is able to broaden its destructive potential through just the upgrading of its older existing assets (Cordesman 2014: 307-308). Despite this artificial missile strike expansion, Beijing has enough recourses and willingness to also push through with brand new domestic modernization initiatives, which include other PGMs like anti-radiation missiles⁴⁸, laser guided munitions, all-weather munitions⁴⁹ or even bombs specifically designed for runway destruction (Cole 2012b; Hewson 2013: 1, 3-4). Another key element accompanying the mainland's highly capable PGM-arsenal are both land- and sea-aimed cruise missiles, which also reflect the mainland's continuation of its military-technical relationship with China even to this day. While Beijing has produced a number of modern domestic cruise missiles, it also incorporates a number of Russian models, which help constitute future and more varied indigenous developments. This cooperative effort made the Chinese R&D scene capable of designing a very versatile cruise missile

⁴⁷ The HGV is expected to operate at speeds ranging from Mach 8 to Mach 12 (Gertz 2014).

⁴⁸ Specifically aimed at a strategic destruction of radars and monitoring stations (Czeszejko 2013: 285).

⁴⁹ In comparison to laser guided munitions, the all-weather munition's precision capability depends on satellite navigation and is thus not limited by bad weather conditions that can obstruct a laser based guidance (Cole 2012b).

inventory, which can be deployed from almost all imaginable military platforms including dry land, air, sea, and even underwater. Given the key role of maritime elements in China's A2/AD strategy, it can be affirmed that precision force meets all the demands, most notably as Beijing's maritime forces have become one of the world's best and heavily equipped assets in terms of highly precise cruise missiles (Gormley, Erickson and Yuan 2014: 15, 89-90).

This leads us to another quite important acquisition for the Chinese SAF, which is embedded in a deal to obtain the highly sophisticated Russian *S-400* defense system. This surface-to-air defense missile system is in its utmost design aimed at deflecting and repressing of the United States' air force strike, which in principle has been a thorn in China's side since its very presence in the region. Not only is the system capable of reaching and destroying key targets like AWACS or stand off jamming outposts, but it also has good protection attributes that make it difficult to sabotage. A single *S-400* system unit includes a commanding outpost with associated radars and most importantly several mobile missile launchers⁵⁰ that can favorably switch positions if ever needed. Supposing the agreement between Russia and China won't get canceled, then the PLA should by roughly 2016 or 2017 have access from up to two to maybe four such *S-400* system units. This delay is mostly the cause of Russia's own high demand on production delivery, which the domestic contractor prioritizes above foreign exports, for which so far only China has been realistically addressed. The *S-400* system has however some serious implications for Taiwan, as its missile range is able to cover the island completely and not only partially as is the case with the PLA's current operating air defense system (Dunai and Smith 2014; McDermott 2014; Schwartz 2014). As such, it remains to be seen if Taiwan will be able to conduct countermeasures till the time of the supposed delivery, or if the United States themselves will provide the island with a solution in terms of a more open access to some needed weapon procurements; especially in the lacking aircraft department.

To end off, Beijing possesses both a quantitative and a qualitative precision force, which is expected to maintain its future progress. What more, the pacing of this progress proves that China is managing to decrease its gap with the more experienced competition. For instance, it took Beijing just about a decade to establish a fully operational ASBMs force, which was initially only a sole concept. Altogether, the combination of the Russian military-technical relationship with China's own emerging expertise and BDSNS, shape a precision strike prognosis that is looking to be highly in Beijing's favor (Huiss 2012: 15; Mahnken 2013: 22; Talent 2014).

3.2 The Case of Taiwan

3.2.1 Information Processing

Because Taiwan similarly to China adheres to an asymmetric military thinking, it is by no accident that it too would seek to integrate a sophisticated C4ISR framework to better accommodate its defensive needs. On top of that, given the state of Beijing's and Taipei's imbalance in terms of military resources and budgeting, it is practically not a question of

⁵⁰ One unit consists of twelve such missile launchers (Schwartz 2014).

choice, but rather an essential development for the Taiwanese forces to invest into a well thought out C4ISR network, that at the end of the day would have to hold up during the whole period of a potential PLA raid. As it turns out, the authorities have been long aware of this fact, as the shaping of a Taiwanese C4ISR infrastructure has been in motion since 1990. While the beginnings were focused more on experimentation, the 1996 missile launches were really the first breaking point for Taiwan's C4ISR, as they triggered the establishment of core needs, like for instance the embedment of fiber-optic communications and with them new compatible equipment. The next big initiative came in 2000, when in accordance with the typical coordinative behavior of the United States towards Taiwan in regards to their military interactions, Taipei received valuable inputs on how to shape its C4ISR in order to maximize information superiority over the mainland. As result, Taiwan was able to up its C4ISR architecture by having access to United States based and approved contractors like *Lockheed Martin* and *Gibbs and Cox Inc.*, which helped to design Taiwan's C4ISR system in relation to a better air and naval awareness (Mulvenon 2004: 147, 152; Ross 2009: 9, 12).

To describe the actual character of Taiwan's C4ISR capabilities, one can argue that they are both a product of American design and of Taiwan's "techno-hybrid approach". To explain the American side of this C4ISR system, it is logical to assume that because of Taiwan's limited military market maneuverability, a United States' contractor was indeed the most valid option. One could however object, that Taiwan would be capable of establishing a more indigenous C4ISR system by the means of implementing its own high standard technological know-how. The difficulty with such an approach would however consist in the challenge of a main domestic military contractor to effectively arrange other subcontractor; especially when it comes to diversified and versatile design choices that have to be interoperable for something as multi-layered as a C4ISR. Letting a well interconnected American company like *Lockheed Martin* take charge of such an C4ISR project makes plenty of sense when considering Taiwan's limited global military market access together with the fact that supposedly most defense contractors in the broad Asian region are believed to have weak links among their domestic innovative industries. On the other hand however, Taipei's prestigious innovation companies have still a fair share in such a construct, as they by the means of foreign direct investment have placed themselves into the middle of many such foreign processes that both widen and implement Taipei's supported diffusion of domestic R&D knowledge. With the United States' core design and Taiwan's additional adjustments and upgrades, such C4ISR system could be considered a hybrid that also uses some of Washington's own C4ISR capabilities (Cheung 2012: 3-4; Bitzinger 2013b: 150).

