Concept Paper on
Sheikh Hasina Neural Network (SHNN), MOFA

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ICT/ITIT Wing
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Introduction:

The term "Artificial Neural Network" is derived from Biological neural networks that develop the structure of a human brain. Similar to the human brain that has neurons interconnected to one other, artificial neural networks also have neurons that are interconnected to one another in various layers of the networks. These neurons are known as nodes. A neural network is simply a network of functions that can learn from examples.

Simplistically, a neural network is rendering inputs into nodes and then the inputs learn (by utilizing Machine Learning protocols) to produce an output which is **predictive** in nature. For the input, datasets are required. For datasets, collection points are needed. To visualize the concept, we can consider this as a micro-concept in a macro aspect and the reverse.

Neural Network for MOFA:

Ministry of Foreign Affairs expresses its interest to co-opt this idea into its mainstream activities to get projective intelligence and read it in forms of various data visualization display. The back end of this project is expected to be supported by internal reports of this Ministry including missions abroad, reports from credible open sources, external links and essentially powered by statistical tools.

Thematically, each country of the world where Bangladesh has a diplomatic interest or a diplomatic representation is a node - of the **Sheikh Hasina Neural Network (SHNN)**. Approx. 100 Nodes (in 80++ missions) are setup and the datacenter/processing hub would be in Bangladesh.

Now, we have an interoperable platform. In this platform, we will select what types of data we want to collect and put. Then we will select and finalize what we want to do with machine learning for this data set and get the outcome. As the datasets will be expanding with each layer of the input – the (predictive) outcomes will become even more realistic and real time. The more samples we have, the more credible the statistics is. After that, the implementation of derived output data can be executed. Examples of the data collection variables: usual data, behavioral variables, choice variables, action variable and so on. Literally anything can be added.

Why Foreign Office needs to build a Neural Network?

A change in the behavior of individuals/institutes/corporations etc. is eminent. It is more prominently displayed in the global arena of the international affairs where Bangladesh is fast graduating from an LDC to now Middle Income Country and eventually to a Developed Country as has been premised by the Hon. Prime Minister. The roles, responsibilities, aspirations and ambitions of the country, and thus the nation is rapidly changing. To understand the direction of this change proper evaluation of the minutest

details of individual entities is essential. If we can evaluate the changes we will be able to predict the outcome precisely. Precisely at the same time Bangladesh would be stepping into a brave new world order which has already started emerging. This new world order is concentric not to ethnicity or nationality and the nation state – but more so to netnography and to access to information and the capability to computational prowess. The industrial output and factor configurations in both the primary and secondary sectors and certainly in the tertiary sector are fast evolving giving rise to the design space and the creative economy an ever greater economic space. Carrier technologies like Blockchain are both decentralizing the regulatory mechanisms and bringing the individual and the marginal assets into the central collateralized distribution mechanism of the economy. The turf of the human identity is fast becoming a playground for the emergent vector of the AI. Those left behind would be colonized in all practical senses by the superior systems being worked on and developed.

The Foreign Office literally sits at the juncture of all national and governmental work flow. There is no single area of governance which is not touched by the Foreign Office or which does not require a Foreign Office input for functioning in the globalized world. Inevitably, for policy making under such fluid conditions and for executing a sovereign free will will require the existence of a Neural Network which would be administered through the Foreign Office and its missions abroad but would be closely interloped with the core committee of the PMO.

5Ws and 1H

WHY – the proposed SHNN will equip us with the ability to make right decisions in a given situation in order to achieve a certain goal. Game Theory provides mathematical models of real-world situations for studying intelligent behavior. Most of the time, effective decision-making in strategic situations (such as competitive situations) requires nonlinear mapping between stimulus and response. This sort of mapping can be provided by Artificial Neural Networks. It will assist us to break down complicated problems into basic elements and then reassemble them from the ground up and to cut through the fog of inadequate reasoning and improbable analogies to see opportunities that others miss. Amongst other things:

It will increase the agility of network/cyber defense of Bangladesh by providing a plethora of proprietary information and actionable intelligence to the security services.

Furthermore, it will help predict and address/manage any ‘problem’ before it turns into a ‘crisis’. For example- inflation and fuel price forecast.
Additionally, it will help connect the factor markets of Bangladesh to their most appropriate consumer and industrial destinations by connecting technology, markets and organizations in a seamless fashion by way of two-way/multiplex channeling of information. It would help facilitate the flow of information, innovation and industry through an interactive network – primarily driven by the Bangladesh-Branding/District-Branding initiatives and utilizing the Complementary Asset Portfolios (CAP) already in deployment (such as UDCs/Ekshop/Ekpay etc.)

WHERE - The infrastructure of the network will be developed in Embassies of Bangladesh around the globe. The central evaluation point will be at the MOFA Headquarters in Dhaka. The Prime Minister's Office, through the a2i (Aspire to Innovate) would act as a development and execution partner of the project.

