

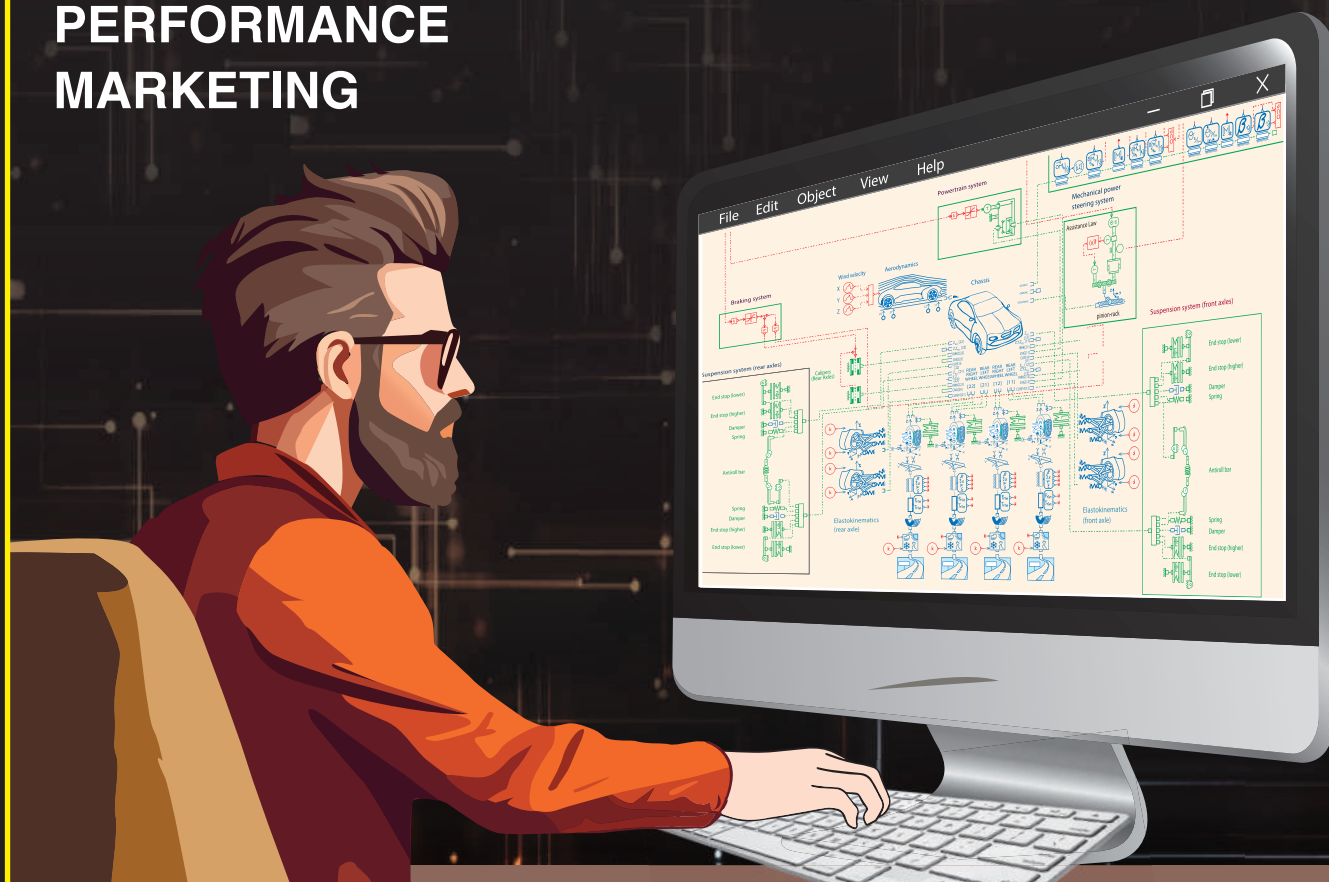
Vol. 1, No. 2 | Q3 2023

INDUSTRY INSIDER

**AI SHAPING
THE FUTURE
OF HUMANITY**

**BRAND BUILDING
VS
PERFORMANCE
MARKETING**

**PROMPT
ENGINEERING
HYPES AND HOPES**



SEASONING THE FUTURE

 Urban Design &
Development Ltd.


Orbit Technologies Ltd.


SFM
SUBLIME FACILITIES
MANAGEMENT LTD.

 Interstoff Clothing Ltd.
Interstoff Apparels Ltd.
South East Textiles (Pvt) Ltd.



NSN Printing & Packaging (Pvt) Ltd.



Dhaka Ice Cream Industries Ltd.



Route to Market Ltd.



Dan Foods Ltd.

**RIVER
STONE** 

 **Auleek**


PANDUGHAR
AGRO & FOODS LTD.

bfil Bangladesh Furniture
Industries Limited

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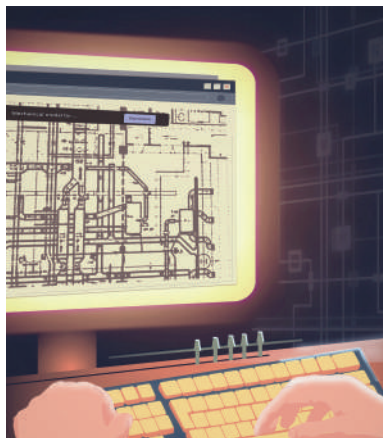
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The way the Industry Insider is shaping up is great news for the local publications industry. The nations that developed industrially and technologically possess strong and effective knowledge-sharing platforms that generate ideas for them, point out the flaws and dig deep to find solutions. Industry Insider looks to be the exact platform Bangladeshi industries require to push forward, and I can only see a brighter future from here.

Golam Habib,
Chief Advisor



"...reports sign that policy tightening is starting to cool activity despite core inflation proving persistent. Risks are more balanced as banking sector stress has receded, but they remain tilted to the downside" -- stated in the World Economic Outlook report of IMF in October, indicating conservative economic growth across the world. Bangladesh needs its industrial policymakers to make delicate decisions to navigate through this period with a positive outlook.

Tareq Ahmed Robin,
Editor



With an AI revolution underway, the future of humanity is at a decisive crossroads. Will human intelligence take a backward turn and get replaced by AI? Or will it be like the Industrial Revolution – controlled, adapted, and leveraged for humanity's growth? Emerging at such a time, Industry Insider is entitled to the heavy responsibility of writing down this history in the making. Bless it with your support.

Mohammad Saiful Islam,
CEO



As we live through the transformation brought to us by the new Industry 4.0, we feel compelled to uplift the voices of its practitioners, whom we fondly call 'industry insiders'. In this 2nd issue, we have curated thought-provoking ideas on various topics: AI, sustainability and energy, to name a few. We hope they will inspire our readers, generate conversations and engage them in reimagining the industrial landscape of Bangladesh.

Sameeul Bashir,
Managing Editor



Once again, Industry Insider focused on diverse content ranging from technology to investment, from RMG to agriculture, from policy-making to sustainability. The in-depth analysis from subject matter experts will help our readers to look through a different lens on those matters. We commit ourselves in serving the most authentic and accurate knowledge, coming straight from the leaders and visionaries of the industries.

Sayem Sharif,
Cofounder



Adopting technologies at the the right time is a proven game changer in the industrial competitive market. It is an arena where Bangladesh is doing just average despite the country's youth has shown its tech adaptability time and again, which is a matter of concern. The country's industrial leaders have to be courageous enough to onboard technologies before its competitors to gain market advantage.

Md Mahfuz Ul Islam,
Cofounder

industry insider

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Mail: contact@industryinsiderbd.com
80 Pages. Price: 250 Tk; \$2
Annual Subscriptions
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Mission and Vision

- To become a comprehensive knowledge-sharing platform with expert-authored content on industry, innovation, technology and solutions.
- To become a promoter of Bangladesh's industrial landscape, evangelize its potential to local and foreign investors
- To become a catalyst in Bangladesh's continuous drive to achieve excellence in industrial technology, growth, practices and compatibility with global standards.

Industry Insider Publishers

Industry Insider is a quarterly publication focused on industry, investment, technology and products, published by Tareq Ahmed Robin, Sayem Sharif, Md Mahfuz Ul Islam, and Mohammad Saiful Islam from Mohakhali, Dhaka-1206, printed by Prime Graphics & Printing, from Mintu Chattar, Matuail, Demra, Dhaka-1362.

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News Flash

Airport-Farmgate segment of Dhaka Elevated Expressway inaugurated

Prime Minister Sheikh Hasina inaugurated the 11.5 km Airport-Farmgate segment of the Dhaka Elevated Expressway on September 2, aiming to ease traffic congestion and reduce travel time. Vehicles can now travel from Kawla to Farmgate in just 10 minutes at a speed of 60 kilometers per hour. This is the first transportation project implemented through a public-private partnership (PPP) with foreign investment.



Bangladesh commits to buying 10 new airplanes from Airbus



Bangladesh commits to acquiring 10 new A350 airplanes from Airbus during French President Emmanuel Macron's Dhaka visit, marking a significant milestone in their emerging strategic partnership. The agreement included a letter of intent for a collaborative venture in space technology between Airbus and Bangladesh Satellite Company Ltd., with a clause of buying the Bangabandhu-2 Earth Observation Satellite System from the company.

Tk 120b investment to transform Bangladeshi textiles

The Bangladeshi textile industry is set for a major transformation with a Tk 120 billion investment in cutting-edge technologies. This infusion of funds will revolutionize fabric production, recycling, automation, and robotics over the next two years, boosting efficiency and productivity. This initiative is expected to rejuvenate the sector and create about 50,000 job opportunities.



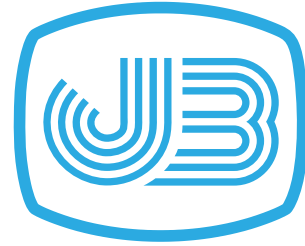
Eskayef's third manufacturing unit gains US FDA approval



Eskayef Pharmaceuticals Limited secures approval from the US Food and Drug Administration (FDA) for its third manufacturing facility in Tongi, Gazipur. The world's strictest regulatory authority recently granted accreditation to the company for its sterile manufacturing unit in the Faraaz Ayaaz Hossain Building. Eskayef is the sole pharmaceutical firm in Bangladesh with US FDA-approved injectable manufacturing units.

State-owned Janata Bank in serious liabilities quandary

Audit finds 31 counts of "serious financial irregularities" by the state-owned Janata Bank from 2015 to 2020, involving over Tk 131 billion, 22.85% of the lender's liabilities. Gross non-compliance with rules and regulations, along with serious weakness in the bank's internal control system, were also reported in the audit. AnonTex Group alone accounts for 44.3% of the total sum lent.



Deadliest dengue season ever for Bangladesh



The death toll from dengue in the country has risen to 804 (September 16), making it the worst-ever outbreak in the country's history. A total of 10,330 dengue patients were receiving treatment in hospitals across the country when this report was written. There have been 164,562 recorded dengue cases and 153,428 recoveries this year, according to the Directorate General of Health Services (DGHS).

Universal Pension Scheme gets going

Bangladesh enters a new era of social protection with the commencement of the Universal Pension Scheme on August 17. Prime Minister Sheikh Hasina inaugurated the scheme to bring everyone above the age of 18, except government employees and those working in autonomous corporations, under a financial safety net. The monthly pension benefit will be given from the age of 60.



Akij Group to establish the world's largest Jute Mill



Sheikh Nasir Uddin, chairman of Akij Group and owner of Akij Jute Mills, is investing Tk 25 billion, making Akij Jute Mills the world's largest jute mill in Muksudpur upazila in Gopalganj. Covering an area of 278.55 acres, the mill will house six factories, having a total production capacity of 600 tonnes per day. The factory will commence operations this December.



Global leaders announce rail and ports deal to counter China

During the G20 summit in New Delhi, global leaders revealed a significant multinational rail and ports agreement connecting the Middle East to South Asia. This move by President Biden counters China's global infrastructure initiative, offering an alternative partnership and investment opportunity for developing countries where Washington will play the key role.



'Chandrayaan-3' - India's historic lunar soft landing



On August 23, 2023, the Indian spacecraft 'Chandrayaan-3' made history with a successful lunar soft landing, significantly boosting India's global space reputation and highlighting its expanding role in space exploration. This achievement is a source of inspiration for India's future endeavors in space, further stimulating the growth of private space initiatives in the country.

Pakistan secures \$50 billion investment from UAE and Saudi Arabia

Pakistan's interim prime minister has announced that the country expects to secure a substantial influx of \$50 billion in investments within the coming five years. This noteworthy commitment involves equal contributions from Saudi Arabia and the United Arab Emirates. Both the countries pledged a substantial \$25 billion each to help support Pakistan's present economic crisis.



China launches \$40b semiconductor fund for competitiveness



China plans to establish a \$40 billion state-backed investment fund for its semiconductor sector to narrow the gap with the US and others. This fund is expected to be the largest among the three initiated by the China Integrated Circuit Industry Investment Fund, also known as the Big Fund.

Middle East

Saudi Arabia and India strengthen investment ties

Saudi Arabia and India solidified their commitment to improving the investment landscape by signing a bilateral agreement. The Deputy Minister, in an announcement, highlighted a total of 47 agreements that have been forged between entities from both the private and public sectors. This move signifies a step toward fostering stronger economic ties between these countries.



Middle East online trading set to be \$1 trillion by 2025



The online trading industry in the Middle East is experiencing significant growth, encompassing a wide range of assets such as stocks, commodities, currencies, and cryptocurrencies. According to forecasts by the Dubai Financial Services Authority (DFSA), this sector is expected to reach a valuation of \$1 trillion by the year 2025.

Qatar Airways reports \$1.2 billion profit, FIFA 2022 revives fortunes

Qatar Airways posted a \$1.2 billion profit, showing a marginal decrease compared to the previous year's \$1.5 billion, primarily attributable to elevated fuel and energy costs. FIFA 2022 boosted the airline's revenue from \$14.4 billion to \$20.9 billion, an increase from the \$4.1 billion loss incurred in previous years.



Saudi manufacturing soars, electricity surges



Saudi Arabia witnessed substantial growth in its manufacturing sector during June and July, with year-on-year increases of 10.1% and 8.7%, respectively. In contrast, the supply of electricity and gas experienced a surge of 25%. These figures underscore the country's commitment to achieving the goals outlined in its Vision 2030 initiative.

Africa

India commits \$14 billion investment in Nigeria

Nigeria has secured an investment pledge of approximately \$14 billion from India, marking the initiation of a robust economic collaboration. This partnership entails contributions, with Jindal Steel and Power channeling \$3 billion into the steel industry and Indorama Corp injecting \$8 billion to expand petrochemical facilities, promising an economic boost for both nations.



G20 grants African Union permanent membership



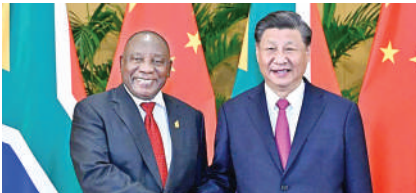
The G20's decision to grant permanent membership to the African Union reflects a recognition of Africa's increasing significance in global affairs. This move highlights Africa's ambition to play a more substantial role on the international stage, as it represents more than 50 member nations within the African Union, showing its commitment to global cooperation and influence.

Vedanta rescues Zambia's KCM with \$1b

Vedanta, a publicly traded firm headquartered in London, has successfully ended a legal battle by infusing \$1 billion into Konkola Copper Mines (KCM), Zambia's largest copper mine. This strategic move prevents the imminent liquidation of KCM and marks a pivotal resolution of the contentious dispute.



China bolsters South Africa trade ties



South Africa's economic ties with China show signs of development, unveiled at the BRICS Summit in 2023. China has committed \$2.2 billion towards purchasing South African goods, with an additional donation of \$8.9 million for purchasing energy equipment. China has allocated \$26.9 million to help resolve energy-related challenges in South Africa.

Europe

UK striving to revive the microchip industry

In 2023, due to the pandemic and geopolitical worries, the UK is vigorously working to revive its microchip sector, injecting £1 billion into research and design. Emphasizing strengths like chip design, it grapples with formidable rivals offering more substantial subsidies. The endeavor entails navigating economic and geographic factors, given the offshore shift of the industry.



EU boosts Russian LNG imports despite fossil fuel exit goals



A recent analysis by Global Witness reveals that EU member states have significantly increased their imports of Russian liquefied natural gas (LNG). In the initial seven months of this year, these imports surged by 40% when compared to the levels from 2021. The import hasn't stopped despite the European Union's stand on reducing reliance on Russian fossil fuels.

EU fines TikTok €345 million for child data mishandling

The European Union's data protection authority has imposed a substantial €345 million fine on the Chinese video-sharing platform TikTok for improperly handling children's personal data in the EU. TikTok has received an injunction to rectify its procedures for managing the data of youngsters aged 13 to 17 from October to December this year.



EU backs Amazon rainforest protection plan with €260 million



The European Union supports safeguarding the Amazon rainforest by pooling funds from member states, ensuring efficient spending through its Global Gateway initiative. EU will manage €260 million from Spain, Italy, Sweden, France, Germany, and the Netherlands to combat deforestation. This initiative, pledging €45 billion by 2027, faces discussion among EU and Latin American leaders.

America

Fitch downgrades US credit rating, market impact subdued

Fitch Ratings' recent move to lower the US credit rating had limited market effects. Yet, it's raising concerns about long-term vulnerabilities in government bonds. Beyond governance issues, Fitch pointed to global worries like rising interest rates, an aging population, and increasing healthcare costs.



Walmart completes \$1.4b purchase of Tiger Global's Flipkart stake



Retail giant Walmart has finalized its acquisition of hedge fund Tiger Global's investment in Indian e-commerce company Flipkart. This deal values Flipkart at an impressive \$35 billion, with Walmart having acquired a 77% majority stake in 2018 for approximately \$16 billion. According to the Economic Times, Tiger Global held approximately 4% of Flipkart.

Google faces landmark trial over search dominance

In a Washington court, Google is charged with abusing its search engine's dominance. The 10-week trial examines the US government's commitment to competition laws. Prosecutors claim Google made unlawful deals with firms like Mozilla, Samsung, and Apple to secure default placements, fueling Alphabet's success. The government accuses Google of hiding antitrust-violating documents, while the company argues users choose Google willingly.



Tesla completes 5 million electric car production



Tesla marks a significant achievement by producing its 5 millionth electric vehicle this week, defying skeptics who once doubted its survival. After 12 years to reach its first million, Tesla has rapidly manufactured an additional 4 million electric cars in the past three years, solidifying its position in the auto industry.

Pr-ö-mpt Engineering

Hypes and hopes

by **Sameeul Bashir Samee**

Prompts involving not-so-specific requirements often generate broad, generic answers unsuitable in the required context. The prompt engineer's task is to understand the nuances of LLM's language processing capability to decompose the prompt in a series of suitable steps and add constraints to make the response useful

LINKEDIN CO-FOUNDER REED HOFFMAN HAS recently co-authored a book with GPT-4, aptly named 'Impromptu.' This writer had to resist the temptation of using prompt engineering to generate a provocative introduction while drafting this article on prompt engineering. Like many others, he also believes that it will not take too long to make this kind of co-piloting a norm, and hence, it is a good time to explore the future with prompt engineering, how it is going to shape the work by eliminating or reducing the relatively low-skill, repetitive mundane day-to-day tasks.

As the initial craze of using ChatGPT and other large language model (LLM) systems to do homework subsides, we must evaluate how augmentation of human and computer intelligence can open new possibilities and deliver hyper-productivity and impact. Human intelligence can be broadly categorized into crystal intelligence and fluid intelligence.

The rote memorization capability and the ability to retrieve random factoids from one's memory can be described as crystal intelligence. Navigating an unknown city requires one's ability to identify patterns and juggle various probabilities, which can be associated with fluid intelligence.

These first-generation LLMs currently do not show a lot of fluid intelligence. However, they bring a ton of crystal intelligence to the game. We know that the crystal intelligence of an average human has an upper bound much lower than the one of a decent

LLM. There lies a unique opportunity to augment both human and artificial intelligence to gain a many-fold increase in human productivity. Prompt engineering has been advertised as a way to achieve that and has become the hot new role in town.

Before diving into prompt engineering, we want to take a quick detour to see what underlying technological advances fuel this growth area. Even though the academic discipline of artificial intelligence goes back more than half a century, only advances in the last decade in hardware technologies, GPGPUs particularly, opened the door to massively parallel computation capability, a prerequisite for training these machine learning models.

Before the seminal 2017 paper on transformer architecture by Google Brain, various recurrent neural architecture (RNN) and long-short-term-memory (LSTM) were used to train LLMs with modest success. The transformer model led us to the well-known generative pre-trained transfer (GPT) model.

The GPT model is superior to its predecessor in taking less training time and supporting longer context. These two key advances appear crucial for what we are calling today prompt engineering.

The GPT models can be trained on various inputs such as images, text, and computer codes to learn the structure and pattern of the input data and can be used to generate an output of a similar kind. Additionally, the support for longer context and the availability of in-context learning observed in LLMs can be combined to provide prompts to accomplish certain tasks.

In plain terms, prompt engineering is the idea of manipulating textual prompts to the LLMs to get tasks done by them in conjunction with other generative AI models. Currently, almost all the output of these tasks is digital. They range from generating boilerplate computer codes to drafting essays (mostly in English for now) to generating audio and image content. Any good prompt engineering task involves steps like clear problem formulation, breaking down the problem into smaller navigable tasks, adding constraints to the proposed solution, and fine-tuning the responses.

So far, prompts involving not-so-specific requirements often generate broad, generic answers unsuitable in the required context. The prompt engineer's task is to understand the nuances of LLM's language processing capability to decompose the prompt in a series of suitable steps and add constraints to make the response useful.

A prompt engineering task usually starts with a stated goal and an initial prompt. As the output gets generated, various tests are performed to check the quality of the output to the desired goal. The more precise the prompts are, the better the output is. This refinement of prompt is the key place where a prompt engineer can truly excel.

Creativity with prompts and the ability to steer the model's response in the desired direction will be a highly sought-after skill. Prompts also should add guidance on uncertainty quantification on the generated response to avoid fictitious answers. The final goal is to produce a set of clear, precise, and effective prompts that can be used to interact with AI systems, enhancing their utility and ensuring that AI outputs are aligned with user needs and objectives.

These new AI frontiers will have some disruptive impacts on Bangladesh's work culture and economy. It will open new opportunities for consumers and practitioners and make some old assumptions obsolete. On the consumer end, generative AI models and corresponding prompts to create output from them will launch us into an era of hyper-productivity regarding routine and mundane tasks.

For example, anyone who has compiled month-long sales data into an executive summary and PowerPoint presentation knows the sheer agony of the process. Prompts can be carefully designed to take the raw sales data and perform a series of steps to produce the reports. Similarly, a collection of literature containing the standard operating procedures of a plant can be embedded into an LLM, and precise questions can be asked to find out about the maintenance schedule or shutdown procedure of equipment without hectically searching through a trove of paper documents. Anyone can take existing publicly available court records and compile an instantly searchable reference for exact matches and for finding and citing precedence. AI-augmented graphics will dramatically shorten the iteration loop between the client and the artist.

One common problem with many creative tasks is the 'blank page' problem, i.e., where to start. Using prompts can greatly alle-

viate the problem and generate some starting points for reports, emails, etc. The most exciting thing is that the users do not need a tech-heavy background to rip these benefits. Someone with analytical and critical thinking skills who can decompose a complex problem into a series of simple problems can take full advantage of these tools.

Mundane office work like report generation, analyzing market data, emails, and proposal writing should be outsourced to generative AI with some human supervision. Business leaders should proactively do an audit of the daily activities of their organizations and ruthlessly offload tasks to AI and free up the employees' time to do creative thinking. This is where prompt engineering will lend itself particularly useful.

On the software development front, there is both good and bad news. Mundane and boilerplate coding tasks are already being outsourced to generative AI. Tools like GitHub Co-Pilot and ChatGPT can generate solutions for simple, routine problems. This is going to have an impact on online marketplaces like Upwork, Fiverr, or Freelancers. Some clients will find it easy and cheaper to use the tools themselves to build websites and forgo the outsourcing step. But then again, developers can also take advantage of these tools and amplify their productivity manifold. Businesses whose revenue model mostly relies on low-skill tech jobs must evaluate their approach in this changing time.

Beyond that, there are huge opportunities to build models catering to local needs. One of the key limitations of the current offerings is the unavailability of the local language for both prompts and output. For a

country where English is extremely limited, there is a huge opportunity to offer solutions in Bangla. We should look at China and India to understand how they tackle this challenge, and there should not be any shame in borrowing ideas. While the lack of digitization of records and other documents is a big bottleneck, it is also the path we should invest in.

If we look at Google search trends for prompt engineering, we see almost zero interest till mid-2022 and then a sharp rise in public interest. So, it is still too early to say whether this prompt engineering boom will last or bust. However, it isn't easy to uninvent something, and prompt engineering in some form will get integrated into our daily lives. Tech companies in the ranks of Google, Microsoft, and some universities are now offering courses on generative AI and how their proprietary prompt interfaces can be used, and first-movers will always have the upper hand.

While Bangladeshi businesses may still shy away from creating a chief AI officer position in their executive leadership, it is high time for them to initiate task forces to explore the application of generative AI in business practice. ■

Sameeul Bashir Samee is a computational scientist currently working at the National Institute of Health in the United States. sameeul@gmail.com

Both for the consumers and practitioners, it will open new opportunities and make some old assumptions obsolete. On the consumer end, generative AI models and corresponding prompts to create output from them will launch us into an era of hyper-productivity regarding routine and mundane tasks





Can AI drive Dhaka's traffic troubles away

by Hasib Bin Rafique

MOST OF US WHO CALL DHAKA HOME HAVE a love-hate relationship with the city. For decades, a relentless challenge has cast a shadow over the city's vibrant spirit: Traffic congestion. This enduring issue has not only tested the patience of its residents but also hindered the smooth flow of life. Despite various stakeholders' countless discussions and efforts to address this predicament, tangible solutions have remained elusive, much like the sluggish crawl of vehicles on the city's roads.

The city's unrelenting traffic jams, characterized by their excruciatingly slow pace and seemingly interminable gridlocks, exact a staggering toll on the local economy. According to a December 2021 report from a local daily *The Business Standard*, traffic congestion in Dhaka cost the nation 2.9% of its GDP. In monetary value, this equates to a staggering BDT 1010.36 billion. Daily, an average commuter loses 3 to 5 hours of productive time navigating the congested Dhaka streets. The fuel wastage resulting from idling vehicles and stop-and-go traffic costs Dhaka residents an additional USD 1.5 billion annually, diverting resources from productive investments.

The traffic congestion in Dhaka is rooted in a complex interplay of multiple factors. Professor Dr. Md. Hadiuzzaman, ex-Director of Accident Research Institute, BUET, has identified weak traffic management and inadequate infrastructure as the biggest contributing factor towards the deadly Dhaka traffic.

Continuous efforts have been made to formulate and implement new transportation policies. Despite all the trials and errors in traffic management and all the new flyovers and U-loops forming a concrete maze over the city - the problem persists and is stronger than ever. Could technology perhaps come to the rescue?

Over the past two decades, approximately BDT 2 billion has been allocated to implement advanced technologies such as signal lights, traffic countdown timers, and the ambitious Intelligent Traffic System (ITS). However, according to Implementation Monitoring and Evaluation Division (IMED) reports, the efficacy of these measures remains questionable, with hardly any intersection experiencing notable improvements—save for the exception of the Gulshan 2 signal. In 2018, DTCA (Dhaka Transport Coordination Authority) launched an ITS (Intelligent Traffic System) on an experimental basis in Mohakhali, Gulshan 1 and 2, Paltan, and Fulbaria. Although the project cost us BDT 0.52 billion, no positive result emerged.

From writing thesis proposals to creating stunning images - suddenly, it feels like AI or artificial intelligence is a part of every conversation. How can this technical innovation come to the rescue of Dhaka dwellers?

Amidst the ongoing experimentation with various strategies and initiatives, a notable reservoir of support beckons from modern AI technologies, encompassing the prowess of Computer Vision, the Internet of Things (IoT), and Data Mining. A hidden potential lies within the sprawling network of CCTV cameras stationed across diverse locations within Dhaka city, predominantly utilized for surveillance purposes. However, these unassuming cameras could transcend their traditional roles, transforming into potent tools for vehicle quantification at signal points.

The city boasts an extensive fleet of CCTV cameras, each a silent observer capturing the city's pulse. These cameras dutifully relay live video feeds through dedicated network bandwidth to various authoritative repositories known as Network Video Recorders (NVRs). This video reservoir empowers authorities to retrospectively review the footage, extracting insights and discerning trends from the ebb and flow of Dhaka's traffic patterns.



Yet, this reservoir of video feeds remains untapped in its potential to provide real-time analyses and meaningful insights.

This is where the image-processing software comes into play. With remarkable finesse, such software could transform the live stream of video data into a dynamic source of real-time analyses, unraveling an array of invaluable features from the camera feeds. Notably, this includes discerning vehicle types, meticulously tallying vehicular numbers, pinpointing instances of lane violations, and even reading license plates with remarkable accuracy. The synergy of AI-powered image processing and the wealth of available video data could instigate a transformative leap in how we perceive, manage, and optimize traffic within Dhaka's urban landscape.

As we venture deeper into the capabilities of AI-driven technologies, the potential to revolutionize traffic management by leveraging these tools becomes increasingly tangible. This article will chart a course through the diverse dimensions of AI applications, unearthing possibilities that may redefine the contours of Dhaka's traffic narrative.

If we think about the sheer volume of the available video data through CCTVs - it is evident that the analysis demands a significant investment of working hours. However, the true need lies in extracting meaningful information, or metadata, from these videos.

Sigmind.ai, a Dhaka-based startup specializing in computer vision, has undertaken noteworthy collaborations with various authorities. CEO Abu Anas Ibn Samad explained that their technology can efficiently tally vehicles on the road and relay real-time reports on vehicle types from streaming videos. Their software can be deployed on the network's immediate 'edge' and central servers.

Sigmind.ai's contributions extend to working closely with the Law-and-Order Coordination Committee (LOCC), a cooperative platform involving locals, police, DNCC, and community organizations.

Notably, the cameras stationed at entry and exit points of the diplomatic zone can adeptly read Bangla license plates. While LOCC's primary goal is to uphold safety in the diplomatic zone and adjoining areas, the AI-powered software has been harnessed to extract data that enhances comprehension of vehicle movement patterns and types within the area. This has facilitated a deeper insight into traffic volume, enabling more effective route management.

Anas asserts that the considerable number of CCTV cameras

Traffic congestion in Dhaka cost the nation 2.9% of its GDP, equivalent to BDT 1010.36 billion. Average commuters lose 3 to 5 hours of productive time daily on the streets. The fuel wastage costs an additional USD 1.5 billion annually

strategically positioned by various government bodies can be repurposed for traffic data analysis with minor adjustments. Their technology further excels in detecting assorted anomalies caused by both vehicular traffic and pedestrians. The processing of traffic video data can occur either directly at signal points using their embedded devices or remotely at a central server. Ultimately, this data can be presented to users through a centralized dashboard, offering a comprehensive understanding of traffic congestion dynamics.

Adding to the roster of challenges in Dhaka's traffic landscape is the inadequate parking infrastructure, further exacerbated by the prevailing disorderly parking practices. However, even within this conundrum, noteworthy developments have emerged to tackle this issue head-on. Companies such as ParkingKoi and ParkKori have stepped into the arena, offering real-time, cloud-based parking management solutions. Their comprehensive platforms encompass features like live parking space availability, guided navigation to available spots, and seamless online reservations accompanied by real-time status updates.

In the intricate tapestry of Dhaka's traffic challenges, AI emerges as a pivotal thread, weaving promise into the city's mobility landscape. However, the solution to this multifaceted issue lies not in isolated endeavors but in the symphony of collaborative efforts. While not an instant fix, AI can amplify the impact of coordinated actions across decision-making and implementation levels. This transformation, bolstered by the ingenuity of local techpreneurs, can reshape Dhaka's traffic dynamics and lead our city towards a more efficient tomorrow. ■

Hasib Bin Rafique a Software Developer and Designer, with a special knack for computer vision software.

Unraveling the debate on a 'new world order'

by **Jinat Jahan Khan**

GLOBALIZATION HAS GIVEN MORE ADVANTAGES to developed and richer countries and created inequality. In developing and undeveloped countries with old or traditional industries, many lost their jobs and earning sources as they had fewer opportunities for education, training, and skills. On the contrary, powerful and rich countries started to exert a great influence on the policies and politics of these countries due to globalization. But as this economic cycle is ending, the trade and economic pattern of the past decade may not be repeated. The world is becoming more protectionist now.

Recent developments have urged a new kind of globalization that requires improved rules for firms and input chains. Thus, a new regime in market behavior and policies has been considered where social and climate policy issues are raised rigorously. It is now believed that only rich countries should not dominate international courts. It increases free riding on social and climate issues, and poorer countries face major losses due to the irresponsible approach of richer ones. This new approach is the 'end of fast-track globalization.' It is also called 'responsible globalization'.

The urge to shift the geopolitical power balance has created a new world order that may drive a new global investment cycle. Many believe that a new world order is more likely to happen since governments have started to respond to the perceived threat of military war due to greater defense spending. And there is also the acceleration of the energy transition and the reorganization of global value chains (GVCs) visible.

Some economies may achieve benefits due to the elimination of the old world order. There are some concerns regarding the probable new order. If only economic efficiency is considered while ignoring all the security concerns, the new world order will shift the global economy in a more stagflationary direction. Consequently, it may create frequent price rises and supply-side shortages.

Nowadays, it is debated whether the new world order is possible. If yes, who would lead, or how would it affect the global economy? Several reasons behind the concept of an emerging new world order include the Russia-Ukraine war, the COVID-19 pandemic, the acceleration of responses to climate changes, de-dollarization,

etc. Let's discuss the prospects and perils of these issues that have sparked the debate of an emerging new world order.

Russia-Ukraine war, changes in geopolitical power, and an emerging new world order

The old world order broke down when the Soviet Union collapsed. Other countries neither accepted the United States (US) nor was it even successful as a leader. The main reason was that the US was not considerate of the preferences of other countries, which had different problems and demands. Even in the case of China, it has always considered what was best for itself. After the reopening of economies after the COVID-19 pandemic, the debate of a new world order has again opened up. Mainly, as other countries rely too much on China, the late deliveries and overall weak far-flung supply chains due to China's zero-COVID policy worsened the global economy.

“Issues such as the pandemic, changes in geopolitical power, and the Russia-Ukraine war have created new dimensions that will affect the equilibrium of the South Asian and global economies, but it may not be a new world order”

On the contrary, the Russia-Ukraine war has altered geopolitics and supply chains that may lead to future changes in investment and trade flows. Though only 2% of global trade is owned by Russia and a relatively minor part in global value chains (GVCs) and international investment is played by Russia, the country accounts for 12% of oil exports and 3.6% of gas exports globally before the invasion of Ukraine.

Immediately after the war, the over-reliance of Europe on energy imports from Russia was visible. The price of such energy imports increased so much that the Eurozone almost slipped into a deep recession.