Fast-forwarding to present day, Taiwan has already achieved a fully integrated and functioning C4ISR system that goes by the name of *Po Sheng* (PS)⁵¹. After the PS saw its completion in 2009, it has become an inseparable component of every following HK exercise, proving efficient in pairing both a better tactical awareness with the already established sense of operational jointness (Mei 2010). One thing to keep in mind however is a still "evolving potential" of this C4ISR system, because despite its initial 2009 setup, the lack of sufficient funding and resources resulted in a rough one third downscaling from an originally envisioned plan. On the other side though, the PS has proven to wield positive results and has therefore become a subject of constant support and financing. Its attractiveness also lies in the flexibility of taking advantage of many information and

⁵¹ Means "broad victory" (Stokes 2009: 17).

COTS based technologies of which Taiwan has an abundance; not to mention the system's direct interconnection with the United States' *Pacific Command* that grants Taipei access to the American *Joint Tactical Information Distribution System* to keep the communication links among all active military platforms always up and running (Arthur 2013; Stokes 2009: 19-20). Equally important are the PS communication and information sharing capabilities on a domestic level, which also prove to be well executed due to their attention to automatic information processing that is distributed among many joint platforms. For instance, the strategically critical Taiwanese air force is being navigated in a seamless synchronization effort and best possible awareness thanks to the interconnection of its standard *Combat Air Command* with a *Joint Air Operations Center* and an *Automatic Air Control Center*. What more, a wider operational interconnectivity between the air force and other service units merges together through a heavily protected underground based facility referred to as the *Combined Operations Center* (COC), which serves as the PS's strategic command and control melting pot (US-Taiwan Business Council 2010: 7).

As for the ISR monitoring capabilities, Taiwan also has a solid backbone in both space based and terrestrial based assets. Although Taiwan's space program is not regarded as expansive in scope like the one of China, it is never the less quite robust on its own. The most renowned space initiative which directly relates to ISR is Taipei's own established series of surveillance systems known better as the *Formosat* series, which other than having the capability to provide military reconnaissance are centered around a structure of smaller satellites and micro-satellites, what creates a greater evasive chance for Taipei to withstand any possible PLA satellite obstructing or even killing capabilities (Stokes 2009: 21-22). Another key ISR element is Taiwan's heavy use of air sensors and radars, which thanks to their mobility are upon request able to recover observability on different areas of interest. Ground based radars and sensors are also more efficiently utilized due to Taipei's investment in several AWACS aircraft, which are able to take notice of far away low-altitude enemy assets that tend to avoid detection from ground based monitoring stations. Still, the perhaps most important asset would be the last year's put in motion *Surveillance Radar Programme* (SRP), which is able to provide a much better precocious alert against both PLA's long-reach missile and air strike. Being once again handled by another American defense contractor, namely the *Raytheon Company*, the SRP uses much of the United States' own accumulated expertise in its area of radar research, making the radar able to track golf-sized targets within a 3,000 kilometer radius, not to mention it is also reported to be able to register standard targets within an impressive 5,000 kilometer radius (Fisher and O'Connor 2014; US-Taiwan Business Council 2010: 7-8). What more, the radar also has the ability to monitor roughly about a thousand targets at the same time, not to mention that it is equipped with reportedly highly effective jamming possibilities. Considering the sheer magnitude of this radar's potential, it should be expected that it would place very high on the mainland's target list. Regarded as one of the most advanced radars to date, the United States are even evaluating a more mutually benefiting partnership with Taiwan, as they are open to consider an interconnection between the SRP and the American ISR, what could in end effect amplify and safeguard the island's current ISR options even more. The catch is however, that Taiwan is somewhat relentless in sharing its monitoring data extensively, unless Washington would provide the island with greater assurances to receive much more required defensive assets than those it does occasionally tend to acquire with difficulties (Minnick 2014a; NTI 2014a)

Other than that, it is also reported that Taiwan is expanding their focus on more advanced UAVs, which have the ability to operate near the mainland's coastline in order to gather data about the PLA's many stationed missile sites that are accumulated on the shores right across Taiwan. While claims of a successful operational maneuverability still await a more provable confirmation, Taiwan has indeed invested in an UAVs project⁵² that produced several drones aimed at ISR based objectives. What more, this indigenous research initiative seems to be doing quite well, as the United States themselves are for instance starting to implement the same data storing components in their own UAVs. On another note, despite the United States' possession of far reaching drones, it is feasible for Washington to promote Taiwan's future UAVs initiative and other ISR capabilities in general, as the relatively close proximity to the mainland makes it a much more cost effective approach to keep a better eye on Beijing (Chang and Hsu 2014; Keck 2014c; Lo 2014).

While Taiwan is in possession of a quite exemplar C4ISR structure that corresponds well with its sense of force mobilization and jointness as opposed to the PLA, it too has a hard time of its own to keep maintaining it that way from the mainland's constant attempts of breaching the system with the ultimate goal of sabotaging it when needed. While China's spying and cyber activities aimed at Taiwan are nothing new, the perhaps biggest breach is directly related to Taiwan's C4ISR, where a high ranking army general Lo Hsien-che was at least since 2004 giving away confidential information regarding the very PS and with it other related C4ISR assets. Other than this most damaging occurrence, there have been several more known exposed cases where Taiwanese officials have been selling out valuable information that was directly related to Taiwan's defense infrastructure. Despite of its quality profile, it is mainly because of these inside breaches that Taiwan's C4ISR is endangered to fall short in the long run, because while it certainly strives to evolve forward, it is also occupied by repairing any damages to the system that would otherwise be misappropriated by follow-up waves of cyber attacks (Cole 2012a; Mozur 2011). As a result of this, Taiwan is constantly in a counter-responsive mode towards the PLA's cyber threat with its own information tactics that revolve mainly around upholding secure networks and connection lines. However, Taiwan's military grade information warfare tactics are due to the economically fixed information proficiency made up of not only defensive arrangements, but reportedly also from offensive malicious software and electronic intervention methods tailor made for the mainland's own information architecture (Mahnken 2004: 217; Ventre 2009: 106-107).

In conclusion, Taiwan's C4ISR seems to be well established for both distributing information among forces as well as for monitoring and obtaining it through ISR capabilities. The real challenge will be in maintaining this modus, while effectively fighting off the PLA's both virtual and more direct espionage attempts. What makes this situation however delicate is the KMT's vision to open up Taiwan towards an even more cooperative exchange with the mainland, what some military observes see as a clear opportunity for the PLA to operate even more easily on the island's inside (Mozur 2011). It is however also because of this challenging factor that Taiwan was more than willing to invest into a strong C4ISR. With that in mind, one could expect that further accumulation of future obstacles and uncertainties will at least continue to justify the betterment of such a system, which has serious potential to rank among the world's best (Stokes 2009: 34).

