APPROACHES FOR THE "INDO-PACIFIC PARTNERSHIP FOR MARITIME DOMAIN AWARENESS" (IPMDA) TO ACTUALLY DELIVER ON ITS PROMISE

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The International Maritime Organisation (IMO) defines maritime domain awareness (MDA), as, *"the effective understanding of anything associated with the maritime domain that could impact (the) security, safety, the economy or the marine environment."*[1] However, this definition is so inclusive and all-embracing in its ambit as to be well-nigh impossible to achieve. Indeed, since there is precious little within the maritime domain that would *not* impact safety, security, the economy, or the marine environment, such an *"effective understanding"* would require an awareness of very nearly *everything.* Clearly, therefore, MDA will remain an *aspirational* goal rather than one that can be achieved in the "here-and-now". This realization makes it critical for the reader to recognize the importance of the three components of MDA that the IMO has identified, namely, *"Maritime Situational Awareness"*, *"Maritime Threat Awareness"* and *"Maritime Response Awareness".*[2] Amongst these components it is maritime **situational** awareness (MSA) — the picture of the current situation within the maritime domain — that *"forms the foundation on which MDA is built".*[3]

This notwithstanding, there is no gainsaying the fact that the acronym MDA has become so commonly used a term that it has largely caused the distinction between MSA and MDA to be ignored almost worldwide. This is, in many ways, a pity, because the distinction is an important one, especially where it relates to information-sharing. One can have a high degree of MSA without any need to share information outside of one's national institutions. One need look no farther than China for this proof of this statement. China has excellent MSA but shares absolutely no information on this entire subject with any country or agency outside of China. On the other hand, to move from MSA to MDA (which involves the aggregating — across geographies — of the MSA obtained or attained by each of a number of nations or agencies), information-exchange amongst the partnering entities is absolutely essential. Likewise, the engendering of international "trust" is not at all required for MSA but is absolutely necessary to move from MSA towards MDA. Consequently, while it is necessary to keep chipping away at the current apathy, the road to establishing widespread awareness of the need to use MSA rather than MDA is likely to be a long, hard, (and lonely) one.

Within India, for instance, the Indian Navy (IN) appears quite content to ignore the acronym MSA and to simply stick with MDA. Indeed, it describes MDA as an *"as an all-encompassing concept… It involves being cognisant of the position and intentions of all actors, whether own, hostile or neutral, and in all dimensions - on, over and under the seas…".*[4] MDA is also central to the Information-Decision-Action Cycle (IDA) and *is a key enabler for maritime security across the conflict spectrum.*[5] This IDA cycle is often also described as the OODA loop, where the acronym stands for "Observe-

[1] International Maritime Organisation (IMO), "Maritime Domain Awareness", https://www.imo.org/en/OurWork/Security/Pages/Maritime-Domain-Awareness.aspx#

[2] *Ibid*

[3] *Ibid*

[4] Ensuring Secure Seas: Indian Maritime Security Strategy, 54, Indian Navy, Directorate of Strategy, Concepts and Transformation, Naval Strategic Publication (NSP) 1.2 October 2015.

[5] *Ibid*, 165

Orient-Decide-Act" — an acronym that was developed by Colonel John Richard Boyd, USAF (Retd).[6]

MDA is also categorised by the Indian Navy into three broad categories, military MDA, which is restricted to naval operations; non-military MDA, which includes Indian maritime security agencies and sectors with interest in the security and constabulary roles; and information-sharing mechanism with navies, countries, regional constructs and other stakeholders.[7]

MDA/MSA may also be seen as, *"a process that collects, fuses, and analyses data about activities in, and the conditions of, the maritime environment and then disseminates the data gathered and analysis results to decision makers."*[8] In somewhat more simplistic terms, MDA has been understood as the ability to comprehend what is *"occurring on, above and below the water — as an essential starting point to understanding maritime security."*[9]

The Quad and its Indo-Pacific Maritime Domain Awareness Initiative (IPMDA)

Of the four member States of the Quad Security Dialogue (more commonly known simply as "the Quad"), MDA matured first and fastest in the USA where, driven by Homeland Security Presidential Directive-13 (HSPD-13)/National Security Presidential Directive-41 (NSPD-41), under the aegis of President George W Bush,[10] it had achieved a reasonable degree of maturity over two decades ago — in 2004. Developments relevant to MDA in Australia, Japan and India grew somewhat more slowly and certainly matured later.