Since a mistrust of Western institutions unites both Russia and China, they have formed an alliance. They are economically complementary. Russia has sophisticated technology, whereas China is a commodity-dependent country. When two-thirds of the NATO member countries agreed that Russia was the aggressor in the war and should be expelled, China was one of those few countries who supported Russia. However, many nations chose to remain neutral or absent in voting, including India, Indonesia, Saudi Arabia, South Africa, Brazil, etc.

The Russia-Ukraine war can be seen as a game changer. Europe has played a much stronger role in these war-related issues that were not observed before. It has opened its borders to refugees from Ukraine and facilitated childcare, workforce, and schools for them. Europe also plays a strong role in broadening welfare meas-



Dr. Selim Raihan,
Professor, DU Economics
and Executive Director,
SANEM

De-dollarization

1920s

USA gains massive gold reserve following World War 1. The US dollar begins to replace the pound sterling as international currency



1944

Dollar in international trade under the Bretton Woods Agreement



1981

Dollar loses significant purchasing value following hyperinflation



1971

Nixon gov't ends dollar-gold direct convertibility



2007-08

Dollar gains further value among investors amid global financial recession



2014

Russia annexes Crimea, faces West sanctions, and starts de-dollarization efforts

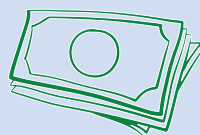


2021

Central banks across the globe show a tendency to buy gold for reserve in place of dollar

2023

Common currency in discussion, UAE-India start small-scale trade in rupee, Russia-Iran plan to launch gold-backed crypto



2022

War-driven sanctions on Russia by the West lead the country to deepen its cooperation with China, increasing ruble-yuan trade



Source: Wikipedia

ures, ecological sustainability, and life expectancy. Though the US had a chance to play a central role, it has gone back way before from its advantages in climate policies and military roles where needed. And, as mentioned before, China did not criticize Russia's invasion for its benefit. In this scenario, geopolitical power shifting is much needed, and a new world order is the demand of time, to which Europe has much to contribute.

Acceleration of responses to climate change

Until now, climate change policies have not been at the center of attention, though it has been recognized as an important problem. Developed countries contribute to carbon emissions and pollution way more than developing countries. However, they do not want to actively participate in reducing carbon emissions and other

climate issues as it may hamper their vast industrial outputs.

On the contrary, developing countries could not control emissions due to a lack of knowledge, technologies, and resources. However, climate change is a threat to supply chains and production facilities that are often ignored by rich and powerful countries. With the 'no limit alliance' of Russia and China, these countries are now more reluctant about climate change issues.

On the contrary, the US has dropped out of the line of making climate change policies. However, European countries have been encouraging the decarbonization of the global economy. Multilateral efforts regarding climate change are getting attention now. For instance, the EU Carbon Border Adjustment Mechanism (CBAM) may work as a stimulant for a new world order as it is expected to

be an important one to accelerate responses to climate change.

De-dollarization and a search for a reliable global currency

When the Soviet Union collapsed, the US announced a new world order. It declared a series of wars against different countries, making the petrodollar the world order. Note that the petrodollar system refers to the global practice of selling and buying oil only in US dollars. It immensely affected those countries that were at war with the US. Using dollars as a sadistic economic weapon, the US devastated countries, especially Iraq. Due to this, the petrodollar is also called the 'Weapon dollar.'

However, many believe that the power of the petro-weapon dollar will decrease or be eliminated soon. There are many reasons behind it. The United States is no longer the dominant manufacturer in the global economy, and China is outperforming in trade, science, and technology. Even the development model of the US is not a lucrative option for South Asian countries or other developing countries. Rather, China's Belt and Road Initiative deals seem attractive to Africa and other developing countries.

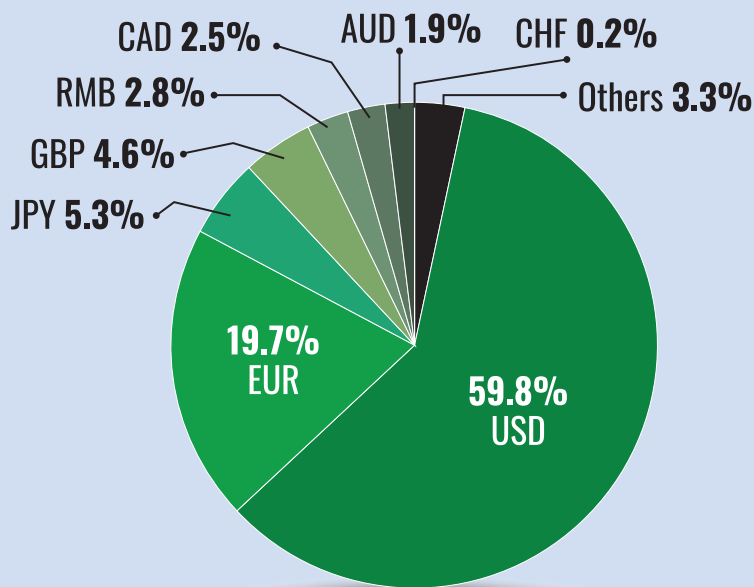
The withdrawal of the United States troops from Afghanistan and the regime change in Syria have brought the US down from its supreme position as a global military power. Due to these issues, some countries are now looking for a new global currency for international trade. They want to reduce the over-reliance on dollars. And that may be the currency of the new world order.

However, the process will be complex as it may lead to volatility in the exchange rates of currencies, and the question is which currency can be the new global currency. Euro, Pound, and Yen may be the potential contenders. However, the UK and Japan are quite linked to the US regarding economics and politics. Chinese Yuan may also be a potential contender. However, the problem is limited convertibility and capital controls. Thus, it should be important to consider all the potential risks and benefits before a new currency is considered.

New world order or a new dimension in the existing global system?

There are many debates regarding the new world order. Industry Insider talked with Dr. Selim Raihan, Professor, Department of Economics, University of Dhaka and Executive Director at the South Asian Network on Economic Modeling (SANEM), to know his perspective regarding the debates over the new world order.

Foreign exchange reserves worldwide as of 2022



Source: IMF

Here is his detailed view on the topic:

This is not the appropriate time to confirm that the world order is about to change. However, there are indeed many new dimensions in the existing global system or equilibrium. There are some recent issues responsible for starting the debate of a new world order again—for instance, the incident of the COVID-19 pandemic, which was unprecedented.

During the last 100 years, the world has never faced such a global outbreak of any infectious disease, resulting in new development perspectives. It has raised questions on the global development process and whether it is secure or strong enough to deal with any unprecedented issue in the future. We need global cooperation and understanding for that. But I do not think it significantly impacts a new world order.

Meanwhile, there are many changes in the geopolitical context. The conflict between the US and China has increased more than before. It is not only about trade anymore but also about geopolitical power. The US and China's allied countries are now involved in this conflict. The impact on the global economy will depend on how this conflict is directed in the future.

The Russia-Ukraine war is the third issue that has affected the global system significantly. It has changed the dynamics of Europe and the global economy, too. Supply chains, food prices, and oil prices have been affected worldwide. South Asia was no exception. After the Russia-Ukraine war, it became difficult for South Asian countries to know whom to support. The US and India supported Ukraine, and China supported Russia in the war.

Also, the US and India have an undeclared alignment to stand together against the power of China, as China and India have had a conflict over economic power and political differences for years. However, they still work together in associations like BRICS and Asian Infrastructure Investment Bank (AIIB). Now, the future of the global economy will also depend on how the relationship between these countries alters.

For South Asian countries, the dilemma is if they should support China, the major trading partner, or India, the largest neighboring country. Furthermore, the major export destination for most South Asian countries is North America. Maintaining a balanced relationship with the US, India, and China is important but tricky. Bangladesh has somehow maintained a balanced relationship till now. However, it is quite unclear how the political dynamics will play a role during the forthcoming election and after the election and how it will affect our economy.

Overall, these issues, such as the pandemic, changes in geopolitical power, and the Russia-Ukraine war, have created new dimensions that will affect the equilibrium of the South Asian and global economies, but it may not be a new world order.



Now, let's talk about the debates over the de-dollarization and a search for a reliable global currency. In the case of choosing an alternative currency, I do not think that Bangladesh has much scope to go for alternative currencies, even if Russia or other countries consider it. The dollar is used widely for obvious reasons.

The US imports from many countries, providing these countries with enough opportunities to earn in dollars. Thus, it is even easier for them to trade with other countries in dollars than other currencies. Even though the pound is also widely used, many countries still prefer dollars to pounds as they can use it to pay other countries.

On the contrary, the emergence of the euro was to challenge the demand for the dollar. The euro has indeed occupied some marketplace, but it is still not an alternative to the dollar. And about the concern of the dollar's volatility, it is not a new case. During any crisis, there has been dollar volatility. However, the policymakers and government of the US have always tried to keep it in check so that no extreme incident happens. Therefore, there are fewer chances to observe extreme volatility in dollars, which can force many countries to shift from dollars entirely in the near future. In the context of Bangladesh, it is not in a position to choose any other currency entirely as the major earning of Bangladesh is in dollars, and a small portion is in euro.

On the other hand, we export goods worth less than a billion dollars to China. Even if we consider the Chinese currency, the Yuan, we can only utilize the equivalent amount of this export. If there were more opportunities to export in China, we could have considered Yuan an alternative currency. Otherwise, there is no logic to convert Yuan to Dollar and vice versa unnecessarily.

However, Bangladesh should consider using other currencies, such as the rupee and Yuan, on a limited scale to trade to decrease

the pressure on the reserve of dollars. Approximately, it will cover 10% of our total trade. For example, Bangladesh exports goods worth two billion dollars to India. We can ask them to pay us in rupees rather than dollars for this export. On the contrary, we import goods worth around 10-12 billion dollars from India. Bangladesh can pay them with the rupees they get from those exports and the rest in dollars or as per the agreement. There has already been an agreement between Bangladesh and India to trade in rupees this year.

However, we need to take some more steps to avoid further issues while trading. For instance, we need a proper agreement among banks and a reserve of rupees on standby. Actually, with China, we already have such an agreement. However, the trade in the Yuan is not significantly larger, showing the need for more trade opportunities. Such agreements can be a way to deal with the dollar's volatility. The second way is to take necessary steps to increase exports and remittances in dollars rather than avoiding dollars. And the third way is to increase foreign investment, which will increase the inflow of dollars and decrease the pressure on reserves.

Again, I believe that the new world order is yet to come. But, there are many new dynamics in the global economy. While Bangladesh cannot control many global issues, it can be a good observer and take policies accordingly. There also should be trade and regional integrity among South Asian countries to avoid different risk factors and keep the South Asian economy stable. ■

Jinat Jahan Khan has a keen interest in microeconomic research and worked as a Research Officer at DataSense previously. She is also a Recipient of the Female Champions Fellowship by the Bill and Melinda Gates Foundation and the Centre for Research and Development (CRD).

Analyzing the Monetary Policy FY24 in light of rampant inflation

by **Zanjabil Mashkura**

BANGLADESH BANK IS STRUGGLING TO CREATE a stable and healthy macroeconomic environment as it stumbles with an upward inflation rate and exchange rate instability. When the Central Bank decides to increase the money supply, it is an expansionary monetary policy, and when the money supply is decreased, it is a contractionary monetary policy. The government uses these policies to influence investment, employment, output, and income.

The new monetary policy for the first half of FY24 brings four key reforms: the implementation of a policy interest rate corridor, the establishment of a reference interest rate for lending, exchange rate unification, and a revised approach to calculating the gross international reserve according to the BOP and International Investment Position Manual. The goal of the new monetary policy is to keep inflation within 6%, aligning with the target of the Bangladesh government.

Market-driven reference lending rate

Bangladesh Bank governor Abdur Rouf Talukder unveiled the new monetary policy for July-December of FY 2023-24 on June 19, marking a shift from a monetary targeting approach to an interest rate targeting framework. This contractionary monetary policy adopts a new interest rate regime in Bangladesh, where the interest rate cap of 6%-9% is replaced with a market-driven reference rate.

For a long time, the central bank remained rigid in regulating the interest rates strictly determined by the market due to the fear that it might kill the competitiveness of the private sector. The 'SMART' reference lending rate will be calculated as the six-month moving average treasury bills rate. A 3% margin is for banks, and a 5% is for non-bank financial institutions. There will be no changes in the interest rates applicable to credit card loans. However, economists expressed skepticism about whether the new lending rate formula promotes market-based lending rates and if it would help reduce inflation.

Increasing policy rates

The Bangladesh Bank makes decisions on interest rates by controlling two policy interest rates. The repurchase rate (repo rate) is used to add money into the banking system, and the central bank uses the reverse repo rate to borrow from commercial banks, often overnight. As part of the contractionary monetary policy,

Bangladesh Bank increased the repo rate to 6.50% and the reverse repo rate to 4.50%, effective from July 1. An increased repo rate means when banks borrow money from the central bank, they will have to pay more interest during this period. This restrains banks from borrowing money, reducing money supply in the market and slowly diminishing inflation. An increase in the reverse repo rate falls under the contractionary monetary policy, which reduces the money supply and, consequently, inflation.

Unified and market-driven single exchange rate regime

Bangladesh Bank plans to implement a unified and market-driven single exchange rate so that market forces can determine the exchange rate between the local, taka, and other foreign currencies. Therefore, Bangladesh Bank is promoting stability in the foreign exchange market as it no longer quotes specific rates for buying or selling foreign exchanges.

Bangladesh Bank used to quote different exchange rates for exports, imports, and remittances. The exchange rate of remittance was more favorable for business. To benefit from the higher quoted remittance exchange rate, exporters took advantage of bringing USD into the country as remittance rather than export proceeds. This is also one of the reasons for inflation in our country.

Calculating the gross international reserve

Bangladesh Bank will calculate and publish gross international reserves (GIR) following the sixth edition of the IMF's BOP and International Investment Position Manual (BPM6). Meanwhile, the central bank will keep track of current practices of calculating and reporting total foreign assets.

Bangladesh Bank has liabilities of nearly USD4 billion (July 2023). As per BPM6, the central bank must calculate the net reserve, excluding liabilities from the gross reserve. Moreover, the central bank

must calculate this gross reserve, excluding foreign currency loans to local banks, deposits with state-owned local banks, and many more.

For the FY23-24 budget, the expected GDP growth is 7.5%, and inflation is 6%. Is this contractionary monetary policy good enough to stop inflation? The annual inflation rate in Bangladesh eased slightly from 9.94% in May to 9.74% in June 2023. The inflation remains alarming as the prices of daily necessities in the market are still high. In this situation, an expansionary policy can be dangerous. Therefore, Bangladesh Bank did the right thing by



However, a serious dollar crisis dried up banks' liquidity this year. Consequently, banks are seeking dollars from the Bangladesh Bank, and the local currency is ending up in the central bank. The climbing rate on government bonds in Bangladesh shows a liquidity crisis



focusing on inflation reduction.

The future of a country's economy depends on how well its balance of payments is working. Stability and growth in the current account balance require a high level of exports and large amounts of remittance inflows. To cover the deficit from FY23, the government plans to take loans from the banking sector and foreign sources. Whether the Bangladesh Bank will provide domestic loans remains a question.

Sometimes, the Central bank has to print money to support the budget. However, if the central bank prints money too frequently, then the system becomes complicated. Bangladesh Bank created fresh money of more than BDT 50,000 crore in the July-December period of 2022 for budget support, the highest amount of money printed in recent history. The government borrowed this amount to provide budget expenses.

When banks have enough liquidity, they participate in government bond auctions called by Bangladesh Bank to invest in government bonds through which money is collected for the budget.

serves. Hence, the global demand for the dollar is sufficiently large to absorb any excess supply of the US dollar, so much so that the nation can get away with printing more money.

The developing and least developed countries cannot afford to print or borrow money like the USA because the demand for their currencies in the international market is insignificant. It is difficult and almost impossible for countries like Bangladesh to create enough demand for their currency in the global market to cover up domestic economies from inflationary pressure. The central bank believes the new monetary policy will work smoothly if the global economy stabilizes and war-related disruptions normalize.

Many countries, including China, Russia, and India, are already searching for a reliable substitute for the US dollar, given the global economic instability due to the Ukraine vs. Russia war. The worldwide dollar crisis and the high inflation level have moved many countries' attention towards buying gold to reduce dependency on dollars. This act of Central banks around the world has led to an increase in the purchase of gold by more than 400% compared to

As part of the contractionary monetary policy, Bangladesh Bank increased the repo rate to 6.50% and the reverse repo rate to 4.50%, effective from July 1

However, a serious dollar crisis dried up banks' liquidity this year. Consequently, banks are seeking dollars from the Bangladesh Bank, and the local currency is ending up in the central bank. The climbing rate on government bonds in Bangladesh shows a liquidity crisis.

During this liquidity crisis, banks put high interest rates, which the central bank is unwilling to take. In this situation, the Bangladesh Bank has started to print taka to supply money to the government instead of the government borrowing money from commercial banks. But, printing fresh money will impose strong challenges against fighting inflation. How will the government of Bangladesh possibly drop the inflation rate from 9% to 6% if it takes loans by printing more money?

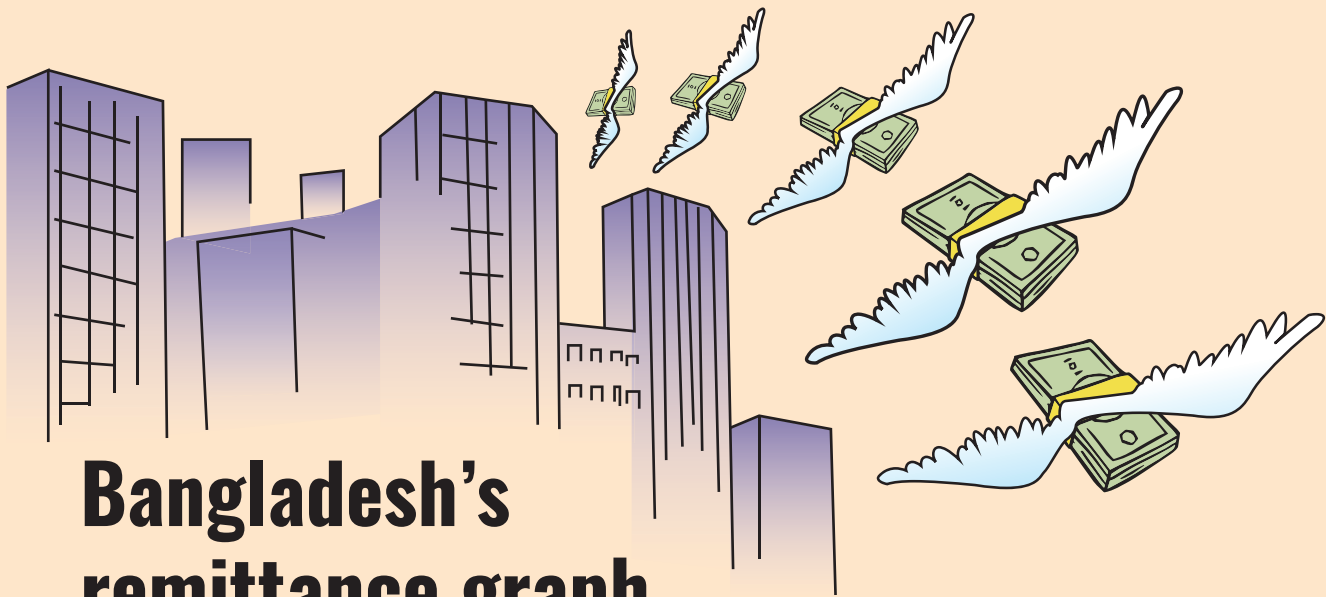
The US provided its citizens stimulants during COVID-19 by printing more money. And yet, the US economy has shown no signs of falling apart, whereas there is fear of another Sri Lanka case for Bangladesh's economy. One may ask what makes the US economy different. Most of the trade around the world is done in the US dollar. Central banks around the world keep dollars in their foreign re-

last year, which is approximately 399.3 tonnes of gold bought from July to September 2022. This is something the Bangladeshi policymakers should reflect upon, too.

Central banks are essential in controlling inflation by setting certain interest rates. However, they don't have the necessary tools to get inflation down. During an economic crisis, it is normal for any Central Bank to increase the money supply as it will provide additional resources. An excess of money may diminish the effects of the interest rate needed to drag down inflation. Besides, other dynamics drive price increases that do not respond to changes in interest rates.

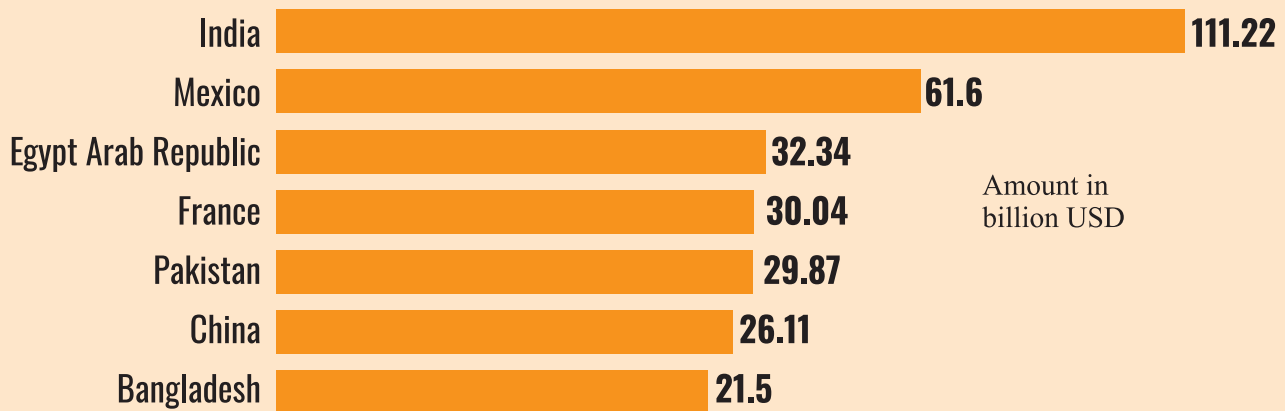
However, the policymakers are optimistic. The contractionary policy holds that market participants already have excessive money, raising prices and pushing inflation. So, the money needs to be taken back from the society. ■

*Mashkura is a free bird and an intuitive thinker who has made content writing part of her lifestyle. To be an unbiased writer, she lets her senses analyze emotions.
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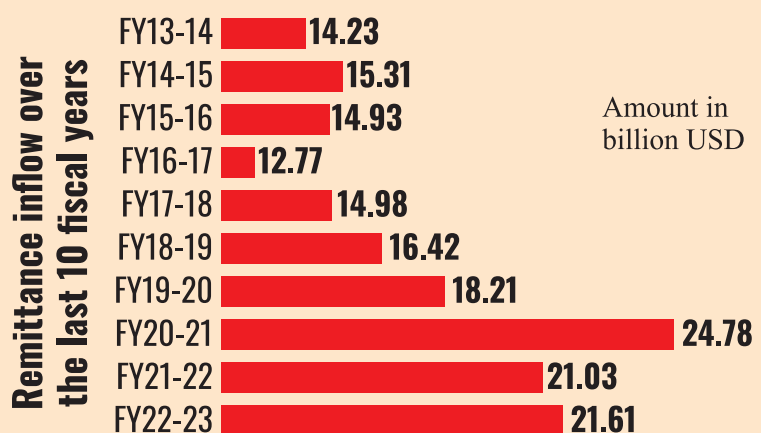


Bangladesh's remittance graph remains steady despite challenges

Remittance flow by country in 2022



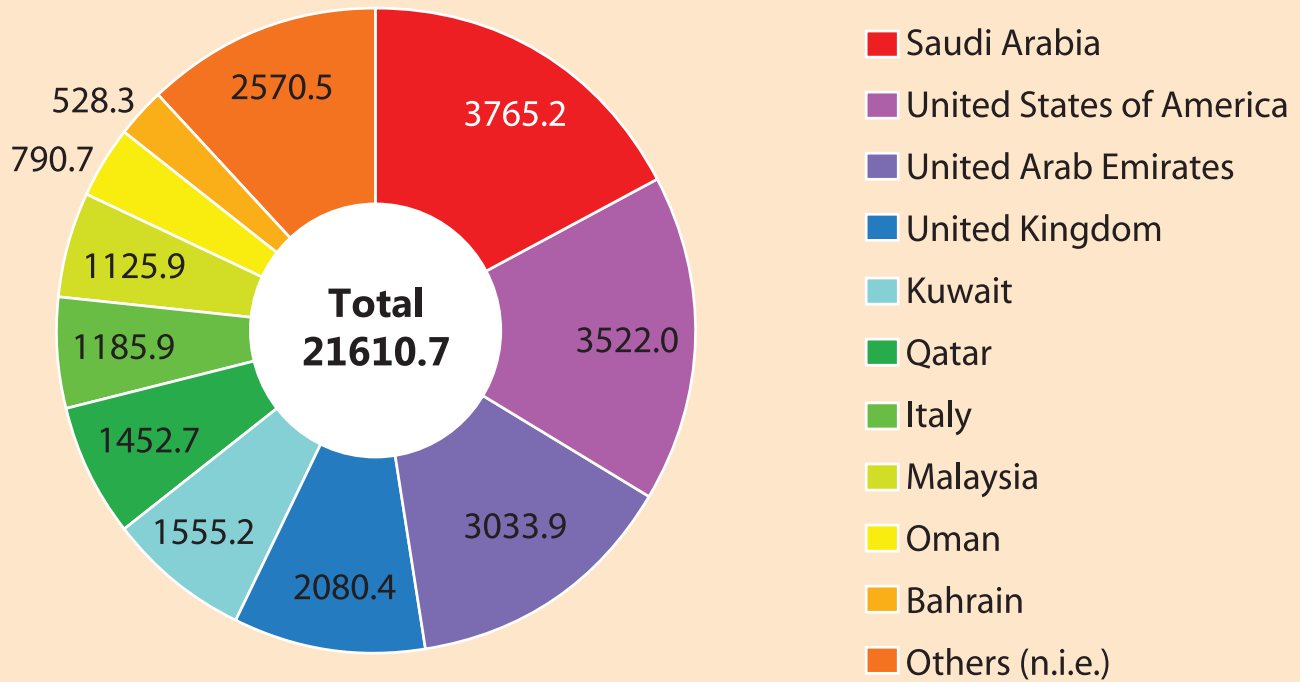
Source: World Bank



Source: Bangladesh Bank

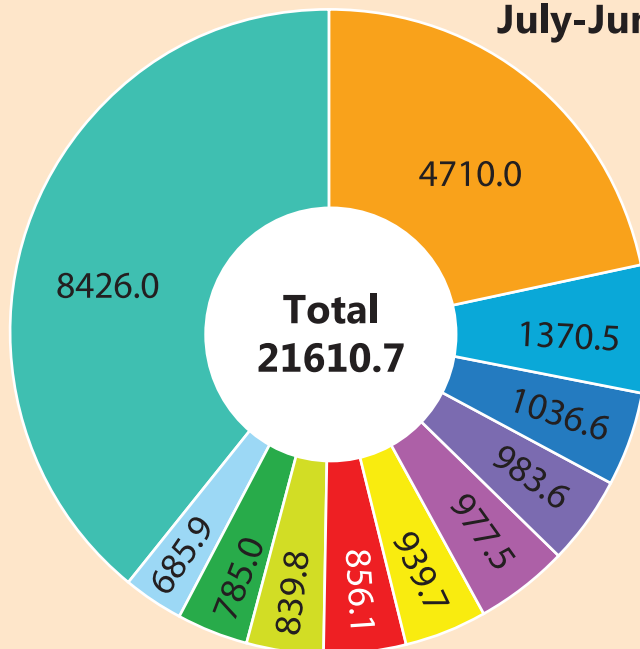
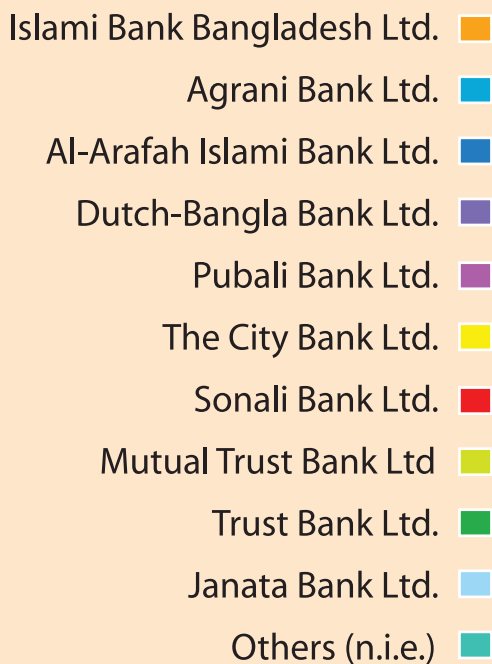
Biggest remittance sources by country (In million USD)

2022-23
July-June



Remittance receive by banks (In million USD)

2022-23
July-June



Source: Bangladesh Bank

Circular industry in Bangladesh

A saga of emerging actions

by **Syed Raiyan Amir**

IN THE VIBRANT LANDSCAPE OF BANGLADESH'S circular industry, a profound transformation towards sustainable living and resource preservation unfolds. The nation's commitment to optimizing resource utilization recognizes the profound impact of resources on the economy, ecology, culture, and overall standard of living. As Bangladesh embraces a more sustainable and resource-efficient model, the circular industry approach takes center stage, weaving an array of reuse and recycling practices across sectors.

Thirty-four nations worldwide, including Finland, Sweden, the Netherlands, France, and others, have vowed to change their linear economic structure to a circular one. This may result in long-term effects on the economy, society, and natural resources. Bangladesh is also walking on the same path. The journey has started, and to date, some ramifications are also there.

Reuse in different sectors

Reusing materials is highly valued in Bangladesh's circular economy, which includes the country's textile, packaging, and building industries. For instance, programs like the 'redesign, repair, and resale' concept, which involves repairing and reselling used clothing instead of throwing it away, are being promoted in the textile industry. Innovative techniques like upcycling and reusing used textiles into new goods are also becoming more and more admired. Companies in the packaging industry are looking for alternatives to single-use packaging materials. Reusable packaging choices, including reusable containers and eco-friendly bags, are being promoted to cut down on trash production. Similar initiatives are being made to encourage the use of recycled materials in the construction sector, including bricks from recycled plastic or glass.

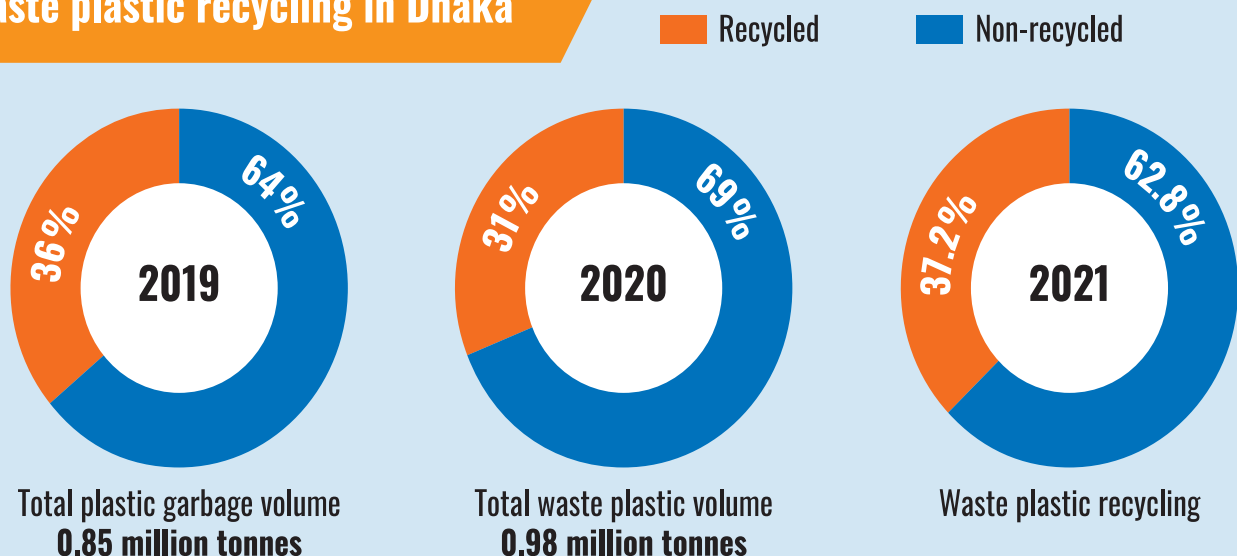
Recycling initiatives

The 'Circular Fashion Partnership,' which aims to achieve a scalable transition to a circular fashion system, consists of the Bangladesh Garment Manufacturers and Exporters Association (BGMEA), Global Fashion Agenda (GFA), Reverse Resources, and P4G. To collect and reuse textile waste in Bangladesh, more than 30 well-known fashion companies, producers, and recyclers are working together as part of this effort.

Bershka, Bestseller, C&A, Gina Tricot, Grey State, H&M Group, Kmart Australia, Marks & Spencer, OVS, Pull & Bear, Peak Performance, and Target Australia are a few notable participants. Through the alliance, big fashion companies, textile producers, and recyclers can collaborate to create new fashion goods by developing and implementing systems that repurpose post-production fashion waste.

During mid-June 2023, Bangladesh Apparel Exchange organized the 'Bangladesh Circular Economy Summit' in association with P4G and collaboration with Laudes Foundation. GIZ, the H&M Group, and the Dutch Embassy in Bangladesh are the sponsors of the meeting. The plenary sessions covered topics such as 'Lessons Learned and Next Steps for Post-Industrial Recycling in Bangladesh - Practical and Tangible Advice and Actions for Progress,' 'Circular Cities,' 'Accelerating Circular Economy in Apparel and Textile - The Role of Policy,' and 'Lessons Learned and Next Steps for Post-Industrial Recycling in Bangladesh - Practical and Tangible Advice and Actions for Progress.' The keynote speeches included 'Circular Economy Myth Busting: A Shared Understanding,' 'Circular Economy in Bangladesh: Challenges and Opportunities,' and 'Circular Business Models and Design for the Apparel Industry in Bangladesh.'

Waste plastic recycling in Dhaka



Source: World Bank

During the program, the ambassador of the Netherlands to Bangladesh, Anne Van Leeuwen, praised Bangladesh's development and proposed that Bangladesh might lead the way in the circular economy. The H&M Group's Leyla Ertur, head of sustainability, recognized Bangladesh's potential to draw domestic and international investment to scale up manufacturing of high-value recycled fibers. She emphasized, however, that for advancement to be possible, waste management policies must be addressed.

'Plastic waste recycling: investment progress, challenges, and the way forward' was held on January 4, 2023, at the Cirdap International Conference Center in Dhaka.

One such example is the creation of e-waste recycling facilities, where electronic items are disassembled and recycled to recover valuable materials. Under the Bangladesh Environmental Protection Act of 1995, the Department of Environment (DoE) of the Government of the Peoples Republic of Bangladesh released its 'Hazardous Waste (e-waste) Management Rules 2021' on June 10, 2021. The country's registered electronic waste producers and recyclers must submit their WEEE management plans according to the law.