⁵² Supervised by the *National Chungshan Institute of Science and Technology*, which oversees many modern and RMA related indigenous developments (Lo 2014).

3.2.2 Military Platforms

From what has been gathered so far, the main difference to mention when comparing Taiwan's main military platforms to those of China, is their role to operate effectively in the range of the island's own territorial proximity and not necessarily far beyond it. Because of the discussed defensive nature of Taipei's strategic arrangement, the applied military platforms would be expected to profit from a better operational accessibility, as they would handle issues like resupplying, refueling or simply being in the coverage range of ground bases more easily and conveniently than some of the PLA's own platforms that would have to function in a more distant non-comfort zone. Still, the sophistication with Taiwan's actual military platforms is a whole other subject. While the KMT finds Taipei's overall defensive capabilities sufficient, the DPP is sounding the alarm bell, suggesting that serious reconsideration should be put into the future prospect of military capabilities. As a result, the DPP's based think tank has produced a report that took into consideration both the inputs from the United States' military analysis experts and domestic military authorities, where besides going back to the claim that Taiwan has to retake its military spending back to the three percentage GDP mark for an adequate investment in its capabilities, it also puts emphasis on focusing these spending for better air capabilities and for an all out indigenous submarine production (Minnick 2014b).

Many of Taiwan's crucial military weapon platforms have to put up with the condition of withstanding the first blow and function with a topographically difficult deployment capability. This is mostly true when looking at the air force, which together with the navy should serve as the main frontier to deflect the PLA's breach further into the island's dry land. As such, the island can afford just a limited amount of air bases, which together account for some more than twenty runways that are also supplemented by a few take-off capable highways. These makeshift dual-use highways present a promising initiative that if diffused correctly could together with Taiwan's plentiful RRR capabilities serve as a viable contribution in a time of crisis. For the time being, Taiwan's air forces are making sure to hold regular drills that also incorporate these highways so that the units would become more accustomed to their use. To compensate even more for the complicated take-offs, Taiwan also implements a fair share of helicopter assets that serve both a defensive and a reconnaissance purpose (Cheng 2012: 332; Hou 2014b; Tsai 2004: 150). Still, even with some alternative take-off means and a wide array of complementary helicopters that greatly make use of vertical take-offs and landings, the situation in general still presents the Taiwanese air force's very assets with the core need to focus their attention on not only weapon attachments that are capable of delivering adequate force, but also on an aircraft's assembly to reduce these by topography caused restrictions. The probably best contributing solution would be a future investment into high-performance aircraft bodies that would possess a greater capability to pull off short take-offs and landings, what could potentially spread out the possibilities by implementing more alternative shorter runways along the way (Cheng 2012: 343).

In regards to the actual aircraft availability however, Taiwan's main contemporary inventory consists of basically three aircraft models, which are the United States' *F-16* series, the French *Mirage* series and finally Taiwan's own so called *Indigenous Defense Fighter* (IDF) series (Fisher 2004: 164). What is however troubling, is the operational

status of Taiwan's aggregate⁵³ aircraft of which a good one third is deemed inoperable. Out of all the available aircraft, the *F-16* series is regarded as the most multipurpose entity in both their applicability for defensive and potentially more outstretching offensive objectives. But even here Taiwan possesses the less advanced and aging *F-16 A/B* models, which even despite a planned future uplift in the equipment department in terms of missiles and radar technology, still lack the engine and maneuverability performance of the superior *F-16 C/D* model. While the provision of the *F-16 C/D* to Taiwan would definitely stir up disapproval from Beijing, the United States was in 2006 ready to give the green light for their shipment, weren't it for the KMT based legislature blockade, which opposed the DPP's budgetary incentive for an upgrade. Despite a supposedly still continuing interest to make this purchase, it is not sure when or even if Taiwan will be able to obtain the new model type, as now both authorities in Washington and Taipei can't reach a definitive consensus in this specific matter. Some even suggest that Taiwan would be better off if it invested in an alternative *F-35* model, which although more costly than mere upgrading would have several benefits over the controversial *F-16 C/D*, mostly when it comes to better stealth and short take-offs and landing capabilities (Fisher 2004: 175-176; Hou 2014c; Thim 2013a). Due to improved electronic as well as safe distance operating capabilities, the *F-35* aircraft is also believed to be best suited to combat the mainland's earlier mentioned *S-400* missile defense platform (Schwartz 2014).

However, the budgetary acquisition of new military platforms in itself can be quite difficult, considering the demanding costs of some of the already obtained assets. The best example would be the French *Mirage* series, which created serious restrictions that originate from high maintenance costs that led to a choice to gradually disband this model. Their specific maintenance alone takes roughly sixty percent of the whole air service's fighting aircraft budget. With such a high maintenance spending ratio on an aging model, it comes as no surprise that Taiwan's air force has a hard time investing into something as the latest fifth generation aircrafts. The best option at the moment therefore suggests focusing more on cheaper upgrade attachments rather than on completely new inventory. As is the case with the *F-16 A/B* model, Taiwan's IDF aircraft are also expected to push forward by receiving an improvement through upgrades in their weapons arsenal and technological equipment. While the IDF represents a somewhat indigenous effort that was initially assisted by the United States, the lack of funding makes progress slow; and while the upgrading brings new life to the assets, their aging engines make them not that efficient both in air and the much needed short take-off capability. Still, the IDF presents a domestic effort that started in the 1980s and keeps on pushing forward in one way or another even today (Cole 2011; Minnick 2014b; Thim 2013a).

However it could be argued, that more than its air force, Taiwan is most relying on its secure waters and with them associated transport lines. After all, air support alone can't provide the densely populated island with all the needed vital resources both in terms of military protection and economic wellbeing. It is perhaps also therefore, that Taipei prioritizes a strong maritime establishment, which holds the perhaps biggest strategic value (Cheng 2014b: 2). Not only is Taipei practicing its readiness by conducting regular exercises and drills in its territorial waters, but also by promoting

⁵³ From the estimate of a total number of roughly 388 aircraft that consist in majority of the three listed series, only about 247 are considered operational (Thim 2013a).

civilian manufacturing of vessels, so that in time of a conflict outbreak, there would be enough industrial support for a warship demand or simply just maintenance. As a result, there are at least two hundred commercial ship manufacturers, most of which are small and medium establishments. To have a better grasp of the production situation, the government authorities even sponsored the so called *United Ship Design & Development Center*, whose role is to oversee various development processes, design choices or even modifications for both civil as well as military vessels (Liang 2003: 150-151; 155). In general however, the Taiwanese navy has still quite a few foreign conventional vessels that are upgraded for the island's defense standards. Most of these are dominated by frigates and even a few destroyers, which are as one would again expect weaponized with modern munitions and technological equipment. On other hand, Taiwan has also many additional domestically produced vessels, which are mostly represented by different types of fast attack ships, whose better maneuverability and missile strike enforcement present a more RMA styled balance. Still, one of the more impressive additions to the navy's inventory are Taiwan's domestic stealthy corvettes of which the recently revealed *Tuo River* model presents a high capability to deter even the PLA's aircraft carrier threat. With a wide range perimeter and the ability to reach high speeds while avoiding detection, makes this nicknamed "carrier-killer" reportedly far more sophisticated than Beijing's own current anti-ship vessels (Cheng 2014b: 8-9; Lo and Chung 2014).

