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Internship report on Defense Industry of
Bangladesh, based on the operation of
A.N.Associates

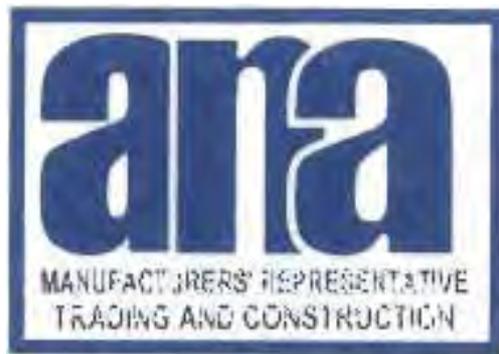
Submitted to:
Ms. MAHREEN MAMOON
Assistant Professor
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Submitted by:
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Submission Date: 6th December 2017

Internship report
on Defense Industry
of Bangladesh

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Letter of Transmittal

Obj:

Date: -- December 2017

Ms. MAHREEN MAMOON
Assistant Professor
BRAC Business School
BRAC University

Subject: Submission of Internship report

Dear Ms. MAHREEN MAMOON,

My name is Abu Naser Farsheed Ahmed, my ID is 15364004. I am enrolled in the MBA program in Brac University.

I have been working in A.N Asscoiates since August 2015. Our company works in the Bangladesh Defense Industry, through participation in tender issued by Arms Forces. Our company A.N Asscoiates focuses only on Bangladesh Ordinance Factories, unlike other suppliers , we focus on only one consumer.

Therefore I pray and hope that you will be kind enough to grant my term paper and oblige thereby. Your feedback will be highly appreciated.
Thankfully yours,

Abu Naser Farsheed Ahmed
ID: 15364004
BRAC Business School
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MBA program

Acknowledgement

I would first like to thank my honorable faculty Ms. MAHREEN MAMOON Assistant Professor in BRAC Business School, BRAC University. For guiding me and giving me feedback to finish my Internship report.

I would also like to thank Managing Director of A.N.Associates , Mr Nijam Uddin Ahmed for taking me under his supervision and mentoring me. Mr Nijam Uddin Ahmed helped me to embrace the required work culture, attitude and tone down my aggressive instinct. It has helped me tremendously and allowed me to succeed in my profession.

Finally, I would like to thank our Manager Mr Hasan Ali, his hard work, attention to details is close to none. Mr Hasan Ali was responsible for providing in-depth step by step details of our operation, which I have incorporated in the report.

There are endless other people who has helped me along the way, it would not be possible for me to acknowledge their contribution, one by one.

Thanking everyone sincerely from the bottom of my heart.

Executive Summary

The report is focused on the Bangladesh Defense Industry, the operation of company A.N.Associates, and job executed by Abu Naser Farsheed Ahmed in A.N.Asscoaites, as part of my internship report for Brac University MBA program.

The company profile is self explanatory, it provides operational information on A.N.Associates with respect to type of operation, scale of operation, company culture and work previously undertaken by the company.

SWAT analysis highlights that A.N.Associates as a company has more weakness than strength.

STP(Segment, Target , Profit), it shows that the Defense Industry in Bangladesh is unique , in the sense that it has only one consumer. Moreover, for revenue and profit generation companies focuses on a small number of Foreign companies, whom to represent in Bangladesh Defense Industry.

For Background of Bangladesh Defense Industry, due to lack of scholarly paper available to analyze the defense industry in Bangladesh, I have emphasized on the arsenal of weapon, vehicle, aircraft , ships, ability to manufacture defense oriented product in Bangladesh.

I have divided Background of Bangladesh Defense Industry into two parts.

First, I gave a historical account of Bangladesh Defense Industry immediately after achieving Independence and post 1975 (After assassination of Sheikh Mujibur Rahman).

I elaborated on the key suppliers of Defense product and service to Bangladesh at both point of time in Bangladesh. Furthermore, emphasized on their weapon Arsenal.

Afterwards I have provided statistical information on the weapon arsenal at the disposal of the Arms Forces of Bangladesh (Army, Navy, Air-force) at present. It would provided a comparative analysis of how far we have come along, in comparison to our situation post Independence, with respect to weapon arsenal at the disposal of the Arms Forces of Bangladesh.

Secondly, I emphasized on the ability of the Arms Forces of Bangladesh to manufacture and providing their own defense oriented product and service. I have done the analysis of Army, Navy, Air force individually, in terms of achieving self sufficiency.

After doing Porters 5 forces analysis, we get a better understanding of Bangladesh Defense Industry market.

- Inconvenience for entry and exit.
- Description of present market player.

- Why the Buyer (Arms forces of Bangladesh) enjoy greater bargaining power & when the buyer do not.
- Reason behind the level of competition in Bangladesh Defense Industry.

Job profile has details of work undertaken by my company A.N.Assocites and my responsibilities as Chief Operating Officer.

The Research Question is answered in the Recommendation. The Recommendation focuses on how private companies being involved in the manufacturing process itself, would allow the Defense Industry to achieve self sufficiency at a faster pace, thus not being dependent on imported products, raw material etc.

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Objective of the Report:

This report is sort of like a guidebook to all the individuals or organization who wants to be part of the Defense Industry.

It will provide insight about the market structure, stakeholders and other relevant parameter to provide a comparative analysis of the Defense Industry of Bangladesh using historical data.

Although this profession is glorified in the western movies , known as “Defense Contractor”. In reality the following three words would best describe my experience in the Defense Industry : Unpredictable yet routine very much Routine, an oxymoron.

Company Profile

Company Name: A.N.Associates

Location: 65 Dilkhusa C/A, 2nd Floor, Dhaka-1000, Bangaldesh

Date of establishment: January 2012

Type of Business: We are supplier of various Defense product, we supply to BOF (Bangladesh Ordnance Factories in Gazipur), it's the manufacturing wing of the Bangladesh Army. We primarily function as a representative of foreign Principle (Supplier) in Bangladesh Ordnance Factories. Either as a Local Agent or as a Local Partner, depending on the MOU that we sign with our foreign Principle. In return for our services we are paid in the form of commission.

We initially participate in a tender and have to be the lowest bidder to win the tender. If we become the lowest bidder, we basically get awarded with the tender. Our liabilities, obligations, next course of action etc will all depended on the category of tender we have participated in.

Tender has two category, one is Foreign Currency Tender and second is Local Currency Tender (It's just a name of a category, the underlying currency that is used, is dollar).

Company Structure: The following hierarchy is ranked in ascending order

- 1) Managing Director and Partner: Nijam Uddin Ahmed
- 2) Partner : Kamal Ahmed
- 3) Partner: Jamal Ahmed
- 4) Chief Operating Officer: Abu Naser Farshed Ahmed

- 5) Manager: Hasan Ali
- 6) IT Executive: Nipen Bala

Company core philosophy:

Irrespective of the present outcome, we will move forward with an optimistic view of the future.

Irrespective of our ability to create an impact, we must take necessary action to make a change.