Within India, for instance, while the Indian Navy was cognisant of the need to share maritime information and was, indeed, doing so as long ago as 2005, it was only over a decade later that the principal Indian centre for the development of cooperative MDA, namely, the "Information Fusion Centre - Indian Ocean Region" (IFC-IOR) was formally established (on 22 December 2018) by the Government of India.[11] Since then, of course, India has made rapid and impressive strides and the IFC-IOR is today considered to be *primus inter pares* throughout the western segment of the Indo-Pacific, namely, the Indian Ocean.

In Australia, the Australian "Maritime Border Command", was established in 2005, *"to lead and coordinate Australian maritime security operations by military and civil agencies through a centralised operations centre, now known as the Australian Border Operations Centre (ABOC). ABOC acts as Australia's national*

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[6] *The OODA loop explains human interaction among individuals or political groups in a competitive environment. Understanding the OODA loop gives one the ability to get inside the time/space decision making cycle of an opponent and thus maintain a competitive advantage.*
For more information, please see: Lt Col Jeffrey N Rule, "A Symbiotic Relationship: The OODA Loop. Intuition, and Strategic Thought", *US Army War College, 2013.* https://apps.dtic.mil/sti/pdfs/ADA590672.pdf
[7] Captain Himadri Das, "Maritime Domain Awareness in India: Shifting Paradigms", *National Maritime Foundation Website, 30 September 2021.* https://maritimeindia.org/maritime-domain-awareness-in-india-shifting-paradigms/
[8] Joseph L Nimmich and Dana A Goward, "Maritime Domain Awareness: The Key to Maritime Security", *International Law Studies, Volume 83.* https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1160&context=ils
[9] David Brewster and Simon Bateman, "Maritime Domain Awareness 3.0: The Future of Information and Intelligence-sharing in the Indian Ocean Region", 15, *Australian National University, National Security College.* https://nsc.anu.edu.au/sites/default/files/2024-09/Maritime%20Domain%20Awareness%203.0%20Report%202024.pdf p. 10.
[10] Andrew Metrick and Kathleen Hicks, "Contested Seas: Maritime Domain Awareness in Northern Europe", *Centre for Strategic and International Studies.* https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/180328_MetrickHicks_ContestedSeas_Web.pdf?AaSGbCYstp_dVE22M_UODVuJvVS0_mkM
[11] Official Website of the Information Fusion Centre – Indian Ocean Region (IFC-IOR): About Us. https://ifcior.indiannavy.gov.in/about_us#

information fusion centre for all civil maritime threats".[12] More recently, Australia has turned to private firms such as Thales Australia to develop an MDA capability to detect, identify, classify and track potential threats in the maritime environment.[13]

In Japan, MDA is developed under the aegis of the National Headquarters for Ocean Policy. However, the Japan Coast Guard serves as the principal operational agency responsible for implementing and managing MDA systems, particularly through its operation, since April 2019, of the "MDA Situational Indication Linkages" (MSIL) platform.[14]

As ships traverse territorial seas and move into international waters, the MDA picture becomes dense, complex, and multinational. Within this complicated environment, other surface and sub-surface vessels also navigate the waters, adding to varying degrees of complexity within the volatile oceanic space. Thus, facilitation of MDA activities becomes problematic with considerable issues surfacing at the operational level.[15]

Perhaps the most topical example of cooperative efforts towards MDA is the Quad's "Indo-Pacific Partnership for Maritime Domain Awareness" (IPMDA). Launched in 2022, the IPMDA is *"…a technology and training initiative to enhance maritime domain awareness in the Indo-Pacific region and to bring increased transparency to its critical waterways. IPMDA harnesses innovative technology, such as commercial satellite radio frequency data collection, to provide partners across Southeast Asia, the Indian Ocean region and the Pacific with near real-time information on activities occurring in their maritime zones."*[16]

As a founding member of the Quad, India has adequately demonstrated New Delhi's commitment to the development of the IPMDA. India recognises that MDA is not simply about information and knowledge but essentially about "understanding" the maritime domain — that is, *"making sense of activities related to the maritime domain".*[17] As such, it has correctly been likened to the *"engine room of nation and regional maritime security"*[18]and because it enables policy cross-domain integration and interagency coordination, MDA can be harnessed to build trust and confidence between Quad member States.[19] It can also resolve some of the *"sociopolitical challenges"*[20] associated with the dissemination of information within the maritime domain. These

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[12] Brewster and Bateman, "Maritime Domain Awareness 3.0"

[13] Max Kufner, "Thales Australia Develops Sovereign Maritime Domain Awareness Capability", *Thales Australia Website, 02 August 2023*. https://www.thalesgroup.com/en/countries-asia-pacific/australia/magazine/thales-australia-develops-sovereign-maritime-domain