Another crucial aspect of Taiwan's military platforms is embedded in a desired future prospect to manufacture indigenous submarines. This seems as a welcome declaration seeing as Taiwan has only four diesel-electric based submarines from which two are only capable of being used outside of the exercise field. The other main reason that encourages such domestic production is the inaccessibility. Despite the United States' more than a decade old unrealized offer to give out new diesel-electric based submarines to Taiwan, a similar offer is nowadays pretty much unimaginable, as Washington has ended their production in exchange for its contemporary nuclear based submarines. However, reportedly Taiwan has already initiated its domestic long-term submarine plan, which has also won some considerable support from the United States, that are presumed to provide a more technical based assistance (Liao and Chen 2014; Wu 2014). Even with such an assistance, the real challenge would further lie in the remaining construction expertise, as Taiwan has no background in designing submarines as opposed to surface vessels in terms of the whole architecture. Supposing that such challenge should somehow become outmaneuvered, than Taiwan's territorial waters could become more prone to stay unprovoked (Liang 2003: 162).

Overall, the aggregate countermeasures of Taiwan's air and maritime military platforms remain to be a hit or miss situation with both utilized and wasted opportunities. It seems however, that Taiwan is rather investing its scarce resources and financing on buffing up maritime assets, as they arguably play a more key role in the overall outer defense of the island. The air service on the other hand is less convincing, as it is a greater victim to the investment issues and the occasional stalling of providing requested military assets from the United States. For what its worth though, Taipei under its limited conditions is at least projecting a desire to counter the PLA's own A2/AD assets; starting with areas that matter the most and hopefully remedying some of the loopholes as time goes by.

3.2.3 Precision Force

Given the PLA's high precision strike potential, it is also here that one can more clearly distinguish how Taiwan's passive and active defense arrangements aid each other in their mission of protecting the island on their own until outside help would arrive. In terms of Taipei's non-offensive deterrence, some argue that one of the best solutions would be to adopt a "porcupine strategy", which would make the authorities in Beijing question, if an assault on the island would be worth taking the risk. Named after the defensive characteristics of the animal, the strategy suggests that in order to survive the mainland's aggression in the long run, the island should focus much more of its attention on maintaining its functionality, which could be enforced simply by giving priority to investments that provide hardening and quick repair initiatives (Gormley, Erickson and Yuan 2014: 153; Murray 2008: 25; Thim 2013b). Frankly speaking, Taiwan was long aware of this and as a result there are solid assumptions that the island has over the years already become one of the best fortified complexes worldwide. While this passive defense doesn't really utilize the precision force as such, it is still a valid part of it, as it raises the odds of preserving a high combat response after a possible PLA preemptive precision strike. Another interesting argument for the importance of Taiwan's passive defense in a direct relation to China's own precision force lies in the assumption, that the more Taipei invests into hardening and quick repair initiatives, the more it is likely that Beijing will try too impulsively to push on with its more and more costly missile requirements, where many of these would still remain fragile against the island's defenses. While this argument in its entirety may come out as questionable, it is undoubtedly correct in its suggestion that this passive defense indeed generates some sort of a further precision development response from the mainland (Easton 2014: 47).

In an effort to reach an utmost preparedness against the mainland's precision force, Taipei has been for some time now investing into the fortification of some of its main outer islets, which should give the main island enough room for mobilizing its military and general society. Other than the expected typical hardening of surface facilities, Taiwan has managed to construct an even more impressive network of underground tunnels and facilities, which should tremendously help the military's operability even if some surface assets should get compromised. Not only does this interconnected and fortified underground network create possibilities for transportation, but it also shelters some complementary C4ISR assets like various mobile radar stations - not to mention the very critical built-in COC outpost. Other underground precautionary arrangements also include deeply embedded communication channels like fiber-optic grids, reserve supply stations for food, munitions and fuels, and also a power plant. Some specific underground storing outposts based conveniently in the vicinity of key surface air bases even have the capacity to shelter as much as half of the entire Taiwanese air force fleet. Even looking at many of the main island's populated areas, one can notice that the infrastructure uses many sheltered and most probably enforced hotspots that range from deeply constructed parking garages to several miles long shopping avenues that are part of a wider metro complex, which alone can provide a substantial shelter capacity for the population (Easton 2014: 48-49; Stokes 2012: 152). However, Taiwan also puts more and more effort into strengthening its surface based outposts from which naval ports and air bases are two of the more essential ones in terms of protection. Due to their higher vulnerability, Taiwan's respective R&D was more than compelled to design high absorption shelters, which should withstand even a breached saturated missile strike. It is

also reported, that the ongoing R&D is in the process of designing such a robust surface shelter technology, which should overcome even the absorption capabilities of the current underground complexes. Should such development in fact succeed, than the quantitative precision threat of the mainland would become far more manageable than it currently is (Easton 2014: 51; US-Taiwan Business Council 2010: 29).

Still, in order to fight fire with fire, Taiwan also needs a well planned active defense that also utilizes its own missiles, which could deflect the Chinese precision strike more directly. This is mostly crucial to guarantee the protection of the island's main SRP, as well as the protection of other complementary ISR outposts, as due to their detection and early warning capabilities, Taiwan is estimated to be able to completely intercept even as much as sixty percent of the mainland's total missile load-out. Of course, to be able to do so, the functionality of these radar systems should not become compromised at any cost (NTI 2014a; Ross 2011). In order to maximize the success rate of an aggressive missile interception, Taiwan also needs to use its best judgement to carefully plan and exploit its available missile arsenal. For this reason, the authorities have in 2004 green-lit a so called *Missile Command*, which oversees and unifies the utilization of pretty much all missiles for defensive and potentially offensive objectives (NTI 2014b).