WHEN- To have any prediction model, a time-frame is needed for the dataset to be accumulated and then to be matured enough. This is the same kind of tech - used to predict the weather - predict the behavior of a pandemic - just here seemingly incomprehensible datasets will be used to predict tangible outcomes. For all things practical, it is actually an exercise in interrogating the "knowns" to understand the patterns and the contours of the "unknowns" and to predict with some degree of confidence the timings of the "unknowables".

WHAT- Along with using Data-Driven Neural Network Models to modernize Service Delivery by the Government, Foreign office aims to do the following:

Branding Bangladesh using deep learning- The neural network team can build up sophisticated machine and deep learning models to design strategies to make the 'Made in Bangladesh' brand a household name across the globe. The goodwill of the brand will enhance our 'soft power' which is in line with our vision 2041.

Economic Diplomacy- The neural network team can design appropriate tools and mechanisms to pursue economic diplomacy in line with the 4th Industrial revolution. As the fundamental structure of almost all the countries in the world has changed, the traditional tools and instruments of economic diplomacy are becoming obsolete. The team can provide data driven scientific strategies to pursue economic diplomacy.

Building a strong network of Bangladesh Missions abroad- The neural network team can help implement the 'think globally, act locally' principle by creating a strong and modern communication network of Bangladesh Missions abroad with the Headquarter and the other Ministries of the Government. With a strong network, the Government can learn better how other nations are providing better services to their citizens. By learning more about the best practices for providing services, the Government can provide the best solution to its local problems.

Capacity Building- Without proper knowledge of the machine and deep learning models, foreign service officers will find it difficult to adapt to the ever-evolving global scenario. The neural network team can provide necessary training to the officers to build up their capacity to perform better by learning to apply deep learning models in their decision-making process. The SHNN would free up the resources and accesses available to the Foreign Office to be effectively utilized by the whole of government.

Modernizing Consular/Welfare Services- It helps to build policy models to fully digitize consular services. There are many deep learning models (NLP for example), which can actually predict exact solutions to the most common consular issues and thus significantly reduce the burden of the consular officers.

Bangladesh Foreign Office, in collaboration with the ICT division will be a central hub for collaboration in the field of AI research and implementation in the policy making level and will coordinate with other government agencies, non-government entities, industries and academia. With its missions abroad, targeting and acquiring any lofty ambition in the ICT/ITES domain would only be a matter of programming and interpreting the data available.

HOW (to execute the plan)- A team will be formed at the Foreign Office that would include the foreign service officers, IT specialists and officers from ICT division/a2i project. The individual components of the project would be crucible into 'reasoning by first principle' and broken down into their smallest possible denominations. The Missions would act as the input/entry points for the data/information. The details can be sorted out once a team is formed. The following factors of the project will be decided by the members of the project. (1) cost (2) duration (3) type and (4) special nature (forced-in) and (5) Risk Score-(RS). (In this Project, the risk performance would be regularly measured through the enterprise risk Management system (ERM) via a Risk Score which considers: Identification, Risk Treatment, Risk Monitoring, Risk Reporting, and Risk Culture for Government)

Advantages:

There are various techniques available for soft decision making by neural networks. Decision making problems are described as choosing an action from possible alternatives using available information. In the context of soft decision making, a single action is not always chosen. When it is difficult to choose a single action based on available information, the decision is withheld, and a set of promising actions is presented to human users. In this case, the SHNN would become a default gateway for both projecting, promoting and protecting Bangladesh's national interests abroad – including those in the political, economic, social, cultural, technological and even legal domains – contributing to both economic and human security (including climate vulnerabilities) and securely locking in stakeholders. Some more traditional and operational benefits which

would accrue to the MOFA/PMO/ICT nexus would be:

i. Parallel processing capability: Artificial neural networks have a numerical value that can perform more than one task simultaneously. This would help automate the intensification of shock-absorption capacity of the policy-making body of the state which would be appraised of the emergent tandems in global affairs before even they have arisen systemically

ii. Storing data on the entire network: Data that is used in traditional programming is stored on the whole network, not on a database. The disappearance of a couple of pieces of data in one place doesn't prevent the network from working.

iii. Capability to work with incomplete knowledge: After Artificial Neural Network (ANN) training, the information may produce output even with inadequate data. The loss of performance here relies upon the significance of missing data

iv. Connecting the productive and financing networks on top of a knowledge-based information matrix – contributing to both urbanization of the remote clienteles both inside the country and across the globe (as in expatriate networks) and popularization of innovation outputs.

Conclusion:

SHNN is expected to be a classic project in delivering works of public service using frontier technologies. Alongside, it will enhance the capabilities and sharpen the overall understanding of current arms of innovation in terms of 4IR technologies. In a nutshell, this is a pledge of new hope and dimension.

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