[14] "New Marine web-GIS services, the "MSIL" in Japan", Japan Coast Guard, Hydrographic and Oceanographic Department, 30 January 2023. https://iho.int/uploads/user/Inter-Regional%20Coordination/MSDIWG/MSDIWG14/MSDIWG14_5B_National%20Report%20-%20Japan.pdf

[15] *The two key operational areas of focus within MDA constructs include HADR and IUU Fishing. However, with increased transparency of the oceans and facilitation of rapid detection and response to a range of maritime activities, IPMDA can provide expertise the beneficiary States to respond to a range of maritime threats.*
For more information, please see: Captain Himadri Das, "Building Partnerships: India and International Cooperation for Maritime Security", National Maritime Foundation/Pentagon Press, 110-111.

[16] Australian Government, Department of the Prime Minister and Cabinet, "Indo-Pacific Partnership for Maritime Domain Awareness". https://www.pmc.gov.au/resources/quad-leaders-summit-2023/indo-pacific-partnership-maritime-domain-awareness

[17] Ronald M Carvalho Jr and Julia F Allen, "Making "SENSE" in the Maritime Domain", *Ocean News & Technology, 24 May 2021*. https://oceannews.com/featured-stories/making-sense-in-the-maritime-domain/

[18] Christian Bueger and Jane Chan (Eds), "Paving the Way for Regional Maritime Domain Awareness — Information Fusion Centre", S Rajaratnam School of International Studies, Nanyang Technological University, Singapore, 2019, 4.

[19] Christian Bueger and Timothy Edmunds, "Understanding Maritime Security", New York: Oxford University Press, p. 174
https://www.ifc.org.sg/ifc2web/Publications/Professional%20Reading/Regional%20MDA/Chapter%201.pdf

[20] Bueger and Edmunds, *"Understanding Maritime Security"*, 179.

sociopolitical challenges occur between States, regional stockholders such as shipping and insurance companies as well as local citizens within the maritime landscape. It is important to avoid the error of placing MDA solely with the technological domain and, instead, to recognise and acknowledge the role of *people* as well. Indeed, "*effective MDA/(MSA) needs to be viewed as a function of both low and high technology*."[21] In fact, in many cases, one ought to favour low-tech, people-centric solutions.[22]

Such an attempt could bring about a tangible shift in the *material balance of power* since Quad partners could potentially build/harness their diverse capacities and capabilities.[23] It can also proactively enable the Quad to build capabilities that are "mission agnostic", which could, in turn, enable the Quad to perform a range of functions that ensures preparedness for multiple contingencies, especially in the long run.[24]

Enhancing MDA in the Indian Ocean

The IPMDA offers integrated maritime domain awareness/maritime situational awareness to a variety of partners across the Indo Pacific.[25] For instance, under the aegis of Australia, the IPMDA has been integrated with "Regional Fisheries' Management Organisations" (RFMOs) such as the "Pacific Islands Forum Fisheries Agency" to *"enhance regional MDA/(MSA) in the Pacific through satellite data, training, and capacity building"*[26] This approach could easily be emulated in the western segment of the Indo-Pacific, namely, the Indian Ocean, involving a strong tie-up between the Quad and the Indian Ocean Tuna Commission (IOTC), which is a major RFMOs, in order to combat illegal, unreported, and unregulated fishing (IUUF).

In this regard, regional stakeholders such as "local fishermen" should be consciously incorporated within existing MDA frameworks so as to enhance the quality of information available to the Quad member-States. Since limited knowledge of the 'local' conditions makes it difficult for security personnel to identify vessels (both foreign and domestic) engaged either in IUUF or in drug-, arms-, and human trafficking, the fishing communities of different subregions of the Indo-Pacific should be incorporated as key stakeholders, as they possess the "generational knowledge" and have an intrinsic awareness of living conditions and working in their local maritime environment. For example, the Indian state of West Bengal, with its fluvial/deltaic landscape has, for millennia, been home to fishing communities who have an excellent understanding of the brooks, *jheels,* lakes, swamps that dot the region, and most importantly, are intimately aware of the conditions that prevail in their area of the Bay of Bengal. These fishing communities also have a nuanced understanding of the boats that are used to fish in 'their' waters and are easily able to identify craft that are from outside their area. They need be hired by

[21] Vice Admiral Pradeep Chauhan, Director General, National Maritime Foundation, in conversation with the author, 02 April 2025.