As for the missile arsenal itself, Taiwan possesses precision strike capabilities that are split between those that were procured from the United States, and those that were locally designed and developed on the island. Beginning with the procurements from Washington, the most noticeable ones are the *Patriot* and the *Hawk* missile series. The *Patriot* series is actually a part of a much more complete defense system package of the *Patriot Advanced Capability-2* and the *Patriot Advanced Capability-3* setups, which among other things include their own radars and launchers pads. While the *Patriot* systems are a welcome addition to the island's defenses, they are marked by two noticeable drawbacks. The first drawback is their price. In order to use this procured precision strike, Taiwan has to purchase the whole system package, what has led only to modest purchases. The other drawback is created by the overall systems' limitations and vulnerabilities. For instance, the to the systems unique radars have an inadequate detection range, which would pose a major challenge in terms of detecting most of the mainland's incoming missiles in time. As such, it is assumed that there are additional costs related to their technical rearrangement, so that they could have access to the island's own early warning monitoring. Even then however, the systems are reported to be much more successful at handling ballistic missiles rather than cruise missiles, of which the mainland has more than plenty. As such, it is understandable that these assets are mostly just supplementary and only beneficial as long as they are mingled with Taiwan's own missile defense assets (Gormley, Erickson and Yuan 2014: 82; Murray 2008: 17; Ross 2011). As for the *Hawk* series, it is headed into retirement, as Taiwan has managed to succeed it with its own domestically produced alternatives. Given that for this case the United States themselves even presented Taiwan with three modern missile procurement deals from which Taipei didn't choose any, makes this choice quite peculiar in the sense as of what it might be hinting at. Even though Washington's offers presented a good functionality and maintenance prospects, there are assumptions that Taiwan's precision strike procurement will become more and more domestically oriented, as Taipei seems not to be able to find a reassurance in the United States' contributions in this area (Minnick 2014c).

This becomes more obvious when looking at the island's incentives on how to follow a more independent precision strike force development. The first thing to realize is Washington's official stance to provide only such missile procurements, which are not

optimized for offensive objectives, but are of a defensive nature. However, as a matter of fact, Taiwan has been since some time developing such missile capabilities, that are reportedly able to strike deep within the mainland's territory (Stokes 2012: 151; Thim 2013b). For instance, the *Yun Feng* missile series marks one of the more controversial developments of such capabilities, as they reportedly have a reach as far as Shanghai. There are several other indigenous missile series that also have the ability to hit many strategic military points on the mainland, to which the United States reportedly expressed a certain discontent, because they see such developments as potentially destabilizing. Even some of the island's currently most prestigious achievements like the *Hsiung Feng* anti-ship missile series were met with criticism and supposedly even pressured into getting abandoned. Even when it comes to actual requests for more advanced military capabilities, Washington can simply provide a firm dismissal by arguing, that if it would have provided such capabilities, than the mainland could exploit their weaknesses either by means of spying or simply by means of observation and surveillance during drill exercises. Given these conditions, Taiwan still sees its missile development as completely justified in regards to its active defense, as the goal for these more sophisticated efforts is not to overtake the mainland, but to hinder the PLA's operational maneuverability during a possible conflict outbreak (Minnick 2014d; NTI 2014b; US-Taiwan Business Council 2010: 31). Thus, the United States' hesitant approach has made Taiwan choose to take up a path of a more independent precision strike development. With many frequent denials the island has developed a very varied and modernized missile arsenal that includes anything from smart munitions, anti-radiation missiles and even super-sonic cruise missiles (Cheng 2014b: 9-10; Fiddian 2013)

All in all, it is expected that Taiwan will carry on with its indigenous missile development program, as there are even plans for the near upcoming future, where Taipei has pledged to make a serious increase in its domestic-based missile defense investments (SCMP 2014). As such, it is fair to suggest that when it comes to a defensively utilized precision force, Taiwan has due to its own undertakings set up a solid expectancy to become more credible against the constantly rising Chinese precision strike (Ross 2011).

3.3 Analysis

With the closure of the second segment, this analysis will now focus on the last two remaining subquestions by reflecting on the cases' exerted military capabilities of the three discussed RMA areas.

As such, the first of the remaining subquestions seeks to find out if Taiwan possesses sufficient RMA counter-capabilities against China. Starting off with the mainland's information processing capabilities, Beijing has chosen the path of a more independent and thus enclosed C4ISR structure that prefers indigenously developed assets that are reserved to be exclusively used by the mainland's many fostered human resources, which strictly specialize on information and cyber-based career paths. As for the actual assets themselves, the main highlight is Beijing's expansive satellite coverage, whose efficiency is even more boosted by the domestically developed BDSNS navigation system. The system presents the PLA with a more secure and reliable RMA interoperability, which provides greater options and benefits for key aspects like communications, reconnaissance or precision strike. Other important key assets are represented by the shore stationed OTHRs and mobile AWACS and UAVs, which all

create a basis for a far more outreaching ISR. Despite its solid ISR capabilities, the PLA is assumed to have some inadequacies on the communication and actual data processing side of things, which is due to its curbed service jointness, that was already indicated in the first segment. Overall, despite Beijing's questionable ability to correctly utilize its obtained information during an outbreak of a conflict, there is no denying that it does possess compensating ISR assets, which are the real center of what could be described as an overly formidable C4ISR structure.

Moving on to Taiwan, it too has been involved in information processing capabilities for some time now. The main difference is however, that Taipei's C4ISR structure is also being underlaid by American defense contractors, which together with the island's own domestic technology and different COTS inputs created an apparent C4ISR hybrid, that has resulted into the current day PS. One critical advantage of the Taiwanese C4ISR against its mainland counterpart is a wide operational interconnectivity, which mostly benefits from a good sense of jointness, as many standard command and control outposts are not only interconnected with each other, but also with more ISR specified outposts that due to a sophisticated automatization present crucial data in a quick and widely accessible manner. While the C4ISR architecture and joint communication are highly centralized under the COC, it is also being given the possibly best protective precautions, as it is being located in an underground fortified complex with other assets that are needed for its functional maintenance. Other than that, Taiwan also possesses some solid space based assets, which revolve mostly around small satellite and micro-satellite divisions, that were designed to withstand China's space oriented damage inflicting capabilities. Coupled with the island's modern radar and sensor grid, it can be affirmed that Taiwan is managing to keep a relatively high threat awareness against a preemptive strike from the mainland. Should such strike indeed occur, Taiwan also has its own advanced AWACS and potential UAVs, which would be able to provide a much more mobile and thus strategically flexible C4ISR supplementation. Even despite the constant spying attempts and cyber attacks from China, the system's very high technological standard and even its established bond with some of the United States' own command outposts, make it an overall successful response in a key area, that can be seen as the perhaps most crucial element of any RMA initiative.