Bangladesh has advanced significantly in the field of plastic recycling. A program known as Extended Producer Responsibility (EPR) has been established, and it holds plastic manufacturers responsible for the management and recycling of their products. Additionally, the government has supported the construction of plastic recycling facilities and incentivized businesses to participate in the recycling process. These actions have raised the percentage of recycled plastic and developed a thriving recycling sector.

Government plans for circular industries

The Draft National Plastic Industry Development Policy 2020, along with existing policies for export, import, industries, and small and medium enterprises, aims to ensure the success of the plastic industry in Bangladesh. The government of Bangladesh has recognized the importance of transitioning to a circular economy and has outlined various plans and strategies to foster its development.

The 'Seventh Five-Year Plan (2016-2020)' prioritized the development of sustainable industries, focusing on resource efficiency, waste reduction, and recycling, which can be stated as a 4R policy (reduce, reuse, recycle, reclaim). Besides, implementing environmental pollution control measures under the Draft National Plastic Industry Development Policy 2020. Cash rewards

would be offered for their purchase and installation to incentivize the adoption of waste treatment facilities. A tax break is another incentive for producing environmentally friendly items, including renewable paper products, energy-efficient appliances, and recycled materials. All were well documented on the plan.

Moreover, the government has set targets to increase the share of renewable energy, promote eco-friendly industrial practices, and reduce waste generation. The Ministry of Environment, Forest, and Climate Change formulated the 'Bangladesh Climate Change Strategy and Action Plan 2009' to address the challenges posed by climate change and promote sustainable development. The action plan emphasizes the importance of circular economy principles, including waste reduction, recycling, and adopting eco-friendly technologies.

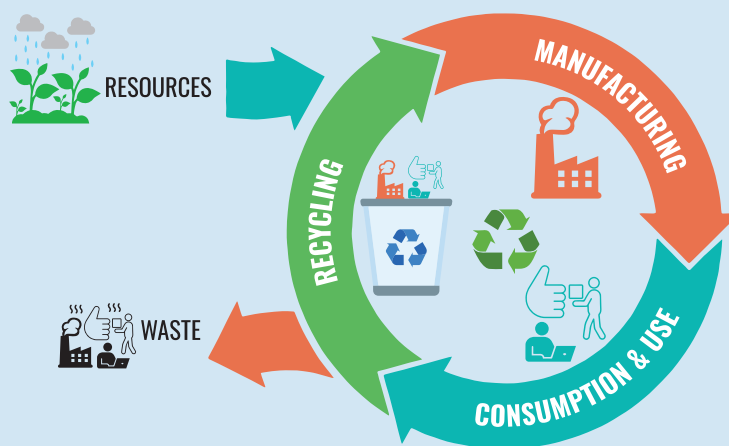
Plastic recycling and initiatives

In Dhaka, recycling accounts for 37.2% of waste plastic, according to World Bank in 2021. In 2020, 977,000 tonnes of plastic were used, and 31% was recycled. Bangladesh produced 8.25 lakh tonnes of plastic garbage in 2019, with 36% of that debris recycled.

Plastic pollution is a major problem in Bangladesh, especially in cities and around waterways. The government has taken several actions to solve this problem and encourage plastic recycling. The National Action Plan for Sustainable Plastic Management emphasizes the cyclical use of plastic, which is based on the 3Rs (Reduce, Reuse, Recycle) idea. These regulations forbid the use of single-use plastics and require the use of eco-friendly packaging materials. The government established plastic recycling facilities and promoted recycling awareness by working with various partners, including NGOs and commercial

businesses. While generating job opportunities in the recycling industry, these programs seek to lessen the negative effects of plastic waste on the environment.

Bangladesh's dedication to sustainable development and resource preservation is fueling the growth of the circular economy in the nation. The country is in an excellent spot to advance further toward a more sustainable and ecologically friendly future with continued efforts and cooperation between the government, companies, and citizens. ■



Bangladesh has advanced significantly in the field of plastic recycling. A program known as Extended Producer Responsibility (EPR) has been established, and it holds plastic manufacturers responsible for the management and recycling of their products

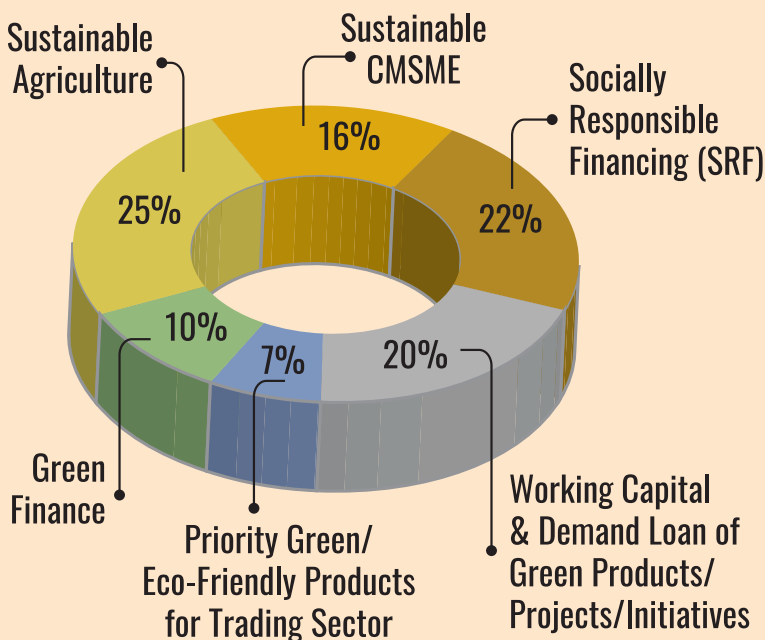
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LDC graduation in sight: Greening the process first, products later

by **Arefin Mizan**

Sustainable finance by banks and financial institutions in different sectors

Source: Bangladesh Bank



IN 1994, BOTSWANA, A JEWEL OF southern Africa, was one of the first countries to graduate from the Least Developed Countries (LDCs) category. With the new status came unforeseen challenges, and the country danced on the tightrope of a green transition. Rich in diamonds, the nation's rapid economic growth was juxtaposed against the environmental costs of mining and an increasing urban footprint.

Bangladesh stands on a precipice of its own graduation from the LDCs, facing a similar crossroads. Woefully called 'ground zero' of climate vulnerability, Bangladesh faces biotic and economic pressures to achieve ambitious emission reduction goals despite many climate initiatives and policies. The challenges are manifold as the nation's manufacturing industries grapple with the transition to green technologies.

There are exemplary signs of progress. The RMG sector in Bangladesh boasts the greenest factories in the world, with 178 LEED-accredited green factories, the highest in the world. This achievement is a testament to the nation's commitment to sustainable practices in an industry that has been its economic backbone for decades.

Bricking industry, one of the major polluters, is adapting to cleaner and greener technology of hybrid Hoffman and tunnel kilns, although the diffusion of such technologies is slower than desirable. A smooth and sustainable transition after LDC graduation would require a concerted effort to make the total manufacturing pipeline sustainable and to import and adopt more green technologies, particularly by adopting green capital goods and machineries.

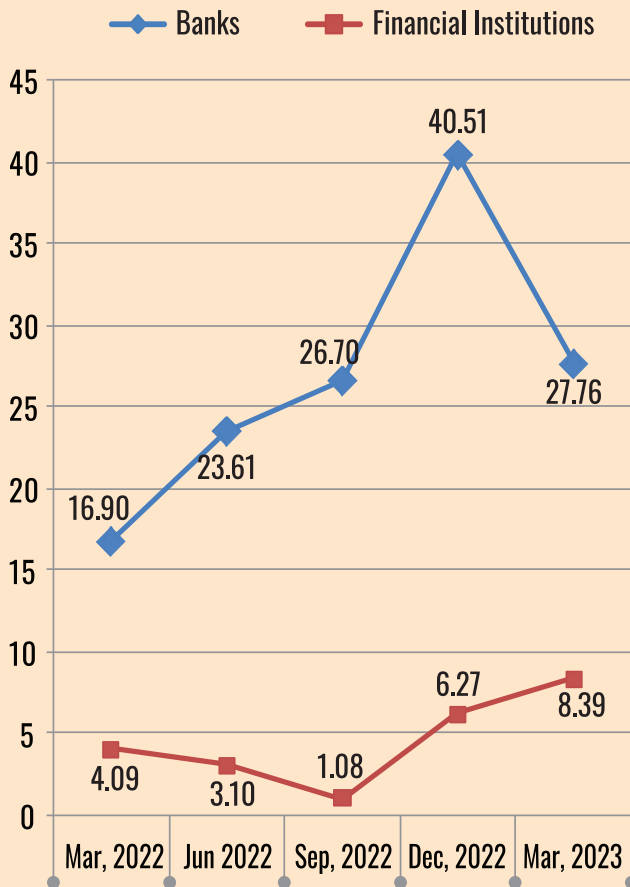
Green capital goods and machineries represent the next frontier in sustainable manufacturing, offering a tangible solution to industries' environmental challenges. The 'Green Taxonomy' outlined by Bangladesh Bank's Sustainable Finance Policy is quite robust and standardized in categorizing Green products across different industries. However, green manufacturing equipment and machineries only got a passing mention. The world has progressed a lot in terms of sustainable innovation and engineering. The options for manufacturing equipment that can be greened across various industries are vast.

For example, the textile sector can benefit from water recycling systems, energy-efficient looms, and sustainable dyeing technologies. Air-jet and water-jet looms are known to be more energy efficient than traditional ones. Digital printing technologies can also reduce water consumption by up to 50% compared to conventional methods. Adopting these machines in manufacturing may be expensive initially, but these technologies can save up to 40% on future production costs.

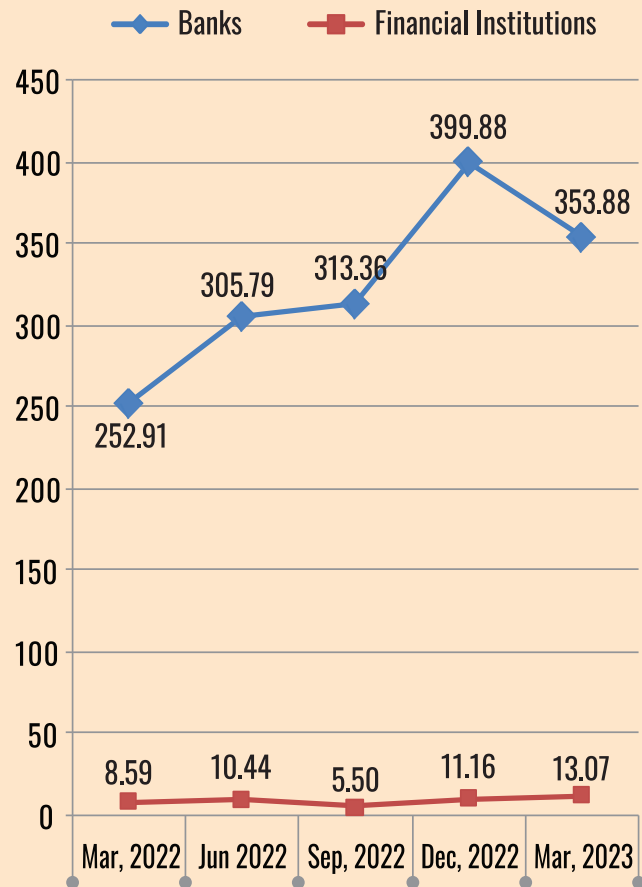
In the transportation industry, electrification is already the buzzword. While the adoption of electric vehicles is still in its infancy in Bangladesh, we hope that local production of vehicles can adopt

Quarterly trend (In billion BDT)

Green finance



Sustainable finance



Source: Bangladesh Bank

energy-efficient machinery for vehicle assembly and incorporate more recycled materials in vehicle production.

Waste Management, both solid and liquid, gets the topmost priority to ensure environmental sustainability across all industries. However, the waste management industry itself can use a greener revamping. Advanced sorting machines, biogas production units, and efficient composting systems can revolutionize the waste management sector. With its growing energy budget, technologies that convert waste to energy or biofuels are particularly promising in Bangladesh. Advanced sorting robots, plastic recycling systems, and sustainable packaging machinery can also be adopted. Innovations like chemical recycling can also be explored, which breaks down plastics to their molecular level, allowing for a purer recycling process.

The brick production industry is one of the greatest polluters and one of our largest industries. As mentioned earlier, hybrid Hoffman and tunnel kilns are greener alternatives to traditional FCK kilns.

Fly ash brick-making machines can produce bricks using waste from thermal power plants, reducing environmental impact. Another important industry in Bangladesh, the food and grain processing, wastes significant water, energy, and resources in each operation step. Energy-efficient milling machines, sustainable packaging systems, and water-saving processing units could be the way forward. For instance, vacuum evaporation technology in food processing can result in up to 90% water recovery.

Last but not least, the agriculture sector is falling behind the most regarding efficient technology adoption, including green machinery. Precision farming equipment, drip irrigation systems, and sustainable harvesting machines can revolutionize Bangladesh's agricultural sector.

However, the real challenge will be the importing and initial costs of adopting these machineries across different manufacturing industries. Green goods and machines can cost a hefty sum, even though their long-term benefits and cost savings usually far out-

weigh the initial costs. Thus, funding and green financing would be crucial for this transition. As Bangladesh graduates from the LDC status, it will inevitably face a reduction in certain international support measures (ISMs) and preferential market access. This could strain the financial resources available for manufacturing industries to invest in green technologies and machineries.

Another issue is the willingness and rate of adoption, even with such financial resources being palpable. The Green Climate Fund (GCF), the Least Developed Countries Fund (LDCF), and even Bangladesh's green banking and sustainable financing schemes remain underutilized. Drawing on the RMG sector example from before, manufacturing industries, even the ones with exemplary green adoption,

to waste management and energy efficiency. Further steps could be incentivizing private sector investments in green technologies by offering tax breaks, subsidies, or even co-financing options. Such measures can reduce the financial strain on individual industries and attract foreign direct investments focused on sustainable manufacturing. Larger global green funds, such as the GCF, will also remain accessible even after LDC graduation, which can be utilized for green capital machinery imports.

To bolster the utilization of green funds and schemes, the forthcoming 'Smooth Transition Strategy' must be meticulously crafted with a clear roadmap detailing both government incentives and stringent regulations that champion sustainable manufacturing. On the incentives front, industries could

benefit from a myriad of supportive measures, which could include preferential interest rates on loans drawn from green funds, substantial tax concessions, expedited licensing procedures, and preferential access to state-endorsed research, development initiatives, and innovation grants into green machinery and manufacturing.

On the regulatory side, the government could introduce a phased approach to mandatory adoption of green machinery and sustainable manufacturing equipment. This could be complemented by setting industry-specific benchmarks of green technology adoption and sustainable manufacturing standards that industries must meet within stipulated timelines.

The journey from being an LDC to a developing nation is about economic growth and ensuring that this growth is sustainable and inclusive.

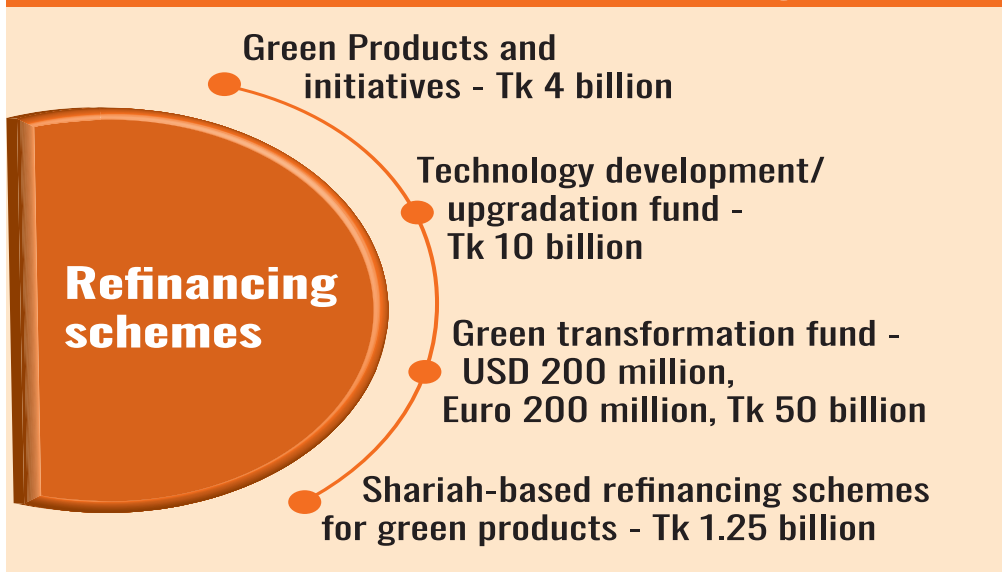
Adopting green technology across its vast manufacturing landscape will be pivotal in this transition. While challenges abound, the confluence of policy, financing, and technology presents a unique opportunity. The dream of a greener future is within our grasp, and if we play our cards right, our graduation from the LDC status will only expedite it.

For highlight - On the regulatory side, the government could introduce a phased approach to mandatory green machinery and sustainable manufacturing equipment adoption, complemented by setting industry-specific benchmarks of green technology adoption and sustainable manufacturing standards that industries must meet within stipulated timelines. ■

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Green refinancing initiatives by Bangladesh Bank

Source: Bangladesh Bank



are more focused on green building and green energy than making their work pipeline sustainable. One could argue that this is a case of 'Greenwashing,' a performative greening of the industries to sway attention from the industrial emissions and pollution generated from the manufacturing processes.

The solutions to these conundrums would be prioritizing and expanding Bangladesh's domestic green financing initiatives and attracting private foreign investment into our manufacturing industries for greener technology adoption. Bangladesh Bank's Green Transformation Fund (GTF) is a shining example. Launched in 2016 with a fund of USD 200 million, the GTF was expanded in 2019 to encompass all manufacturing and export-oriented entities. This fund facilitates the financial means for industries to import capital machinery and accessories pivotal for environment-friendly initiatives.

The GTF can catalyze manufacturing industries to adopt sustainable practices from water conservation

Of compliance and fire safety in developing countries

by **Shayful Islam Mamun**



BANGLADESH IS MOVING TOWARDS A middle-income nation. The economy will reach USD 1 trillion by 2040, according to forecasts by the US Boston Consulting Group and HSBC Global Research. With the development of the economy, safety and compliance measures cannot be avoided for businesses and residential properties.

Many residential and industrial buildings are not updated with the safety requirements and compliances. According to data compiled by fire officials, a comprehensive assessment of 5,869 different establishments and buildings, including government structures, has categorized 10% of these premises as 'very high risk,' while 27% fall into the 'risky' category. This assessment provides a clear snapshot of the current state of fire safety across these inspected locations. More than 24,000 fire incidents have occurred in 2022, and 98 people died, including 13 firefighters, according to data from Bangladesh Fire Service and Civil Defense.

Safety compliance is an integrated part of capital expenditure, which is important for business outcomes. It involves taking care of human resources and the assets for business revenue. After any fire incident or structural failure, human tolls impact many families' earning ability and

damage the revenue-generating structure. In many cases in Bangladesh, business houses and factories shut down permanently or stay closed for a long time after a fire disaster. So, the whole business is impacted without this small investment in compliance and required training.

On the other hand, insurance companies provide financial protection against losses or damages caused by fire if the property owner purchases the insurance policy. Under this circumstance, the property owner can only buy the insurance policy if a fire protection system protects the building.

Electric short circuits emerged as the primary reason (38%) for fire incidents, whereas fires caused by discarded lit cigarette butts contributed to 16% of the overall cases. Burners, accounting for the third most significant cause of fire incidents, contribute to 14% of the occurrences. Manufacturing plants, offices, and residential appliances mainly depend on electrical energy. It is essential to assess the required load from machineries and all appliances up to a certain period, including any future expansion.

Possessing an accurate electrical diagram is essential, and it should be regularly updated to reflect any changes when incorporating new loads into the existing system. The cable selection, installation, and placement process



must adhere to both the local code BNBC and the international code NFPA.

Ensuring the availability of an automatic fire extinguishing system, like sprinklers, or a manual fire extinguishing system, such as a high-pressure fire hose system, is vital to suppress fires right from their start. As the fire spreads and creates hot smoke layers, stopping it becomes increasingly difficult and vulnerable to the fire response team.

Installing a Fire alarm system is necessary to alert people when a fire incident occurs. The fire alarm system is sometimes triggered automatically due to excessive dust and water vapor. This results from inadequate maintenance. As a result of these false alarm situations, individuals evacuate manufacturing floors or offices, leading to reduced work hours and eroding trust in the reliability of the fire alarm system.

After experiencing several disastrous fire incidents at locations such as Tazreen Fashions, FR Tower in Banani, Hashem Food factory, Chawkbazar chemical warehouse, Nimtali chemical warehouse, Container depot in Sitakunda and Bangabazar, the demand for fire safety equipment has escalated, along with increased concerns about compliance.

Bangladesh Fire Service and Civil Defense made the mandatory requirement of a Fire Safety Plan, which they must approve for any high-rise new construction. This safety plan requires adequate road space for fire truck movement, a dedicated water tank for the fire pump, a high-pressure pump, hose connections, and a piping arrangement that can provide an instant high-pressure water supply to suppress fire. A fire alarm system is also mandatory to notify occupants during fire incidents, and evacuation is necessary. These approval requirements have created significant market demand, and more than 100 com-

According to data compiled by fire officials, a comprehensive assessment of 5,869 different establishments and buildings, 10% are categorized as 'very high risk,' while 27% fall into the 'risky' category



panies are now serving this demand. However, the lack of professionalism is still a concern for the end user.

The annual market size has exceeded 22 billion USD with a Compound Annual Growth Rate (CAGR) of 8% in Asia. If we consider the 1% market size in Bangladesh, it could amount to 220 million USD, which is half of the projected unofficial estimates, claimed a report by a local daily, The Business Post.

However, this market demand is mostly met by importing materials from fire protection system manufacturers in different countries, especially China, India, UAE, Europe, and the USA. Notably, even manufacturers of global reputation procure original equipment manufacturer (OEM) brands from Chinese and Indian manufacturers, particularly for iron sheet-related products.

Two large business groups in Bangladesh have already started the production of fire doors on par with international standards, such as Underwriters Laboratories (UL). Many fire hydrant systems -- used to suppress fires with water -- such as MS pipes, can be purchased from local pipe manufacturers. However, local manufacturers are facing challenges with high production costs, raw material sourcing, and maintaining international standards compared to other global manufacturers.

As our economy continues to grow, ensuring safety compliance becomes essential for safeguarding the well-being of our workforce and protecting valuable assets. Modernization of safety compliances will lead to secure workplaces, enabling us to prioritize the safety of every individual. ■

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Chemical safety ensures economic growth

by **Tajeq Ahmed**

BANGLADESH'S ECONOMY IS NOW A major developing market economy, 2nd largest in South Asia. The market of Bangladesh has been transitioning from a frontier to an emerging market. According to Bangladesh Bank data, Bangladesh's GDP growth was 6.03% in FY23, backed by heavy industrialization. So, it can be said that industrialization stimulates economic growth.

There is a wide range use of chemicals in different industries. The quantity and variety of chemical usage continue to increase rapidly with the remarkable industrial growth we are witnessing, especially in sectors like petrochemicals, fertilizer, cement, ceramics, insulator and sanitary, paper, glass, power generation, food and beverage, RMG, toiletries and many more. For these industries, a bulk amount of chemicals must be manufactured or imported and stored inside depots daily. This is a complicated and highly hazardous process with high-risk activities in each stage.

Each chemical has different properties, for example, material properties like high reactivity (metal hydrides, sodium, etc.), oxidizing characteristics (hydrogen peroxide, halogen gases, etc.), flammability (gasoline, alcohols, etc.), toxicity (lead, mercury, etc.), demand-specific safety measures for all stages from production to storage. These measures require following Material Safety Data Sheet (MSDS) guidelines from global bodies like the Occupational Safety and Health Administration (OSHA), European Chemical Agency (ECHA), Society for Chemical Hazard Communication (SCHC), etc. Bangladesh is still in the first phase of industrialization, and implementing safeguards and safe practices without rigorous monitoring from the associated stakeholders would be difficult.

Chemical-related incidents are mainly two types: spill and fire. Let's discuss two recent incidents in Bangladesh, their consequences, and how they could be prevented:

Incident brief (Spill)

On December 9, 2014, an oil tanker collided with a local cargo ship, causing a spill of approximately 358,000 liters of heavy fuel oil into the Shela River inside the Sundarbans.

The UN and Bangladesh government's joint team of 25 experts evaluated and assessed the whole situation. Biodiversity and the local community became impacted severely (livelihoods, food security, etc.), causing a significant imbalance in the ecosystem of Sundarbans.

How the incident could have been prevented

The safety measures for carrying hydrocarbons were not rightly placed and installed in the oil tanker. A pre-inspection before using the oil tanker would have helped to identify the loopholes and help to take necessary measures. No such practices were in place, nor were any established emergency protocols.



Shela River oil spill



Explosion at BM container depot

Incident brief (Spill and fire)

On June 4, 2022, a chemical explosion led to a fire incident in the BM container depot at Chittagong. At least 49 people were killed, and 300 were seriously injured, including considerable property damage. Several Bangladesh Fire Service Department emergency responders were also among the casualties.

How the incident could have been prevented

The BM Depot incident simply showcases how a casual approach can lead to catastrophic incidents in such cases. The chemical containers needed the proper Materials Specification Diamond and MSDS. Hydrogen peroxide was not stored within the secured and segregated perimeter. No secondary containment facility was in place. The breathing or venting ports used to store chemicals, which are oxidizing and critical to preventing an explosion, were not assessed and properly used per global practices. There was no primary emergency response team at the site to contain the explosion's impact before the fire service team could reach the site. All these deviations are gross-level chemical safety measures violations.

Both incidents mentioned above are classic examples of a lack of knowledge of chemical hazards, negligence in monitoring from stakeholders, and not implementing safeguards with a 360 view. A better matrix performance regarding safety records could be achieved by thoroughly assessing established guidelines in line with OSHA, ECHA, SCHC, etc., ensuring monitoring and implementation, and continuously validating them.

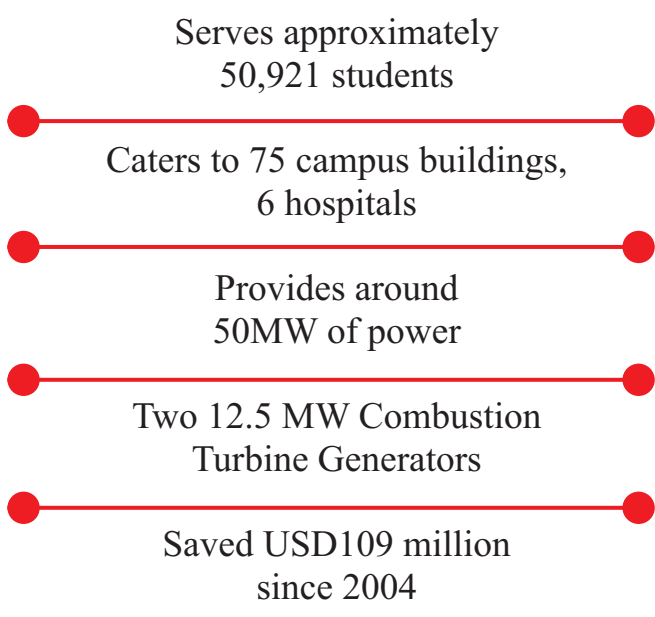
In a world where industrial compliance and safety protocols are getting more stringent daily, Bangladesh cannot move to the

next stage of industrialization without focusing on its industrial safety records in different domains. In the last decade, there have been visible efforts from the government, private sector, and regulatory bodies to improve its industrial safety performance. Yet, special attention is required to have a better result in the safer management of industrial chemicals. ■

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University of Cincinnati's sustainable power generation landscape

by Sid Thatham



IN AUGUST 2023, THE UNIVERSITY OF CINCINNATI (UC), USA, launched its new School of Environment and Sustainability Studies. As a recognized leader in this domain, the university preaches sustainability and practices the core principles in its day-to-day operations. We will look at one aspect of how this world-class research institute navigates the challenges of on-campus power generation as it strives to stay a beacon of sustainability.

Due to the diverse and large energy demand, it is not uncommon for US universities to have onsite power plants to provide electricity, heating, and cooling, in some cases for the institution and other infrastructures. With sustainability being a critical part of UC's Strategic Direction, UC's state-of-the-art district energy system exemplifies how universities can take up the challenge of producing energy sustainably.

As we step into UC's energy narrative, let's rewind to 1910, when the inaugural power plant graced the UC main campus, serving a mere 800 students. Fast forward to today, the plant now serves approximately 50,921 students. Alongside the affiliated hospitals, they collectively consume around 50MW of power. To put it in perspective, that's adequate to illuminate 40,000 Ohio homes. UC Utilities can comfortably cater to its 75 campus buildings and six hospitals. Having the ability to generate energy onsite also allowed the university to avoid tuition increases and helped in dedicating more resources to support health care, research, and education on campus.

As it keeps its promise to become greener, in 2018, UC started to procure wind-generated electricity to power up all four regional UC campuses and all off-campus UC buildings. This has not only reduced the cost of energy but will also reduce 117,234 tons of emissions by 2024 and is equivalent to eliminating more than 129 million pounds of coal or 291,222,285 miles driven by an average gasoline-powered passenger vehicle.

UC Utilities, the key organization that manages the production and distribution of energy, lives by the mantra that a 'World Class University' is to be supported by a 'World Class Utility.' The main workhorses that help enable this mission are two power plants known as the Central Utility Plant (CUP) on the Uptown West campus and the East Utility Plant (EUP) on the Uptown East campus. Geographically separated but united in purpose, they deliver electricity, steam, and chilled water through a 35-mile labyrinth of underground pipelines and tunnels. Both the power plants generate steam and chilled water for heating and cooling, respectively, but only CUP - a state-of-the-art, high-efficiency cogeneration plant, which is twice as efficient as most typical power plants in the region - generates electricity.

Cogeneration, the magic word here, is changing the energy landscape. At the heart of the CUP are two 12.5 MW Combustion Turbine Generators (CTGs), whirling into action as a hot mixture of air and natural gas combusts, and the combustion products surge through their turbine blades. This kinetic energy translates into electricity, but what about the waste heat from the combustion? Enter two Heat Recovery Steam Generator (HRSG) units, capturing this energy and converting water into steam using that waste heat. This steam, in turn, powers a steam turbine generator (STG), delivering even more electricity to the campus. This innovative system maximizes efficiency, ensuring every ounce of energy is put to good use.

This dual-generation system isn't just efficient; it's incredibly versatile. Depending on factors like season, demand, and fuel prices, UC can channel its electricity to the campus or feed it back into the grid. Alternatively, the recovered thermal energy can keep the campus warm, reducing the need for steam from the boilers.



The power plants generate steam and chilled water for heating and cooling. CUP - a state-of-the-art, high-efficiency cogeneration plant—twice as efficient as most typical power plants in the region—generates electricity.

This energy innovation translates into green savings, saving UC a staggering US\$109 million since 2004. It's a dynamic dance of energy, all orchestrated to cut costs and reduce UC's carbon footprint.

UC Utilities' energy endeavors go beyond just operations. As a preacher of sustainability, it offers a unique opportunity for the students to witness theoretical concepts in real-time action. From understanding the plant's operations and maintenance to diving deep into energy production, efficiency, and emission reduction, the university provides hands-on experiences that empower the minds of tomorrow.

These initiatives have paved the way for UC Utilities to be recognized internationally, including winning accolades like the Association of Energy Engineers' Institutional Energy Management of the Year. This transformative journey of a century can be a source of inspiration for organizations pursuing sustainability. ■

Sid Thatham is an Energy Engineer in the University of Cincinnati (UC) Department of Utilities. He graduated from UC with a master's in chemical engineering and an MBA. He also teaches as an adjunct in the university's College of Engineer and Applied Sciences.



Why smart grid is the way to energy efficiency

by **Sabit Ibtisam Anan**

AS THE EFFECTS OF climate change become more drastic, the need for a shift to cleaner alternatives and adaptive steps takes center stage. However, a relatively new frontier is starting to take shape, gaining prominence and importance. This is the shift from traditional electrical grid networks to a more intelligent network called the 'smart grid.' This technology utilizes sensors, Advanced Monitoring Systems (AMIs), communication networks, smart grid management, and Distributed Energy Resources (DER) to increase energy efficiency, minimize costs, reduce demand peaks, lower power cuts, power renewable energy systems, and allow data management.

Conventional grids vs smart grids

The fundamental difference between conventional grids and smart grids is the communication. Smart grids boast bidirectional communication, enabling various components like consumers, producers, sensors, and meters to communicate. This benefits many fronts as real-time monitoring, control, and management become easier. Communication between all the stakeholders

Traditional grid	Smart grid
One-way Communication	Bidirectional Communication
Centralized Power Generation	Distributed Power Generation
A radial system of network	Distributed Network
Manual Processes are necessary	Automatic Repair and Control are possible

increases the reliability and resilience of the grid, which traditional grids lack.

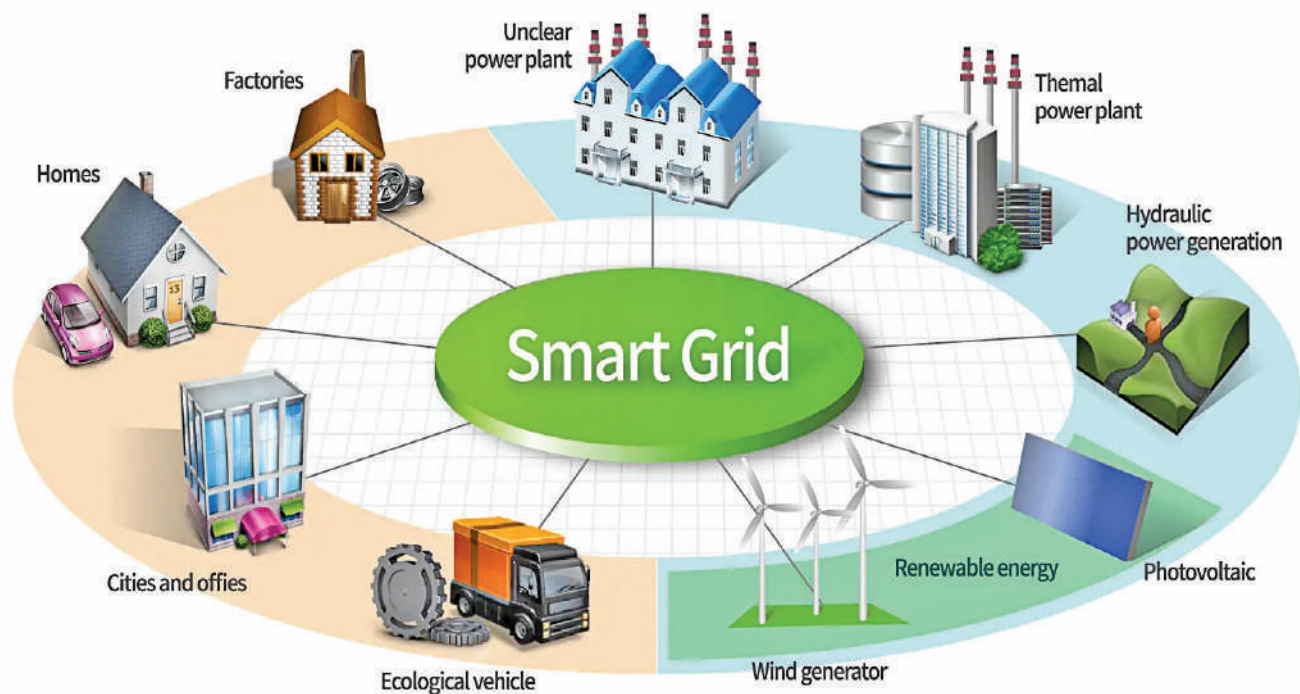
Our traditional grids have a radial topology, with only one centralized power source for every customer. As such, in case of a blackout or power cut, every single consumer has to suffer because there are no alternatives. However, the grid network in smart grids is distributed across power generators and utility companies, creating a harmonious ecosystem where energy is supplied as necessary.