Below is a list of all the work we have undertaken since 2013

SL. No	Project/supply	Client	Foreign Principal	Execution Period	A.N. Associates Scope of Works
01	Design, Build and Turnkey Supply, Installation, Construction, Testing and Commissioning of fuze Manufacturing plant.	Bangladesh Ordnance Factories, Gazipur	Tara Aerospace and Defence Product a.d, Montenegro	March 2017	Civil design/engineering and construction of one storied building, foundations of equipment. Erection/installation of equipment & instrumentation systems; smoke & fire detection Installation, testing & commissioning of the Fuze Manufacturing Plant including Custom Clearance, local transportation
02	Supply of 300,000 complete Fuze Component	Bangladesh Ordnance Factories, Gazipur	Tara Aerospace and Defence Product a.d, Montenegro	June 2016	Custom Clearance, local transportation and handed over the good to the authority.
03	Supplied 50,000kgs of Polyamide 12, Rilsamid AESNO TL	Bangladesh Ordnance Factories, Gazipur	ARKEMA, France	2016	Custom Clearance, local transportation and handed over the good to the authority.
04	Supply of 300,000 complete Fuze Component	Bangladesh Ordnance Factories, Gazipur	Tara Aerospace and Defence Product a.d, Montenegro	April 2015	Custom Clearance, local transportation and handed over the good to the authority.
05	Supply of 200,000 complete Fuze Component	Bangladesh Ordnance Factories, Gazipur	Tara Aerospace and Defence Product a.d, Montenegro	March 2016	Custom Clearance, local transportation and handed over the good to the authority.
06	Supply of	Bangladesh	M/s Liao	December	Custom Clearance,

	600mt GMCS Strips 3.1mm	h Ordnance Factories, Gazipur	Shen Industries Group co. Ltd. China	2016	local transportation and handed over the good to the authority.
07	Supply of 300mt GMCS Strips 0.99mm	Banglades h Ordnance Factories, Gazipur	M/s Liao Shen Industries Group co. Ltd. China	September 2016	Custom Clearance, local transportation and handed over the good to the authority.
08	Supply of 600mt GMCS Strips 3.1mm	Banglades h Ordnance Factories, Gazipur	China XinXing Export & Import Corporation, China	July 2015	Custom Clearance, local transportation and handed over the good to the authority.
09	Supplied of Brass Strip	Banglades h Ordnance Factories, Gazipur	Local Currency Tender Manufacture r from U.K	November 2015	Custom Clearance, local transportation and handed over the good to the authority.
10	Supplied of GI Sheet	Banglades h Ordnance Factories, Gazipur	Local Currency Tender Manufacture r from Japan	December 2014	Custom Clearance, local transportation and handed over the good to the authority.
11	Supplied of Tools and Cutter	Banglades h Ordnance Factories, Gazipur	Local Currency Tender Shaanxi Fuyan Int'l Inc, China	February 2014	Custom Clearance, local transportation and handed over the good to the authority.
12	Supplied of TIN Leaf	Banglades h Ordnance Factories, Gazipur	Local Currency Tender Shaanxi Fuyan Int'l Inc, China	February 2014	Custom Clearance, local transportation and handed over the good to the authority.
13	Supplied of Cold Drawn Steel Rod	Banglades h Ordnance Factories, Gazipur	Local Currency Tender Shaanxi Fuyan Int'l Inc, China	November 2014	Custom Clearance, local transportation and handed over the good to the authority.
14	Supply of 300mt GMCS Strips 0.99mm	Banglades h Ordnance Factories, Gazipur	M/s Liao Shen Industries Group co. Ltd. China	December 2014	Custom Clearance, local transportation and handed over the good to the authority.
15	Supplied of Die & Punch	Banglades h Ordnance Factories, Gazipur	Local Currency Tender Shaanxi Fuyan Int'l Inc	December 2013	Custom Clearance, local transportation and handed over the good to the authority.

16	Supply of 200mt GMCS Strips 3.1mm	Bangladesh Ordnance Factories, Gazipur	China XinXing Export & Import Corporation	December 2014	Custom Clearance, local transportation and handed over the good to the authority.
17	Supplied of TIN Leaf	Bangladesh Ordnance Factories, Gazipur	Shaanxi Fuyan Int'l Inc	July 2013	Custom Clearance, local transportation and handed over the good to the authority.
18	Supply of Tools for ammunition	Bangladesh Ordnance Factories, Gazipur	Local Currency Tender Shaanxi Fuyan Int'l Inc	January 2013	Custom Clearance, local transportation and handed over the good to the authority.

Swat Analysis

Strength:

- 1) We have a very strong relationship with all the relevant stakeholders in Bangladesh Ordnance Factories., unlike other competitor we do not work in any other Defense Oriented Institution in Bangladesh for example Director General Department of Purchase (DGDP). In this business relationship building is the most critical aspect as the inherent mechanism (Bureaucratic) and structure of these Defense Oriented Institution in Bangladesh is such that it is difficult to establish an simple working relationship. Because any decision made in these institution directly affects the long run ability of our country to defend

itself. Thus it's a fundamental requirement of these Defense Oriented Institution to constantly probe and inquire at every stage of operation, by requiring the supplier to provide documents, letters of Assurance and financial commitment in the form of Performance Guarantee.

- 2) Our Organization emphasizes a lot on efficiency. We have a very compressed team, work and responsibilities is divided, cutting corners in not accepted and we have an output based reward system. All of this amalgamates into a very conducive working environment, which in the end translates to an efficient working culture.

Weakness:

- 1) We are not a big company, so when it comes to spending money and utilizing non-financial resource we have a higher lag time with regards to making a decision in comparison to our peer's. We have to do cost benefit analysis, we have to think if there is any way for us to avoid making a particular investment, after taking all of this into consideration we finally take a decision. For example as local agent we have to pay the transportation cost from Chittagong Port to Bangladesh Ordnance Factories in Gazipur. It require multiple of truck, plus we have to factor in penalty for delay in releasing the consignment (Usually due to not having required documentation), in such a case we consider between borrowing from Banks or our Stakeholders , if we are in cash crisis.
- 2) It takes from two to three hours (One way) to go to Bangladesh Ordnance Factories (Located in Gazipur), we cannot go there more than twice or thrice a week, because of security reason, distant and traffic. Physically being present can help us to better facilitate the entire process.
- 3) We have shortage of man power, so we cannot act swiftly, which is a requirement in our business. We usually have a very short window of opportunity to capitalize on a certain change in dynamics/circumstance/events. More often than none we end up short on man power to take advantage of the opportunity.

Opportunity:

- 1) We are currently doing Transfer of Technology which is done in different phases. Moreover, the projects that we have undertaken is very complex as each phase has to be treated like a mini separate tender, plus keeping in mind there is continuity for the upcoming phase. Here onwards we would focus only on supply rather than TOT, as TOT will add weight to our portfolio, thus it will give us a slight edge over other.

Threat:

- 1) There is no assurance when or if we might win another tender, this is the very nature of this business. So if we do not accumulate sufficient Retained Earnings to keep our business floating during the time our cash dries up, we might end up in Bankruptcy.

STP: Segment, Target , Profit

STP helps a company take on consumer oriented approach, by having a better understanding of the target audience.

In case of government tender especially in the Defense Industry there is only one consumer with respect to our business, BOF (Bangladesh Ordnance Factories), but we will treat the our Foreign Principle (Supplier) as the Consumer.

Because our company acts as a representative of the Supplier and also an intermediary between the Supplier and BOF.

So for our company to generate revenue, we need to find foreign supplier, who will participate in this tender, who in return for our services, will provide us a commission.

Segment:

We prefer to work with Foreign Currency Tender rather than Local Currency Tender (Just a name of category, the actual transaction takes place using dollar).

We target supplier who belong to the 'Group A Counties', this grouping of countries is done by Bangladesh Ordinance Factories based on their unilateral belief, preference, perception and understanding of a particular country.