Next on the list are military platforms, which due to China's respective strategic arrangements lay their focus on airborne and naval assets. All in all, there are two basic aspects that have shaped Beijing's current domestic-heavy military platforms production. The first is the initial procurement of many platforms from Russia, which served as stepping stones in the mainland's plan to recover from the opposition's head start in modern military advancements. The second aspect is China's absorption of foreign technology knowledge from manufacturing and development partnerships with foreign associates, through which many dual-use COTS and technologies are being exposed. These combined absorptions have helped the mainland's R&D to leap-frog forward and produce an indigenous inventory that includes more standard assets like frigates, as well as more RMA reminiscent ones like stealthy aircrafts or AWACS. As far as China's previous aging variants are concerned, they are mostly being given an upgrading treatment, which turns them into useful complementary assets. Still, the evidently biggest interest in regards to the PLA's military platforms would have to be aimed at naval assets. It is estimated that Beijing has achieved major progress as its operational maneuverability has moved from a "near coast" one to a more sufficient "near seas" one. The major achievement is marked by Beijing's endeavor to expand its partly refurbished and newly

developed submarine fleet, which together with the varied surface operating offensive-, monitoring- and even replenishment-based assets, create access to a noteworthy offshore presence for the PLA.

In Taiwan's case, the established platforms present a more uneven state. The very acquisition of more modern military platforms is mainly victim to budgetary constraints and already existing maintenance costs for in some cases aged assets that would need a complete replacement in the first place. In order to cover a wider range of platform imbalances, most of the fundings are directed towards upgrades, as they present a cheaper alternative aimed at the prolongation of older, but still operable service assets. The most troubling case in this manner are Taipei's airborne assets, which even with the upgrading tactic have only about two-thirds of operable aircraft. The most functional assets represented by the American *F-16* series and Taiwan's IDF series are also quite outdated and sooner or later destined to be replaced by newer alternatives. Speaking of alternatives, besides some modern and for Taiwan's topography suited helicopters, there have been official requests for newer aircraft prototypes, which other than because of budget limitations were also stalled by the United States, which as it seems are more hesitant at providing physical assets, as opposed to their willingness to assist in a more know-how based technical support. However, on the other side of Taiwan's military platforms are also the naval based assets, which show a much bigger promise in handling the service's modernization and with it related financing. The prioritizing of these naval platforms could be explained by the mainland's A2/AD strategy, where functioning sea lines are one of the most vital aspects of the island's very survival in a conflict scenario. In relation to this, Taiwan has established a strong civilian industrial support for the maintenance and production of vessels, what should support a more convenient indigenous production of maritime platforms. And if Taipei's stealthy corvettes capable of sinking carriers are any indication, than it is possible to assume that this approach might pay off in the long run. Last thing worthy of pointing out is also Taiwan's strong desire to manufacture indigenous submarines. Given China's lack of longer range ASW capabilities, a modern indigenous submarine fleet could become one of Taiwan's most determinant military platforms yet.

Last on the list is the subject of precision force, in which Beijing possesses a wide variation of long and close range missiles. The most ambitious of these seems to be the development of the HGVs, which due to their supersonic maneuverability and a high precision rate present an upscaled power projection not only upon Taiwan, but also upon any other intervening force. Other than that, Beijing is also showing more concern towards protecting its own mainland outposts by implementing modern defensive missile systems, that are mostly aimed at repelling foreign air strikes. However, the currently most available and adequate precision force is made up from short and medium range missiles that are of an offensive character. Despite the fact that many of these are made up from more conventional models, China is through relatively cheap remodeling able to significantly increase their damage potential by simply equipping them with add-on precision abilities. Due to the high quantities of such missiles, it is expected that they would be utilized in saturated strike deployments, which would present an additional "soft kill" threat to Taiwan's more stationary targets. On top of that, China's newer precision initiatives coupled with the many naval assets, present another complex layer for Taiwan's defenses to deal with, as these would have to oppose the mainland's missile flexibility, which is not only embedded in the available variety, but also in the capability to carry out their deployments from various places and distances.

In response to such a high threat level from the mainland's missile force, Taiwan has made sure to withstand any preemptive strike that would come its way. The combination of both surface and underground hardened facilities together with plentiful recovery capabilities makes the island and its outskirts well prepared and protected for probably any initiative attack. However, in order to ease the burden on the passive defense capabilities as well as to repel and push back on the PLA's military advancement, Taipei has also managed to start its own indigenous precision strike development. Despite the United States' disinclined assistance, Taiwan is managing to release an output of diverse missiles, that should prove vital in protecting its many vital peripheral and inner-land assets. The main advantage of this indigenous precision strike as opposed to the limited missile system provisions from Washington, lies in a more offensive capacity, which could be utilized for a more far-reaching protection of the island. All in all, even despite Washington's hesitance to provide more offensive based precision capabilities, Taiwan's decision to have a more independent missile development might as well pay off along the way, as it gives a brand new outlook to some of the island's other domestic endeavors like for instance the maritime military platforms.

To conclude with the last subquestion, it has been showcased that both cases possess assets that abet their respective strategic arrangements to a satisfactory degree. Although it is highly arguable as far as which strategic arrangement would hold out against the other, it is evident that China possesses more beneficial odds than Taiwan does. Not only has Beijing succeeded in establishing a rapidly growing military development that embraces many of key RMA features in the right ways, but it also has taken initiatives to modernize a great part of its already vast conventional arsenal, which could also be deployed to further push and waste Taipei's own limited defense capabilities. As such, Beijing possesses adequate means in all the three discussed categories, making its A2/AD strategy an already viable option, whose credibility is expected to rise as the mainland's current military development pace is step by step picking up in a regular transitive manner. Still, Taiwan's mixture of active and passive defenses present Beijing with enough uncertainty, as the island's combination of C4ISR awareness, damage resistant hardening initiatives and even the domestically growing precision force together with some of the more prioritized platforms, all present a well-thought-out deterrent, which in its current form has the potential to hold out on its own until an outside intervention would commence.