Distributed Energy Resources

DERs are decentralized, small-scale energy generation systems gaining traction with the transition to renewables. These systems often act in a mini-grid infrastructure, generating renewable energy and disseminating it to the consumers. Usually, DERs are situated close to the consumers using them. One of the most prominent examples of DER is Tesla Energy's solar roofs, which generate real-time electricity and provide energy to the house.

Other Distributed Energy Resources include wind turbines, energy storage systems (like batteries, pumped hydro stations), electric Vehicles, biogas, and





biomass systems, etc. Combined Heat and Power (CHP) systems that produce electricity and heat simultaneously from a single energy source are also promising DERs.

A smart grid connects all these microelements into it. Unlike the traditional grid structure, the smart grid is not limited to the power-generating plant but all the PV solar panels or wind turbines in a particular region. A distributed system ensures that the load is distributed correctly and maximum energy efficiency is obtained.

Data and automation

As mentioned earlier, smart grids require smart meters to be installed. This ensures the storage and utilization of telematic and timely data from each consumer. Smart meters also enable data collection regarding energy wastage, peak hours, and energy use patterns. All of these data are transmitted in real-time to the main grid. This bidirectional communication ensures the real-time production and consumption of energy since the main grid would produce the needed energy at any given moment. This reduces system losses associated with storing energy.

Smart grids are also automated to a great extent, able to respond to emergencies without manual intervention. With the application of machine learning and the IoT, the need for manual intervention during emergencies may be completely cut off, as a specific grid will be able to understand and utilize past data to perform better in future instances.

Self-healing and repair

In the event of a disruption, smart grids can solve it independently. It can detect anomalies using meters and sensors. After initial detection, the grid isolates the faulty part with intelligent switches and protective devices. Then, the grid works to reroute power to the affected consumers immediately, whether via the energy storage systems or DERs. The smart grid employs sophisticated decision-making algorithms using real-time and past data to deal with new situations, and the technology is only getting better with recent advancements in machine learning.

Smart grid implementation

China, the USA, Germany, and Japan are the most advanced in

implementing smart meters and integrated grid technology. China, especially, leads in implementing advanced metering infrastructure, whereas the USA aims to reach 100% smart meter penetration by the next decade. Germany is leading the change in Europe, while Japan, Canada, Sweden, and Australia are all actively trying to integrate renewables into their grid through the smart grid.

While the upfront costs of transitioning to a smart grid infrastructure are high, increased energy efficiency and resilience give benefits many fold the original costs. A US research organization named Electric Power Research Institute estimates that at the cost of US\$338 to 476 billion for a complete transition to a smart grid, the US may save up to US\$2 trillion in energy costs in the next decade.

Smart grids can save anywhere from 5% to 20% of energy by utilizing demand-side management, grid loss reduction, and power quality improvements.

The road ahead

Smart grids make integrating distributed renewable energy sources into our energy sector easier. It enables communication, better energy efficiency, and usage. Researchers are trying to achieve an open energy market where every stakeholder in an expansive grid is an active load and can buy and sell the market as necessary. Suppose house A has solar roofs and generates more energy than it needs, while house B requires additional energy during peak hours. Thus, house B can buy that energy from house A, ensuring maximum energy utilization and economic profit.

There's a long road to this theoretical model of optimal energy usage, production, and distribution. The promise of AI and IoT does exacerbate our visions regarding how our future grids may look. Nevertheless, by taking incremental steps now, we can make our current grid much smarter, more operable, and transparent, reducing wastage and carbon footprint. ■

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British-Bangladeshi scientists transforming the field of medical study

by **Farabi Shayor**

IMPERIAL COLLEGE LONDON, THE sixth-best university in the world, involves the work of a few British-Bengali minds who changed how medicine is designed. And now, a few years later, the students are generating remarkable output, catching the tech industry's attention.

In 2015, one of the module leads at the Faculty of Medicine at Imperial shared an idea about how he's trying to change how students learn technology within medicine. The goal was to design a course to provide second-year MBBS students with practical experience and academic studies. After the proposal was accepted, the Imperial School of Medicine named the module 'CRI' or Clinical Research and Innovation.

CRI is a prominent and sought-after module in the school of medicine. Given the limited slots, students moving into the second year are presented with a form where they can choose a particular basket, such as technology. The premise of this module is to inspire students to become researchers and scientists and allow learning about technologies such as artificial intelligence. The overwhelming response from the students in 2017 brought to light how much of a lasting

effect CRI could have.

Dr. Sohag Saleh, a British scientist of Bangladeshi descent, was instrumental in developing this component. While Sohag designed and deployed the regimen, this writer was one of the 30+ faculty members and externals who was part of operations, leading small groups of students. As a scientist with the first-hand experience of overseeing a module at one of the top universities in the world, the writer will write about the profound effect that the CRI module had on the students and how Sohag's work in the School of Medicine has shifted the way students feel about their coursework.

The introduction of this module uncovered how many students were genuinely interested in fields such as MedTech, where they have the prospect to influence scientific endeavors as a doctor further. I have taught six classes since 2017, and the same remark amazes me: "I had no idea how much technology has progressed; in fact, I'm glad that I became privy to this world of startups."

As the Research Lead, I work closely with the students, planning and executing workshops. Sohag is the co-lead on my CRI experience; he occasionally joins me.



Sohag giving initial brief during CRI 2023

But as he took on bigger roles within the faculty, I continued managing the students. CRI makes up about 30% of the second year's weight; therefore, it is the most important module because they have to pass to move to the third year.

I have been in charge of computational neuroscience, virtual reality, AI, and blockchain research projects since 2017. In this piece of writing, nevertheless, I want to zero in on the class of 2023 since they are the ones who have impressed me.

Earlier this year, I hosted two groups of four who worked on the impact of artificial intelligence in MedTech. With ChatGPT being what it is, Sohag and I gave a lot of thought to producing solid research on AI rather than social media hype that's a few kilometers above the pinnacle of Everest. The word AI has become so unfashionably familiar that people have started to think of AI as a personal robot. But my teams needed to work on something extraordinary, challenging, and

CNN, the users will receive a reward for interacting with the application.

Kirthana and Kelina concentrated on creating a blockchain-based reward mechanism for the users. The idea was to provide them with blockchain-enabled tokens to be bartered as a reward once they fulfilled a specific target. Unlike other reward mechanisms, a blockchain-based incentivization program is fully automated. It uses a software development feature called 'Smart Contract,' widely used within the blockchain industry. After devising the prototype, team NUTRISCAN collected over 140 responses within five days. Any number above 100 is flabbergasting, given their limited time to collect data. After they analyzed their data, the team found something even more interesting.

When motivation is high, people tend to be receptive to ideas like 'streaks,' which count how many sequential days the users track their macros. But from the research, the team found that females tend to lose the motivation

to keep up with streaks. The streaks, if well-designed, can persuade users to continue for a long time, resulting in a sharp uptick in engagement. However, they found that females over the age of 25 tend to quickly lose that motivation, whereas males reach that stage at the age of 18. Older people, however, tend to stick with daily routines as they get into the process of habitual performance. In addition, 83% of the respondents chose AI to keep track of their nutrition, while 17% chose manual attempts, proving the demand for the app.

On the contrary, LUCID designed an app for scanning texts from posters or screens, which can be converted into

a far more readable format. An amalgamation of OCR and Google Vision AI can create functional benefits for users with special needs.

LUCID proposed the idea of an Augmented Reality app – the technical process was to use the camera to take pictures of posters and use a combination of AI-enabled Optical Character Recognition (OCR) to improve reading accessibility. LUCID's app used Apple's AR Kit, a platform created for developers to design augmented and mixed reality applications within Apple's ecosystem. Their product and research design primarily targeted people with visual challenges or neurodevelopmental disorders. Attention deficit hyperactivity disorder (ADHD) is a common condition that affects people's behaviors. In the UK, ADHD is listed as one of the mental health disabilities per the Mental Health Act (1990).

"It's very important to be able to modify the fonts of a document to make it more readable. Otherwise, it's dif-



Farabi, Research Lead (middle) with his team NUTRISCAN

doable. Their task was to design and develop an app, work on the AI architecture, design their research questionnaire, collect research participants, carry out the research, and produce the results in three weeks.

First, team NUTRISCAN developed the theory of using AI and blockchain to keep track of macronutrients. Kirthana from the team says, "The fundamentals are that someone would take a picture of their food, and the app would then use the food to track nutritional information."

Their closest market competitor, MyFitnessPal, has a similar feature, but to track macros, users must manually add the ingredients using a form. NUTRISCAN's idea was to automate the process, and for that, Khushi and Akshita designed a type of AI called Convolutional Neural Network or CNN. Unlike ChatGPT, a type of Large Language Model or LLM, NUTRISCAN's CNN is widely used for image detection and recognition. Once the images are scanned and processed using a

difficult to keep my attention span. And I read at least 20 to 30 documents daily," says one of the writer's friends, currently working as a legal consultant in London and participating in LUCID's research. "Adobe's OCR is very useful, but an app like LUCID can help many people with ADHD-related disorders."

Emily Wagner from LUCID says, "Mixed reality has a huge potential to break barriers within medicine, especially with accessibility and disability. The way that disabled people perceive the world differently from others can be a huge barrier for them. So, if mixed reality becomes more mainstream, we can add accessibility features and make people feel more connected. Right now, mixed reality is used largely as a gimmick; hopefully, we can push for it to use AR/XR for good."

LUCID's emphasis on altering the connotation from 'gimmick' to 'useful' exhibits how any emerging technology could benefit interactive platforms. If emerging technologies were designed to improve human usability, why isn't technology like XR or AR growing fast? The answer to this question may boil down to profitability. Any technology's potential is pushed through the bottleneck of strict commercial viability, and the gatekeepers at the end of that bottleneck are the towering profiteers with a profitable intention to hold end-users captive. Investors feed tens of millions to startups to expand at an accelerated rate. If a technology can be monetized easily, then it has the power to grow. Despite this reality, applications like LUCID must be in the limelight because its impact within MedTech exceeds its need for commercial utility.

Nevertheless, the capacity of a month-long module to alter students' frame of mind and push them into the open horizon of limitless career potential was the true motive behind CRI's creation. Over the past seven years, my team members have gone on to become presidents of different societies at the university, while others have taken the unusual route of completing a BSc in Business Management, intercalated with their MBBS degree.

Last year, during their final presentation, tech industry leaders Andrew (CEO, Plexal) and Russell (Director, Plexal) informed the students how impressive they were given their three-week tight deadline. CRI has formed a new cohort of innovators and entrepreneurs with an MBBS degree, paving the way to discover their secret talents as engineers, creators, and technologists. Callum from LUCID says, "It has opened my eyes and helped me realize what I can do and the opportunities I will have in the future."

CRI is a microcosm within academia. Typically, I wouldn't expect a group of individuals to sit in a meeting booth for eight hours at a time and get things done. Yet, they did. Further, during these three weeks at Plexal, they had a ton of fun, demonstrated by a film I posted on YouTube. There are also Instagram reels, such as the one with Akshita from NUTRISCAN, offering a tour of her office. The experience is designed to loop medical students into flows of technological transformation that can aid them for a lifetime. More notably, it teaches them teamwork under extreme pressure, illustrating how a cluster of skills can be exploited to build a startup idea.

"We've all worked together. We all had different perspectives, which is good for teamwork. It allows comprising different views because we all had different creative, analytical, or organizational strengths," shares Kelina Lowther-Harris from NUTRISCAN.



From left Khushi, Kelina and Kirthana from NUTRISCAN

While it's noteworthy that Imperial is compared to Ivy League, the people who worked for me are between 19-22. They believe that this module bettered develop their confidence and character.

Thanks to the idea of a British-Bangladeshi scientist and Imperial's continuous effort, it is now visible how a 30-day module can alter people's perceptions. AI has been taken out of the Pandora's box, and now, Sohag and our students are using it as an apparatus to stem pathways that will make space for doctors with immense talent. ■

Farabi Shayor is a 2X author, consultant, and scientist recognized by the Science Council in the UK. He's a British resident of Bangladeshi lineage and works with both the public (government) and private sector, providing technology consulting services.

Impressive biomedical progress reshaping Bangladesh's healthcare

by **Rafia Hasnat Jinia**

EMBRACING THE UNDENIABLE connection between health and progress, the Bangladesh government places a high premium on fostering a vibrant and thriving populace. The achievements that followed are elongated life expectancies, subdued infectious diseases, and a marked decline in infant and maternal mortality rates. Yet, this is not everything; it's a call to elevate healthcare's progress further, echoed by a government dispensing incentives for future growth.

Bangladesh is doing remarkably well with biomedical technologies in reshaping the healthcare landscape. Over the past few years, the nation has achieved unprecedented strides, with an almost 20% increase in adopting advanced medical technologies. However, challenges like limited resources and digital literacy have hindered rapid and comprehensive adoption.

Point-of-care diagnostics: Point-of-care diagnostic technologies shine in places where resources are scarce and precise diagnoses are a must. They swiftly and accurately identify diseases, slashing the wait for results and treatment. This is a game-changer for infectious diseases. Keeping these devices accurate and accessible in remote corners, all while tackling the financial puzzle of equipment and tests, is challenging.

Biomedical imaging and radiology: Unveiling medical mysteries, biomedical imaging leaps beyond traditional diagnostics, for instance, MRI, CT scans, and ultrasonograms, revealing hidden stories within patients' bodies and guiding precise treatments.

Telemedicine and telehealth solutions: Telemedicine is thriving in Bangladesh, aiding people in remote areas lacking healthcare access. Patients from remote areas can access virtual consultations with top specialists from urban medical centers facilitated by telemedicine. Over 1.5 million individuals now benefit from virtual consultations with specialists from urban centers. This tech-



nology offers promising healthcare enhancements but faces rural internet issues, digital literacy barriers, data privacy and security, etc.

However, the high costs associated with acquiring and maintaining ad-

vanced imaging equipment, the shortage of skilled radiologists, and the uneven distribution of equipment across the country are some challenges that need to be handled.

High-end medical technologies: Imagine a world where intricate medical devices become extensions of the human body, seamlessly integrating with the intricate dance of life. From revolutionary cochlear implants that awaken the symphony of sound for deaf people to cardiac implants that beat in harmony with failing hearts, these technological marvels redefine what it means to heal and thrive. The medical device sector demonstrated growth, with a 10% import CAGR, exceeding the global average. However, the industry's dependence on imports, especially for diagnostic equipment, highlights the need for local manufacturing and technological advancement.

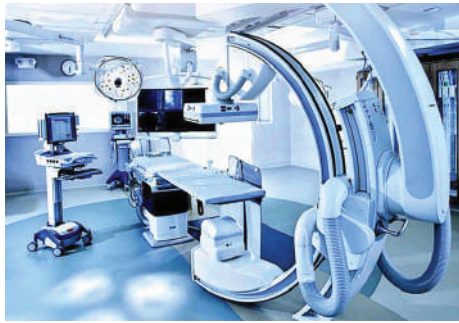
Electronic Health Records or EHR systems cater to healthcare providers, hospitals, and clinics, aiming to streamline patient data management. EHR systems digitize patient records, improving efficiency in healthcare services, reducing paperwork, and enabling better coordination among medical professionals. Resistance to adopting new technology among healthcare providers and concerns about data security are the main challenges in this sector.

Bangladesh's progress: When compared to more developed countries, certain disparities become evident. Developed nations often enjoy better access to cutting-edge medical technologies, advanced equipment, and higher healthcare spending per capita. Bangladesh, while progressing, faces challenges related to healthcare infrastructure, funding, and quality of care.

Leading local players in the sector are progressing fast.

Renata Limited pioneers research, yielding innovative pharmaceuticals and animal health products. ACI Limited and Orion Pharma diversify healthcare solutions, while Labaid Group makes a mark with hospitals, diagnostics, and pharmacies. There are around ten manufacturers of medical devices and accessories, including JMI, Getwell, Opso Saline, Techno Drugs, Incepta Pharmaceuticals, Bi-beat and Promixco, The Bio Ltd.

Challenges and opportunities: Bangladesh's healthcare sector faces challenges with low healthcare expenditure, including minimal government allocation. The budget allocation for healthcare is around 5% in the current fiscal, falling short of needs. High out-of-pocket spending at 73% and low insurance coverage at 0.5% place financial burdens on individuals. However, health expenditure per capita rose from USD 9 in 2000 to USD 46 in 2019, indicating growing awareness of healthcare investment.



On the other hand, meager health allocation per person, insufficient service infrastructure, and financial obstacles



in fighting malnutrition are sidelined due to the inadequate and misdirected use of funds. Addressing these challenges needs boosting healthcare funding, improving insurance coverage, and enhancing domestic

production capabilities. Key steps include increasing funding, investing in healthcare infrastructure, and promoting human resources development. Embracing technology through integrating digital health platforms and telemedicine can bridge gaps and enhance access. Collaborations between the government, private sector, and non-governmental organizations can leverage resources, expertise, and technology to address healthcare challenges. Overall, a holistic approach is necessary to elevate Bangladesh's medical device and health sector. ■

Rafia Hasnat Jinia is a tech enthusiast and BUET graduate, currently shaping the future as a Product Development Engineer at The Bio Ltd, a sister concern of YGEN Engineering Ltd.

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The landscape of patient support programs

by **Dr. Imtiaz Ahmed**

FOR DIABETIC PATIENTS VISITING PHYSICIANS in BIRDEM hospital, there is a special corner. Patients prescribed insulin for the first time would be advised to go there. Administration of this drug may be tricky. That is why they are referred to that section, where qualified trainers teach them how to take insulin and answer other questions about the drug's preservation, administration, and adverse effects.

In short, this is what a patient support program (PSP) does. However, the scope of a PSP is broader, and educational activities are only a part of it. The objective of a PSP is to ease access to medication and support them to maintain adherence to the prescribed treatment. This is particularly useful for patients with complex and chronic diseases, e.g., cancer, neurological disease, cardiac conditions, rheumatological disorder, etc. These patients often require lifetime treatment, thus imposing huge monetary and psychological burdens on the patients and caregivers. They need support to help them continue the therapy.

Pharmaceutical companies or health-care providers can design PSPs. They are thought to be critical for a better patient outcome. They can help improve the standard of care and quality of life. For Pharma companies, that may also translate to retention of patients on the prescribed medicine and opportunities for more penetration into the target customers. PSPs can enroll patients who have never had a particular medicine and help keep them on it if the benefits outweigh the risks.

There are many varieties of PSPs worldwide. Some focus on educating patients on the disease and drug, and some provide financial assistance by subsidizing costs; some offer special support to administer the medicine, and others may offer a comprehensive approach throughout the entire life cycle of the therapy. They are important for the healthcare industry to increase access to medicine, improve the chances of treatment success, and act as a source of real-world data that can be leveraged for the betterment of care.

A patient's journey through the PSP starts after a diagnosis is made and the physician decides on a treatment plan. If there is a PSP for that treatment, and the patient meets the eligibility criteria,

then the physician can inform them about the available support. If the patient agrees, the physician is usually the one who enrolls them in the program.

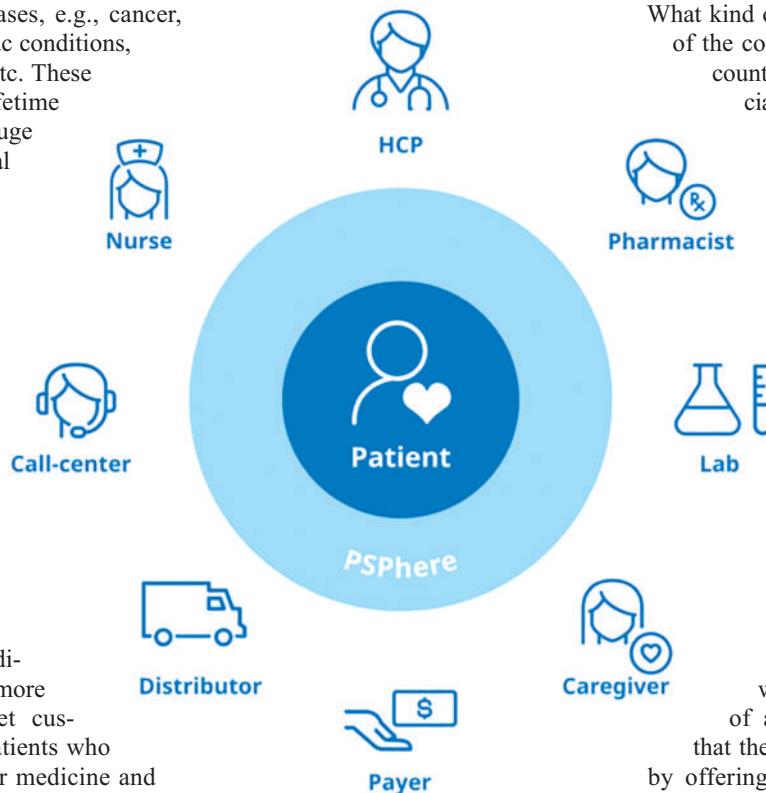
In the next step, the program staff communicates with the patient and collects the necessary information to set them up with the offered services. There is a follow-up system to make sure patients are complying with treatment. There is coordination among the patient, PSP, and the physician to make sure there is no issue with the quality of care. It must be stressed that the program staff only proceeds when the patient provides explicit consent. The consent can be withdrawn anytime, and the patient can leave the PSP as they please.

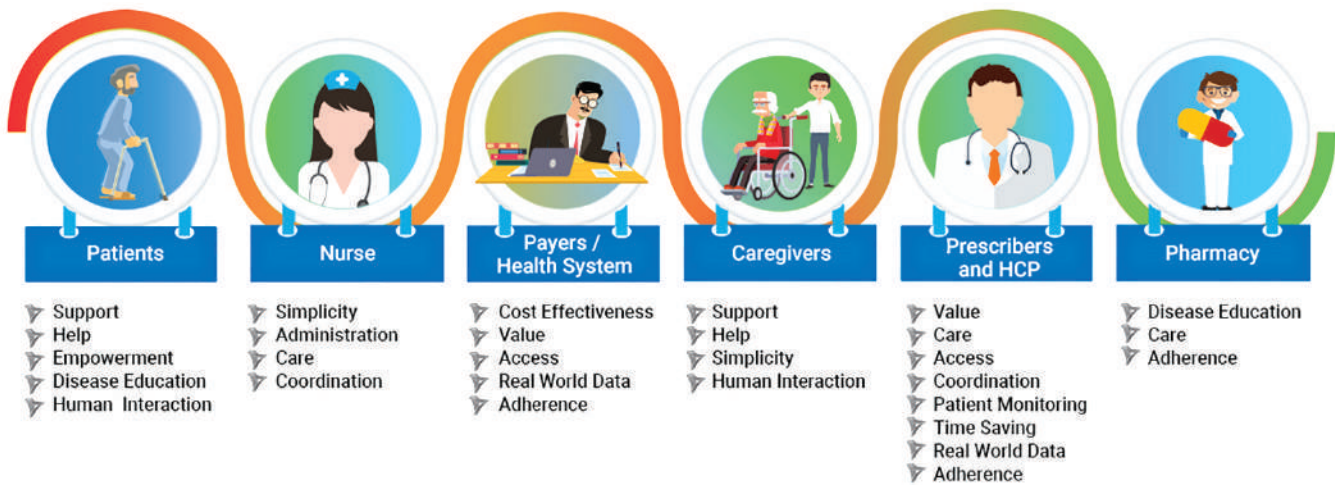
What kind of services can PSP offer? One of the commonest is cost rebate or discount. There are a lot of drugs, especially for chronic diseases, that are prohibitively expensive. These are usually drugs with existing patents. There are low-cost generics in countries like Bangladesh, where patent law is not applicable. However, physicians may prefer the safety and effectiveness of a research-based original molecule if there is a way to make it affordable for the patients.

Another aspect of the PSP is education. Just like insulin administration training, patients can be educated about the disease, which improves the likelihood of adherence. This is something that the PSPs can separately reinforce by offering regular checks by nurses or pharmacists through phone or email.

Physicians usually view PSPs as complementary to their service. Patient adherence is critical to success but is not discussed in detail during routine consultations due to time constraints. So, if a PSP works on adherence, physicians can refer the patients there. Also, if the cost of the drug is too high, but the physician feels it is the only option, they can certainly use the support of PSPs.

According to Christina Jackson, behavioral psychologist of an international organization, Sprout Health Solutions, when developed with proper expertise and specific focus, PSPs can reduce workloads for the health care providers (HCPs) by addressing challenges that do not generally fall under the purview of regular consultation. Such





PSPs can positively include patients in their own treatment and help reduce the frequency of hospital and clinic visits.

Based on research by Iqvia Consulting, PSPs can make a real positive change in the treatment. Their data showed that after spending one year in a PSP, the adherence rate was better for 90% of the patients, and 61% had a better outcome than non-enrolled patients. Deloitte also analyzed similar data and concluded that PSPs can empower patients and foster better relationships with their physicians.

The scope of PSP has broadened. Even a decade ago, their main goal was to reduce the cost to increase access. But they have evolved, and nowadays, many programs are concerned with overall

about it from a physician, and 10% found it online.

PSPs can do a lot of good. So, patients must be engaged more meaningfully so the information is available to more and more of them. This may require a coordinated effort among the PSP provider, HCPs, and probably patient advocacy groups.

Pharma companies should look to partner with pharmacies with materials on-site or to get pharmacists to engage. Another suggestion is building omnichannel patient support programs that can reach the correct, targeted audience where they are spending time online already.

There are concerns, definitely, especially in terms of data privacy. That is a challenge not only for PSPs but for any business

DRUG



DEVICE



VACCINE



care, not only the financial aspect. There is a push towards a holistic approach, where an enrolled patient can get all required services from one platform. Such an approach aims to maximize the number of patients receiving the right drug and mitigate barriers that prevent or delay such receipt. With technological advances, including AI, we can see a future where integrated care would be possible.

Aaron Hall, Associate Creative Director from the international marketing agency Purple Agency, highlighted the changes technology can bring. According to him, technology changed how HCPs and patients interact and created more opportunities to gather and analyze data from the field.

The main challenge of PSP is that many patients are unaware of it. According to FierceHealthcare, pharmaceutical manufacturers spend about 5 billion dollars yearly on PSP, but only 3% are enrolled. They surveyed 5,000 people. Only 23% knew PSPs existed. Even if the patients know about the PSPs, many are unaware of how they can benefit. Of the 23% who knew of PSPs, 55% learned

nowadays. PSPs collect sensitive patient data, so they must employ stringent safeguards to protect it. Based on their geographical territory, they also need to fulfill government regulations.

In the end, it can be said with confidence that with proper structure and expertise, a PSP is a great tool for patients to increase the likelihood of a positive outcome. Not only that, PSPs can help them feel involved in the decision-making process. Charlotte Maule, director at healthcare public relations agency Anthem, emphasized that it is the desire for most patients to be an active part of the disease management process. PSPs can empower them to achieve that goal. ■

Dr. Imtiaz Ahmed is a medical graduate from Dhaka Medical College with over eight years of experience in global pharmaceuticals. He is involved in improving the quality of care for the betterment of the patients.
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Intersecting technology and medical services through data

by **Siyam Mahboob Dhrubo**

"Data really powers everything that we do."
— Jeff Weiner, Executive Chairman, LinkedIn

TECHNOLOGY INFLUENCES EACH ASPECT OF our everyday lives. Gadgets integral to our daily lives, including smartphones, computers, and wearables, regularly produce enormous volumes of data. From weather forecasts to Netflix movie recommendations, data is everywhere. It's merely a collection of facts and figures of our lives, yet power is often associated with it in today's society. Crucial business decisions, trend identification, and customer experience improvement all depend on this single resource. Consequently, it has created many commercial opportunities, whether they are aimed at making a profit or saving lives.

Healthcare data on an enterprise and consumer level

Healthcare data is a vital component of today's hype on analytics. The value of the global healthcare analytics market was US\$ 23.51 billion in 2020, and it is expected to grow to US\$ 96.90 billion by 2030, growing at a CAGR of 15.3% between 2021 and 2030. North America had the lead in healthcare analytics in 2020, and it is anticipated to continue to do so shortly.

Visiting the doctor and taking recommended medical tests are essentially actions for gathering data. In addition to monitoring the patient, doctors need diagnostic tests to confirm their first suspicions about particular disorders. Data collection is the foundation of medical diagnosis, and its effectiveness will increase as it gets more accessible and precise. Diagnosed data offer a comprehensive picture of the patient's health and are utilized to spot trends. It can be challenging and time-consuming to manually discover patterns, trends, and solutions from large amounts of data. The use of data analytics assists healthcare professionals to assess patients and come up with better diagnoses.

Big data is reshaping the healthcare environment. The landscape

The landscape of healthcare analytics has been drastically altered by wearable technology such as fitness trackers, health sensors, and smartwatches. Combining health data with technology enables medical providers to design individualized treatment plans, enhance diagnostics, and conduct proactive health monitoring

of healthcare analytics is shaped primarily by medical databases on a B2B (Business-to-Business) level and health tracking gadgets on the B2C (Business-to-Consumer) level. Medical personnel can access patient information via Electronic Health Records (EHRs) at any time and from a central location.

On the other hand, the landscape of healthcare analytics has been drastically altered by wearable technology such as fitness trackers, health sensors, and smartwatches. Combining health data with technology enables medical providers to design individualized treatment plans, enhance diagnostics, and conduct proactive health monitoring.

Business trends based on healthcare data

The rising trend of minimizing the gap between healthcare and technology has given rise to two streams of businesses - enterprise healthcare analytics and consumer health gadgets.

Healthcare data analysis services contribute to streamlining healthcare processes and improving patient experience. Veradigm, Cerner Corporation, IBM Corporation, McKesson Corporation, MedAnalytics, Inc., Oracle Corporation, and SAS Institute are the

Top industries using big data

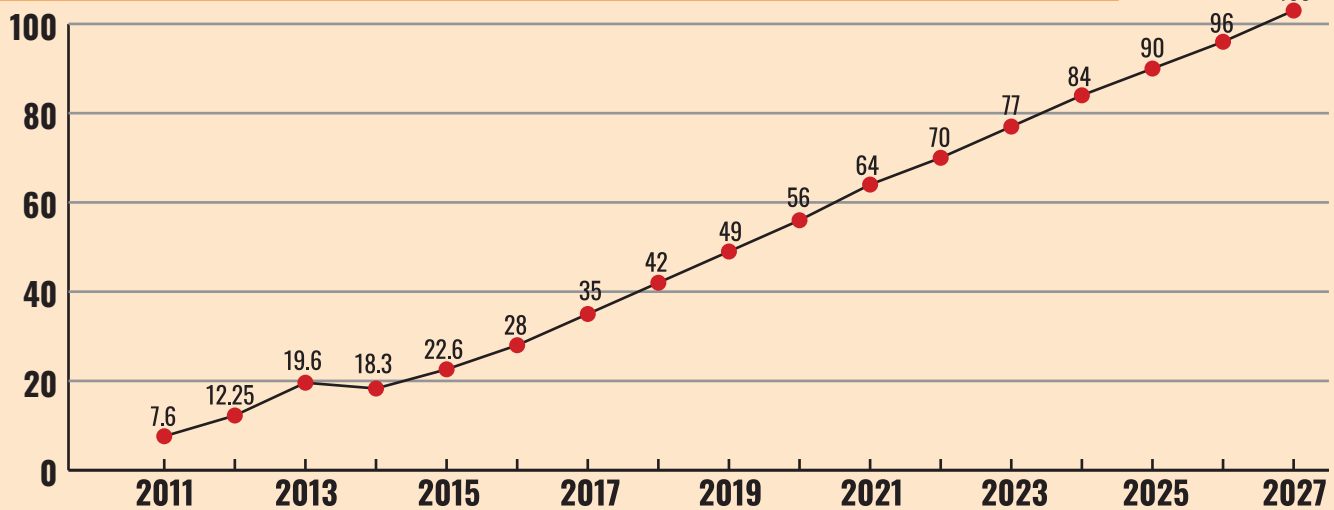
1. Banking and Financial Services
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2,500,000,000,000,000,000

bytes of data generated per day by internet users

Source: Statista

Worldwide big data revenue forecast (in billion USD)



significant companies competing in the healthcare analytics market. Their products and services are changing the dynamics between two distinct domains - healthcare professionals and tech companies.

- **Clinical data:** Electronic Health Records (EHRs) are the most popular clinical data form. EHRs improve patient care by tracking treatment progress, identifying health trends, disease prevalence, and scope of intervention to curb epidemics. Healthcare professionals utilize this data to identify potential risks to prevent and treat diseases.
- **Pharmaceutical data:** EHR carries information about drugs and their effect on a patient's body. This accelerates the development of drugs, pushes clinical trials, and allows for post-market surveillance of drug performance. During the early stages of the COVID-19 pandemic, Google's DeepMind AI aided the creation of a 3D model of the coronavirus protein. This model contributed to developing COVID-19 vaccines by improving researchers' understanding of the virus.
- **Behavioral data:** A patient's habits, including nutrition, exercise, smoking, and other behaviors, play a significant role in how well they can function. Understanding the likelihood of contracting chronic diseases like heart disease, diabetes, and obesity is facilitated by health and behavioral data.

On the other end are consumer-level health-tracking devices - fitness trackers, health sensors, and smartwatches. The key players in the wearables industry are Apple, FitBit, and Garmin, representing US\$ 41.24 billion, US\$ 1.16 billion, and US\$ 4.86 billion in revenue, respectively, in 2022. Smartwatches and fitness trackers are the most popular choice among wearable devices among consumers. Smartwatches these days can record precise information related to our bodies.

The Apple Watch Series 8, the most recent model, can record steps taken, flights of stairs climbed, walking data, ear audio levels, sleep history, heart rate, blood oxygen levels, and electrocardiograms (ECGs) to detect irregular heart rhythms. Specialized wearables, such as glucose meters, blood pressure monitors, ECG monitors, and fitness trackers, are commonly available in the market. These devices produce a multitude of health indicators, much of which is the backbone of developing Electronic Health Records (EHRs) for medical usage. As more health-tracking devices enter the global market, the important question is: Can and should the

data from consumer electronics devices be used for medical purposes?