As the name suggest, 'Group A Counties' are considered to provide the highest quality of product. When we represent 'Group A Counties', it enhances our reputation in BOF (Bangladesh Ordinance Factories) . Moreover, it adds additional weight to our Portfolio and Track Record.

Target:

In other business, we usually try and target mass consumers. However, in our business we usually work with one to two supplier at a time.

Once we find a supplier willing to participate in a tender with us, we have a lot of follow up formalities.

So the nature of our business is such that we can cater to one or two business simultaneously. Moreover, due to unpredictability nature of our business we cannot scale up quickly, as we do not know if we will be financially solvent enough to support our operation on a bigger scale.

Background of Bangladesh Defense Sector:

History of Bangladesh Defense Industry, right after Independence:

Every country wants to attaining self sufficiency when it comes to providing their Armed force (Army, Navy and Air force, Border Guard, Police) with all the physical assets required to protect and serve the country, instead of purchasing it from foreign suppliers.

Before I elaborate on the present scenario of the Bangladesh Defense Industry, I would like to shed light on the humble beginning of the Bangladesh armed forces, starting from 1971.

Immediately right after Independence, Bangladesh Army, Navy and Air force utilized what they had in-terms of surrendered weapons and vehicles by the Pakistan army, damaged military assets that were functional after repair, 'neutralized maintenance facilities' and finally assets provided by foreign countries during the war to fight for Independence (Bangladesh: A country study, 231).

Late Prime Minister Sheikh Mujibur Rahman saw India and Soviet Union as the primary Defense Partners, in order to obtain equipment, vehicles, aircraft, arms and ammunition, ships etc. However, other countries also provided military oriented assets to Bangladesh.

For example "The Soviets supplied MiG-21 aircraft, An-26 transports, and some miscellaneous equipment items.

In addition, Egypt transferred thirty Soviet-built (Type 54/55) tanks, and Yugoslavia donated a small naval patrol craft" (Bangladesh: A country study, 226).

Relationship with Defense partners had changed after the assassination of Sheikh Mujibur Rahman. The equation between the Bangladesh and its primary Defense partner India and Soviet Union had soured, consequently Bangladesh had to look elsewhere. Bangladesh took drastic measures by normalizing its relationship with Pakistan to a certain extent, in order to gain China's collaboration and support in the Defense Sector, as Pakistan and China have been long term friends. Henceforth during the early 1980's China became Bangladesh's biggest Defense supplier (Bangladesh: A country study, 226).

Bangladesh decided to reach out to Britain and USA by buying "Three aging frigates" and "limited quantities of small arms" respectively.

Bangladesh also inherited a 'Munition Factory' after achieving independence, that was set up when Bangladesh was known as East Pakistan, with Chinese support. Now the factory is known as Bangladesh Ordnance Factories. I will elaborate later on the current product portfolio and condition of the factory (Bangladesh: A country study, 226).

The Navy started off with much more depleted resources. During the war for Independence, the Indian Navy was responsible for the Naval operation. Thus Bangladesh was not provided with any assets by its foreign friends that could have been used to fight West Pakistan over water. So after the war was won, Bangladesh Navy did not inherit any Naval oriented asset, unlike the Army (Bangladesh: A country study, 231).

The Navy right at the point of inception had “ 12 officers and 1000 Seamen, who previously served in East Pakistan Navy”. Furthermore, the Navy had six speed boat along with some weapons.

From that scenario, the Navy managed to grow, “By 1988 it had 600 officers and 6900 enlisted personal” (Bangladesh: A country study, 231). That a stark increase considering that it takes decades to educate, train and provide the right exposure to circumstances and events in order to build up the rank, in the upper hierarchy of the Armed Forces.

Moreover in the 1980's the Bangladesh Navy did not have any “ Air wing, marine corps, or reserves”.

The Air Force, fared comparatively better than the Navy, but when compared to the Army, was far behind in terms of resources at their disposal. The officers who filled the rank in Air force at it's inception had previously served in West Pakistan Air Force. The Air Force personal comprised of “5,000, including more than 400 officers, of whom about 175 were pilots”. The Air Force inherited “Destroyed aircraft, damaged runways, looted stores, and neutralized maintenance facilities”, which was later repaired, renovated and modernized wherever possible (Bangladesh: A country study, 234).

The Air force acquired Fighter planes and Transport oriented helicopters from the Soviet Union, they also provided training to Bangladesh Air Force Pilot, post immediate Independence period.

The Soviet supplied Aircraft (Very likely 15 aircraft, not specifically mentioned) became un-useable in late 1980's and due to breakdown of communication from the Soviets in 1975, due to assassination of Sheikh Mujibur Rahman. The Air force was partnered with China, after fulfilling the pre-condition of normalizing ties with Pakistan.

By 1988 the “Chinese-supplied fighter inventory totaled two squadrons, or about thirty A-5s and F-6s” (Bangladesh: A country study, 234).

In a nut shell, because of constant shift in primary supplier of Defense related inventory, arising out of changes in political party and political dynamics in Bangladesh, Bangladesh security was in a vulnerable position. For example, due to break down of communication with the Soviets some of the Combat/Fighter planes became redundant, as spare parts required was not available elsewhere other than Soviet Union. Moreover, the repair service required was not provided as well.

However, Bangladesh made the best of what they had, Bangladesh Air force had to “Cannibalize weapon system”. ‘Cannibalize’ means substituting spare parts from other similar aircraft, to be utilized in Soviet Aircraft (Bangladesh: A country study, 226).

Henceforth, Bangladesh understood the importance of self sufficiency, and decided undertake long term measure to try to reduce their dependency on import of foreign Defense oriented Inventory and Services.

Evaluation using historical data ,of the progress of Defense Sector in Bangladesh

In order to evaluate how far the Defense Sector of Bangladesh have progress, in comparison to the scenario mention above, we need to answer the following two question.

- 1) In comparison to the past, what is the state of our Defense oriented product and service portfolio of the Armed Forces.
- 2) What is the degree of self-sufficiency we have managed to achieve with respect to maintaining, repairing and manufacturing our Defense oriented product and service portfolio.

Obtaining and developing knowledge, technical know how, skilled Human Resource, infrastructure, funding, defense oriented educational entity, competent relevant private partners, etc these are time consuming and long term process that takes years to achieve. So the table below shows list of all Defense oriented product and Service portfolio of the Army, Navy and Air force, [will provide the answer to the first question.](#)

Navy:

In my humble opinion, the Navy started off with the limited resources at their disposal. Navy's active ship portfolio at the present moment will reflect the stride they have made in just a span of four decade

The table below provide a list of vessels active in the Bangladesh NAVY				
	Type of vessel	Quantity	Related Information	Country of Origin
1	Attack Submarine	2	Used to destroy other submarine	China
2	Guided Missile and Patrol Frigate	Guided missile - 5. Patrolling- 1.	Guided Missile- Warship with Anti Aircraft capability. Patrolling, respectively.	China- 3. South Korea-1. USA- 2.
3	Corvettes	4	Small warship, below the frigate category, armed with missile and relevant weapon.	United kingdom- 1. China- 3.
4	Large Patrol craft	4	Semi stealth, Anti submarine vessel.	Bangladesh-2. Singapore- 2.
5	Offshore patrol vessels	11	Coastal Defense duties, Anti- smuggling and rescue operation.	Bangladesh 5. United kingdom 5. South Korea- 1.
6	Fast attack craft	Missile- 4. Anti Submarine-warfare- 4. Guns- 5	Small, fast, agile and offensive warship armed with anti-ship missiles, gun and torpedoe. Operated with close proximity to land, not suited deep sea war fare.	Missile: China- 4 Anti Submarine-warfare: China-2 Yugoslavia- 2. Guns: China 1 South Korea 4
7	Mine countermeasure vessels[edit]	River Class -5. Ocean Mine Sweeping- 1.	Finding and destroying naval mines.	River Class: United Kingdom – 5. Ocean Mine Sweeping: China - 1