[22] Christian Bueger, "Effective Maritime Domain Awareness in the Western Indian Ocean", *Institute for Security Studies Policy Brief 104, June 2017*. https://issafrica.s3.amazonaws.com/site/uploads/policy-brief104.pdf

[23] Arzan Tarapore, "What the Quad could learn from AUKUS", Lowy Interpreter, 03 April 2023. https://www.lowyinstitute.org/the-interpreter/what-quad-could-learn-aukus

[24] Arzan Tarapore, "America Needs a Real Indian Ocean Strategy", *Foreign Affairs*, 07 April 2025. https://www.foreignaffairs.com/united-states/america-needs-real-indian-ocean-strategy

[25] Bueger and Edmunds, *Understanding Maritime Security"*, 171-172

[26] White House, "The Wilmington Declaration Joint Statement from the Leaders of Australia, India, Japan, and the United States", 21 September 2024. https://www.whitehouse.gov/briefing-room/statements-releases/2024/09/21/the-wilmington-declaration-joint-statement-from-the-leaders-of-australia-india-japan-and-the-united-states/

state agencies to provide for low-tech MDA.[27] In this regard, not just fishermen who fish in the sea but also those who ply their trade along rivers need to be engaged by the State to combat illicit maritime activities that often occur within and along the estuaries that connect the rivers to the sea. The Farakka port in Murshidabad district of India is a typical "hotbed" of smuggling and offers an excellent case in point.[28]

A good example of people-involvement and low-tech solutions to MDA is the "National Spatial Data Infrastructure" (NSDI) of Bangladesh, which attempts to create a variety of "mediums" that integrate the *whole of society* to achieve its national objectives within the maritime domain. This ambitious endeavour incorporates a series of legal statutes that enable the authorities to mobilise fishermen operating in international waters, and the *"cultivation of people and (web) applications"* within the established system to enhance greater State control.[29]

Within India, the *Pradhan Mantri Matsya Sampada Yojana* (PMMSY) already provides a blueprint for benign and constructive community. Community Interaction Programmes (CIPs) and the State Marine Police (SMP) are jointly attempting to improve the interface between the local people and security agencies in order to better disseminate knowledge and acquire information.[30] Such initiatives can be emulated/conceptualised at the level of the Quad with all the Quad members effectively engaging with their "own" local communities to gain a more robust understanding of MDA/MSA, instead of concentrating solely upon solutions based on high technology.

Perhaps local units, on the lines of the Australian "Northwest Mobile Force" (NORFORCE) — a fleet of indigenous people within Australia[31] — offers a model that could be used within the Quad construct. As is the case in India and several parts of South Asia, such local units could act as eyes-and-ears and work in conjunction with security agencies so as to provide a more nuanced picture of specific maritime areas of activity. Through such efforts, human intelligence could be given additional primacy within MDA/MSA constructs that are generally considered highly technical in nature.

Since success at local levels engenders success at broader levels including regional ones, information-coordination amongst diverse domestic maritime stakeholders associated with maritime law enforcement and coastal security, and coastal defence, such as coast guards and navies, customs authorities, fisheries, and border control, and other agencies charged with the

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[27] Mohammad Afzalur Rahman, "Bengal's Fishermen: Through War, Famine and Partition", *The Daily Star, 13 November 2023*. https://www.thedailystar.net/opinion/focus/news/bengals-fishermen-through-war-famine-and-partition-3468381

[28] "Huge Arms Haul in Murshidabad, 4 Arrested: Bengal Police STF Busts Bihar-to-Bengal Arms Smuggling Racket Near Farakka, Seizes Nine Firearms, 158 Cartridges", Bhaskar English Online Newspaper https://www.bhaskarenglish.in/local/west-bengal/news/huge-arms-haul-farakka-stf-arrests-four-seizes-firearms-cartridges-disrupts-bihar-bengal-smuggling-racket-135323767.html

[29] Chisako T Masuo, "China's "National Spatial Infrastructure" global governance: Chinese way of Military-Civil Fusion (MCF) over the Ocean", *Maritime Affairs: Journal of the National Maritime Foundation of India, 2021, Vol 17, No 2*, 27-42.

[30] Captain Himadri Das, "Coastal Security in India: Twelve Years after '26/11'", *National Maritime Foundation Website, 01 December 2020*. https://maritimeindia.org/coastal-security-in-india-twelve-years-after-26-11/

[31] SBS News Australia, "The Unconventional Army Unit where Indigenous Soldiers are Key", 25 June 2017. https://www.sbs.com.au/news/article/the-unconventional-army-unit-where-indigenous-soldiers-are-key/da7lwtxw4

promotion of maritime safety and security, could be improved *within* each constituent country of the Quad to supplement specific information that is sought to be shared amongst the partners.[32]

At the present juncture, however, the IPMDA initiative seems to be concentrated upon satellite-based data of vessel movements correlating data from automatic-identification system (AIS) transmitters with that obtained from satellite-based surveillance of vessel-transmissions across the entire electromagnetic spectrum.[33] The attempt is to make the system sufficiently robust so as to detect such craft as choose to deliberately switch off their AIS (becoming "dark").