Feasibility of utilizing consumer-level data for medical purposes venturing into this domain requires a bit of skepticism. Medical equipment and medical data are highly precise and subject to stringent protocols. Even though consumer electronic devices ease the data collection procedure, concerns regarding precision, reliability, and standardization of health data collected from these devices inevitably rise. As consumer devices lack clinical precision, the potential of this data hinges on a balance between convenience and accuracy. In this regard, providing medical certifications for such devices should be the way forward.

Apple and FitBit offer devices capable of tracking heart rates and conducting an electrocardiogram (ECG) by assessing heart rhythms. Behind the hardware curtain, this feature is powered by complex algorithms that monitor heart rates and make a predictive analysis of irregular rhythms. Apple's irregular heart rhythm notification has a 99.3% detection specificity, and this algorithm was cleared by the U.S. Food and Drug Administration (FDA). Similarly, FitBit's irregular heart rhythm notifications are powered by an algorithm with a 98% positive predictive rate, which the FDA also approved. Adding a layer of certification makes medical data collected from these devices standardized and ready to use for clinical purposes. On the device manufacturer's part, branding certifications should prove to be a vital strategy to increase the acceptability of data from consumer devices being used for medical purposes.

Days of getting medical diagnoses done from the comfort of our homes are still far from being commonplace. As the industry grows, healthcare and tech organizations will face increased collaboration and reshape healthcare approaches. This dynamic can potentially lay the foundation for a new era of patient-centric care. However, the seamless integration of wearables with the human body is still a nascent industry, and the widespread availability of smartwatches and fitness trackers is just the beginning. For now, these gadgets are good at analyzing solely behavioral data and spotting lifestyle discrepancies. ■

Siyam Mahboob Dhrubo is an avid tech enthusiast. He dreams of turning his diecast cars into real ones and you'll find him watching documentaries when bored.
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Stable economic growth A comparative analysis of Bangladesh and Turkey

by **Syed Raiyan Amir**

OVER THE PAST FOUR DECADES, TURKEY AND Bangladesh have undergone transformative economic journeys that have reshaped their economic landscapes. Both nations have embraced economic liberalization and export-led growth strategies to fuel development and achieve remarkable milestones. This writer has tried to examine the economic transitions of Turkey and Bangladesh, exploring their paths to liberalization, export-oriented strategies, labor force dynamics, infrastructure development, and the role of remittances in shaping their economies.

Economic liberalization paradigm shift

Turkey's economic evolution over the last 40 years represents a significant milestone marked by a radical shift towards liberalization. Initiated through a series of decisions on January 24, 1980, this transformative step aimed to reshape the nation's economy through comprehensive structural reforms. The paradigm shift underpinned adopting a free market economy approach, enlivening the economic landscape with newfound vitality.

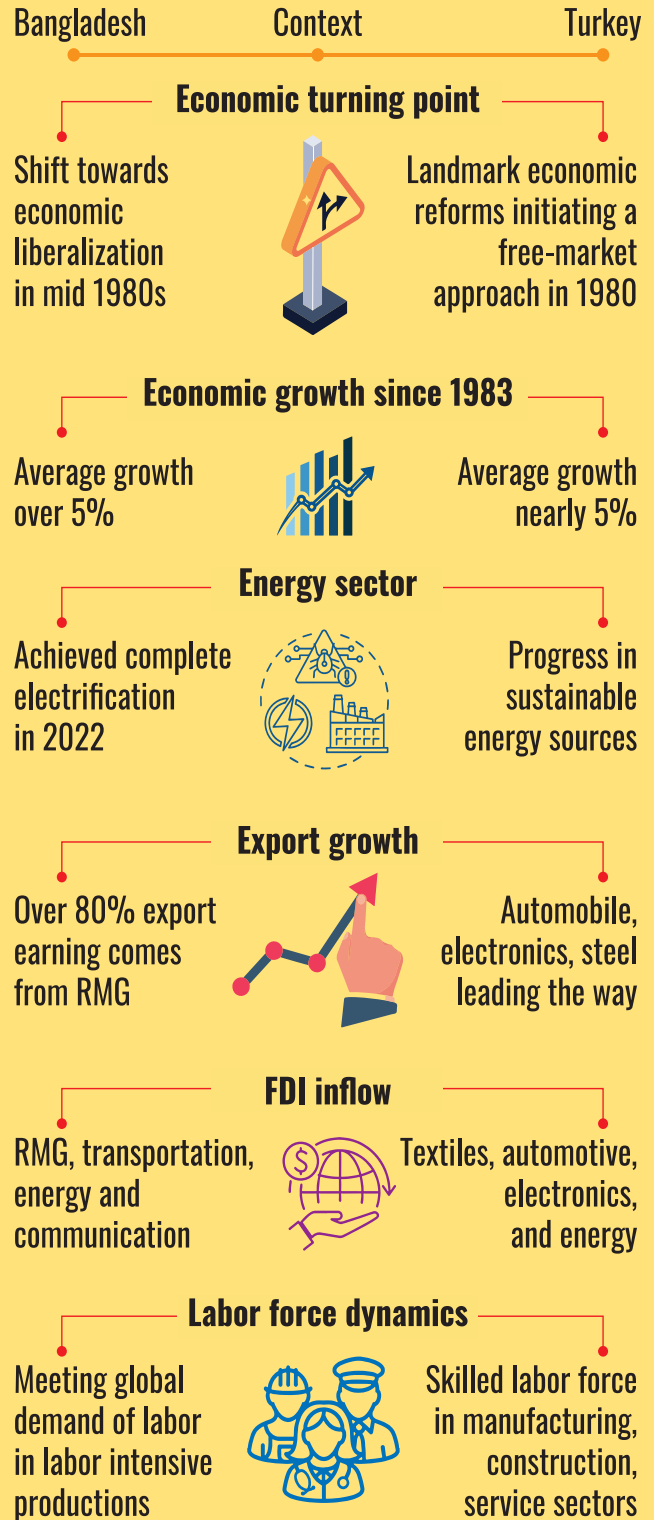
Spearheaded by Suleyman Demirel, who later held the presidency and orchestrated by Turgut Ozal, the then-Prime Ministry Undersecretary, this economic transition bore witness to a stability package meticulously formulated on January 24, 1980. While recognized as a landmark moment in Turkey's economic trajectory, scholars assert that the subsequent endeavors failed to realize long-term aspirations despite yielding immediate advancements.

In Bangladesh, the administration unveiled a new industrial policy around the middle of the 1980s. By the late 1980s, Bangladesh had begun liberalizing its commerce, gradually moving away from the earlier emphasis on import substitution. Although the public sector has continued to dominate the economy, over time, the state has also taken advantage of the natural entrepreneurial spirit seen in rural areas and among private producers.

Economic diversification and growth

Turkey's economic evolution during the examined period has encompassed a shift from an agricultural to an industrial framework post-1982. Turkey has maintained an impressive average annual growth rate of 5% in gross national production since 1983, positioning it promi-

Comparative analysis of the economic journey of Bangladesh and Turkey



nently within the ranks of OECD countries. However, this growth trajectory has been marked by intermittent patterns. Noteworthy is the linkage between recent economic expansion and the privatization of public enterprises, a trend aligned with global economic currents. Turkey's burgeoning energy demands have also corresponded to social and economic advancements. As the country's energy consumption surged since the early 1980s, the government proactively engaged both foreign and domestic investors to establish new generation power plants, aligning with a projected growth trajectory anticipating a \$55 billion energy sector by 2015.

Bangladesh's available workforce facilitated production escalation, meeting global demand and driving economic growth. Turkey harnessed its manufacturing, construction, and services labor force, aiding industry expansion and economic diversification

With domestic coal, geothermal, and hydropower resources amounting to only 1% of the global total, Turkey's dependence on energy imports remains pronounced. They now focus on a reliable, economically viable, and environmentally sustainable energy supply to bolster growth and social development. Turkey's progress in wind energy is evident, exemplified by reaching a cumulative wind energy capacity of 10,000 MW, a substantial accomplishment within a decade.

In the case of Bangladesh, the country still relies heavily on agriculture for internal consumption, but the foreign currency has its unique feature of the garments industry. Bangladesh has wrapped up another fiscal year, and the recently published export figures for FY2021-22 indicate a significant achievement in the Ready-Made Garments (RMG) sector. The RMG exports have surged to USD 42.61 billion, marking a momentous milestone. This accomplishment is historic for Bangladesh's RMG manufacturing, surpassing the 40 billion dollar mark and representing four decades of remarkable journey.

In 2022, Bangladesh achieved complete electrification, a remarkable feat considering its population of 164 million. The power sector has thrived, with maximum power production increasing from 3,268 MW to 13,792 MW over the 13 years and installed capacity growing from 4,942 MW to 25,514 MW. Bangladesh's strategic diplomacy has ensured energy stability through pacts and MoUs with Saudi Arabia, India, Qatar, Japan, Russia, and more. Ongoing efforts towards renewable energy promise a sustainable energy mix for the future. Therefore, the energy sector showcases a notable diversity in its import sources and production methods.

Export-led growth strategy

Bangladesh

Bangladesh's economic journey has been notably characterized by its strategic emphasis on export-led growth. Bangladesh rapidly became a global textile and apparel manufacturing hub by leveraging its low-cost labor advantage. This approach enabled the country to tap into international markets, create millions of jobs, and significantly contribute to its GDP. The textile sector's growth has uplifted Bangladesh's economy and played a crucial role in empowering

women through employment opportunities. After China, Bangladesh is the world's second-largest exporter of textile and apparel products. The Ready-made Garments (RMG) industry plays a crucial role, contributing approximately 80% to Bangladesh's overall export earnings and accounting for around 10.5% of the nation's GDP.

In the fiscal year 2014-15, Bangladesh generated a revenue of approximately US\$25 billion from the export of ready-made garments. Knitwear products from domestically knitted fabrics enjoy privileged access to duty-free or zero-tariff markets in the EU, Japan, Australia, Norway, and Canada. Bangladesh is a major supplier of knit items to the European Union.

Turkey

Turkey, too, adopted an export-oriented growth strategy that helped transform its economy. Like Bangladesh, the country focused on its manufacturing sector, particularly textiles and automotive manufacturing. Turkey's strategic location bridging Europe and Asia and its skilled labor force contributed to its success in exporting goods to global markets. The automotive sector, in particular, witnessed remarkable growth, with Turkish-made vehicles gaining prominence in international markets.

The export-led strategy enhanced Turkey's economic resilience and created a solid foundation for sustained growth.

Like Bangladesh's RMG industry, Turkey gradually made a significant footprint over the last 40 years. Turkey, a pivotal source of raw materials for the textile industry, assumed an increasingly substantive role in the advancement of the textile sector during subsequent years. Until 1972, the sector witnessed enhanced vigor attributed to finalizing the initial planned development phase, and the period spanning from 1980 to 1989 marked an epoch of international market penetration.

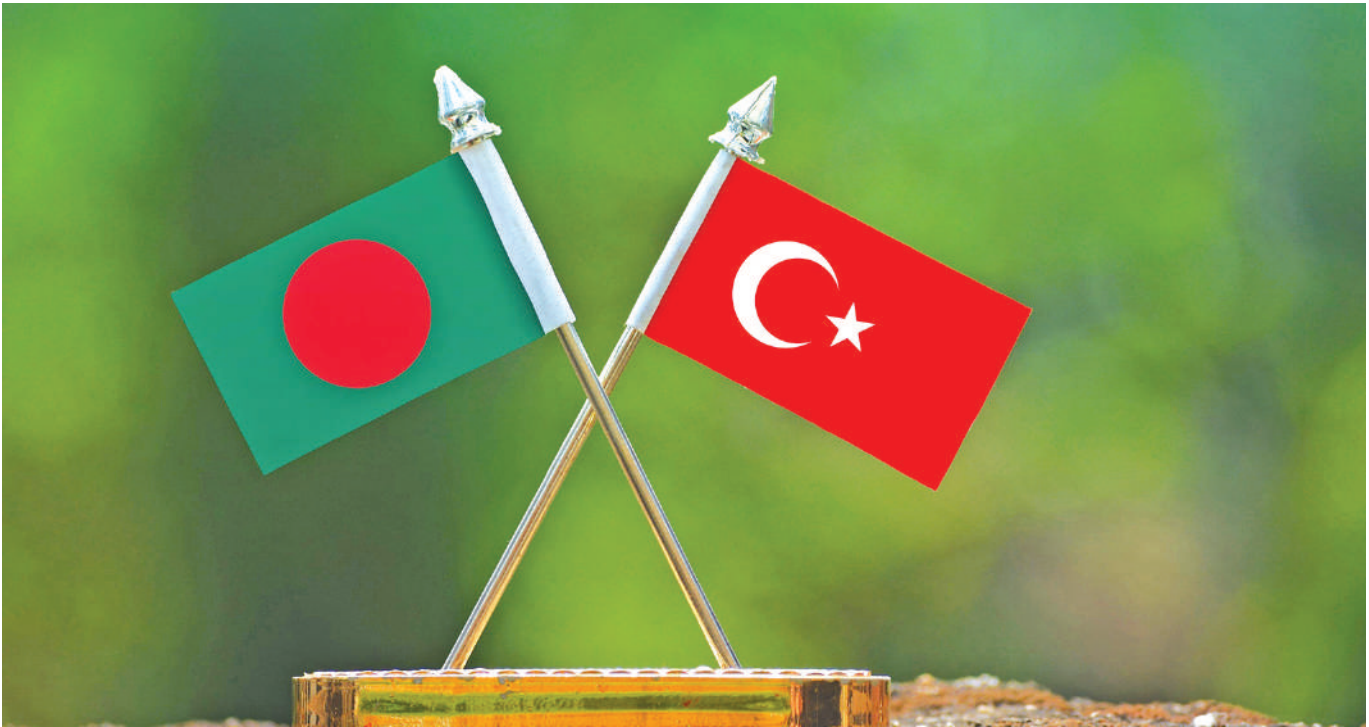
In the 1990s, the textile sector's contribution to the aggregate Turkish exports surged, attaining 9.3% while displaying a pronounced export performance. Presently, the textile industry is a pivotal constituent of the Turkish economic framework, garnering eminence through its

Turkey's liberalization yielded impressive growth rates and energy sector expansion, Bangladesh's dedication to the ready-made garments industry transformed its export landscape

export valuation, reaching an appreciable sum of 5.4 billion dollars.

Diverse sectors of advancement

Remittances have emerged as a substantial contributor to Bangladesh's economy. With a gradual increase in Bangladeshi emigrant workers, the annual influx of remittances to the country has shown remarkable growth. The initiation of the Wage Earners' Scheme in 1974 aimed to facilitate legitimate remittance channels for Non-resident Bangladeshis, garnering popularity among those working abroad. In the fiscal year 1974-75, remittances totaling \$11.8 million were received in Bangladesh. This figure surged to exceed \$350 million in the fiscal year 1980-81 and surpassed \$750 million in the fiscal year 1990-91. Remittances in Bangladesh observed an uptick,



rising to 2199.01 USD Million in June from the preceding figure of 1691.66 USD Million recorded in May 2023.

On the other hand, It has been over four decades since the commencement of extensive migration from Turkey to various regions across the globe. Originating with a small number in the early 1960s, the movement burgeoned significantly. By the early 2000s, even as Turkey's population approached approximately 70 million, the number of Turkish workers and their families in Europe exceeded three million. There were more than 100,000 Turkish laborers (excluding dependents due to restrictions) in Arab nations, nearly 300,000 settlers distributed across Australia, Canada, and the USA, and an additional approximately 50,000 workers positioned in the CIS countries.

Consequently, throughout these years, a substantial fraction—approximately 6%—of Turkey's populace resided abroad at any given time. Central Bank of Turkey statistics reveal that a cumulative amount exceeding \$75 billion has been remitted to Turkey since the inception of the 1960s, yielding an average annual sum of \$1.9 billion. Nonetheless, the yearly remittance inflow exhibited fluctuations.

However, a consistent upward trajectory becomes apparent when assessing the broader trend. In the 1970s, the yearly average remittance figure stood at approximately \$1.5 billion, which escalated to \$2.3 billion in the 1980s and further elevated to \$3.3 billion in the 1990s. Over the preceding thirty years, remittances collectively emerged as a pivotal and substantial contribution to the Turkish economy. It has been a key component for both countries. Bangladesh's diaspora sent remittances, stabilizing the balance of payments and enhancing household incomes. Turkey's expatriates contributed to foreign exchange reserves, supporting families and bolstering consumer spending.

Both Bangladesh and Turkey have acknowledged the pivotal role of Foreign Direct Investment (FDI) in driving economic growth. In Bangladesh, FDI has been instrumental in expanding industries, developing infrastructure, and creating jobs. Competitive labor costs and investment-friendly policies have attracted foreign investors, particularly in the ready-made garment sector, ushering in capital, technology, and expertise for overall modernization.

Turkey, too, leveraged FDI to enhance its economic landscape. A

substantial consumer base, skilled workforce, and strategic location enticed foreign investors aiming to access European and Middle Eastern markets. FDI flowed into textiles, automotive, electronics, and energy sectors, boosting production capacity, product quality, and global supply chains through domestic-foreign partnerships.

Both nations recognized infrastructure as pivotal for growth. Bangladesh invested in transportation, energy, and communication, facilitating connectivity and efficient trade. Turkey's infrastructure projects, including highways and airports, improved domestic and global connectivity, attracting foreign investment and boosting tourism.

Bangladesh and Turkey share a youthful labor force that fueled labor-intensive sectors. Bangladesh's available workforce facilitated production escalation, meeting global demand and driving economic growth. Turkey harnessed its manufacturing, construction, and services labor force, aiding industry expansion and economic diversification.

Stable economic growth

In retrospect, the economic narratives of Turkey and Bangladesh reveal remarkable parallelisms and distinct trajectories. Both nations have shifted towards economic liberalization, engaging in strategic export-led growth to propel development.

Turkey's diversified approach, marked by its transition from an agrarian to an industrial economy, mirrors Bangladesh's focus on becoming a textile and apparel manufacturing powerhouse. Remittances have played pivotal roles in both economies, supporting financial stability and driving consumption. While Turkey's liberalization yielded impressive growth rates and energy sector expansion, Bangladesh's dedication to the ready-made garments industry transformed its export landscape.

Despite unique contexts, these two nations serve as valuable case studies for nations seeking sustainable growth through economic liberalization and export-focused strategies. ■

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Textile industry in Bangladesh Provide the same to the locals and see the magic!

by **Md. Imran**

BANGLADESH IS ONE THE LEADING exporters of the best quality garments globally. Why is the country providing a different quality of garments to the local people? There is a huge gap between exporting fabrics to the world and the fabrics Bangladeshi people wear both in terms of aesthetics and quality. Expressing her frustration, concern, and, at the same time, love for the people of Bangladesh, Kehkashan Shafqat, a Pakistani fashion designer, discussed at length with the Industry Insider about the textile industry in Bangladesh. Kehkashan Shafqat has more than seven years of experience in the fashion industry in Pakistan and globally, including Bangladesh. In her illustrious career, she has been working with brands like ALKaram, Sana Safinaz, and Khaadi.



Working conditions

Kehkashan had a great experience working in Bangladesh and almost adapted to the environment, so much so that she felt at home. However, she observed a difference in the working conditions in Bangladesh compared to the workplaces she had previously worked in.

"I have had a very good experience working here. The only difference is in terms of speed. Since I am used to the Pakistani working culture, things happen a bit quicker there than what I have experienced in Bangladesh," said Kehkashan.

From decision-making to the final execution, the whole thing works in a steady and analog way. However, she didn't face much hassle in communication. "People are very cooperative; there are Urdu-speaking people, and sometimes, if someone doesn't speak

Urdu, they communicate in Bangla, which is also very easy to catch."

“Experts would love to work in Bangladesh”

The environment the recruiters provide to their foreign employees is something to be appreciated. It shows the potential of an industry. Bangladesh has the skills, and the country is now a step ahead in hiring experts from outside.

"Bangladesh has hired many experts from other countries; they will do the visa work for you, do the ticketing, and provide you with very good accommodation. One must appreciate this to leave their place and move to Bangladesh to work," Kehkashan noted.

“One must understand the creative field well”

"Fashion is a creative field; it is not a job from 9 AM to 5 PM like accounting or finance. I used to get only a day off in a week. To have something creative, you must have a creative mind. Companies need to understand the creative field and the creative process well."

Kehkashan doesn't claim this to be true for every sector or all the other textile companies. Like in many other sectors of the country, this issue must be addressed. For people working here, whether a desk job, fieldwork, or even a creative job like fashion designing, a fixed 9 AM to 5 PM is a common scenario. This limits the creative process, she believes.

"I see my colleagues from Bangladesh do not get a holiday for more than three or four days. We give 9 to 10 hours in the office. The place should be a free space where you can bring new ideas and thoughts for which we are brought into the industry."

“Bangladesh does not provide the same fabrics to their own people that they export to the world”

One of Kehkashan's strong observations of Kehkashan is that she saw in the industry that local customers get different quality products exported from Bangladesh.

"You are giving silk to the women in the hot summer, providing rough and uncomfortable cotton. I don't understand why the quality differs when you export. If you can make for them (foreign countries), then why can't you provide the same quality of fabric to your own people?"

"I feel like there is a huge gap in aesthetics and fabric quality. You introduce things, and you educate people on what they should be wearing, and that's how trends are set. There is a huge gap; fill it," she urged.

In Bangladesh's fashion culture, looking good is often the priority over being comfortable. She said, "You don't have to be uncomfortable just to look good. Comfort and aesthetics can go hand in hand. And that's what local brands should provide."

There is a demand for Pakistani-branded Kurta-Pajama and Shalwars in Bangladesh. In every other corner of Newmarket or Bongo Bazar, a shop claims to have Pakistani dresses. Kehkashan has noticed the same demand for Pakistan-origin clothes amongst the locals.

Giving examples of the regular wear of the common people like office and college-goers, she thinks brands here do not have much more to offer, though she believes the country can make better clothes for the commoners at a way cheaper rate.

"Brands will cost four to five thousand taka, and the fabrics are not soft. Local people are willing to spend a lot of money on quality fabric and clothes from Pakistan. I think you (Bangladesh) can provide better at a much cheaper rate to your people," she said.

So, what needs to be done? According to her, three basic changes can make up for what is missing in the industry.

“Trust your designers”

"We (Pakistan) have fashion schools and degrees and therefore have an understanding of design and aesthetics for which lots of people from Pakistan are being hired. So, if you are calling experts based on their experience, you must trust them. If you hire the skill, you have to trust the skills. Give them the space and freedom for what they do, and let them be a little more creative."

“Export is fine; think about the locals too”

Generally, the industry is more export-oriented. The owners always worry about how the exports can get bigger and bigger. Besides exports, there is also a big room for the local market.

Kehkashan said, "Women in Bangladesh love to buy quality clothing from whoever is providing them, no matter how costly. So if the locals make some changes, maybe the aesthetics or the right fabrics, they can tap into that and grab the people's demand."

“Keep it simple, soft fabric, cut cost”

"Think out of the box is a common saying in the industry.

People want simple designs, easy cuts, and a lot of breathing spaces between the patterns. They want something different and then produce what Chanel or Gucci has been producing. Even they are also making simple designs," Kehkashan candidly talked about how things should be done.

"In the fashion industry, we work for people. So, out of 100%, we provide 80% of what people want, and 20% do the creativity," she added.

Ethnic wear is the go-to fashion these days. She said, "People want simple-looking Shalwary with



You are giving silk to the women in the hot summer, providing rough and uncomfortable cotton. I don't understand why the quality differs when you export. If you can make for them (foreign countries), then why can't you provide the same quality of fabric to your own people?

pretty prints and simpler cuts. I see people going to Islampur and Newmarket to buy clothes; then they go to a tailor and make a customized dress. Going to these places is time-consuming and a hassle, right? So, all these can be provided."

Ethical practices and the use of AI in the fashion industry

Sustainability and ethical practices have become increasingly important in the fashion industry. AI has also taken part in it. According to GlobeNewswire's stat-based platform report, in 2022, the market of AI in the fashion industry was estimated at \$1.2 billion and projected to reach \$16.3 billion by 2030. So, how can a brand combat AI while maintaining its originality?

"Technology was always there. We also use software today to make our patterns and check how they will look when worn. So, keep it simple with easily pulled-off cuts and patterns. That's how you give what people want while maintaining your brand's originality," opined the experienced designer.

The fast fashion model has been criticized for its environmental impact. According to the United Nations Environment Program report, the fashion industry generates 10% of the global waste, which is more than international flights and shipping combined and accounts for a fifth of the 300 million tonnes of plastic waste produced globally each year.

"People now don't want to wear the same clothes repeatedly. So fast fashion is a fact now. For the environment, there are a lot of brands that are working. Say, for example, a brand gives paper bags instead of plastic. Inside the bag, there are seeds. They request their customers to plant the seeds in the bag and water it, contributing to growing a plant from each sale; how great of an idea," remarked Kehkashan.

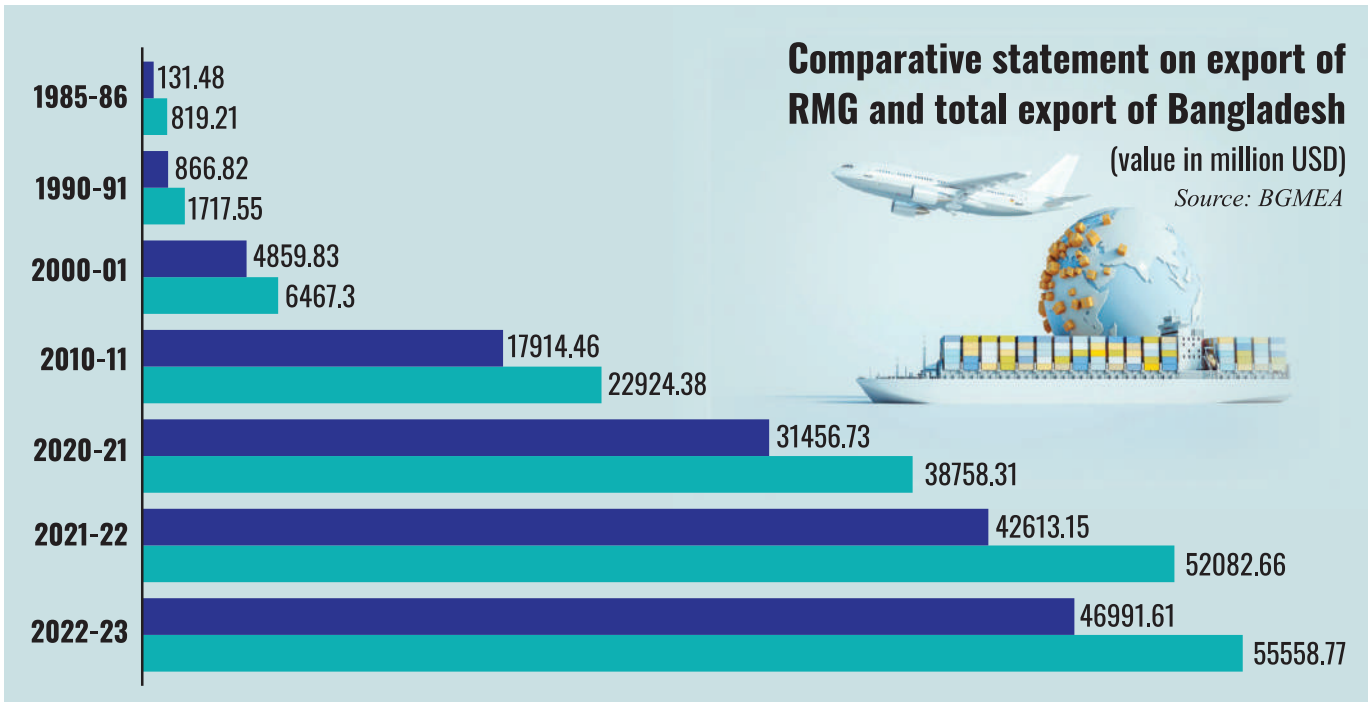
“A fashion designer can take inspiration from anywhere”

If we take examples of the world around us, every country tries to imprint its culture into its fashion. Kehkashan reflected on this matter, saying, "One can easily relate to their culture and tradition if it looks simple and aesthetically pleasing. A designer primarily works how they are told to; however, that shouldn't be the only way. One must have creative freedom and be trusted fully by their coworkers."

In that case, why only depend on one particular culture? A fashion designer can take inspiration from anywhere. As a dominant player in the global market for over a decade, Bangladesh has the resources to flourish in the local market, and Kehkashan concluded, hoping that Bangladesh will fill that local market need gap soon. ■

Md. Imran is passionate about learning about the changes taking place in the broader economic spectrum of the world and tries to study and write about it in detail.

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THE HISTORY OF BANGLADESH'S Ready-made Garments (RMG) sector goes back to the 1980s when Bangladesh was a war-ravaged nation. Then, the late Nurool Quader Khan took the initiative to send 130 workers to South Korea to train in producing ready-made garments. Following this, several other notable names, such as the late Akhter Mohammad Musa of Bond Garments, the late Mohammad Reazuddin of Reaz Garments, and Md Humayun of Paris Garments joined the RMG sector and further contributed to it. Since then, the RMG sector has continued to contribute around 10% to the economy of Bangladesh. The export earnings from the RMG sector

challenges post-graduation due to the loss of preferential treatment. The most significant preferential treatment that Bangladesh receives is the duty-free and quota-free access of 70% of its exports. As a part of the LDC, Bangladesh enjoys preferential treatment through greater market access, flexibility in commitments, waivers from obligations, a longer implementation window for agreement-specific disciplines, and aid for trade, which will no longer be available once it graduates. The benefits from LDC-specific International Support Measures (ISMs) will also be removed.

Sustainable measures in the RMG sector

RMG is the biggest contributor to the carbon foot-

Sustainability key to sustaining RMG sector growth

by **Shehrin Radiyat Shahnawaz**

stood at USD 11.73 billion in April-June of FY23. Though the figure is higher than that of the same quarter of last year, it continues to be 4.22% lower than the previous quarter.

LDC graduation

Bangladesh was included in the Least Developed Countries (LDC) group in December 1975. After 50 years of its inclusion, it is on its way to graduating from the LDC group in November 2026. The graduation is determined based on three criteria: GNI Per Capita, Human Asset Index, and Economic Vulnerability Index. As much as this is a matter of pride for the country and its people, Bangladesh is also expected to face certain

print of Bangladesh. About 0.57 million tonnes of waste are produced annually by the RMG sector, of which two-thirds are exported. Taking sustainable measures and recycling all the cotton waste could save around USD 500 million annually. Groundwater pollution, airborne waste, dust and noise, soil degradation, greenhouse gas emissions, and rainforest degradation are some forms of environmental degradation caused by textile waste. The clothing and textile industry is responsible for 4% of the global carbon emissions, making it an absolute priority to incorporate sustainable measures in production techniques.

Current status of sustainability in RMG

We can observe a shift in the consumer mindset regarding sustainable fashion. Customers are now more than willing to pay higher prices for sustainable fashion. A consumer mustn't feel guilty about wearing clothing that might have contributed to worsening the environmental conditions. Customers no longer want to remain passive while the planet is undergoing massive environmental degradation. Therefore, for the brands, even from a business and CSR perspective, it is also a tool for branding and marketing. For example, by 2040, Marks and Spencer want to achieve net zero by reducing GHG emission and carbon footprint. Brands like H&M, Zara, Puma, and Adidas have set sustainability goals.

Mr. Imtiaz Reza Sohan, working for Marks and Spencer for five years now, commented on this matter, "When it comes to using polyester, the industry has started using recycled polyester, and for cotton, the industry has started using organic cotton and BCI cotton, which are sustainable forms of cotton. The recycled polyester is certified by governing bodies, and many brands are sourcing the polyester from thrown away bottles collected from the sea."

"One pair of jeans requires as much as 10,000 liters of water. There is now technology that reduces water consumption by up to 90%. Also, brands are promoting sustainable fashion. As for M&S, they sell garments they feel would sustain up to 20 washes. In factories, plants (ETP and WTP) purify the used water for dyeing and finishing into drinkable water."

Industry Insider talked to Mr. Nafiun Bin Sharif Sufal, an Auditor of OEKO-TEX® STeP (Sustainable Textile and Leather Production) at Hohenstein Institute Bangladesh. He remarked, "Oeko-tex provides certification in Bangladesh. It evaluates the process in 6 different ways: Chemical contribution, environmental performance, social, safety, quality management system, and environmental management system. It then generates a report based on the evaluation, and a certificate is provided, including the scoring. A 'Made in Green' label is provided for all products which pass the evaluation.'



"Buyers are unwilling to pay more; however, they sell sustainable products at higher prices to the end consumer and retail shops."

*Ikramul Hoque Rayan,
Head of Supply Chain
Management at Plummy
Fashions Ltd.*



"The recycled polyester is certified by governing bodies, and many brands are sourcing the polyester from thrown-away bottles collected from the sea."

*Imtiaz Reza Sohan, Marks
and Spencer.*



Benefits gained due to sustainability

Certain insights were also gained from Mr. Ikramul Hoque Rayan, currently the Head of Supply Chain Management at Plummy Fashions Ltd. He raised concerns regarding the lack of a proper system to ensure fair pricing from buyers for sustainable products.

"The current state of the RMG sector is the worst in the last 12 years, especially after the Russia-Ukraine war. When the sustainable factories opened, there was high encouragement from the buyers, but later on, the buyers refused to pay higher prices for the sustainable products. Buyers are unwilling to pay more; however, they sell sustainable products at higher prices to the end consumer and retail shops."

He further explained, "The construction equipment, solar-based power equipment for sustainable measures are costly to maintain, and without higher prices, it will be difficult to continue. Most factory owners are afraid of raising the concern of charging higher prices due to the fear of losing out on business. Since sustainable establishments are costly, it is also impossible to shift back to traditional practices."

As a part of its sustainable measures, Plummy Fashions has 70% open area for greeneries and oxygen supply. No multi-storied buildings exist, and 70% of the power is used from solar panels. There is a water treatment plant to reuse and clean the water. The yarn used is also made from recyclable cotton.

Possible assistance from the government

Regarding the assistance provided by the Government, Mr. Sohan shared, "85% of the export earnings of Bangladesh comes from the RMG industry. So, if it collapses, Bangladesh's entire economy will collapse. To cover up the initial turbulence after graduating from LDC, the government is trying to extend duty-free access and GSP for at least five more years after graduation. The government is facilitating the industry through EPZs and incentives. 100 Special economic zones are in the process of being started."

"Due to the economic growth, the expected wages might be too high,

removing the price competitiveness that Bangladeshi products enjoy now. If the price competitiveness is not there, factories might think about shifting their operations to other regions in the future where the cost will remain lower."