8	Rapid response boats	Response Boat-16 High speed patrol boat-16	Search , rescue and patrolling.	Response Boat: USA: 16 High speed patrol boat-Bangladesh :16
9	Amphibious warfare	Landing Craft Utility- 5 Landing Craft Mechanized-5 Landing Craft Vehicle & Personnel- 3 Landing craft tank- 2	Carry troops and light equipment. Carry vehicle and troops. Carry vehicle and troops. Carry tanks.	Landing craft Utility: Denmark-1, USA-2, Bangladesh-2 Landing Craft Mechanized-: China-5 Landing craft tank: Bangladesh- 2 Landing Craft Vehicle & Personnel-: Bangladesh- 3
10	Auxiliaries	13	Has 9 different categories of ships for 9 specific purposes. Some suitable for sea, while other for coastline. It usually supports combat ships. Provides services to execute an operation.	Bangladesh-9 China – 1 Yugoslavia -1
11	Training Ship	1	Used a training ship	United Kingdom
12	Research & Survey Ship	2	First hydro-graphic survey ship to serve with Bangladesh Navy. It gathers information and statistical data.	United Kingdom -1
Aircraft at the disposal of Bangladesh Navy				
	Type of Aircraft	Quantity	Related Information	Country of Origin
13	Maritime Patrol Aircraft (MPA)	“Dornier Do 228” 2	It is a fixed-wing aircraft designed to operate for long durations over water in maritime patrol roles	Germany
14	Search and Rescue Helicopter	Augasta Westland Helicopters 2	Used for search and rescue operation both Land and Water.	Italy

Air force:

The Air force has also managed to expand their portfolio for their planes (En.wikipedia.org, 2017).

The table below show list of all airplane at the Air forces disposal							
Type	Origin	Class	Role	Introduced	In service	Total	Note
Aero L-39 Albatros	Czechoslovakia	Jet	Trainer	1995	7	8	
Antonov An-32	Ukraine	Propeller	Transport	1990	3	3	
AgustaWestland AW119	Italy	Rotorcraft	Trainer	2017	2	2	
AgustaWestland AW139	Italy	Rotorcraft	SAR	2015	2	2	
Bell 206 Long Ranger	United States	Rotorcraft	Trainer	1981	6	6	
Bell 212	United States	Rotorcraft	Utility	1977	14	14	
Chengdu F-7	China	Jet	Fighter	1989	37	57	F-7 BG, F-7 BGI, F-7 MB versions.
Hongdu K-8	China	Jet	Trainer	2014	9	9	
Let L-410 Turbolet	Czechoslovakia	Propeller	Trainer	2015	3	3	
Lockheed C-130 Hercules	United States	Propeller	Transport	2000	4	4	C-130 B version.
Mikoyan MiG-29	Russia	Jet	Multi-role	1999	8	8	Six MiG-29B and two MiG-29UB.
Mil Mi-17	Russia	Rotorcraft	Attack /	1993	33	33	4 more

			utility				on order.
Nanchang PT-6	China	Propeller	Trainer	1977	9	53	
Yakovlev Yak-130	Russia	Jet	Trainer	2015	15	16	

Army:

Below is a list of all the weaponized equipment, weaponized vehicle (Land and Air) at the disposal of Bangladesh Army (lpfs.io, 2017).

The list of weapon showed in the table below **are excluding the weapons used by Infantry division** such as types and quantity of guns, grenade, anti-tank weapon etc. All of it is used to fight battle on the ground.

Tanks				
Name	Type	Origin	Quantity	Notes
MBT-2000 VT-1A	Main battle tank	China	44 ^[1]	Forty four units were purchased from China in 2011 for \$162 million. ^[2]
Type 69 II	Main battle tank	China	50 ^[1]	
Type 59 G	Main battle tank	China	180 ^[1]	Upgraded to Type 59G Durjoy with Chinese help. ^{[3][4]}
Type 59	Main battle tank	China	66 ^[1]	Includes 30 T-54 tank donated by Egypt and later converted.
Type 62	Light tank	China	36	

Armoured vehicles				
Name	Type	Origin	Quantity	Notes

MT-LB ^[5]	Armoured personnel carrier	Soviet Union	66	Multi-purpose fully amphibious auxiliary armoured tracked vehicle
Otokar Cobra	Light Armoured Vehicle	Turkey	22 ^[1]	Infantry mobility vehicle
BTR-80	Armoured personnel carrier	Russia	1030	Second largest user of BTR-80 after Russia. Bangladesh Army is currently establishing an overhauling plant as they plan to purchase more units is near future.
BTR-82A	Infantry fighting vehicle	Russia	330	Three hundred thirty units was placed in order from Russia in 2014

Artillery				
Name	Type	Origin	Quantity	Notes
Nora B-52K2 ^[7]	Self-propelled artillery	Serbia	18	
WS-22	Multiple Rocket Launcher system	China	6	Two more battery ordered.

Air Defense Missile				
Name	Type	Origin	Quantity	Notes
FN-16	MANPADS	China		Will be manufactured in Bangladesh Ordnance Factories with Transfer of Technology in the

				future.
FM-90	Surface to Air missile	China		Two regiments ordered in 2015.

Anti-tank weapons				
Name	Type	Origin	Quantity	Notes
Metis-M	Anti-tank missile	Russia		Added in 2013. ^[7]
PF-98	Anti-tank weapon	China		Added in 2013. ^[7]

Aircraft				
Aircraft	Role	Origin	Quantity	Notes
Cessna 152	Primary Trainer	United States	5	
Cessna 208B Grand Caravan	Utility aircraft	United States	1 ^[9]	IISS 2011 also list one Piper PA-31T Cheyenne (IISS 2011, 226)
Airbus C-295W	Transport aircraft	Spain	1	Delivered in 19th september 2017. ^{[10][11]}
Helicopter				
Mi-171Sh	Combat helicopter	Russia	6	Six helicopters delivered in 2016. ^[4]
Eurocopter AS365	Utility helicopter	France	2 ^[9]	

Dauphin				
Bell 206	Utility helicopter	United States	3 ^{[12][13]}	

Extent of self sufficiency achieved by Bangladesh Defense Industry:

During the decade post independence, Bangladesh sourced their defense oriented product from many different countries. It created the following problems:

- Product that required spare parts change constant, lack of access to spare parts for example, due to unforeseeable reason created a lot of problems. At times it even made the product obsolete.
- The diversity of equipment imposed severe maintenance problems, the military that lacked technical know how and sophistication, during the period post independence .
Most overhauls of major equipment items had to be performed by foreign technicians or in the country of Origin

Consequently the Arms forces decided to emphasize on self sufficiency, to manufacture their defense oriented product with in the boundary of Bangladesh.

In order to answer the second question regarding the extent of self-sufficiency achieved by the Bangladesh Arm forces, I would elaborate on Army, Navy and Air force individually, as I did when I answered the first question.

Navy:

The Navy has made tremendous progress in terms of the ability to manufacture their own Naval vessel.