4. Conclusion

In conclusion, this thesis has managed to identify several observations, which contribute to the answering of the main research question. Based around the subquestions, these observations are as follows:

1. China established a solid foundation for its ongoing RMA development, which was in its forming stage proceeded by many foreign military acquisitions that mostly came from Russia. Even today, China is accustomed to obtain foreign advancements with the goal of utilizing them into their own indigenous efforts, in which they should act as subsystems for a broader domestically developed RMA system. As such, China's RMA process is a carefully planned transitive one that clearly serves as a tool to enforce the mainland's regime security. Altogether, Beijing's RMA can be described as a *Modernization-Plus* with Chinese characteristics that uplift a patient development with a desired amount of added opacity.
2. Taiwan has shown a high RMA applicability, which is justifiable by reason, recourses and access. Beijing's unchanged attitude for using force for retaking the island is still keeping Taiwan's military awareness relatively high. Even despite budgetary and foreign modern military procurement limitations, Taiwan has a solid economic affordability to receive procurements from either Washington, or to invest into its own alternative indigenous initiatives.
3. In terms of RMA, the United States don't seem to have any cooperative relation with China. The only real effect the United States have had on the mainland in regards to RMA, was through their own RMA power projection, which ignited Beijing's serious interest in the concept in the first place. As for Taiwan's potential RMA, the United States have showcased a clear role by both providing the option for obtaining military capabilities and by serving as coordinators for Taipei's military planning and development.
4. Should a conflict break out, China's main strategic arrangement against Taiwan that would benefit from the RMA would be the A2/AD strategy, which seeks to entrap and decapitate the island from all its surroundings. Knowing this, Taiwan's strategic arrangement lies in an effort to be able to prevent such an isolation attempt, while also being as much flexible with its defensive and offensive military response as possible. As such, Taiwan implements a combination of a passive and an active defense, which present the island and its outskirts with a better survivability and a better utilization of offensive means.
5. China has shown both a qualitative and a quantitative strength in its primary RMA assets. However, Taiwan has also proven that it does have more counterbalancing assets than it does not. With a highly capable C4ISR system and a promising missile development, the only really noticeable gray area to point out is represented by the military platforms of which some are more prioritized than others, what leads to some military service imbalances.

6. Overall, China's military assets do considerably abet the strategic arrangement of secluding and attacking Taiwan. However, Taiwan in its current state also demonstrates enough convincing means, which abet both its passive and active defense in acquiring just enough time for a foreign intervention to arrive.

Moving to the answering of the actual research question, when taking all the above observations into account, it can be concluded that this paper's hypothesis has enough evidence to be deemed right. Taiwan has indeed showcased many of its own counterbalancing capabilities, which consist both from a fair share of domestic initiatives as well as from Washington's own inputs. Still, due to Washington's position to be able to intervene and provide more needed but unattainable RMA assets in the future, its contribution can be considered as a more vital aspect of Taiwan's constantly developing countermeasures, which even within their indigenous efforts are and most probably will continue to utilize any helpful outside inputs they can get.

Ultimately, Taiwan's response to China's RMA pursuit is a very direct one, which closely reflects upon the mainland's own actions and developments, and is therefore similarly classifiable under the category of *Modernization-Plus*. Even though Taiwan has showed some impressive results in some certain RMA areas, their development also occurred in a transitive manner over longer periods of time, mostly even alongside China's own initiatives. This implies that Taiwan's RMA reminiscent capabilities are indeed a response to China's own endeavors both in terms of specific assets they address and in terms of their pace in which they would or do occur. On the other side, Taiwan's own RMA impulse and pacing has faced certain limitations, what caused the island to be more successful in some RMA related areas than in others. These limitations are mainly the result of an inner political disparity and of long lasting budgetary constraints. Even the United States' hesitant approach, which although ignited some more robust indigenous initiatives, has caused slowdown as far as the obtaining of some much more needed capabilities is concerned.

Still, it should be pointed out that China's and Taiwan's *Modernization-Plus* centered RMA developments are in essence also somewhat differentiating. It is quite possible that without its described limitations, Taiwan would be capable of pursuing a much more fast paced RMA modernization, which could have a much wider impact on both the exerted capabilities and with them associated tactical arrangements. Given some of its desired acquisitions like for example a modern submarine fleet or new generation aircrafts, it is quite possible that if it weren't for the originally by Beijing imposed limitations, than Taipei could be more generous in its RMA related spendings than it is right now. The reality is however that even though Taiwan tries its best to keep its RMA at least normalized, China has substantially much more opportunities and resources to pick up its transitive pace, with which Taiwan might under its current circumstances have difficulties to keep up. But in order to judge that, there are many yet to come future developments, which will dictate if Taiwan will be able to maintain and further develop its defensive and with them related RMA needs. Just the upcoming 2016 elections alone could bring some essential changes to Taiwan's defensive posture and with it identified limitations, which are all pretty much greatly interconnected variables that each have the potential to effect each other. The same goes for China, as its progress according to this thesis should continue to directly shape Taiwan's future countermeasures. As such, it remains to be seen if Beijing manages to successfully complete its second phase of its ongoing RMA development in time and according to its envisioned grand scheme of

informationization. Therefore despite Taiwan's currently stable response, there are still many uncertainties ahead, which could make the island's RMA and defense matters become better or even worse.

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Abbreviations

A2/AD	Anti-Access/Area Denial
ADIZ	Air Defense Identification Zone
ASBMs	Anti-Ship Ballistic Missiles
ASW	Anti-Submarine Warfare
AWACS	Airborne Warning and Control System
BDSNS	BeiDou Satellite Navigation System
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
C4I	Computers, Control, Communications, Intelligence Processing
COC	Combined Operations Center
COTS	Commercial off-the-shelf
CPC	Communist Party of China
DBK	Dominant Battlespace Knowledge
DPP	Democratic Progressive Party
DRT	Defense Review Talks
EBO	Effect-Based Operations
GDP	Gross Domestic Product
GPS	Global Positioning System
GR/GP	Global Reach/Global Power
HGVs	Hypersonic Glide Vehicles
HK	Han Kuang
IDF	Indigenous Defense Fighter
ISR	Intelligence, Surveillance and Reconnaissance
JSTARS	Joint Surveillance and Target Attack Radar System
KMT	Kuomintang

MTR	Military Technical Revolution
NATO	North Atlantic Treaty Organization
OFT	Office of Force Transformation
ONA	Office of Net Assessment
OTHRs	Over the Horizon Radars
PGMs	Precision Guided Munitions
PLA	People's Liberation Army
PS	Po Sheng
R&D	Research and Development
RIMPAC	Rim of the Pacific
RMA	Revolution in Military Affairs
RRR	Rapid Runway Repair
SAF	Second Artillery Force
SOS	System of Systems
SPD	Strategic Planning Department
SRP	Surveillance Radar Programme
TRA	Taiwan Relations Act
UAVs	Unmanned Aerial Vehicles