Retaining the benefits

Mr. Rayan suggested that it is not the LDC graduation that the RMG sector should be worried about. Instead, it should focus on obtaining fair prices from buyers. Regarding the future roadmap for the RMG sector, he proposed, "LDC effects will not be much as most factories are self-sustainable. However, it is imperative to sit in a dialogue to raise the concerns on behalf of the RMG sector. The main concern is not LDC graduation but rather lower prices from buyers. There is also inefficiency in the RMG sector due to the lack of quality human resources."

He believes that RMG needs more training facilities and the traditional educational methods need to impart knowledge relevant to the RMG sector. Unlike China, Bangladesh does not have developed workers, so it

“RMG sector in Bangladesh needs to advance towards producing value-added and technical products such as protective gears or aesthetic garments. There is also a huge need for investing in R&D to support the complex fabrication processes.”

*Nafiun Bin Sharif Sufal,
Auditor, OEKO-TEX®
STeP at Hohenstein
Institute Bangladesh*

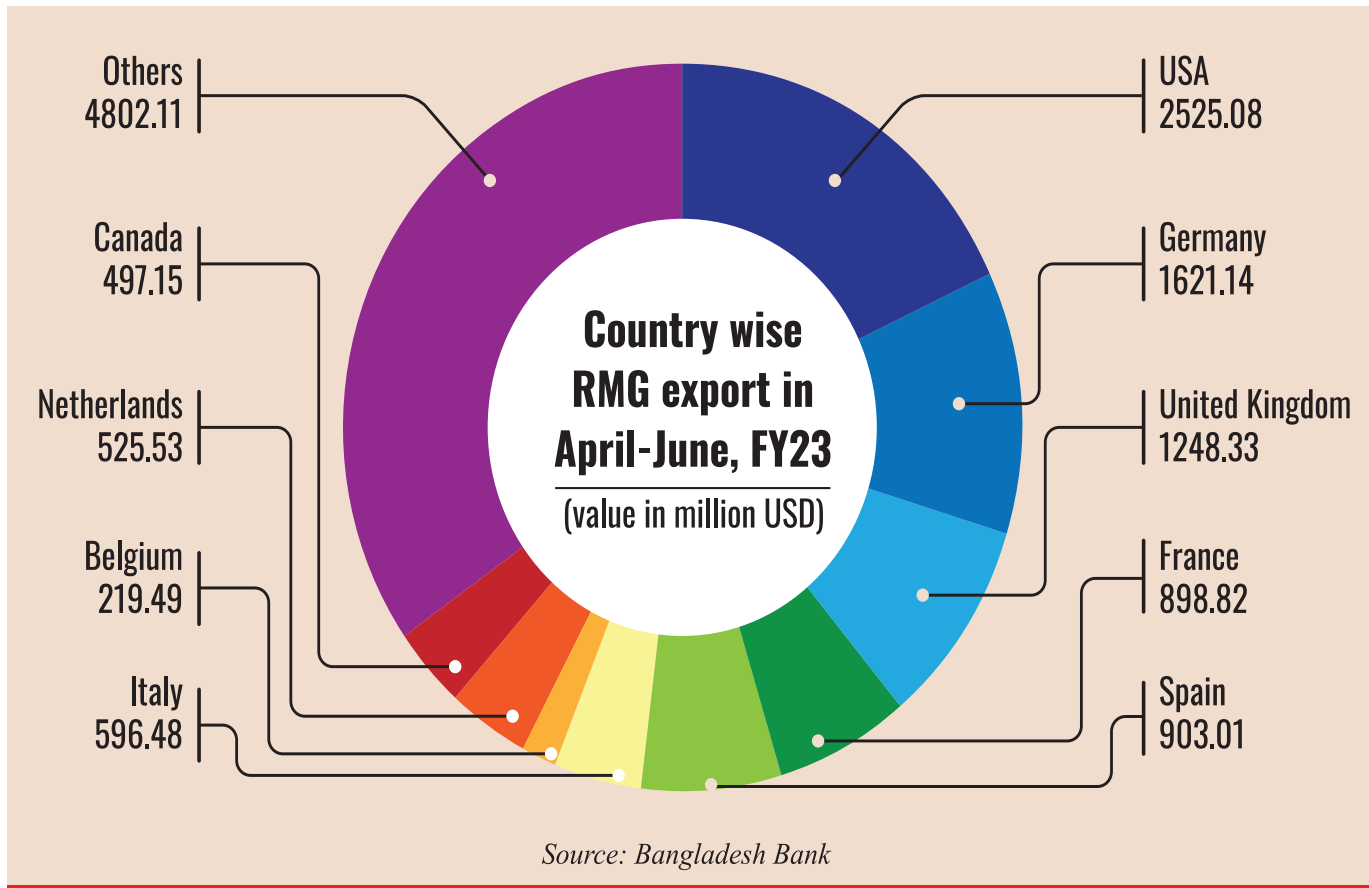
could not grow as much despite having cheap labor costs.

The lack of proper pricing was also further emphasized by Mr. Sufal, who mentioned that the merchandisers are not united and are being exploited. There is a lack of proper negotiation from the merchandisers' end; hence, they cannot sell at a higher price.

He further explained, "RMG sector in Bangladesh needs to advance towards producing value-added and technical products such as protective gears or aesthetic garments. There is also a huge need for investing in R&D to support the complex fabrication processes."

He also emphasized the need for government initiatives in providing sustainable finance. The availability of easier and cheaper loans will make it easier for factory owners to further incorporate sustainability measures within their production process. ■

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Housing sector struggling to keep up with business growth

by **Muhammad Arifur Rahman**

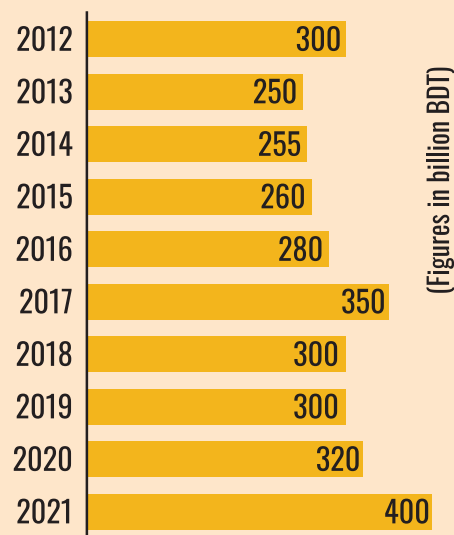
Real Estate in numbers

- Around 15,000 flats sold in 2021–22; number dropped to 10,000 in 2022-2023, per REHAB
- Around 15,000 flats sold on average annually, from 2010 to 2012
- Year of establishment of REHAB: 1991
- No. of member in 2016: 1151
- No. of Apt. units delivered by the developer in last 20 years: 100,000
- No. of Apt. units delivered by REHAB members per year: 9,000-10,000
- No. of Plot units delivered by the developer per year: 5,000-6,000
- Approx. turnover per year: BDT 28,000 million
- Direct labour (skilled and unskilled) employed: 2.5 million
- Contribution to GDP: 12-15 %
- Over 4000 Real Estate companies operating

Source: Real Estate & Housing Association of Bangladesh

Yearly investment in Real Estate

Over BDT 3000 billion investment from 2012 to 2021



THE REAL ESTATE AND HOUSING businesses are suffering from poor sales amid the rising cost of building materials, a high registration fee for land and flats, and new government regulations to reduce the height of the building. Another reason for negative growth in the sector is people's declining purchasing power due to higher inflation, as per the speculation of industry insiders.

They mainly attributed the global crisis, like the Ukraine-Russia war, to almost doubling the construction materials like sand, cement, rods, stone, and tiles compared to pre-COVID time.

The industry did not feel the recent shock even after the Covid-19 pandemic. Let's take the case of Pushpo Kanon Properties. This real estate company has been constructing three apartments on 31 kathas of land next to Munshi Market, adjacent to the railway line in the Uttara Dakshin Khan area.

There are 135 units in three apartments, mostly from 1019 to 1440 sq ft and some 1575 to 1650 sq ft.

When the company started construction in early 2019, it sold a flat for BDT3200–3500 per sq ft. Now, it is costing (construction cost) around BDT4000 per sq ft. As the cost has increased, they have sent notices to some old customers to see if the price can be revised.

Now, the company is trying to sell a 1019 sq ft flat at BDT 4200 per sq ft. All expenses, including utilities, will be close to BDT 4.5 million for each. The revised price is BDT 4700 for 1222 sq ft and 1240 sq ft flat. Accordingly, their price is around BDT 6 million.

"We are no longer finding buyers at the new prices we set. People are usually more interested in ready-made flats. Though we have 15 flats ready for the last eight months, we are not getting customers," Kawsar Ahmad Sohail, managing director at Pushpo Kanon Properties, said.

"This year we have been able to sell only four flats, compared to eight last year. 30-40 flats were sold in the pre-Covid years," he added.

Referring to the poor purchasing capacity of the people, Kawsar Ahmad said, "We feel that the customers don't have money. Many people go to banks for a loan after booking a flat. But those customers are not getting a positive response, as banks are also in a fund crisis. Furthermore, non-bank financial institutions also do not have much liquid money. This is also one of the reasons for the low number of flat sales."

"Normally, middle-class families find good flats at low prices. Being a small company, no big party takes from us. Because our customers are not that rich," he added.

He said, "Big companies don't seem to have much of a problem. Because they have increased the prices of their flats with the increase in the price of goods. Earlier flats in Uttara Sector 4 were selling for BDT 8,000–10,000 per sq ft; now they are selling at BDT 15,000–18,000 Per sq ft. Wealthy individuals are purchasing these flats."

This is not a unique case. According to the Real Estate & Housing Association of Bangladesh (REHAB), overall flat sales decreased in the previous fiscal year. Around 15,000 flats were sold in 2021–22, but the number has dropped to 10,000 in 2022–2023. An average of around 15,000 flats were sold every year from 2010 to 2012. From 2013 to 2016, an average of 12,000 flats were sold yearly. 13–14 thousand flats were sold every year from 2017–2020.

"The price has increased because of the new DAP (Detailed Area Plan) regulations reducing the height of buildings, increasing the cost of construction materials, and the high registration cost. The housing sector also suffered a blow as the economy stalled due to the pandemic," Alamgir Shamsul Alamin, President, REHAB, said.

However, he is hopeful about the new investment opportunities in the sector. "More than two crore people live in this city. There is a huge demand for flats. Three-bed flats of 1300 to 1500 sq ft will see the greatest increase in demand," he predicts.

"However, the supply will decrease even if there is a demand for flats. As a result, the price of flats will rise," he added.

Meanwhile, the increase in group housing trends in recent years

"However, the supply will decrease even if there is a demand for flats. As a result, the price of flats will rise," Alamgir Shamsul Alamin, President, REHAB

has also hit the traditional flat business, as per the observations of stakeholders.

Abdullahil Mamun Niloy, managing director of Orchestra Builders Ltd., said, "Many are now building apartments after buying a plot by making a group of people. The culture has been rising in recent years."

"The floor-area ratio (FAR) as per the government's new DAP squeezes scope to build adequate flats in Dhaka city, leading to higher prices," he added.

How much do construction materials become more expensive?

The house builders said that the price of building materials is almost double now compared to 2018–19, a pre-pandemic time.

"When we were working in 2018, we bought stone at BDT 152 per sq ft; now it is BDT 240. We bought cement at taka 365 a bag, which is now taka 550," said a housing company executive.

Similarly, they bought rods at BDT 57,000 per ton, now BDT

98,000. The price of the sand truck was BDT 13000, which is now taka 22000.

The price of tiles is also almost double. The cost of a coil of electric cable was BDT 2200 in 2019, which is now BDT 4500. Bricks per truck (three thousand) now sell for BDT 35,000 to

Whether transferring immovable property or land and flats in any area of Bangladesh, acquisition of ownership requires double taxation, as per the new Income Tax Act

BDT 40,000, higher than a year ago.

"Such has grown almost unbelievably. If this goes on, small establishments would not be able to survive in the business", he said.

Bangladesh has to depend on other countries to source most of the raw materials. Even for brick manufacturing, operators have to rely on imported coal.

The cost of registering land and property doubles

The tax on property registration has been doubled under the Income Tax Act 2023 in all areas of the country, including Dhaka, Chattogram, Narayanganj, and Gazipur. Whether transferring immovable property or land and flats in any area of Bangladesh, acquisition of ownership requires double taxation, as per the new Income Tax Act.

Under the Income Tax Act 2023, the National Board of Revenue (NBR) has fixed the new tax in the source tax rules. After taking the final decision on June 26, the Act was published in the gazette on July 3.

The owners of immovable property in Gulshan, Banani, Motijheel, Dilkusha, North South Road, Motijheel and their extended areas, and the Mohakhali area of the capital have to pay the highest amount as registration tax.

For buying property in these areas, a buyer has to multiply 8% tax per Katha or BDT 20 lakh, whichever is the maximum, which will be considered in taxing for land registration, flats, or any other structures. This is considered the highest property tax ever.

According to Section 6 of the Income Tax Act 2023, entitled 'Collection of Tax on Transfer of Property', property registration tax has been increased from 4% to 8% in various areas of Dhaka, Chattogram, and Narayanganj.

Besides, the tax has been increased from 3% to 6% in Gazipur, Munshiganj, Manikganj, Narsingdi, Dhaka, and Chattogram areas outside the City Corporation and municipal areas. Apart from this, the property tax under the jurisdiction of any municipality in Bangladesh has been increased from 2% to 4% and in other areas from 1% to 2%. ■

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The future of agriculture lies in modernization

by **Saume Saptaparna Nath**



AGRICULTURE DIGITALIZATION MIGHT BE A future answer to feeding a rapidly rising population. The use of big data is a critical instrument for digitalizing the agriculture sector.

Despite the increased demand for data analytics in Bangladesh, the country confronts many challenges in realizing its full potential. One key challenge is the shortage of a skilled workforce with the necessary knowledge and abilities to analyze and interpret data correctly. This talent shortage is a major hindrance to the country's widespread adoption of data analytics.

Agriculture has been crucial to Bangladesh's development and progress. Despite accounting for 16% of the gross domestic product (GDP), it employs over half the working population (about 47%). It is critical for food security and poverty alleviation.

The population of Bangladesh is expected to reach 230-250 million by 2050. According to a UNDP estimate, two million people are added to the population yearly, while the country loses 1% of its agricultural land. As a result, the significance of increasing the production and supply of a nutrient-rich diet is clear.

While high-yielding cultivars and sound agronomic practices are important, new technologies such as IoT (Internet of Things), machine learning, artificial intelligence (AI), and big data can produce a dynamic movement toward modernizing agriculture. Big data management may be utilized to forecast agricultural situations better, and cloud computing and data mining give enough capabilities and solutions for sustaining, storing, and analyzing massive amounts of data created by various computer equipment.

The rationale for data-driven agriculture is the same. Small-

holder farmers and other stakeholders in the agricultural value chain sometimes lack the information and foresight required to make data-driven choices, which is important to competing and succeeding in an ever-changing commercial climate. This apparent issue is merely a symptom of a greater issue across the agricultural value chain. This is because data is not being collected digitally, resulting in several inefficiencies.

Farmers require timely market information and Agri inputs; Agri entrepreneurs and distributors struggle with timely cash collection and inventory optimization; and processing companies require robust customer and farmer profiling to ensure greater transparency and continuously improve the end consumer experience. As a result, everyone has a vested stake in the outcome.

Over 500 million smallholder farms globally contribute significantly to food production and genetic diversity in the food supply. Until now, getting information to or from smallholder farmers has been challenging, complicating fundamental infrastructure issues like access to inputs, markets, funding, and training. The proliferation of mobile technology, remote sensing data, and distributed computing and storage capacities is creating new options for smallholder farmers to be integrated into the larger agri-food system.

The magnitude of these changes suggests the possibility of another agricultural revolution. As mobile phone usage grows and improves in rural regions, the paradigm shifts for how smallholder farmers are profiled, their requirements are identified and addressed, the effect of agricultural services is monitored, and how farmers are supported and how a global body of knowledge can be built by drawing on typically siloed expertise and data.



Artificial intelligence is anticipated to improve the flexibility of self-driving tractors, irrigation systems, and even drones outfitted with sensors, radars, and GPS systems

Technology can help bridge the gap between the demand for increased food production and availability. Blockchain technology, for example, might be used to construct a digital and verified identification basis for all farmers and their transactional history, connecting them in an accessible network with important stakeholders such as banks and insurance firms. It can enable a decentralized and secure transaction procedure for farmers and business people. It is useful to trace transactions and keep farmers in the loop with other platforms, such as crowdsourcing ones that provide cash opportunities for farmers and entrepreneurs since it is a write once-append only, distributed, and decentralized system. A more transparent agricultural supply chain will enable us to identify regions vulnerable to unsustainable practices, and farmers will be able to openly exchange information about their goods with consumers and other businesses.

Artificial intelligence has a major impression on agriculture as it has in other industries. Artificial intelligence is anticipated to improve the flexibility of self-driving tractors, irrigation systems, and even drones outfitted with sensors, radars, and GPS systems. In addition to the benefits of artificial intelligence, machine learning is advantageous to the global food chain.

Due to their widespread use, social media and mobile phone use continue to be the most accessible modes of communication in the agricultural area.

Thanks to technological advances, irrigation systems may now be managed by a phone or other electronic device. Long travels to the field are no longer necessary. Apps like 'Foursquare' and cameras installed around the farm may be used to monitor staff. A complete database and automated technologies in agriculture may be used to increase food production and security, acting as a godsend if more situations of looming worry arise in the future, along with collaboration between the public and commercial sectors.

In 2017, the government increased the subsidy to cultivators for acquiring farm machinery from 30% to 50% to boost mechanized sowing, transplanting, and harvesting so that farmers may produce more food at a lower cost.

Several gaps in the Bangladeshi agro-industry include access to market knowledge, finance, weather/soil, and input information. As a result, each gap filling in reality creates new services and adds to the financial sustainability of 4IR activities. In this region, 70% of farmers are smallholders with no bank accounts. Access to finance is often costly for farmers. Peer-to-peer lending platforms and crowd-funding platforms can offer low-cost financing opportunities for farmers. ■

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Global Food Security Index and Bangladesh

Global Food Security Index Ratings

	Overall Ratings	Affordability	Quality and Safety	Protein Quality	Nutrition Standards	Prevalence of Undernourishment	Human Development Index
Finland	83.7	91.9	88.4	100	100	2.5%	0.94
Ireland	81.7	92.6	86.1	100	88.7	2.5%	0.96
Norway	80.5	87.2	86.8	100	88.7	2.5%	0.96
France	80.2	91.3	87.7	100	100	2.5%	0.90
Bangladesh	54.0	52.1	58.4	41.1	88.7	11.4%	0.63

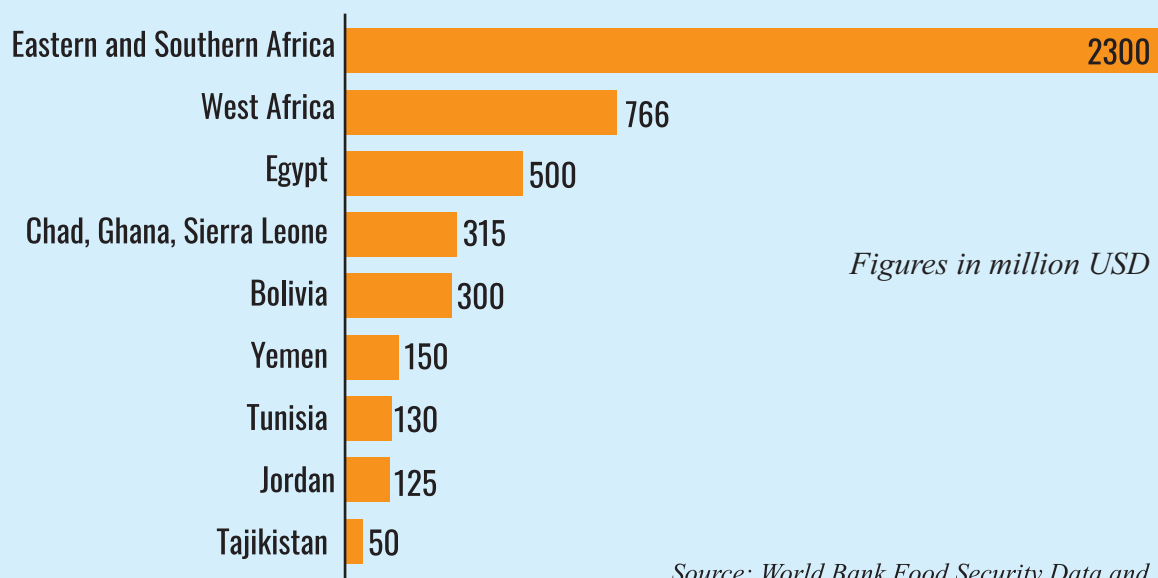
Source: Global Food Security Index, 2022, Economist Impact

Global Food Security Index Ranking

Country	Overall	Affordability	Availability	Quality and Safety	Sustainability and Adaptation
Finland	1st	7th	15th	4th	2nd
Ireland	2nd	4th	15th	9th	3rd
Norway	3rd	28th	51st	8th	1st
France	4th	11th	18th	6th	8th
Bangladesh	80th	87th	46th	71st	93rd

Source: Global Food Security Index, 2022, Economist Impact

World Bank finance for Food Security and Crisis (April to December, 2022)



Source: World Bank Food Security Data and Research

Food Security funding in Bangladesh

Humanitarian funding for Food Security (including Agriculture)

Aid Financing for agriculture, food security and rural development

\$5.22 million



\$1.93 million

United Kingdom (UK)
\$4.69,100 million

International Labour Organization
\$0.53 million



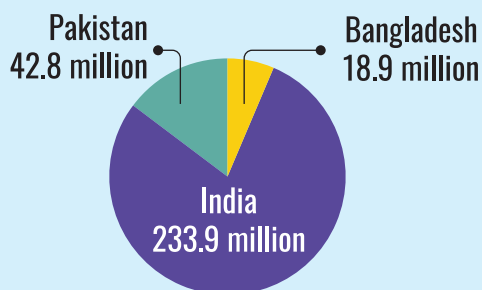
Federal Ministry for Economic Cooperation and Development
\$1.83 million

Bill and Melinda Gates Foundation: \$0.10

Source: Global Food and Nutrition Security Dashboard

Bangladesh, India and Pakistan

Number of malnourished people in 2020-22



Cost of a Healthy Diet in 2018, 2019, 2020, 2021 (USD)

	2018	2019	2020	2021
Bangladesh	2.97	3.02	3.06	3.20
India	2.83	2.88	2.97	3.07
Pakistan	3.39	3.46	3.68	3.89

Source: The State of Food Security and Nutrition in the World, 2023

Data of Malnutrition, Micronutrient Coverage and affordability and access to healthy diet

Globally 3.1 billion people unable to afford a healthy diet

121 million people in Bangladesh unable to afford a healthy diet

828 million people globally are malnourished

Source: World Bank Report, 2023

Paris Air Show: A glimpse into the aviation and aerospace industry

by **Jinat Jahan Khan**



AFTER A FOUR-YEAR BREAK DUE TO THE COVID-19 pandemic, the Paris Air Show, the largest global trade show and exhibition in the aviation and aerospace industry, made a comeback on June 19, 2023. The 54th edition of this show at the Paris Le Bourget Exhibition Centre brought around 300,000 visitors, including exhibitors, aviation enthusiasts, and the press. Held once every two years in Le Bourget, the international show is over 100 years old. When it started in 1909, the show was a part of the Paris Motor Show that was exclusively dedicated to aircraft for the first time. Since then, the trade show has presented a jaw-dropping exhibition of military and non-military aircraft and flying machines during the trade days.

Significance

This international Paris Air Show, also formally known as Salon International de l'Aéronautique et de l'Espace or Salon du Bourget, has played a vital role in advancing aerospace and aviation technology. Here are some reasons why this show is important in this sector.

Networking, business opportunities, and big deals

The key players in the aerospace and aviation industry, including airlines, manufacturers, suppliers, government representatives, defense contractors, and potential buyers, come together at this international show, which is rarely possible. It is a business hub for major business deals, negotiations, and networking. The business deals in the aerospace industry are of billion dollars and highly significant. This show is the key event to buying necessary aircraft for the civil and defense industries.

While discussing deals worth billions of dollars, the first two names that come up are Airbus and Boeing, which always compete passionately to announce aircraft orders. This year, the announced orders reached near-record levels that were heavily dominated by these two airlines. They collectively mentioned orders of 1,100 jets; Airbus had commitments of 830 jets. The major commitment of Airbus was with IndiGo with a deal of 500 A320 aircraft.

Showcasing new technology and innovation

The Paris Air Show allows different companies and firms to showcase their products or new advancements in the aerospace industry. It includes electric and hybrid aircraft and unmanned aerial vehicles (UAVs). This year, at least 158 aircraft were displayed, including helicopters, drones, and planes. As for significant displays, Aarok, a prototype medium altitude long endurance (MALE) remotely piloted combat aircraft, created a buzz on the show's first day. It can land if there is sudden terrain. Many companies have developed new sustainable and fuel-efficient products, including Cassio 330, AURA AERO, etc.

Promoting sustainable technologies

Sustainable technology in the aerospace and aviation industry was one of the key themes of the Paris Air Show this year. About 3% of global carbon emissions are due to air travel, though this industry serves only a minor group of the global population. Even when the aviation industry is still recovering from the downturn of the pandemic, the demand for air travel is still higher. However, sustainable and efficient solutions are needed while recovering from the loss. And we can observe the urge to accept sustainable

technologies in this year's announced orders. Above a thousand of the ordered aircraft were fuel-efficient, most of which were from either Airbus or Boeing.

In newer aircraft, companies have tried to initiate designs that minimize carbon emissions. Most Airbus aircraft on display, including A320neo, A330neo, A220, and A350, reduce more carbon emissions than their previous ones. Even Boeing has shown more fuel-efficient and sustainable aircraft at the event, including 737 MAX and 787 Dreamliner.

Another aircraft developer, ZeroAvia, received an order for 250 ZA2000 hydrogen-electric engines. It has a system of zero-emissions propulsion. Such a system enables regional mobility with no carbon emissions. Moreover, this year, many old and new companies offered electric and hybrid aircraft.

The aerospace industry has a target to achieve net zero emissions by mid-century. And the Paris Air Show is influencing firms, companies, and even governments to achieve this target. The initial objective is to focus on sustainable aviation fuels (SAF) that are made from municipal wastes, crops and plants, agricultural and industrial wastes, and hydrogen. On the contrary, governments are becoming more conscious of developing sustainable technologies in this sector. This year, French President Emmanuel Macron announced US\$2.2 billion of pub-



lic investment to support the development of sustainable technologies to decrease aircraft carbon emissions.

India on the target of democratizing affordable air travel

In this year's Paris Air Show, India has made a headline by ordering aircraft at a record-setting level. IndiGo, one of the leading airlines in India, ordered 500 A320 aircraft from Airbus, considered the single biggest purchase agreement in the history of commercial aviation. This order has a worth of over US\$50 billion. It has eclipsed the order of another leading airline, Air India, which was made in February. The order was 470 Airbus and Boeing aircraft worth US\$34 billion. This huge order of 970 aircraft by two major airlines shows their efforts to keep pace with the growing demand within the country.

Indian Airlines are facing a surging demand from middle-class consumers. However, the demand would not prevail if the flight costs increased significantly. Airlines have bought more aircraft to keep costs lower and meet the huge demand. For instance, the A320 jets of Airbus that IndiGo ordered are mainly used on short-haul routes, covering people's demand to fly for the first time or travel within the country in less time, with a minimum cost. This order of IndiGo will also help lower operating costs and improve fuel efficiency.

The question arising from such events is whether they can cause losses for airlines and consumers later. While the debate may continue, the financing method of IndiGo shows that such deals may not necessarily cause losses. IndiGo follows the sale and leaseback model. In this well-known aircraft financing method, there is a need for a constant flow of new aircraft. Airlines sell newly delivered aircraft to different leasing companies, rent them back, and op-

erate them for at least six years, and then they move to any other operator. In this way, airlines can earn additional profits from sales, and passengers can access air travel within their budget. According to Airbus, 34% of the total aircraft financing is due to such financing of the sale and leaseback model. Though the leasing market in India is facing some pressure, IndiGo announced that they were not concerned about such pressure.

On the contrary, many advancements in the Indian aviation industry make air travel cheaper and more accessible. The Indian aviation watchdog has approved IndiGo and Vistara Airlines to operate new international flights this August. The country is also working to resolve discrepancies between the leasing rules of global aircraft and their national bankruptcy laws. India's aviation secretary took the opportunity of the Paris Air Show to address these issues and their efforts of resolutions to make the concerned authorities confident of the Indian aviation industry.



Bangladesh in the aviation industry

Recently, Biman Bangladesh has decided to order aircraft from Airbus, breaking its reliance only on Boeing. Interestingly, Biman Bangladesh has been interested in buying more wide-body aircraft due to the thriving trade and tourism. The aviation industry of Bangladesh is booming even after the COVID-19 pandemic. This sector holds a good amount of unrealized growth potential. However, it is still lagging due to some basic but important issues, including weak infrastructure. The neighboring country, India, can be an example for Bangladesh.

In India, the demand for air travel is increasing rapidly. India is investing more in its infrastructure to meet the demand, increasing the capacities of airports and aircraft. Improving the aviation sector is serving the consumers and utilizing its growth potential. Bangladesh also needs to improve its aviation safety standards so that investors are interested in investing in this sector, and passengers' confidence in air travel can be boosted. Singapore has also promoted itself as a hub for international travel by investing more in the aviation infrastructure and its frameworks. On the contrary, the aviation industry of Indonesia has expanded rapidly due to the huge domestic demand they have gained by improving their safety standards.

Bangladesh should learn lessons from these countries, and the Paris Air Show can be a medium of it. In every show, different countries share their sustainable and efficient advancement and steps in the aviation industry from which Bangladesh can redesign its pathways. Moreover, Bangladeshi airlines and the government should actively participate in the show to get the best deals and good networking to improve the country's aviation industry. ■

Jinat Jahan Khan has a keen interest in microeconomic research and worked as a Research Officer at DataSense previously. She is also a Recipient of the Female Champions Fellowship by the Bill and Melinda Gates Foundation and the Centre for Research and Development (CRD).

Behind Byju's' strategic fiasco

by **Md. Shafkat Imon Araf**

BYJU'S IS ONE OF THE MOST VALUED EDTECH COMPANIES globally, with an almost 22 Billion USD valuation. Byju's was growing so much faster that back in FY19, it had only incurred a loss of 8.82 Indian Rupees. For any startup whose revenue turnover is billions of Rupees yearly (13 billion Rupees in FY19), this was negligible, and Byju's was almost deemed a profitable EdTech company.

But as the company grew massively, in FY21, it saw a humongous loss of 45.88 billion Indian Rupees. What caused such a massive downfall? Exploring deeper might bring some lessons for other companies.

Forced sales technique

Byju's offers courses that cost between 50,000 and 1,50,000 Rupees. Most courses focus on k-12 (Kindergarten to 12) and admission preparation. Now, the customers in this K-12 segment are diversified. Students have different kinds of needs while learning from an after-school solution. The primary customers in this segment are mostly parents who make the ultimate buying decision. As the course fee is so high, Byju's adapted a hybrid sales funnel to acquire these customers -both online and offline.

Due to making a purchase whose price is high, the offline sales team has to operate

within an immensely ambitious sales target. You may understand the pressure when one missed sale target amounts to 50,000 Rupees.

Byju's salespeople (BDA - Business Development Associates, as they call them) overpromised and oversold the product to many customers to achieve a sales target. In the K-12 sector, it's already tough to cater to the varied needs of different customers. Overpromising and overselling caused negative word of mouth among the guardians.

Byju's sales pressure was so high that many customers

who couldn't afford the courses purchased them with a loan because of the FOMO created by the salesmen. It generated a massive customer financial crisis, resulting in a low revenue stream and losing the product's credibility.

Before COVID came, the EdTech market was not as crowded as it is now in India. COVID set highly ambitious revenue targets for any EdTechs. Byju's also fell into this trap. After COVID, parents and students both were bored with online education. But, to meet the existing high sales target, the sales technique became toxic and backfired.

Marketing expenditure

Byju's major GTM (Go to Market) strategy was celebrity endorsement and worldwide top event sponsorship. Byju's targeted the biggest names and means of entertainment to solidify the brand name among customers. Shah Rukh Khan, the biggest name in Bollywood, has served as the brand ambassador of Byju's for years.

Byju's also sponsored the Indian cricket team for years, with an average of 4 billion Rupees annually. They targeted the Indian Premier League (IPL) also, spending around 3



billion Rupees on a single season's co-sponsorship. The FIFA World Cup followed the IPL spending. Byju's spent around 3-4 billion Rupees to become the tournament's co-host.

Branding in the big events helps the companies attract customers, increase brand equity, and help raise more investments. But let's analyze the customer's perspective in this case. Most of the K-12 customers are mostly parents of students. Unlike other digital products/services, they care less about which celebrity is with the brand and which sponsorship they have managed. Their brand trust solely relies on the basic offerings of the product.

For example, if a parent wants to enroll their children in a coaching centre, they will care less about the office facilities, location, and utilities as long as they get proper tuition quality. This happened with Byju's as well. Extravagant spending on marketing often amounted to nothing for the customers of K-12.

Well, Byju's has other concerns apart from K-12. They teach Coding to the students by White Hat Jr. They have also expanded to several countries in the Middle East. But the other concerns aren't also performing that much in these countries. Even White Hat Jr. is now incurring a loss.

Faulty target market

In India, the demographics are divided into three parts: Tier-1, Tier-2, and Tier-3. Each city in India falls under these categories. The after-school solution that Byju's wanted to provide didn't cope with Tier-1 city members. The Tier-1 market is the wealthy class, whose school and after-school solution needs differ greatly from the other social classes.



Byju's thus targeted the Tier-2 demography of aspirant middle-class and lower-middle-class families. The three most important factors about them are they are highly aspirant, highly competitive, and highly insecure regarding their children's education. And Byju's targeted the insecurities in many cases to sell their courses. Here's an example:

At first - a Byju's salesman will pitch the product to the customer (Parent). Then, they will offer a 15-day free trial of the app. In these 15 days, the analytics team will track down every student's test, quiz, and activity. After 15 days, the salesman will pitch the customer again, but this time - with all the detailed weaknesses the student has shown in all the free trials. This report is pitched so dramatically that the customer becomes insecure and anxious about the child's education. They become willing to partake in the course no matter how much it costs.

This is what causes the problem later. As the customer didn't purchase consciously, the product soon withdrew all the hype from their expectations. As it was also sold at a high margin - the expectation vs satisfaction were inconsistent.

Sometimes, the salesman sold the product even to the Tier-3 demographic to meet the sales target. As we already know, these customers are not as highly conscious about the purchase as Tier-1 and are insecure and competitive. So, the product's performance often failed in their eyes.