It is manufactured in “Khulna Shipyard” located in Khulna.

“Khulna Shipyard” has manufactured the following vessel for the Navy (En.wikipedia.org, 2017).

Type	Quantity	Note
Durjoy-class Large Patrol Craft	2	Two more units under construction
Padma-class Patrol Craft	5	
Aluminium harbour patrol boat		CGS Atrai
Bangladesh Navy floating crane		BNFC Balaban

Steel fire fighting boat		
Ferrys		
Buoy laying vessel		
Tug Boats		
Passenger ship		
3 X Oil tanker		
Landing craft utilities		

'Khulna Shipyard" carries out repairing and up-gradation job of private companies, thus ensuring cash flow, and minimizing dependency on government allocated funds.

Air Force:

In order to reduce reliance on foreign technology in the aviation industry, Bangladesh has established Bangabandhu Aeronautical Centre (BAC), in 2011. It is a state owned entity, that has been established in 2011 and it is under the supervision of Ministry of Defense.

Even though the extent of work, progress, list of present and future project is not public knowledge. Bangabandhu Aeronautical Centre was established to attain self-sufficiency within a decade, in terms of designing, developing and building the following:

- Aircraft.
- Unmanned aerial vehicle.
- Manufacture and maintenance of high tech electronics such as radar etc both for Air force and Navy.
- Avionics systems for country's armed forces.

Bangabandhu Aeronautical Centre will also carry out MLUs (Mid Life Upgrades) it extend the service life of an Aircraft. Through upgrading its Avionics, Equipment, major overhaul, repair of the Airframe or through any combination of the above mentioned points.

Regular maintenance work and over hauling of civil and military airplane, will also be undertaken in Bangabandhu Aeronautical Centre.

In order to realize the dream of manufacturing Air planes, Bangabandhu Aeronautical Centre taken their first step in the right path. In first phase of acquiring knowledge, it will do so through making an F-7 overhaul plant for Bangladesh Air Force, in order to upgrade current fleet of F-BG+F-7BGI.

Through up gradation it will acquire sensitive knowledge and also figure out the area's where intensive information gap exist regarding any aspect of building aircraft.

Moreover, take necessary steps for designing training program that will churn out competent, knowledgeable and skilled individual. And create a system where new knowledge acquired can be passed on effectively and efficiently.

Other future endeavor includes development/manufacturing program for 4.5th generation fighter jet to be undertaken by Bangabandhu Aeronautical Centre, it's at the initial planning phase at the moment (Defenseupdatebangladesh.wordpress.com, 2017).

Army:

After independence Bangladesh had inherited a Munition factory (It specialized in filling various munitions, such as: bombs, shells, cartridges, pyrotechnics etc), it was established by West Pakistan through China's help, as mentioned earlier (Bangladesh: A country study, 226).

Later on the factory was renamed as Bangladesh Ordnance Factories (BOF). The factory product portfolio was extensively expanded and now it comprises of several small factories (Bof.gov.bd, 2017). They are as follow:

- Small arms factory
- Small arms and ammunition factory
- High caliber ammunition and Grenade factory
- Tools manufacturing factory

I will briefly talk about the final product and different process that take place in order to get the final product.

Small arms factory:

From 1970 till 2006 Bangladesh Ordnance Factories (BOF) produces 7.62 mm semi Automatic Rifle T-56. It was used by Bangladesh Army, Navy, Air Force and also by Para-Military and auxiliary forces like Border Guards of Bangladesh (BGB), Coast Guards, Bangladesh Police etc

Post 2006 Bangladesh Ordnance Factories (BOF) under went up-gradation to produce 7.62 mm Automatic Assault Rifle BD-08, currently the factory produces 10,000 units yearly.

BOF Small Arms Ammunition Factory consists of the following production shops (These are small scale individual units within the factory premises that produces component or carries out certain function), in order to produce Rifle, they are:

- Rifle Machine Shop-1.
- Rifle Machine Shop-2.
- Heat and Surface Treatment Shop.
- Induction Furnace Plant.
- Forging Shop.
- Wood Work Shop.
- Works Inspection.
- Rifle Proof Range.

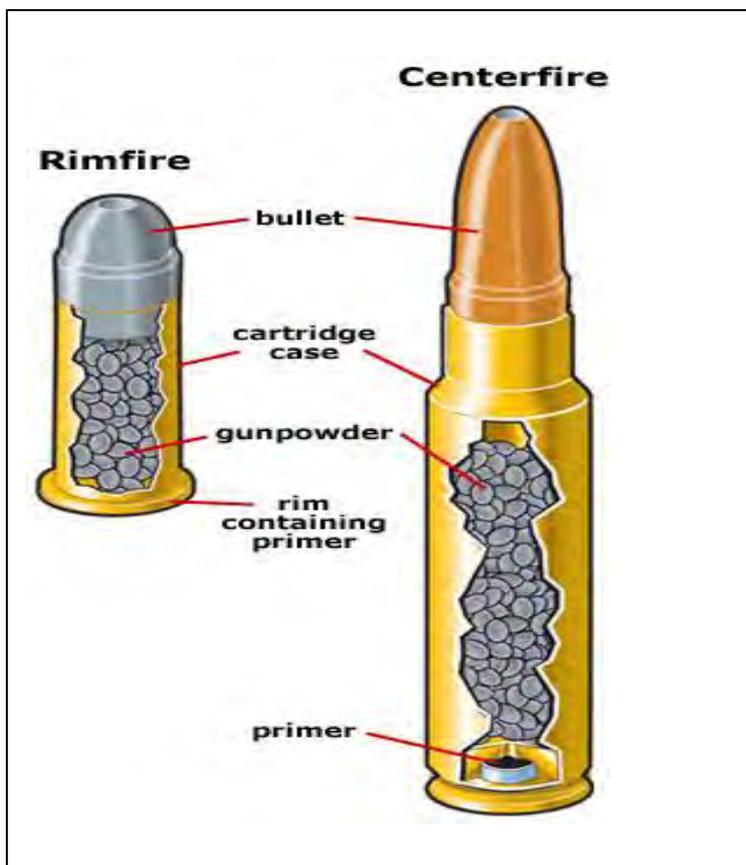
There are ancillary Shops contribute to the final product directly or indirectly, they are:

- Case and Bullet Shop (FX-2 &3).
- Ammunition Box & Clip manufacturing Shop.
- Loading and Packing Shop.
- Explosive Shop.

High Calibre Ammunition & Grenade Factory

This has three sub factory, they are Fuze factory, Hand Grenade Arges 84 BD factory and and High Calibre Ammunition factory.

Small Arms and Ammunition Factory



In the earlier day's BOF imported primer cap from abroad and later assembled these with BOF produced cartridge and bullet. Later in 1981 BOF attained the technology to produce primer, thus attaining self-reliance in production of "Small Arms **Ammunition**" within the country.

BOF initially produced Tracer Cartridge of Type-53 & 56 during 1982 to 1983 Fiscal year using existing machineries, technical facilities and experience of the skilled technicians. Later on during 1995 to 1996 fiscal year, BOF also started to produce 7.62x51 mm NATO Ball ammunition and

7.62 mm Blank Cartridge (Type-53 & 56).

Presently, BOF is producing various types of "Small Arms **Ammunition**" very efficiently at a large scale.

As a part of modernization and expansion of "Small Arms **Ammunition**" production, a new project termed as CB-10 Project has been implemented successfully in 2012.