Appendix

Appendix 1

Abstract

This thesis concerns itself with the question of how Taiwan is or has been responding to China's pursuit of the *Revolution in Military Affairs* (RMA). The thesis tries to test the suggested hypothesis that Taiwan has or is responding by developing its own RMA counter capabilities against China by implementing a mixture of both indigenous means as well as implementing RMA based contributions from the United States, who are one of the world's biggest pioneers in this field. In order to find a suitable answer to this question, the thesis is separated into two main interconnected segments. The first segment's aim is to characterize the Chinese pursued RMA and to consider the applicability of an RMA concept to Taiwan. Due to the United States' strong regional presence and role as a key benefactor to Taiwan, the segment also evaluates the United States' military relation with both cases, seeing if there are some RMA affecting implications. Lastly, the segment confronts China's and Taiwan's strategic arrangements that would benefit from the RMA concept. The second segment compares China's and Taiwan's main RMA related military capabilities and tries to see how they benefit the earlier evaluated strategic arrangement. The main results of the thesis reveal, that Taiwan to some degree indeed responds in an RMA related manner. While this response includes some indigenous efforts and developments, the vital contributing aspect comes from the United States, which are able to supplement the island with needed rebalancing assets and even provide some guidance. Still, Taiwan's own RMA response is limited mostly because of inner political disparity, budgetary constraints and even to some degree by the United States' hesitant approach to provide more suitable RMA provisions. As of right now, Taiwan's RMA response is similarly as China's among the lines of *Modernization-Plus*. However, when it comes to the actual pace, China's constantly rising RMA capabilities are far more befitting to its strategic arrangements than Taiwan's slowly moving response.

Appendix 2

Kurzzusammenfassung

Diese Arbeit beschäftigt sich mit der Frage, wie Taiwan früher oder zur Zeit auf Chinas Streben nach der *Revolution in Militärischen Angelegenheiten* (RMA) reagiert. Die Arbeit versucht die aufgestellte Hypothese zu testen, dass Taiwans Reaktion auf eigenen RMA spezifischen Maßnahmen gegen China basiert, die durch eine Mischung von einheimischen Mitteln und die Implementierung von amerikanischen RMA spezifischen Beiträgen entstanden sind, da Amerika einer der weltweit größten Pioniere in diesem Bereich ist. Um eine passende Antwort auf diese Frage zu finden, ist die These in zwei miteinander verknüpfte Segmente getrennt. Das erste Segment hat das Ziel, die durch China verfolgte RMA zu charakterisieren und die Anwendbarkeit eines RMA-Konzeptes auf Taiwan zu evaluieren. Aufgrund der starken regionalen Präsenz der USA, so wie auch ihren Anteil als Wohltäter für Taiwan, wertet das Segment auch das militärische Verhältnis der USA mit den beiden Fällen und untersucht, ob einige RMA beeinflussende Implikationen davon abgeleitet werden können. Schließlich stellt das Segment Chinas und Taiwans strategische Vereinbarungen vor, die von dem RMA-Konzept profitieren würden. Das zweite Segment vergleicht Chinas und Taiwans wichtigsten, auf die RMA bezogenen militärischen Fähigkeiten und versucht zu unterscheiden, wie sie in die vorher ausgewerteten strategischen Vereinbarungen hineinpassen. Die wichtigsten Ergebnisse der Diplomarbeit zeigen, dass Taiwan zu einem gewissen Grad tatsächlich in einer RMA bezogen Art reagiert. Während diese Reaktion einige einheimische Bemühungen und Entwicklungen enthält, kommt der entscheidende Beitrag von der amerikanischen Seite, die in der Lage ist, die Insel mit benötigtem militärischen Inventar zu ergänzen und sogar eine gewisse Führung bietet. Dennoch ist Taiwans eigene RMA-Reaktion, vor allem wegen der inneren politischen Ungleichheit, Budget-Einschränkungen und sogar bis zu einem gewissen Grad auch durch ein zögerliches Vorgehen der USA, mehr geeignete RMA-Möglichkeiten zu bieten, begrenzt. Momentan ist Taiwans RMA-Reaktion ähnlich wie im Chinas Fall unter die Kategorie der *Modernisierung-Plus* einzuordnen. Doch wenn es tatsächlich zu einem Fortschritt kommt, sind Chinas ständig steigende RMA-Fähigkeiten in Gegensatz zu seinen strategischen Vereinbarungen viel fruchtbarer als Taiwans sich langsam bewegende Reaktion.

Appendix 3

Lebenslauf

Angaben zur Person:

Name	Michal Wuketich
Geburtsdatum/Ort	23. März 1989 in Bratislava, Slowakei
Staatsangehörigkeit	Slowakische Republik

Ausbildung:

2012 bis vorr. 2014	Studium des Studienganges „Wirtschaft und Gesellschaft Ostasiens“ an der Universität Wien, Studienabschluss Master of Arts (MA); Studiendauer voraussichtlich 5 Semester
2008 bis 2012	Studium des Studienganges „Japanologie“ an der Universität Wien, Studienabschluss <i>Bakkalaureus der Philosophie</i> (Bakk. phil) im Juni 2007; Studiendauer 7 Semester
2004 bis 2008	Besuch des Gymnasiums Matky Alexie, Slowakei, Erwerb der Hochschulreife
1995 bis 2004	Besuch der Volksschule Matky Alexie in Bratislava, Slowakei

Auslandsaufenthalte:

2009	Dreimonatiger Aufenthalt in Japan, Tutor Aushilfe in <i>Seido Cultural Center</i> , Besuch von Japanischen Sprachkurs
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Arbeitserfahrung:

2010	Nachschule Tutorium für Japanisch am Gymnasium Matky Alexie
seit 2009	Mehrfache Teilnahme auf Familienhäuser Bauprojekten

Kompetenzen:

Sprachen	Slowakisch (Muttersprache) Kroatisch, Englisch, Deutsch (fließend) Japanisch (gut) Chinesisch (Grundkenntnisse)
Technische Fähigkeiten	Adobe Photoshop, Adobe Illustrator, Aperture, Microstation
Soziale Kompetenzen	Leben in einem multikulturellen Umfeld, Zuverlässigkeit, Teamfähigkeit
Interessen	Fotografie, Design, Sport, Kochen, Reisen