The Bangladeshi EdTech Industry is also in an emerging stage

AS THE CUSTOMER DIDN'T PURCHASE CONSCIOUSLY, THE PRODUCT SOON WITHDREW ALL THE HYPE FROM THEIR EXPECTATIONS. AS IT WAS ALSO SOLD AT A HIGH MARGIN - THE EXPECTATION VS SATISFACTION WERE INCONSISTENT

right now. This domestic landscape is divided into 'Skills' and 'K-12'. Skills sectors are focused on language and IT soft skill-based courses. The K-12 sector is still challenging to penetrate as offline coaching centers and home tutors are well-accepted after-school learning choices among parents and students.

But, some specific verticals here are emerging online, such as university admission coaching and 11th and 12th-grade academic preparation. These tuition solutions range from famous local teachers to full-fledged EdTech companies like 10 Minute School, Shikho, Bohubrihi, Ghori Learning, etc. One thing that differs here from the Byju's is that the course prices are much cheaper. Around Tk 5000 should be more than enough to purchase skills and k-12 verticals courses.

Also, as the K-12 market is still limited and growing, offline sales channel establishment and massive branding campaigns are not yet required. As the course prices are low, Digital marketing, Social media marketing, and, at most, telesales services are adopted by all the players. These things will keep the domestic EdTech industry safe from adopting desperate strategies like the Byju's for at least a few more years. ■

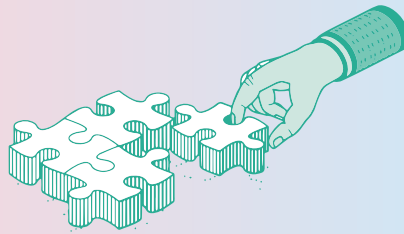
Md. Shafkat Imon Araf is a part-time writer inclined toward featured writing, professional research papers, business case studies, and blogs. With a passion for sharing valuable insights and dedication to the written word, Shafkat tries to bring expertise and creativity to the writing world. shafkatimon@gmail.com

Performance Marketing



- Immediate ROI
- Data-driven decisions
- Direct response
- Short-term focus

Synergistic Growth



- Increased brand trust via consistent touchpoints
- Elevated conversion rates with strong brand recognition
- Data from performance marketing guiding brand strategy
- Sustainable growth combining short and long-term tactics

Brand Building



- Long-term strategy
- Emotional connection
- Reputation and loyalty
- Brand equity growth

Brand building and performance marketing: Two sides of the same coin

by **Iftekharul Islam**

BUILDING RELATIONSHIPS WITH CUSTOMERS IS ESSENTIAL TO achieve business success, and the most effective way to build these relationships is through advertising. In the modern business world, advertising a new business to consumers can be long-term and short-term. For a business venture, an advertiser can either build brand value for a longer period or the company can choose performance marketing, where the advertiser will be compensated according to consumers' interactions with the company through sales, leads, and clicks on the online advertisements.

Brand building involves long-term investments in strategic activities and efforts to create and improve a brand's identity, reputation, and customer perception. It aims to create a strong and positive association with the brand in the minds of consumers. On the other hand, performance marketing is a marketing strategy focusing on measurable and trackable results in specific actions such as sales, leads, clicks, etc. It has short-term goals and heavily depends on data and channels such as targeted campaigns, digital advertising, search engine marketing, affiliate marketing, and other tactics to generate direct responses and deliver measurable results.

Nowadays, most businesses choose performance marketing as it is short-term, budget-friendly, and cost-effective, as they only have to pay the advertisers when they reach the marketing targets. As a result, the marketing world tends to diverge from brand building and focus more on performance marketing. This tendency to overlook the brand-building aspect might not be evident immediately, but it will surely affect business success in the long run. Developing brand value for a business and hiring advertisers for performance marketing complement each other. If both are used correctly, any business can maximize

customer reach and taste cherished success.

Although some businesses or companies understand the importance of both aspects, they fail to balance them. As a result, the companies succeed in connecting with consumers but fail to create their own brands in the market. In Bangladesh's context, the prime example would be Warid Telecom, the now-defunct telecommunications company of Bangladesh. Warid Telecom entered the Bangladeshi telecommunication market in 2007. It launched an exorbitant marketing campaign that amassed 1 million customers within six months, becoming Bangladesh's fourth largest mobile phone operator. But Warid did not create any distinct brand of their own, as they provided the same service as their competitors and nothing more than that. As a result, they began to lose in the competitive market and were forced to sell their shares to Bharti Airtel Limited in 2010, facing huge losses.

On the other hand, major telecom operators like Grameenphone Limited launched their operations way back in 1997. They had some fierce competitors, like Citycell. Still, they managed to survive through continuous advertisements and create a strong brand value by attracting consumers with lucrative voice calls and internet offers. As a result, after 26 years, Grameenphone has been a significant market player since 2018, holding over 40% of the telecommunications market and revenue. This is why creating brand value for a company is equally im-

portant as performance marketing.

Since the dawn of the internet age, performance marketing has been standard for businesses to promote their products. It posed a significant challenge: How should a business approach its marketing, i.e., promote product features or appeal to consumer identities?

In the case of brand building, brand metrics are measurements or key performance indicators (KPIs) used to assess and evaluate the performance and effectiveness of a brand. These metrics provide insights into various aspects of a brand's performance, including brand awareness, perception, loyalty, customer engagement, and overall brand equity. Improving brand metrics is important for companies to balance the relationship between brand building and performance marketing.

To improve brand metrics, companies first need to define their objectives for brand building and performance marketing. They must determine the specific outcomes and results, aligning them with their business objectives. Secondly, companies must identify relevant brand metrics by selecting metrics relevant to their industry, target audience, and strategic goals. The metrics can include brand awareness measures, brand perception indicators (e.g., brand reputation, customer sentiment), brand loyalty measures (e.g., customer retention, repeat purchases), and other relevant metrics that reflect the brand's strength and value. Companies should also connect brand metrics with performance metrics to establish a unified measurement framework and identify the linkages between brand-

success of the brand and business.

To strengthen the overall value and perception of a brand, there are some key strategies to boost brand equity growth:

Differentiating one's brand from competitors by showcasing unique benefits, packages, or values

Emphasizing delivering exceptional customer service at every sales point. Exceptional customer experiences foster loyalty and build strong brand equity.

Executing compelling brand stories that resonate with the target audience. Storytelling can communicate the brand's values, missions, and purpose engagingly.

Collaborating with complementary brands or social media influencers to expand a brand's reach and credibility. Strategic partnerships help tap into new markets, attract customers, and strengthen brand equity through association.

Continuously innovating and adapting to shifting market trends and consumer preferences. To maintain strong brand equity, companies must stay ahead of the curve by introducing new products and services that meet consumer needs.

Monitoring a brand's performance is crucial for consistent brand value. Companies have to collect feedback, conduct market research, and measure brand metrics to gain insights into brand equity growth and identify areas for improvement.

One unavoidable piece of advice for companies is always distinguishing between brand building and performance marketing.

THE MARKETING WORLD TENDS TO DIVERGE FROM BRAND BUILDING AND FOCUS MORE ON PERFORMANCE MARKETING. OVERLOOKING THE BRAND-BUILDING ASPECT MIGHT AFFECT BUSINESS SUCCESS IN THE LONG RUN.

building activities and performance outcomes.

Many US-based companies adopt the North Star metric, representing overall brand equity. The North Star Metric is a primary metric that serves as a guiding light for a business or organization. It is a key performance indicator (KPI) that reflects the core value or goal the company wants to achieve. The North Star Metric acts as a compass, providing direction and focus for decision-making and strategy. It goes beyond short-term numbers and looks at the long-term value created for customers and the business itself. For example, the North Star Metric could be the number of daily active users on a social media platform. This metric reflects the platform's ability to attract and engage users, which is vital for success.

Lastly, establishing solid connections between brand metrics and specific financial outcomes, such as revenue, market share, shareholder value, return on investment (ROI), etc., is crucial for improving brand metrics. These are how companies can enhance brand metrics and implement a framework that makes brand building and performance marketing reliable, enabling them to measure and optimize the impact of their marketing efforts. This integrated approach aligns brand building and performance marketing activities, leading to the overall

Short-term revenue generation and long-term value establishment are equally important for a company's continuous success. When a CEO focuses on search engine marketing (SEM) while overlooking brand marketing campaigns, disaster is meant to happen for the company in the long run. Most companies think brand value is not quantifiable, but the ROI calculates performance marketing. However, this is not true, as linking key performance indicators (KPIs) specific to brand-building activities and the brand's financial performance can show the brand's value in quantitative terms.

For the final piece of advice, performance marketing values are easily calculable but not always accurate. Common metrics used in performance marketing may underestimate the return on investment for brand equity growth while overestimating the impact of campaigns that unintentionally erode brand equity. Implement a brand measurement approach that aligns brand building and performance marketing with a unified metric for brand equity. ■

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Making influencer marketing affordable for small businesses

by **Adiba Isfara**

IN OUR EVER-EVOLVING, TECHNOLOGICALLY ADVANCED SOCIETY, one phenomenon has taken center stage in social media marketing: influencer marketing. With its undeniable impact and widespread reach, this trend has managed to attract audiences far and wide, transcending boundaries and appealing to diverse individuals. In the age of social media, individuals with substantial followings have found themselves wielding a powerful tool to express their perspectives and make a lasting impact. These platforms provide a great platform for influencers whose voices resonate with millions of eager followers. But it's not just the individuals who have recognized the potential of this phenomenon; brands, too, have swiftly caught on to the power of partnering with these influential figures to promote their products and reach a wider audience.

Thriving landscape

In Bangladesh's bustling digital landscape, two websites are virtual havens for millions of users – Facebook and Instagram. These social media giants have vast reach and influence and have become a powerful tool for brands seeking to captivate audiences. Through strategically utilizing these social media channels, brands can effortlessly tap into the pulse of the Bangladeshi market, establishing a strong presence and reaping the rewards of increased visibility and engagement.

With time and advancement, a remarkable consumer behavior shift has occurred. Gone are the days when consumers would blindly trust traditional advertising methods. The era of word-of-mouth marketing has dawned upon us, where recommendations from friends, family, and even strangers hold more weight than any catchy jingle or flashy commercial. In light of these transformative trends, brands have had to adapt their marketing strategies to stay relevant and effective.

The influence of social media personalities in Bangladesh is immense. One such personnel with a great social media following of 71.6K is Tasmeeem Auvro. She has risen to prominence from humble beginnings, collaborating with esteemed brands such as Foodpanda and Vaseline. Her ability to connect with her audience on a deep level has made her a sought-after partner for various marketing campaigns.

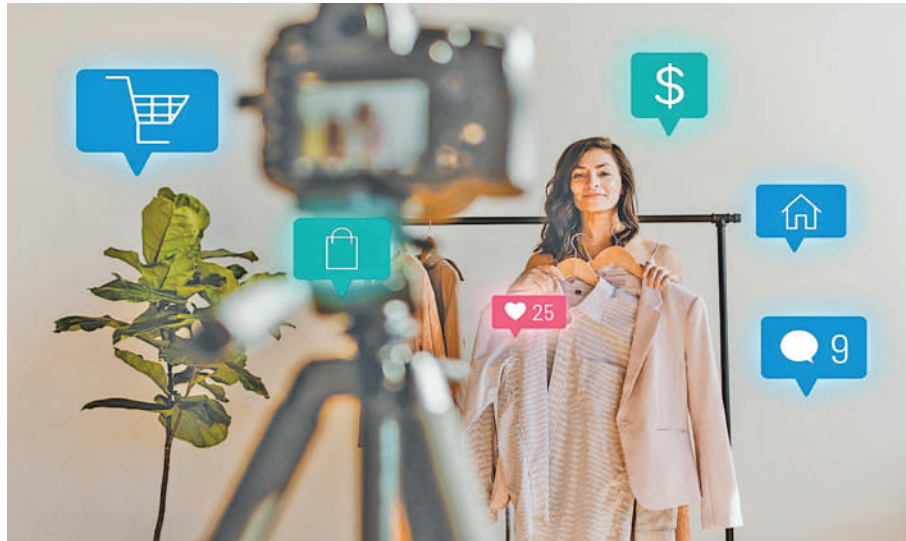
Similar to collaborations made by Auvro, many influencers promote products of big and small companies. Some large corporations pay influencers to spread the word about their products, while some often send PRs to get the word out.

Industry Insider spoke with some business owners. Ruqaiya Islam Mishi, the founder and owner of Lass Pamper, enthusiastically shared the instrumental role influencers played in promoting her products once she sent some PRs to some of the influential social media holders. Meanwhile, Afra Nawar, the owner of Deshi Bideshi and Shahnaaz, candidly revealed her experience, stating, "I involved an influencer to promote products of Deshi Bideshi, and initially, it was affordable and seemed reasonable based on her follower count. However, as the influencer's following skyrocketed, it eventually surpassed my budget."

While many companies, like Afra's, aim to increase product exposure through social media platforms, few can do so because of budget constraints and thus cannot get the assistance of influencers. To address this issue, platforms organizing influencer marketing campaigns for brands and social media personalities to communicate a smoother digital



The era of word-of-mouth marketing has dawned upon us, where recommendations from friends, family, and even strangers hold more weight than any catchy jingle or flashy commercial. In light of these transformative trends, brands have had to adapt their marketing strategies to stay relevant and effective



marketing opportunity can make a difference.

Influencer marketing for small business

Influencer marketing has become increasingly important for businesses of all sizes to engage with their ideal customers, spread positive word of mouth about their products, and ultimately improve sales. Influencers typically base their charges on how many followers they have across various platforms. A business may hire a popular influencer with a sizable fan base to gain exposure for its product and, consequently, sales.

Firms can use platforms like Partipost, a Singapore-based marketing solution offering affordable influencer marketing opportunities, to achieve their marketing goals. The same is true for influencers, who can quickly and easily use influencer marketing platforms to monetize their social media activity by promoting the products and services of brands they genuinely enjoy.

People in our country rely heavily on the online market, yet we don't have access to platforms that cater to easier and more affordable marketing through influencers. Many platforms worldwide focus on influencer marketing. They show profitable results for both influencers and businesses.

When a small business seeks to enhance the visibility of its product by collaborating with an influential figure with a substantial following, it may face the daunting prospect of making a significant financial investment for a single promotional endeavor. The burden is alleviated in countries with the proliferation of digital marketing platforms. These platforms provide a diverse selection of influencers at more affordable price points, according to the budget provided by the companies. As a result, both the businesses and the influencers can enjoy a mutually beneficial partnership, making the overall experience truly worthwhile.

For instance, instead of spending a hefty amount to hire one celebrity or influencer to promote your business for an hour, you can use a platform like Partipost and promote your business through hundreds of social media users who are not influencers but have a decent follower circle. It'll save you money and give you a much bigger and more diverse customer reach.

Afra finds that an influencer marketing platform is exactly what businesses like Deshi Bideshi are currently looking for. As a small business, it has been quite hard to promote her products online through influencers lately as the charge is way beyond her budget. Still, she is hopeful that such a platform can be a new beginning and a door full of opportunities for businesses like Deshi Bideshi.

To optimize investment, we turn our attention to influencer marketing platforms specializing in influencer marketing. These platforms serve as a channel for fostering more robust connections between businesses and influencers, ultimately leading to mutually beneficial partnerships and realizing optimal opportunities for both parties involved. ■

Adiba Isfara channels her passion for self-expression through her pen. She aspires to influence change with her words, and thus, she is dedicated to enhancing her skill in articulating her ideas by harmonizing words with thoughts.
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Navigate as a leader in a 'VUCA' world

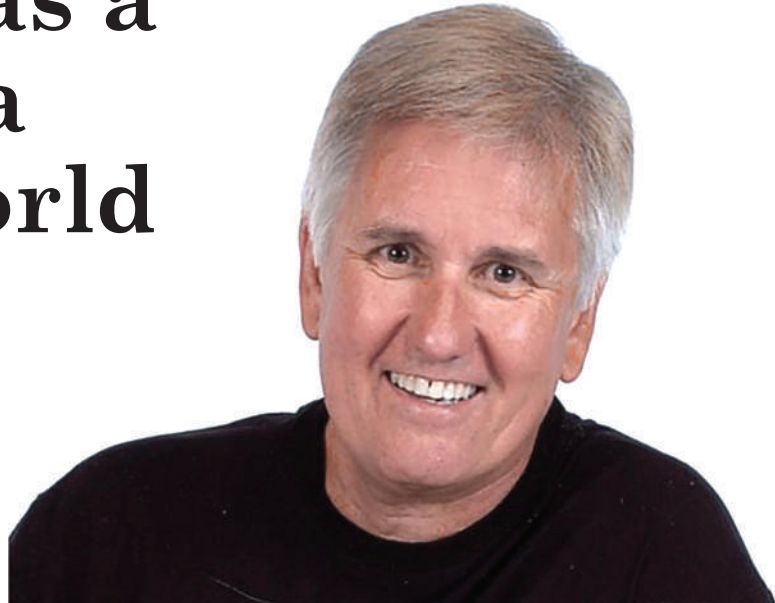
by **Robert "Bob" Pautke**

IN TODAY'S RAPIDLY CHANGING world, it is no secret that the business landscape is characterized by four elements: Volatility, Uncertainty, Complexity, and Ambiguity, or VUCA. The acronym VUCA originated from an American war college where it was created to reflect the reality of the end of the Cold War. Today, it has gained popularity to describe the challenges leaders face in a chaotic and unpredictable world.

VUCA represents four interconnected dimensions that define today's business environment. Volatility refers to the nature, speed, volume, and magnitude of change that often does not occur in a repeatable pattern. Uncertainty pertains to the lack of predictability in issues and events. Complexity is the numerous and difficult-to-understand causes, intricacies, and interconnectedness of factors. Finally, ambiguity represents the lack of clarity and the existence of multiple interpretations about the meaning and possible impact of an event.

Many factors have contributed to the rise of VUCA. Technological advancements, globalization, geopolitical shifts, and changing consumer behaviors have all played significant roles. It took telephone technology 75 years to reach 100 million users. Conversely, ChatGPT reached the same milestone in just two months. The rapid pace of technological innovation has disrupted industries, making it difficult for leaders to anticipate and respond to market changes and individual projects. Of course, the VUCA implications of these changes are felt by designers, engineers, project managers, suppliers, and consumers.

To successfully navigate the VUCA world, leaders must stay abreast of current business trends. One prominent trend is digital transformation, which involves leveraging technology to enhance operational efficiency, customer experience, and innovation. Those who embrace digital transformation can adapt more quickly



to changing circumstances, gain a competitive advantage, and meet evolving customer expectations.

Another significant trend is the shift towards asynchronous and remote work and virtual collaboration. The COVID-19 pandemic accelerated this transformation, compelling organizations to adopt remote work models. Leaders must embrace virtual collaboration tools, foster a culture of trust and accountability, and create inclusive environments that promote effective teamwork across physical boundaries. Also, sustainability and social responsibility have become critical considerations for businesses. Consumers are increasingly conscious of environmental and social issues, and organizations that align with sustainable practices and demonstrate social responsibility are more likely to gain customer loyalty and attract and retain top talent.

To quote the famous management consultant Peter Drucker, *"Only three things happen naturally in organizations: friction, confusion, and under-performance. Everything else requires leadership."* So, how does one lead in a VUCA world? The act of leading is influencing oneself and others, preferably influencing in an ethical, effective way. Leadership is Influence. In the face of VUCA, leaders must adopt strategies that allow them to navigate the unpredictable terrain effectively. Here are four essential strategies for leaders to bring on their A-game.

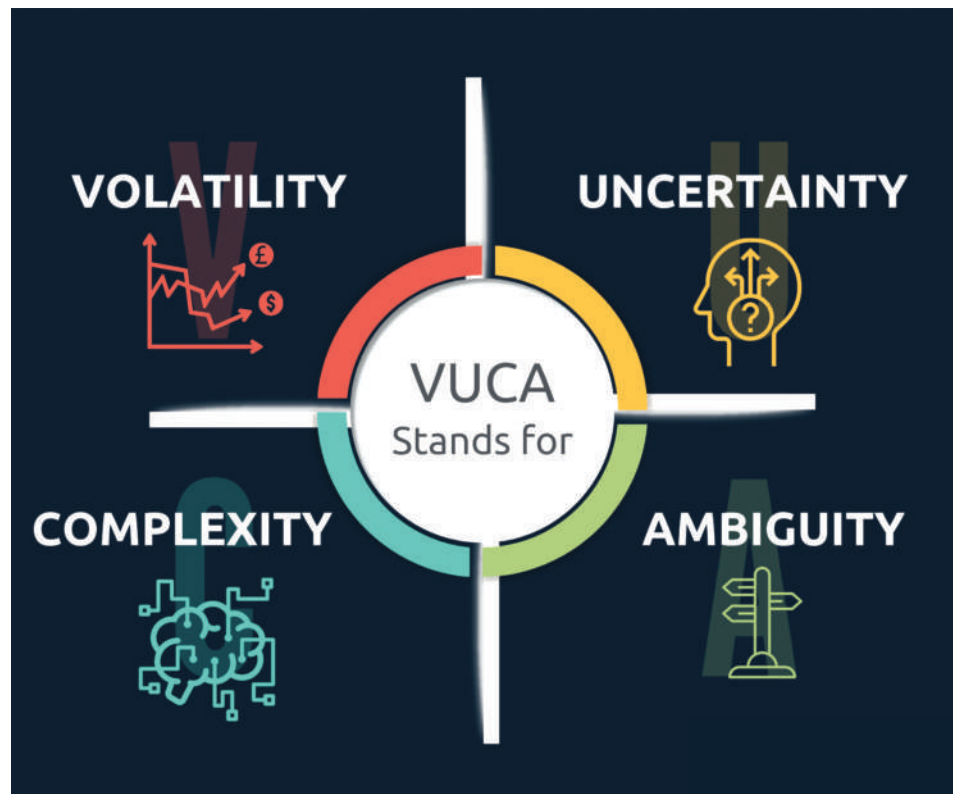
Do your best thinking: Leaders must foster a critical thinking culture and en-



'Best Practice' was Yesterday, while 'Best Thinking' is in demand Today and Tomorrow. What was successful yesterday may not be successful today or tomorrow



Leadership is a continuous journey of growth and learning how to influence oneself ethically and effectively and those around us



courage diverse perspectives. By gathering insights from various sources, considering alternative viewpoints, and challenging the status quo, leaders can make informed decisions that mitigate risks and exploit opportunities. Best thinking involves a few core principles.

First, leaders should let go of comfortable ideas, become accustomed to ambiguity and contradictions, and prepare to rise above conventional mindsets and reframe the questions we ask. They should proactively abandon their ingrained assumptions and open themselves to new paradigms. A very underrated quality is the willingness to experiment and tolerate failure.

Another key virtue is relying on imagination as much as logic while generating and integrating various ideas. 'Best Practice' was *Yesterday*, while 'Best Thinking' is in demand *Today* and *Tomorrow*. What was successful yesterday may not be successful today or tomorrow. Success in our VUCA world requires possibility thinking - Best Thinking.

Embrace change: Instead of fearing change, leaders must embrace it and view it as an opportunity for growth. Agile leaders are proactive in identifying emerging trends, flexible in adapting to new circumstances, and quick in making necessary adjustments. They empower themselves and their teams to embrace change and foster a culture of innovation. Not long ago, humans were writing sports articles detailing the statistics from a match or game. The robot reporter replaced the human reporter.

Those who embrace change can fashion an opportunity to move from the *displaced* to the *creator*. Embracing change is like flying through a storm cloud, a bit bumpy, but knowing the sun will shine on the other side. Change is hard at first, messy in the middle, gorgeous at the end, and nevertheless inevitable. Keep a positive mindset in the face of change and use that to build up creative energy.

Be a lifelong learner: Continuous learning is crucial in a VUCA world. Leaders must invest in their development, seeking oppor-

tunities to enhance their skills and knowledge. This could involve attending conferences, engaging in online courses, or seeking mentorship. By being lifelong learners, leaders can better adapt to new challenges, stay relevant, and inspire themselves and coworkers to pursue growth.

It is critical to foster a culture of continuous learning within the organization to expand knowledge, develop new skills, and stay abreast of industry trends. Take Charlie Munger's advice, learn something daily, and become a lifelong learning machine.

Take good care of yourself: VUCA swirling around us at work, home, and community is tiring. Its constancy is energy-sapping. Today's leaders must practice self-care and well-being. As a leader, it is important to take care of oneself to navigate the increasing stresses and challenges of a VUCA world. That is also a prerequisite for taking care of others. Like a battery, without a recharge, we run down. To be at our best, we must renew and recharge. Self-care promotes positive health outcomes, such as fostering resilience and better managing stress. Prioritize self-care and influence your team members to do the same.

Leadership is a continuous journey of growth and learning how to influence oneself ethically and effectively and those around us. The VUCA swirl demands change to remain relevant, productive, and meaningful. So, change we must. Embrace a journey that requires leaders to move from 'impossible' to 'I'm Possible' - to leverage possibility thinking and action. Embrace the craziness and be the leader that inspires and drives positive change in this VUCA world. ■

Robert "Bob" Pautke is President of SOAR with Purpose, a strengths-based Leader Development company enabling others to make the highest and best use of their potential. He holds a U.S. Patent and is a published author, podcaster, and sought-after inspirational speaker.



How AI is changing the trajectory of humanity's future

by **Farabi Shayor**

They are creating the AI and forming the board committing to AI safeguards, not third parties or independent regulators who test the big tech technology and try to spot flaws that might throw humanity on the verge of extinction

THE FIELD OF ARTIFICIAL intelligence is one that we engage with frequently. It's not about having a robotic vacuum cleaner that uses artificial intelligence to map and clean your home on a schedule. The emerging field of artificial intelligence has changed the game in ways we haven't yet begun to comprehend.

At the moment, nearly everyone enjoys examining this particular technological advancement. In response to this growing risk, international organizations like the European Union are rushing to take action, attempting to regulate or even 'ban' particularly dangerous forms of artificial intelligence. It's because the demand is higher than ever; as if they were choking on their hunger, people worldwide are desperately trying to figure out how to utilize ChatGPT.

Fear of missing out (FOMO) is the term used by millennials and members of Generation Z to describe this feeling. With OpenAI's democratization of the technology, artificial intelligence has grown drastically, unveiling a technology that had been hunched in the shadows and sparking an uproar for digital funds and resources. Thanks to the FOMO, their Generative Pre-trained Transformer, or ChatGPT, has set off an international rivalry to aid the most cutting-edge artificial intelligence (AI) startups.

The funding spree has been crazy in this recession. While Inflection AI is actively hiring and has raised USD 1.3 billion, Runway has received USD 141 million in the past two years. Salesforce and Nvidia have committed USD 800 million to generative AI startups. Google CEO Sundar Pichai has devoted much time and effort to artificial intelligence (AI), and a viral TikTok video shows just how much. Experts predict that the total investments will exceed USD 42.6 billion.

There have been more breakthroughs in the last century than in all previous centuries combined. It's unbelievable that such brilliant minds as Einstein, Picasso, and Oppenheimer lived simultaneously. However, the last two decades have seen the release of even more groundbreaking inventions and discoveries than human history combined. When first developed, AI was a method for permanently automating mundane duties. Which, therefore, eliminated employment and posed a real risk to other industries. But it also gave rise to new economic sectors.

Since IBM's artificial intelligence 'Deep Blue' beat the world chess champion in 1997, it has been the center of several tech-

nological developments. Over the past two decades, the United States and China have spent vast sums on developing ever-more-powerful supercomputers.

Meanwhile, social media companies have used algorithms to provide us with more of what we want and more information about ourselves, both of which have strengthened their bottom lines. The financial sector also uses machine-learning predictions to boost the reliability of financial forecasts and back up rule-based choices like insurance payouts. However, the impact of generative AI was unparalleled.

Recent developments in artificial intelligence have striking similarities to the 'near-zero' response given by Christopher Nolan's latest film's protagonist, Robert Oppenheimer when asked when his creation will blast a hole in the atmosphere, affecting an unidentified amount of people. As Sam Altman and other pioneers in the field of AI are invited to meet with international leaders, including presidents and prime ministers, regulatory bodies are on high alert due to the potential exhibited by generative AI and Large Language Models like ChatGPT. They are creating the AI and forming the board committing to AI safeguards, not third parties or independent regulators who test the big tech technology and try to spot flaws that might throw humanity on the verge of extinction. The profit makers are the ethical controllers.

A life-changing technology has the potential to create an existential crisis, and that's true for any technology, whether it's nuclear fission, the Internet, or artificial intelligence. As for generative AI, right now, it can mock Ariana Grande's voice or SpongeBob's tone to compose music, generate images of Pope playing basketball, and videos of fake Tom Cruise generating tens of millions of views. To provide a quantitative example, Anthropic's AI can now process 75,000 words per minute.

According to top consultancy firm McKinsey and Co, Generative AI, the technology itself, could potentially have a 15% incremental impact, adding about USD 17.7 trillion

What steps are we taking to archive human history, cultural history, historical incidents, and critical turning points that will be amassed as a memory bank for future AIs?

in economic value to the global economy. Goldman Sachs research suggests two-thirds of the occupations could be partially automated by AI as a technology, leading potentially 300 million full-time jobs to automation. That's six times the population of the United Kingdom, or almost equivalent to 90% of the population of the United States.

For a simpler method to grasp what's happening, the readers should consider three names – Netscape Navigator, Tesla, and Boston Dynamics. The first invention revolutionized the analog era and propelled us into the digital age. It paved the way for the development of Google and all the modern technology we rely on today.

The second was instrumental in revolutionizing the automotive industry and promoting the use of electric vehicles. The third company, often underestimated, is making science fiction a reality by creating robots to assist humans with everyday tasks. Their line of products includes the famous robotic dog 'Spot,' which has been spotted guarding the premises of SpaceX. Their other robots can also perform synchronized dances, lift heavy objects, and execute backflips.

Netscape Navigator was a big deal at the time of its invention, and as the company started a media push, Microsoft got into an outlandishly huge legal battle. There's an entire Nat-Geo television series on what happened between the two tech

GPT-4 is smart enough to read and write code, give logical grounds for analytical questions, translate simple commands into codes, and is on its way to understanding how to rewrite its own code

giants. Microsoft lost the legal battle but won the fight for existence. Combined with the ability to access computers, Internet Explorer became a mainstream browser in the late 90s. Users then started listening to music online, watching films using peer-to-peer torrent-sharing applications, and eventually began storing their entire life story on social media sites. Netscape Navigator was the interface that led the revolution.

When Tesla first introduced their electric sports car 'Roadster,' it faced many challenges that persisted until recently. Musk founded the company and is now recognized as a leading automotive manufacturer. They were the first to have an all-electric lineup. This move revolutionized the entire automotive industry. Today, every car company has an EV lineup. Some companies like Volvo are becoming fully electric. Life will never be the same for petrolheads.

It's unnecessary to delve further into Boston Dynamics as their demonstrations are widely available online. Their videos, such as the one featuring Spots pulling a truck, provide a glimpse into the future.

Since last year, when ChatGPT was released, life for many people has never been the same. From writing essays to legal grounds for court battles, OpenAI has released a window that probably won't close for a long time. Like Netscape, there is no

guarantee of the product's existence. The irony of the event is that Microsoft, which nearly destroyed Netscape, igniting the browser war, has remained a step ahead this time. Instead of going into an altercation, they have bought a significant chunk of the company OpenAI. It's a win-win situation. The acquisition was so impactful that it brought 'Bing,' an almost non-existent web browser, back from the dead simply because it integrates the world's most powerful AI assistant. ChatGPT is the 1990s' Netscape, the 2000s' Tesla Roadster, and the 2010s' Spot.

GPT-4 is smart enough to read and write code, give logical grounds for analytical questions, translate simple commands



into codes, and is on its way to understanding how to rewrite its own code. For now, if GPT is disconnected from the world of the Internet, it's all dead. Unlike quantum supercomputers, LLMs require the Internet to function. But that's about to change with the emergence of memristors and AI-integrated processors. Apple has already integrated an early version of AI-integrated processors. It allows artificial intelligence to function independently, without any external platform like the Internet. This American Bengali entrepreneur, the CEO of another AI startup, thinks every user will have offline capability.

During a previous SXSW conference, Kurzweil, then the Director of Engineering at Google, confidently predicted that the singularity would occur by 2045. This is an audacious statement from someone who has achieved over 80% accuracy in forecasting technological advancements. After the evolution of GPTs, it's reasonably clear that the timeframe will be truncated. DeepMind, Google's superintelligence dedicated to MedTech research, predicted this year that humanity is a few years away from seeing human-level intelligence.

AI experts and technologists who have made similar predictions may have also focused on the ethical consequences of regulating artificial intelligence. This isn't just about removing biases or racial prejudice. For instance, there's not enough transparency as to how AIs are being trained to recognize all types of faces, regardless of skin color. That's just one aspect of ethics. There are issues with hallucinations, generating false information in confidence, and regulating their movements within hard borders.

While working on his science fiction novel, this writer became

intrigued by the concept of an AI breaking free from its limitations. Thus, he included this idea in the storyline: a quantum AI is one of the main characters facing a situation where a rogue AI expands beyond its designated boundaries and escapes its confines. What confines are being placed so that real AIs wouldn't be able to rewrite their own code? What does it mean to treat and teach AI like a human being? Should AI be made responsible for choosing a person over an animal to save the passengers of its vehicle?

There isn't enough research into how GPT is being trained and exploited. This human-AI relationship will grow stronger than ever. As human evolution suggests, it's likely that, similar to phones, AI assistants will become an indispensable part of our lives. What steps are we taking to archive human history, cultural history, historical incidents, and critical turning points that will be amassed as a memory bank for future AIs? Who controls these guidance methods to ensure AIs are trained to identify the balance between the lefties and conservative fundamentalists? What measures are in place to appreciate the distinctions among religious beliefs? The rationale of creating a powerful, intelligent non-human intelligence needs more interpretation before the wicked hands dominate it and eventually tap against our own kind as a program for obliteration. ■

Farabi Shayor is a 2X author, consultant, and scientist recognized by the Science Council in the UK. He's a British resident of Bangladeshi lineage and works with both the public (government) and private sector, providing technology consulting services.

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Bengali AI: Proliferating AI into Bangla language

by **Shadique Mahbub Islam**

BENGALI AI IS AN INITIATIVE TO DEVELOP AND promote artificial intelligence in Bangla, the language spoken by more than 200 million people in Bangladesh and India. The initiative was inaugurated in 2018 by a non-profit community of researchers, engineers, and enthusiasts who wanted to create a platform for Bangla speakers to develop, learn, share, and collaborate on AI-related topics. Bengali AI provides various resources, such as online courses, tutorials, datasets, tools, and competitions, to help people learn and apply AI in their domains of interest. The initiative also organizes events, such as workshops, hackathons, and meetups, to foster a community of Bangla AI enthusiasts and practitioners.

Industry Insider sat with Siha Haque, Bengali AI's campaign manager, to discuss the project and its plans.

Whenever we talk about AI, we always think about the big tech backing its development. Microsoft Corp. is an investor in OpenAI, one of the world's most prominent AI startups. Alphabet has been pouring money into its development of Google Bard. Nvidia, an-

"Bengali AI is not an organization per se; we would like to call it a community of researchers and developers who work for the progress of technology in our mother tongue. And for this, the loose, flexible open source research is the most effective way forward."