This project enabled BOF to produce approximately 90 million "Small Arms **Ammunition**" in total per year and thereby helped to attain self reliance in production of "Small Arms **Ammunition**".

Tools manufacturing factory:

It is **different** from **Bangladesh Machine and Tools Factory**.

Tools & Clothing Group consists of three shops, namely Tools Manufacturing Shop, Central Tools Godown (warehouse) and Inspection & Clothing Shop. Main function of this group is to manufacture and supply of Tools, Gauges, Jigs, Die-Punch and Fixtures etc for the production of rifles, ammunition and grenade.

Besides these, this factory manufactures hand gloves, lab-coat & maintenance clothing items as per the demand of BOF. At present this factory is capable of providing 70% of the required tools, die, punches, jigs, fixtures and gauges for various production lines (Bof.gov.bd, 2017).

Bangladesh Machine and Tools Factory Limited:

Bangladesh Machine and Tools Factory Limited is a commercial enterprise under management of Bangladesh Army. It was previously owned by the government, but they were not running a profitable organization nor a productively efficient one. This in 2000, Bangladesh Machine Tools Factory was formally handed-over to the Army.

Bangladesh Machine and Tools Factory Limited was established in 1979. Its has a diverse arsenal of production machineries & equipment's in order to Produce various engineering products. It has basic production facilities like casting, forging, machining, heat and surface treatment etc. It has thirteen large production shops along with administrative building, training school, residential area etc, within the complex

Bangladesh Machine and Tools Factory Limited, has the following sub-factory (bmtfbd.com, 2017):

- Footwear & Leather factory
- SPC Pole Factory
- Vehicle Assembly Shop
- Forge Shop
- Foundry & Pattern Shop
- Heat & Surface Treatment Shop
- Machine Shop
- Steel Structure Manufacturing Shop

Bangladesh Machine and Tools Factory Limited has the following product portfolio:

- Both produce's and assembles army vehicle.
- Manufacture line hardware for Rural Electrification Board and Power Development Board.
- Imports vehicles in completely knocked down (CKD) and semi knocked down (SKD) conditions for assembling in the country.
-

For the very first time in Bangladesh in 2005, Bangladesh Machine and Tool managed to assemble diesel-run light and heavy commercial Nissan vehicle. It was a huge achievement considering the fact that we do not have sufficient skilled individual, technical know-how, relevant ancillary industry, required infrastructure to carry out such activities back in 2005 (Pike, 2017).

Porter five- forces model analysis of the Defense Industry of Bangladesh

The Porter five model is basically used for Industry analysis. In a way it reflects how attractive the market is for investors and other stakeholders.

There are 5 aspects on which industry analysis is carried out, they are:

- Bargaining power of buyer.
- Bargaining power of seller.

- Threat of substitute product or services.
- Threat of Entrant.
- Extent of Rivalry among firms.

Before I go into the Industry Analysis, I would like to state the key players of Bangladesh Defense Industry, they are as follow:

- Individual Manufacturer of the Defense Industry. In Bangladesh the Army, Navy and Air force each have their own entity which provided relevant goods and service, private sector entity is NOT DIRECTLY permitted to be involved in the production of Defense related goods and services.
- Local supplier (As the name suggest, these are individuals or entity that are based in Bangladesh). They usually provide goods and service that are NOT complex in nature. Good and services required for running individual factories and it's respective organization are sourced from local supplier.
For example food & beverage, clothing, basic raw material such as small spare parts, stationary, Air conditioning etc.
- Foreign Supplier/ Foreign Principle (As the name suggest, these are individuals or entity that are based outside Bangladesh). Usually the Arm forces source Weapon, Vehicle for transpiration, Vessel, Aircraft, Complex raw material, High-tech technology, Technical/ Non- technical training, Machinery etc from Foreign supplier.
- Local Agent/Local Partner/ Supplier with Foreign principal, these are all the terms used to refer to those entity that represent Foreign principle. Moreover, they participate in tender floated by the Arms Forces, through Local Agent or Local Partner in Bangladesh. Moreover, it acts as a mechanism to keep the image of the Arms Forces as clean as possible, in case a supply goes bad. If any of the Arms forces directly contacted the supplier with no local agent or local partner in the equation. In such a case, the individual in the Arms Forces would solely had to bear the responsibility, thus it also acts as a mechanism for the Arms forces to keep their reputation clean. As integrity and honesty of the Arms forces is an integral component of their institution.
- The Bangladesh Government is responsible for allocating fund to the Arms Forces. To keep the individual manufacturing, training and administrative and other entity of the Arm Forces.
- Local Ancillary industry such as transportation companies, Utility provider, Individual CNF agents they all play an important role in facilitating the operation of Arm Forces oriented organization.

Porter's Five Forces Model Analysis of Bangladesh Defense Industry:

Threat of Entrant:

Till now only the Arm Force's individual manufacturing entity are allowed to Manufacturer Defense oriented product.

However, private companies do get involve in the manufacturing process, through supplying raw materials or any other product or service to facilitate the manufacturing process .

The relation is similar to a PPP (Public Private Partnership), the private companies get involved through government tender. When it comes to finding Foreign supplier, the local companies find foreign companies willing to work in a specific tender. The local companies perform the role of facilitator and mediator between Arms Forces and the foreign supplier. The local companies, help foreign companies to understand the norms and rules of working in the local Defense Industry. The local companies are held accountable by the Arm's Forces along with the Foreign supplier. Each an every aspect of the supply is scrutinized from the execution tender as per specification technical specification, financial aspect, after supply follow up service if such arrangement is made, Quality of product or service etc.

Current status of Threat of New Entrant:

In terms of private entities getting involved in the manufacturing of defense product, the threat is close to non-existent. **The illegal production and imports of arms are only consumed by illegal entities, thus cannot be considered as competition.**

Threat of New Entrant, in terms of private companies getting involved in the tender and working through PPP, is on a moderate level. Because of the following reason:

- It's difficult to find reliable foreign supplier.
- The payment structure is unique as it resembles the 'Open Account payment System'.
- Without proven track record not everyone can participate in every tender
- New players involved in the industry take a bit of time to understand the process and the norms, as it's very different than working in the private sector.

Both high barrier to entry and high barrier exit are variables that either prevent or put hurdles, for new entrant to enter the market.

Bargaining power of Buyer:

The buyer in the Defense Industry of Bangladesh is an entity of the Arm's Forces

Current Status:

When the entity of the Arm's Forces deals with any other stakeholder, it has an enormous magnitude of power. The Arms Forces is a very integral part of the any country. Moreover, the fact that its been only 48 years since our country's independence and the role played by the Arms Forces is still enshrined in our history. The Arm Forces importance is reflected in our culture and the status they command in the society.

The bargaining power of private Individual or company involved in executing a particular tender, when dealing with stakeholder is extremely low.

They are in a very peculiar position, as they are not a formal part of the foreign supplier's organization nor are they part of any of the Arm Force's individual manufacturing/ business oriented entity, thus when they play the role of facilitator and mediator, it is very difficult to coordinate, communicate, execute a task etc.

There is always a certain degree of communication gap that creates an metaphorical grey area, which is left on the part of the private individual/ companies to explain or fill in.

On top of that if you factor in 'Red Tape' that is in placed for the safe guarding national security related information, the complexity involved increases by multiple folds.

Bargaining power of supplier:

The supplier is usually either a foreign company being represented in Bangladesh through a local partner or local agent, or a domestic supplier of a good or service.