This naturally shifts one's attention to "Information Fusion Centres" (IFCs). While fusion centres such as India's IFC-IOR, Singapore's IFC, the IOC's RMIFC in Madagascar, etc., rely extensively upon technological means to fuse data-with data, data with track information, and track with track, it is important to take note of the enormous value that human inputs provide, by way of International Liaison Officers' (ILOs). These ILOs are perceived not just as *"conduits of data"* but as agents who add the analytical and interpretive value to the data generated by technological means. A significant percentage of the credit that accrues to the IFC-IOR, for instance, which indubitably provides the region's most reliable source of insightfully analysed information that meaningfully promotes coordinated regional engagement[34] across the maritime domain, must rest with its ILOs. The congeniality of the cooperative and collaborative atmosphere that the IFC-IOR is steadily breaking down the silos of narrow national security suspicion and concern. However, despite all this — and the enormous expertise and experience of the ILOs notwithstanding — their role continues to be undervalued and almost reflexively derided, particularly by a few Australian scholars who decry what they perceive to be a lack of guidance and geopolitical constraints on the ability of ILOs to share outputs and consequent country-specific actions or results with their fellow ILOs. It is, however, opined that such conclusions are reflect a strong reflexive bias, fed by extremely superficial exposure — unfortunately combined with excellent writing skills. Quite correctly ignoring these biases, the IFC Singapore continues to value its ILOs, while India's IFC-IOR ILOs is actively increasing its number of ILOs to as many as forty.

Given that India and her Quad partners will always need incrementally better situational awareness, the IPMDA initiative needs to be extended to the Western Indian Ocean Region (WIOR) as well, so that a greater geographical swath is covered. India, whose IFC-IOR does cover this critical subregional space, needs to take the initiative in this regard, coopting the United States and other regional partners both, within the Quad construct and beyond it.

Conclusion

It is very important for Maritime Domain Awareness (MDA)to be understood as an aspirational goal of the spread of Maritime Situational Awareness (MSA). As a collective initiative, the IPMDA is a partnership that has enormous potential and this potential can best be realised through a wide rather than a narrow geographical embrace, through the leveraging of both, hi-

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[32] *Information sharing is not the same as Maritime Domain Awareness and states engaging in MDA/MSA activities may choose to share/retain specific information that they may deem to be important, considering their national security interests. The author acknowledges Vice Admiral Pradeep Chauhan for sharing this very vital input.*

[33] *Other types of automatic identification devices include the Vessel Monitoring Systems (VMS) which are widely used in fishing fleets. However, the data on the VMS, unlike AIS, is only available to national agencies for review. Other key position reporting tools include the Long-Range Identification and Tracking Systems (LRIT) system. LRIT applies to passenger ships and cargo ships larger than 300 tonnes and mobile offshore drilling units. The author expresses her gratitude to Captain Himadri Das for sharing this vital piece of information.*

[34] Chirayu Thakkar, "Indian Fusion Centre- Indian Ocean Region: Security and Stature", *South Asian Voices, 07 June 2021.* https://southasianvoices.org/indian-fusion-center-indian-ocean-region-security-and-stature/

tech and low-tech means — ranging from satellite-based detection to the analytical and skills of ILOs and the harnessing of community-skills of a variety of coastal and fishing communities that characterise the littoral of the Indo-Pacific in all its vast entirety. India needs to take the lead but to do so subtly and intelligently so as to create and sustain inclusive mechanisms that leverage both people and technology. The IFC-IOR is proceeding down this very path, as is Singapore's IFC and Madagascar's RMIFC. It is for the Quad partners to take the fullest advantage of these and similar national and subregional efforts and generate a regionally stable maritime environment that is marked by inclusive maritime safety, holistic maritime security, and maritime commerce that promotes societal growth and economic prosperity throughout the Indo-Pacific.

In this regard, 'local communities' across different geographies within the Indo-Pacific can be sanguine partners in providing a more nuanced picture of the maritime domain. The IPMDA initiative under the Quad could be geared towards this endeavour as well. Through such initiatives, we can envisage the amalgamation/mélange of 'local' elements within more abiding 'global' constructs.

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