Current Status:

The extent of power enjoyed by a supplier depends on the following:

- The availability of substitute supplier, providing same product.
- The higher the extent of complexity of the nature of the product, in terms of technology, distribution channel, etc; the higher the extent of power the supplier gets to exert.
- Foreign companies with proven track record gets more leverage in the negotiation table, with respect to pricing. Their selling point is usually that they consistently supply superior quality product.

Threat of Substitute product:

Threat of substitute product does not exist.

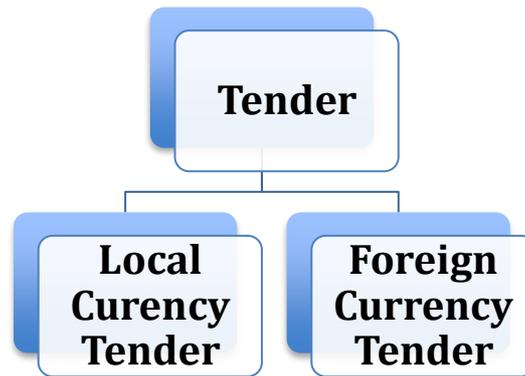
Extent of Rivalry among firms:

As the Arms Forces oriented and supervised organization, are only allowed to manufacture Defense product as per the law of land in Bangladesh, the extent of rivalry in the Defense Industry is non existent.

Job Profile

First of all I will explain about tender, then role of my company, finally I will talk about what I personally do for the company.

Tender:



As the chart shows above, tender have two categories. First is Local currency tender (This is simply a name of a category, it is NOT necessary that the transaction can only take place in Taka) and second is Foreign currency tender. In both the cases, when foreign supplier is involved, the underlying currency used is dollar.

Local Currency Tender vs Foreign Currency Tender			
	Factor	Foreign Currency tender	Local Currency Tender
1	Country of origin	When tender specification states suppliers from specific foreign country. Group 'A', 'B' & 'C' these are list of countries in each group. Group A considered the most advanced and developed countries in Defense Oriented product.	When tender document Does NOT explicitly state, foreign suppliers belonging to a certain group (A,B, &C). Any country can qualify.
2	Participant in tender	Only foreign supplier can participate.	Both foreign and local supplier can participate.
3	Budget Allocation for Tender	For very big projects/supply, usually foreign currency tender is issued. No universally agreed upon monetary threshold is available.	For supply with very small budget, usually it's in local currency tender.
4	Bid Bond & Pay-order	Newly enlisted supplier will provide a bid bond of a certain amount, this is a one time payment for the enlistment in Bangladesh Ordinance Factories. This bid-bond requirement might vary from one institution to another.	Newly enlisted supplier will provide a bid bond of a certain amount, this is a one time payment for the enlistment in Bangladesh Ordinance Factories. This bid-bond requirement might vary from one institution to another.
5	Performance Guarantee (PG) & Bank Guarantee	To ensure a specific level of performance against supply. Failure to meet performance criteria based on mutually agreed	Bank Guarantee provides the same function as PG, it is usually used in Local Currency Tender.

		upon parameter, would provide Arms Forces the leverage to either force the supplier enhance the level of performance to the required level or take punitive actions against them.	
6	Letter of Credit (LC)	Issued by Customer/buyer	Issued by local agent, local partner, local supplier
7	Currency	US Dollar	US Dollar

This is pre-tender participation process carried out by all the stakeholder:

- The Arm Forces carries out In-house research to find out the best suitable requirement, which the will insert into the specification. Specification is that part of the tender that provided technical information, which has to match when supplying the goods or service. Other critical information stated in the tender are country of Origin, payment terms etc.
- Once the tender is created it is circulated. Meaning the tender is advertised and the documents are made available to be bought by potential supplier in designated outlet.
- Newly enlisted supplier will provide a bid bond of a certain amount, this is a one time payment for the enlistment in Bangladesh Ordnance Factories. This bid-bond requirement might vary from one institution to another.
- Potential supplier looks at the specification that is advertised. In case it is stated that it can be supplied by local manufacturer, if the supplier himself has the capability to supply a good or service, then the supplier will buy the 'Tender Document'.
In case, the tender ask for foreign goods or service, the supplier usually has to find Foreign principle whose product matches the technical requirement, and persuade the Foreign principle to participate in the tender.
- After deciding to participate either directly or along with a Foreign principle, a lot of tender related documents are created that needs to be submitted to the designated **Tender Drop Off location**.
Tender documents has two parts, one is Technical specification the other is Financial Specification.
In the technical specification provided by the supplier, they need to provide documents that proves they have the ability to provide the goods or service, as per tender requirement.
In Financial specification, the supplier mentions the per unit and total cost at which they can provide the goods or service.
The financial part is one of the most important information.
After all the participants of the tender are done with submitting their individual Technical and Financial specification, those who match the technical specification is qualified, next whoever is the lowest bidder among qualified bidder will be awarded the 'Tender'

Process and steps taken by A.N.Associates our company once we come across a tender that has been advertised.

- After looking at the advertised tender, we find out the budget from the concerned personal. To analyze if there is scope for sufficient margin after undertaking a particular tender.
- If the answer to the above question is Yes, then we scout for supplier. As informed earlier our company acts as middleman between buyer and seller. We focus on supply of imported product or service, it could be both Local currency tender and Foreign currency tender.
- Depending on the category of country of origin we look for suppliers from a particular part of the world. We search over the internet and contact potential supplier through email, phone calls etc. Moreover, we contact our business associates abroad to link us with a supplier that meet the technical requirement, in return for a cut.
- Once a potential supplier is willing to participate in the tender with us, they sign a MOU (Memorandum Of Understanding) or contract stating the nature of partnership they want to forge with us. So A.N.Associates could either be a Local partner or a Local Agent.
- Then the foreign principle would provide the following to A.N.Associates, which we would later submit to BOF, they are as follow:
 - Technical specification: To proof that the seller meet the technical requirement as mentioned in the tender by the consumer.
 - Financial specification: It is similar to a seller's Invoice, providing details of the cost at which the seller can supply the product or service.
- If we (A.N.Associates and our foreign supplier) become the lowest bidder, we sign a MOU and later a contract to supply the product or service.

There are countless procedures, guideline, supervising bodies overlooking the tender process.

Here onwards ,I will focus on my responsibilities in A.N.Associates:

1. To scot for potential foreign supplier of a product or service, means undertaken is explained earlier.
2. After winning a tender, during the stage of supplying the product, service and after sales service, there is a lot of follow visit to Bangladesh Ordinance Factories is required. I am responsible for the follow up, doing the following:
 - When submitting a letter to Bangladesh Ordinance Factories, first it as to been officially registered into Register Office. The office keeps record of all the letters , documents submitted by different companies. They do not focus on the content of the letter.
 - Then it needs to be recorded in their Register Data storage Department called CR.
 - Then it is sent to the Dealing office, where they store the letter, documents etc.

The Dealing office is responsible for dispersing/sending the letters and documents to the concerned personal.

But there is a another process **before** the documents are **dispersed to the concerned personal Officially**.

Those same official who would will receive the documents officially later , first acknowledge and verify that the documents and letters are under their respective supervision. This official acknowledgement and verification is called “Documents being Seen”.

After the documents are marked seen by all the individual personal they are sent back to the “Dealing office” only to be send again to the same individual’s, this time officially receiving it and reviewing it’s content.

My job is to get feedback from Register Office, Register Data storage of department (CR), Dealing Office, and respective Personal Assistant of each concerned Official, through official means. In order to find out the status of the letter or document.

It’s very difficult as there are restriction on entry to the above offices, usually I would request one of the concerned official to give me the status of my document. The concerned official would co-ordinate with other related department to give me an update on the status. Or would send me to a particular department, with prior permission from the authority.

So after getting the status of the document from the respective concerned official.

If due to circumstances, the document requires immediate attention, I make an appointment with the concerned personal, to a request them to have look at my letter or document

Because there are too many documents that needs to be addressed, so sometime it creates a ‘Bottleneck’ situation.

3. Mediation is fundamentally the most important function that needs to be carried out by local agent or local partner of foreign principle. Our company Managing Director contributes mostly, while I provide strategies, third person point of view, things NOT to do , when trying to diffuse a situation.
4. We do all contracts, draft for documents such as MOU (Memorandum of Understanding), In-house, rather than going to a lawyer. I usually provide the skeleton and gist of such documents. While our Managing Director polishes it and adds the final touches.
5. After the shipment sent by our foreign supplier reaches either the port or Airport, we release the shipment. We then have to perform a series of procedure in order to deliver it to the premises of Bangladesh Ordinance Factories.
They are as follow:
 - Inform MRO department and Receive Control department of BOF.

- We need to collect entry pass and request BOF to assign people to unload the goods from the vehicle.
- We need to collect 'Challan' for the vehicle issued by the transport company. And 'Convoyner' from CNF agent.
- Get security clearance for our vehicle, by providing information about vehicle as well as all the individuals accompanying the vehicle.
- Once the shipment enters Bangladesh Ordnance Factories premises, it then needs to contact with the security of the various factory premises, get further entry clearance into the factory.
- The product is inspected and matched with documentation.
- If the inspection is successful then it is placed in a temporary premises or placed into the respective factory location.

Research Question

If Private companies were involved in the Defense industry in the manufacturing process, would it help to narrow down the gap between Bangladesh Defense Industry and Defense industry of other developed countries.

In terms of Knowledge, skilled & competent Human resource, reduced lag time for development, creation of relevant infrastructure, and having dependable homegrown supplier.

Recommendation

If Private companies were involved in the Defense industry in the manufacturing process, would it help to narrow down the gap between Bangladesh Defense Industry and Defense industry of other developed countries.

In terms of Knowledge, skilled & competent Human resource, reduced lag time for development, creation of relevant infrastructure, and having dependable homegrown supplier

My humble opinion is that allowing private companies to manufacture defense product would allow Bangladesh to catch up more quickly with other countries in terms of ability to develop new product and reduce dependency on imported products.

According to an article, the approach taken by countries such as USA and Russia is such that they encourage and provide scope for private companies to be involved in the manufacturing of defense related product and service (Indian Defence Review, 2017).

A statement issued by US War Department, it states that “

- Defense industry is highly technology driven and it is the private sector that adapts itself better to rapidly changing technology.
- The private sector possesses business acumen to spot fleeting opportunities for long term survival and continued prosperity of their enterprise.
- Open and free competition compels companies to master frontier technology to beat their rivals for the limited orders available. It, in turn, helps the nation to build a reservoir of latest technology to give it an edge over its prospective adversaries”.

In the same article, it is mentioned that Russia is also partly emulating the approach by followed by it's western counter part. Since the early 1990's a large number of defence production facilities were privatized. Nonetheless, “Major research and design establishment and production facilities falling under strategic disciplines were kept under the Government's direct control” (Indian Defence Review, 2017).

If nothing else, it highlights the fact that the route taken by countries which are exporters of Defense Products, has been one where private companies has been part of the manufacturing process as well as product development process.

There are stark economical, sociological, differences between Bangladesh and western countries, which export Defense Product world wide. We need to factor in the following parameters when making a comparison of the Defense Industry, they are as follow:

- Culture
- Infrastructure
- Quality of domestic private companies
- Work ethic
- Mechanism and effective system to supervise, analyze and govern the operation of private companies.

It would best if we compare Bangladesh with it's neighbor India, even though we are no where near India if we were to quantify the above mentioned parameters. But we share enough similarity to make the comparison.

The article gives us an analysis of India's defense industry struggle to achieve self sufficiency. The article focuses on the mistakes made and positive decision taken by India to achieve self-sufficiency, in defense industry. Bangladesh can learn from the mistakes made by India over the years and integrate` the positive decision. Given that it's a good fit and serves the strategic interest of Bangladesh Arm Forces.

In 1991 India first allowed private companies to be involve in manufacturing of components, assemblies and sub-assemblies. Later in January 2002, India allowed 100 percent private equity with 26 percent Foreign Direct Investment. Afterwards, a detailed guide line was published by Industrial Policy and Promotion for the production of arms and ammunition (Indian Defence Review, 2017).

Bangladesh could also start by allowing private companies to be partially involved in the manufacturing and development of defense product. For example allowing Bangladesh private companies to import defense product in Knock-Down and Semi Knock-down condition and supply it to the Arms Forces. In this case the private companies could later on Reverse Engineer and even develop new product, once they get a better understanding of technology.

We also need to learn from the mistake that India made that had slowed down the rate of progress which respect to attaining self sufficiency and innovation of new products, that inherently resulted from not utilizing and integrating private sector companies, in the Defense Industry.

As per the article, **in India** “Only a small number of companies are involved in value defense contract” (Indian Defence Review, 2017). Because of the following reason:

- “Old mindsets, complexity of procurement procedures and clout wielded by the public sector”.
- Information Gap:
 - When “Decision is taken by the Defence Acquisition Council to categorize a proposal as ‘Buy’ or ‘Buy and Make’ or ‘Make’”. The input of private companies are not factored in. Hence there is a information gap and the India end up importing something that could have been manufactured domestically.
 - “When technical detail for procurement is prepared where parameters required is set. It is done after reading the brochure of foreign manufacturer”, thus ruling out the domestic private companies. However, making acceptable small changes in parameters, which would not affect the functionality and still achieve the desired result. Would have qualified local companies in contention for bidding.
- “Requirements of the armed forces are not made known to the private sector sufficiently in advance, with the result that it does not get adequate time, either to scout for foreign tie-ups or to establish the necessary facilities”.

Finally in order to encourage and achieve innovation, I would suggest to widen the diversify of different types of stakeholder involved in the Defense Industry, which contribute directly or indirectly.

This is a tried and tested method, and practiced in USA, which is one of the largest exporter defense product worldwide.

For example according to Defense Advance Research Project Agency (DARPA) website, it’s a defense oriented entity that is responsible for creating

an ecosystem that fosters innovation. Defense Advance Research Project Agency focuses on “Transformational change instead of incremental advances”. Partnering with universities and other relevant academic institution that contributes directly or indirectly to innovation.

Moreover, other institution such as corporate partner and government partner contribute to the ecosystem.

“Cutting-edge aerospace research is conducted at the University of Arizona, primarily in the Department of Aerospace and Mechanical Engineering.

Nineteen research laboratories focus on such vital topics as fluid dynamics, aerodynamics, energy and fuel cell efficiency, mechanical characterization of materials, and space engineering.

The department also oversees the Rocket Laboratory which develops propellants for space.

Current research delves into hybrids, safe oxidizers, and environmentally benign exhaust products.

This lab, among others in the department, is often utilized by industry partners such as Raytheon Missile Systems. UA researchers also pursue interdisciplinary projects that seek to apply aerospace innovations to biomedical engineering endeavors” (DARPA, 2017).

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