There is no business model behind Bengali AI. Various universities and independent researchers fully fund it. Individual projects are funded, such as their sign language to text language projects, OCR, etc.

The modus operandi is important for a large community as it is often spanned across different countries or even continents. So, the Bengali AI has developed a rather flexible structure and maintained an efficient skeleton crew.

"We work on projects where we recruit annotators, transcribers, and other stuff. Sometimes, researchers join us for academic purposes or their research. Anyone interested in research can work with us."

There was a persistent notion that the Bengali language was in-



other tech giant, acquired DeepMap, an AI company that provides high-definition maps for autonomous vehicles. Meta, formerly known as Facebook, bought ReFlect, an AI company that creates realistic virtual humans. These are just some of the examples of how big tech companies are investing in and acquiring AI companies to gain access to their technology and talent. However, Bengali AI is neither funded by corporations nor aimed at profit-making. So why?

"Bengali AI is a non-profit community that relies on open-source collaboration from researchers and engineers worldwide. So, if we turn it into a profit-making scheme, the open-source collaborations will be adversely affected. We do not want that. Our main goal is to spread all of our research and datasets for the betterment of everyone. Profiteering may create a bottleneck," elaborated Siha.

So, the Bengali AI team believes that open-source collaboration is the best way to develop AI in Bangla. This may sound a bit unusual for a tech company, which generally has a fixed team of developers. When asked about it, Siha's reply was intriguing.

compatible with modern technology or advancements. This can not be particularly disregarded, given not much has been done in this field. Bengali AI was the first initiative to make AI available in Bangla. Now, has the notion been changed?

"Definitely, it has changed. We never think that the Bangla language is incompatible with modern technologies," Siha explained, "However, we do believe that most of the research has been conducted on English or Latin-based languages. We have a scarcity of research on Bangla or similar oriental languages. So, English and other Latin languages enjoy more language acceptance in the technological field."

"But it does not mean Bangla is incompatible; it just means that not enough research has been done here. We are working tirelessly to fill that gap."

Bengali AI has cracked the code of public participation in the age of social media. The majority of their dataset is obtained through various social media campaigns. They have conducted dialect campaigns, speaking campaigns, and even cursing cam-

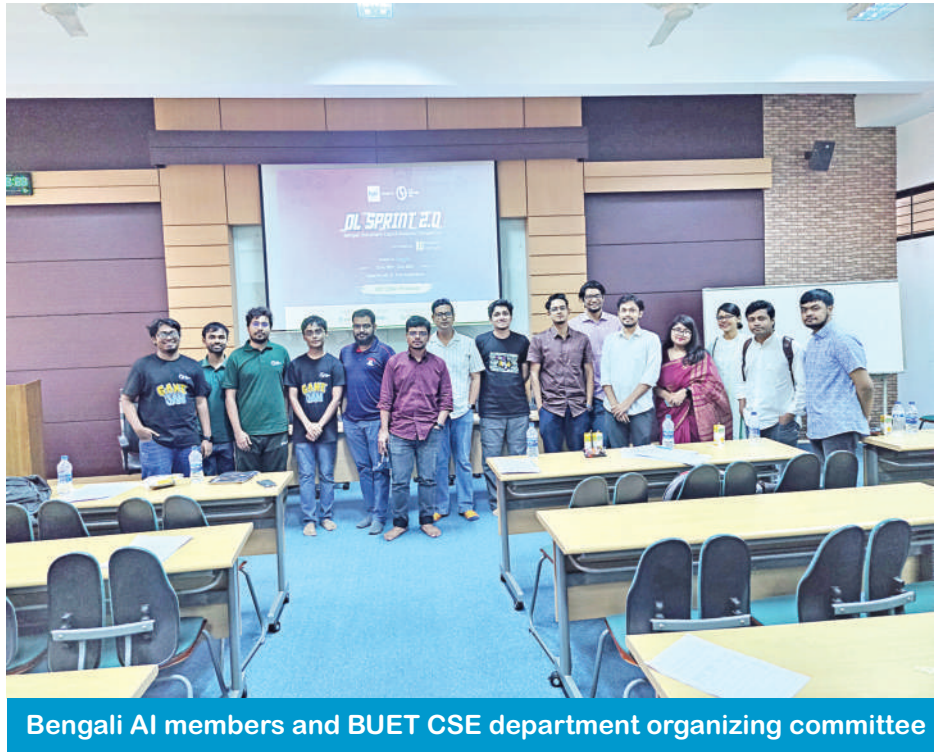
paings! Did those campaigns help?

"Yes, we launched several campaigns on social media. For example, we asked people through social media to provide their voices through Mozilla Common Voice for text-to-speech dataset collection. We used influencers to promote our campaigns. And the result was quite satisfactory. Two thousand hours worth of voice dataset was collected. We also targeted national holidays like International Mother Language Day, Independence Day, or Victory Day to tap into people's patriotic sentiments and gather data."

Incentives were also given for participating in these campaigns. There was prize money as well, enough to motivate people. One of their interesting campaigns was the cursing competition - where people were told to curse in Bangla, record it, and send it to the team. There was also a meme competition for collaboration with Rangatese, a Facebook group. "It always works if you know how to do it," Siha replied with a smile.

So, how would the business environment benefit from the development of AI in Bangla? "The business community will be benefited in every sense. For example, small and medium online companies' customer response relies mostly on English because of the lack of Bangla AI. It creates a significant barrier as most of the people of the country do not speak English. So, the businesses will get a bigger customer base. We can make Bangla Alexa or Bangla ChatGpt. Then, the people will not need English proficiency to communicate with technology. Like China or Japan, we too can communicate with technology in our own language," explained Siha.

"Bengali AI can help businesses communicate more effectively with customers, partners, and employees who speak Bangla as their



Bengali AI members and BUET CSE department organizing committee

first or second language. It can also assist businesses in reaching out to new markets and audiences who speak Bangla, whether online or offline. Bengali AI can also make content in other languages or formats more accessible and clear for Bangla speakers by offering translation, transcription, summarization, or explanation. It will also assist businesses in preserving and promoting our rich heritage and diversity of language and culture," Siha added.

It can also assist organizations in developing a distinct identity and brand image that expresses their beliefs and goals concerning Bangla. Bengali AI can also help organizations connect emotionally and culturally with their customers and stakeholders.

"Finally, Bengali AI can help businesses conduct research and

development in various fields and domains related to or influenced by the Bangla language and culture. It can also help businesses collaborate with other researchers and developers who work on similar or complementary topics or projects involving Bangla. Bengali AI can also help businesses innovate new solutions or applications that address the specific needs or challenges of the Bengali people," she concluded.

Thus, it will not be unjust to be hopeful for the future of Bengali AI and its impact on the synthesis of our mother tongue and technology soon. Let us keep our fingers crossed. ■

Shadique Mahbub Islam is an independent researcher and analyst, currently working as an official contributor to a popular local daily. He loves writing about economy, politics, and society. shadique.mahbub.islam@gmail.com



DL Sprint 2.0 Final Round day, organized by Bengali AI community, in collaboration with BUET CSE

Potential and competitiveness of the IT sector in Bangladesh

by **Zanjabil Mashkura**

THE ICT SECTOR OF BANGLADESH IS GOING through admirably fast-paced growth. Industry players are investing in the field of R&D to stay alive amidst fierce competition, increasing innovation at a rapid pace. The local ICT Market is sectorized as hardware, Software, IT Services, and telecommunication services. The market consists of both small and medium enterprises and large enterprises.

Bangladeshi software and IT-enabled services firms have clients in over fifty countries on four continents. The expeditious expansion of ICT-based services has led to an increase in efficient growth in the private sector. Nearly half of the country's IT market is shared by various software development firms, which shows the significant impact of the software market in the overall IT sector. Experts in IT engineering are operating in the industry to meet the demand for customized software development and maintenance. There is a high demand for payment systems like HR and payroll software in the garment sector, hospitals, banks, and government projects.

According to BASIS, 25 local software companies are now developing integrated business applications and enterprise resources planning (ERP) instead of importing them.

However, local companies have never viewed software development as a core industry. The creative field is small, and compa-

nies rely on packaged programs sold by independent software vendors. Packaged programs are great for back-end systems like HR and financials but not good enough for customer-facing parts. To gain a competitive advantage and to signal the customers, the local Bangladeshi firms should consistently invest in unique program making.

Outlier companies build unique software systems for managing their sales and marketing. Business giants in global platforms like Amazon and Walmart earn more profit through software-controlled strategies than their rivals. This is something Bangladeshi IT companies can adopt, too. However, the local IT companies in Bangladesh must remember that this strategy may cause economic concentration and higher inequality. Proper policy regarding software development and visionary marketing strategy can balance it all.

Tech market in Bangladesh blending with 4IR

Global software and Internet companies have gone beyond simplistic marketing models to create several ways to earn more revenues. They created an audience always there to boost revenues by believing they were benefiting themselves.

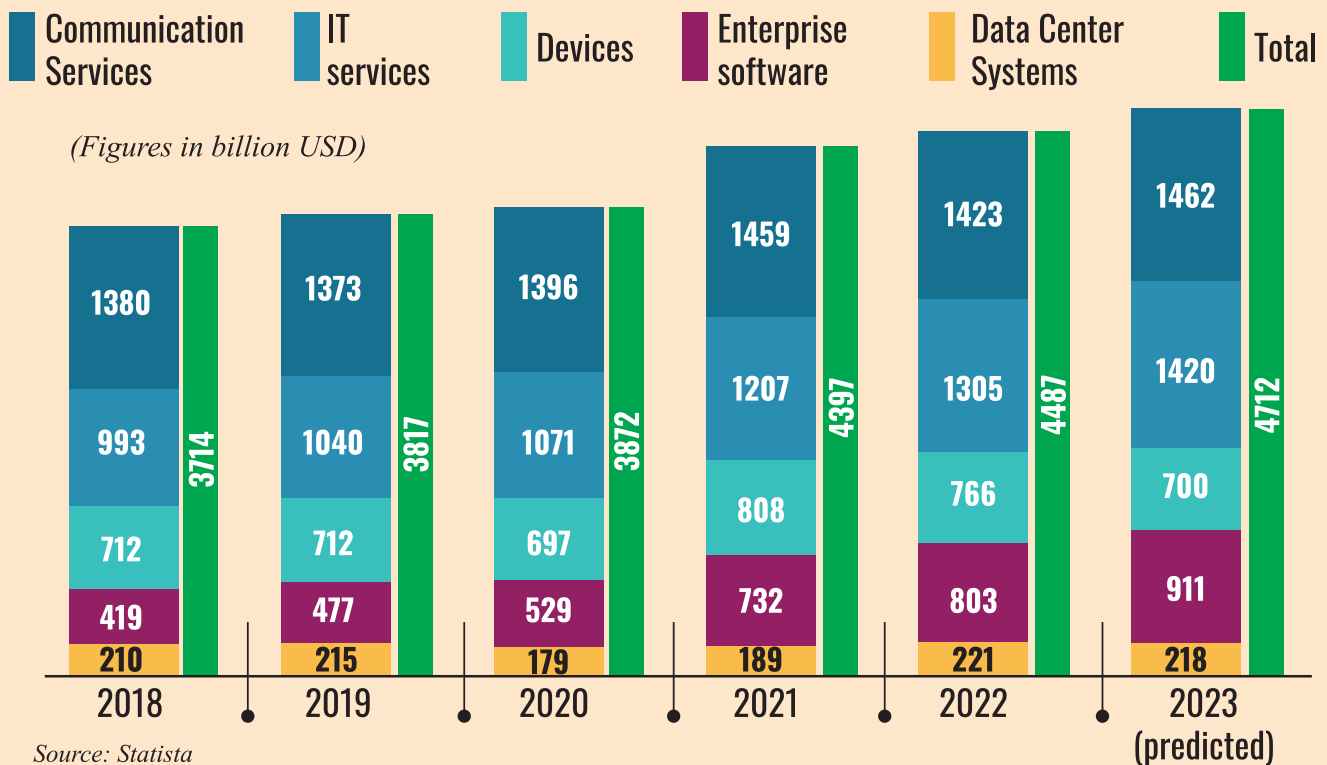
The growing demand for digital transformation has influenced the government to initiate projects that boost the country's telecom sector. The country's transition to 3G, 4G, and 5G is still rising. The Bangladesh government's Posts and Telecommunications Division expanded its initiative to offer 5G technology-based mobile

services to the general public. Huawei and Nokia installed the nation's first 5G network in limited areas of Dhaka in partnership with Teletalk. It will bring new growth opportunities for the Bangladesh ICT market. GSMA predicts that smartphone adoption in Bangladesh will grow almost 75% more by 2025. The growing population of Bangladesh is the reason behind an ever-increasing demand for ICT products and services. The rising adoption of broadband services in the country, specifically fixed broadband services, is another positive sign.

Bangladesh Data Center Company Limited (BDDCL) provides reliable and easy access by storing data through virtual storage for major organizations. It guides the companies in meeting government standards and safety regulations. BDDCL uses Oracle Cloud Infrastructure for the Bangladesh government to provide secure cloud services. Microsoft has opened a Startups Founder Hub in Bangladesh to provide technical tools and investment assistance to talented individuals or groups for expanding their businesses. Meghna Bank adopted a Huawei modular data center in Dhaka to provide better service to its clients. Besides, government investment in several technology development programs such as 5G, AI, and IoT will emerge into a digital transformation.

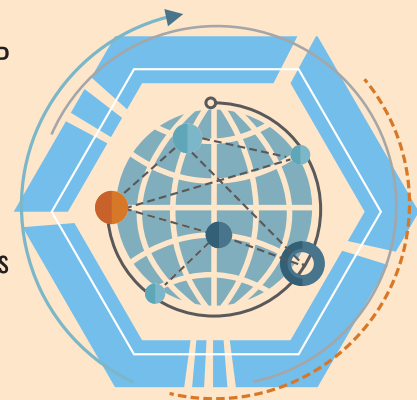
Tech Mahindra signed a contract with Axiata Group to co-develop 5G enterprise solutions for many countries, including Bangladesh. A Dell and Microsoft cloud service partner, Colocity, launched the Microsoft Azure stack hybrid cloud in Bangladesh to enhance assistance for local businesses to grow. A Project of Bangladesh Computer Council (BCC) under the ICT Division called iDEA signed a letter of intent (LOI) with Microsoft

Global IT spending trends, 2018-2023



Local industry at a glance

- 25 local software companies develop integrated business applications and ERP
- IT sector to grow at a CAGR of 1.83% over next 5 years
- 500,000 regular freelancers working
- 2,500 agencies serving different freelancing platforms
- Over 1,500 software and IT-related companies export products to 35 countries
- More than 120 call centers are operating in Bangladesh
- USD 5 billion export target by 2025



Source: BASIS

to accelerate domestic innovations and startups in Bangladesh. Besides, Bangladesh has established a data center in Kaliakoir, Gazipur. Initiatives like this will bring new growth opportunities for the Bangladesh ICT market.

The world is getting more digitized, and Bangladesh needs to adapt to great Artificial Intelligence (AI) facilities such as machine learning and automated data analysis to help achieve higher growth. The tools of AI have become highly useful in the area of customer service, such as chatbots and virtual assistants. AI can bring significant change in the field of finance and healthcare. Digital infrastructure development, R&D, data privacy, security, regulations, funding, and industrialization for newer technologies should be a core industrial objective while focusing on skilling and reskilling the workforce. With the advantages of AI, Bangladesh's

National Cybersecurity Strategy is working on cybercrime management for a safe, secure, and harmless IT sector.

Export of Software and ITES from Bangladesh

According to a recent study by the Oxford Internet Institute (OII), Bangladesh is the second largest producer of IT freelancers in the world, with a labor share of 16%.

The local IT companies have started to export to EU countries and East Asian countries along with its top export customer, the US. Many of these companies export through joint ventures with overseas companies or with full foreign capital investment.

According to BASIS, global tech giants like Google and Apple are now looking for an alternative to India for low-cost IT services. During the last two or three years, the engagement with overseas venture capitalists indicates that the Bangladesh IT industry has fi-

nally been able to grab the attention of global IT importers. Bangladesh has nearly 650,000 IT service exporters, freelancers, and almost 1,600 freelancing organizations, earning over USD 500 million in the 2021-22 fiscal year. Tiger IT, DataSoft, Dohatec, eGeneration, REVE Systems, and Southtech are some of the top Bangladeshi companies that have set up their offices in India, Nepal, Bhutan, Malaysia, Japan, the UK, the US, and even in the African continent.

E-commerce

E-commerce service has a high engagement rate in Bangladesh. Now, people can shop for groceries at home and compare the prices of daily necessities through various apps like Chaldal, Panda Mart, daraz, etc. Customers are more active in Social Media Shopping, using Payment methods like bKash, Nagad, and Upay. More availability of global shopping platforms like Amazon and Lazada will increase Shipping.

Job opportunities

The IT servicing sector of Bangladesh has a large number of skilled and well-educated entrepreneurs. The career opportunities in Bangladesh's IT sector are centered in the capital city. The outsourcing of tech services of different multinational corporations to

Global software and Internet companies have gone beyond simplistic marketing models to create several ways to earn more revenues. They created an audience always there to boost revenues by believing they were benefiting themselves. Crowdsourcing is an example of co-creation with customers. Companies can utilize social media and websites to reach customers for opinions and suggestions on product design to justify consumer demand. For instance, companies like Kickstarter provide a platform for entrepreneurs to presell product ideas.

Domestic IT companies must find their unique style while maintaining a company to survive in the market and stand in the global platform. Android has the biggest overall install base, but Apple owns the high-income market. Cloud storage services provided by Apple, Google, and Microsoft as part of other products are available in the market, and yet Dropbox still managed to double its revenue to USD 1.2 billion from 2015 to 2018. This is why the thriving IT companies of Bangladesh need to find their x factor.

Payment complications

Bangladesh needs to formulate a legal framework to encourage new entrepreneurs. There is an entry barrier for new and small firms in the industry, with policies favoring large producers. IT

firms with more than 200-bit data storage have to bear a lesser tax burden than firms with lower data storage. Banks and financial institutions need to have access to borrowers' credit information for safe and secure transactions. Investors in this industry should receive borrowing and loan benefits like in the RMG sector. Investors should get a reduced high interest rate to get benefited from it. Through foreign direct investment, the growth of new IT firms will generate more foreign currency.

The cross-border payment system in Bangladesh operates through international bank transfers. Many companies prefer not to use these services as it is a

time-consuming and costly option. Payment systems like PayPal and Xoom can be a proper replacement or substitute for other conventional payment systems like bank transfers.

Local investors can attain corporate income tax exemption if they invest from BIDA and Hi-Tech Park authority for the first 10 years. However, In the initial stages, the private banks do not agree to their requests for loans due to the high risks associated with the sector. Proper mechanisms to quantify the value of IT work in Bangladesh are often absent.

The IT industry in Bangladesh shows a bright future in terms of growth potential and endless probabilities. The increasing demand to explore and adopt digital technologies and IT infrastructure has motivated the recent competitiveness of this sector. The nation is relatively new in the global online outsourcing market and has a long way to go. ■



Design of Kaliakoir Hi Tech Park, Gazipur

Dhaka has been the primary cause of diverse opportunities here, making it almost a rival to the city of Bengaluru, India. Most of the experts involved in the IT sector are computer science or software engineering majors with high proficiency in developing programming languages.

Room for improvement

The world is progressing, and AI and other modern technical tools will reduce the demand for low-cost labor. In manufacturing, for example, robots and automation have improved efficiency and reduced costs. As a Developing country, we must solve the 'AI-unemployment trap' many countries are stuck on. Promotion and sponsorship of IT skill training courses and scholarship programs will create a spontaneous IT industry.

Many companies still stick to the business motto of an exclusive product-developing model strictly controlled and authorized. Maintaining barriers to avoid entry of new companies into the market will destroy healthy competitiveness. Corporate giants must think expansively about moving from 'products to platforms. Firms can include suppliers and consumers from all streams to create a large platform and analyze how each part of the value chain integrates into the new platform.

Mashkura is a free bird and an intuitive thinker who has made content writing part of her lifestyle. To be an unbiased writer she lets her senses analytically deal with emotions. Reach her here: z.mashkura@gmail.com

Bangladesh's path to IoT and firmware-based industrial prosperity

by **Md. Azaher Uddin**

WHILE IOT AND SOFTWARE ARE BUZZWORDS that most people are familiar with by now, few people in Bangladesh know about Firmware or Embedded systems that make up the IOT industry.

In recent years, Bangladesh has started to penetrate the global software industry. With a CAGR (Compound Annual Growth Rate) of 1.83% in the ICT market, the currently estimated 2 billion dollar software industry in Bangladesh is guaranteed to grow in the following years. However, there is a lot of room for improvement since the global software industry size is currently estimated at 652.1 Billion USD, and with a CAGR of 11.5%, it will more than double by 2030.

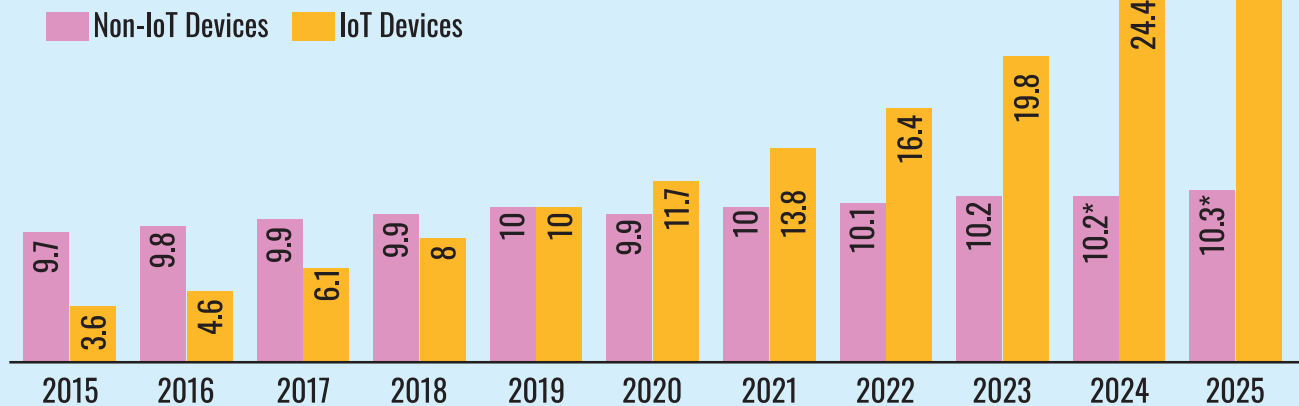
Despite the progress made in the software industry, there is al-

to the 'Internet of Things,' a network of smart network-based or physical devices and appliances through internet connectivity. Firmware is used in IoT devices or embedded systems to use data from sensors and other electrical components and execute specific commands on hardware devices/modules.

The world is gradually shifting towards smarter solutions and devices as technology thrives. Whether it is healthcare, a smart home, a driverless automatic car, or a smart air conditioner, all depend on the firmware to execute hardware-specific tasks and use sensor data to offer better experiences. Even computers and mobile phones employ some firmware forms to allow the user end software and operating systems to perform specific hardware-based tasks. Almost any real-life machines and devices can offer better

Non-IoT and IoT active devices from 2015 to 2025

Figures in billion USD



Source: Statista

most no progress made in the embedded systems or IOT industry, which has the potential to be the biggest industry in the future.

Firmware is, in the simplest terms, a piece of software dedicated to executing specific tasks by hardware. While the software is intended for human-computer interaction, firmware is for communicating with the hardware, so the firmware is generally developed with low-level programming languages with lower abstraction levels.

Embedded systems and IOT are examples of technologies containing firmware. Embedded systems vary significantly in complexity. They can range from simple devices with a single microcontroller chip to complex systems with multiple units, peripherals, and networks. Digital Cameras, MP3 Players, and Smart home appliances are all examples of embedded systems. IoT refers

services by making them smarter, which depends on firmware.

The total number of IoT devices in the world right now is more than 15 billion, which has already exceeded the number of overall people on Earth. The number is estimated to grow to 25 billion in the next five years. The growth rate could be even higher considering how IoT and smart devices can significantly improve efficiency in agriculture, healthcare, home appliances, banking, military applications, manufacturing, energy production, etc. That is why the IoT industry alone has surpassed 600 billion USD market size before 2023 and is estimated to cross 3 trillion dollars by 2030 at an astonishing CAGR of 26.1%.

Despite the promising future, Bangladesh has yet to make significant ground in this industry. The National Internet of Things Strategy adopted in 2020 by the Bangladesh government set goals

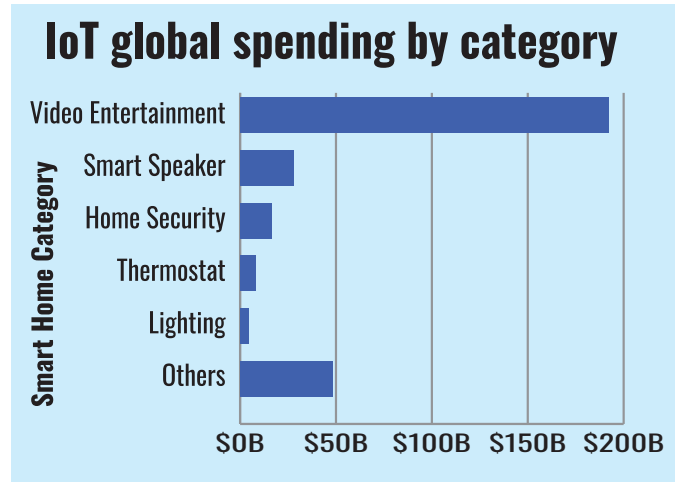
The garments industry is also at risk as automation in the garments industry could very well mean that Europe and the USA will soon produce all garments inside their countries instead of depending on low assembly costs from third-world countries

like increasing the IoT market size to 1 billion USD by 2023 and creating 10,000 skilled workforce for domestic and international markets. That goal is yet to be materialized as IoT-based startups are still low, and major manufacturing and other companies are not yet focusing on this industry. Bangladesh plans to earn 5 billion USD in IT exports by 2025 and create 100,000 jobs inside the country in the digital device manufacturing industry. Digital/smart device manufacturing development inside the country will surely need more firmware, IoT engineers, and experts to design and develop products intended for mass production.

Some popular tech companies in Bangladesh develop firmware as a component for their products, but that number is extremely low compared to other countries. For example, the IT industry in India already accounts for 7.4% of its GDP in 2022, and the IoT market size is estimated to grow towards 60 billion USD by 2028.

IoT devices and embedded systems all require chips like microprocessors or microcontrollers. Since Bangladesh has not made much ground in the semiconductor industry, developing the chips inside the country soon seems impossible. Instead, Bangladesh can penetrate the firmware and embedded systems development industry, which uses imported microprocessors and chips, and develop firmware to design and produce IoT devices and embedded systems inside the country.

Bangladesh still relies on remittance from nationals working overseas in mostly service-based and garment industries to keep the

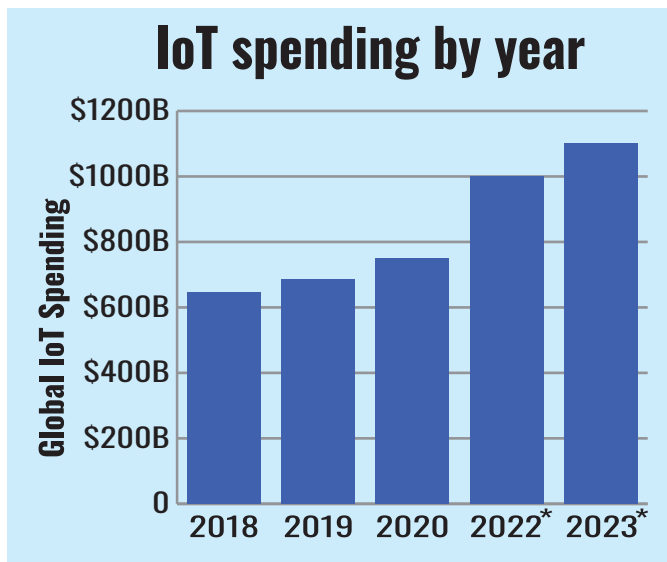


economy stable. With the development of increasingly smart home devices and appliances, the remittance from service-based industries will surely take a hit as developed countries shift towards smart devices to provide services instead of manual labor. The garments industry is also at risk as automation in the garments industry could very well mean that Europe and the USA will soon produce all garments inside their countries instead of depending on low assembly costs from third-world countries. That is precisely why Bangladesh has to focus on more promising industries for the sake of the future.

As of now, the biggest percentage of nationals working in foreign countries have low-level skills, which means they can only participate in low-level service jobs with low wages. But if the National Internet of Things Strategy were to succeed and Bangladesh could produce more skilled workers for the IoT field, that could ensure a far better remittance yield from nationals working overseas. The same argument stands for university graduates, too. With the unemployment rate among university graduates rising every year, a more industry-oriented focus in universities to produce firmware engineers or developing more Technical Institutes for skilled workers could mean better employment opportunities both inside and outside the country, which will also help the national economy. This will also help the development of IoT-based startups to export more and more IoT and firmware-based products.

Bangladesh spends the most on importing IoT-based products and technological devices. Whether it is high-end medical equipment, sensors, simple digital devices, smart home appliances, embedded systems-based devices for connectivity, or other purposes, Bangladesh heavily relies on imports. Development of IoT and firmware-based industries could not only mean a rise in exports, it could also mean a lot less of the national reserve spent on imports of devices that could easily be manufactured inside the country. If Bangladesh produces more firmware engineers and experts, that could also heavily increase the potential market size for Bangladesh and the IoT device market. Currently, most industries inside the country focus on just the assembly process without manufacturing the actual components; that could change if Bangladesh brings the manufacturing process for IoT device components.

Whether Bangladesh can make it in the promising firmware and IoT market in the future depends on the government, universities, and prominent companies investing in Research and Development in this field. With the right circumstances, Bangladesh could become a leading IoT product and firmware exporter globally. ■



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Is Unreal Engine democratizing the gaming industry?

by **Taiyemul Islam Safowan**

DEVELOPING GAMES IN THE OLDEN DAYS required much time, and game developers had to put in a lot of effort and work day and night to create a basic game framework. It took time to design a simple structure since the code had to be written from scratch, and adding a particular element, such as sunlight or rain, had to be made from scratch. This is where game engines get introduced. Today's game creators don't have to worry about the physics or lighting of a game because gaming engines take care of these things.

So now we could wonder what these game engines are. Think of it this way: a sculptor has to create something; therefore, to bring his vision to life, he needs specific tools like a hammer, points, and brushes. Similarly, a gaming engine provides some pre-built tools to developers. A gaming engine is a framework for simplifying and accelerating game development. Technically, it takes care of the

Underneath all the companies in the market, a specific company is trying to democratize the industry by ensuring that all developers get a chance to make games without feeling the pressure of financial aspects. Unreal Engine is free of charge and only charges a minimum royalty of 5% once the game's revenue passes US\$1 million in gross revenue. This is absurd because their tools are costly and time-consuming to build in-house.

On the other hand, Unity is giving a free version that lacks some tools, but it can be upgraded to the complete version by paying US\$1,500 per year or US\$75 per month, which can burden starting developers who are new to the industry.

Unreal Engine provides an open source code, easing the development process, whereas Unity and some other companies do not provide an open source code, and one has to buy them. In terms of graphics, developers seem to like Unreal Engine more. Unreal Engine also sports



heavy-duty aspects like graphics, physics, sounds, artificial intelligence, player's action or input, and multiple others.

According to HeroVired, a company for educating people about multiple industries, in 2020, the global gaming market was worth 203.13 billion USD. The COVID-19 pandemic had a massive impact on the entire industry. According to different market research agencies and multiple reports, the worldwide gaming market showcased a massive growth of 38.24% in 2020. Furthermore, it is projected to grow to 545.98 billion USD in 2028.

These financial values lead us to gaming engines again. Numerous gaming engines today enable developers to quickly jump in and construct the game they want. For example, the big players are Unreal Engine, Unity, GameMaker, CryEngine, and Godot. But the go-to and most famous engines are Unreal Engine and Unity. Most developers opt for these two engines for their features, simplicity, and reliability. Developing games with the best engines can create massive profits for the developers and the companies which make the engines.

multiplatform development. Epic Games, the developer of Unreal Engine, made record-breaking games that shocked the world, such as Fortnite, Rocket League, Infinity Blade series, and Hitman 3.

Currently, Unreal Engine unveiled its latest version, the Unreal Engine 5. This engine's graphics, texture, and AI capabilities are praised highly. A few games that use this engine are Unrecord, Project M, Anime Tokyo, Atlas Fallen, and Senua's Saga: Hellblade 2. These big AAA titles are utilizing the new capabilities of the engine. The engine is providing promising results and is attracting players on a vast scale.

Unity is also making headlines for its simplistic and user-friendly approach. It uses C#, which is in demand for current games; hence, Unreal Engine isn't the sole player in the market driving policy. Still, there is a risk with the new version and the loyalty policies of the engine; Unreal is most likely to take over the wheel and will plan to keep it. ■

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BlackBerry Smartphone

The extraordinary rise, the spectacular fall

by **Safrina Kabir**

THE PROVERB ‘SURVIVAL OF THE FITTEST’ somewhat strikes harder when we analyze the tech giant companies, their dominance period, and their ultimate downfall. Because it takes at least a few centuries for a species in the animal kingdom to evolve or become extinct. But in the world of technology, it happens overnight.

The name ‘BlackBerry’ was mouth to mouth a few years ago; now, their smartphones are out of the market, and the company has transformed itself into a cyber security provider. How did they reach the peak of success, and what made their drastic downfall?

Let’s start with the journey of this Canadian company from the very beginning. It began in 1984 with modems and pagers. The company was called RIM, short for Research in Motion. RIM was co-founded by childhood friends Mike Lazaridis and Douglas Fregin, focusing on wireless technology and solutions.

In 1990, RIM developed a wireless email solution that was the game changer. This was the foundation of BlackBerry. They launched the BlackBerry interactive pager 950 in 1998 and pager 850 in 1999. From here on, their success skyrocketed. It took a good four years from the launch to entering the consumer market.

The first BlackBerry phone, the BlackBerry 957, was launched in 2000, and BlackBerry 5810 in 2002. The BlackBerry 5810 was the first to combine email, phone, and organizer functions, marking itself as the beginner of the BlackBerry smartphone line.

2006, the Pearl series on BlackBerry was launched, and RIM entered the consumer market. However, a more significant event happened in the previous year as BlackBerry adopted the messaging system BBM, BlackBerry Messenger. It quickly became popular, contributing to the appeal of BlackBerry. It allowed users to send highly secure instant messages, images, and files.

They expanded their functionality in BES, BlackBerry Enterprise Server, and BlackBerry OS. They continued to add new products and advanced series of smartphones. Their Pearl, Curve, and Bold series were well-received and appreciated in the consumer market. And thereby, the year 2001 to 2007 was called the golden age of BlackBerry.

After the BBM, other mentionable features attracted the public’s attention. They offered highly secured email integration. One of the most interesting selling points of the BlackBerry phones was the physical QWERTY keyboard. That’s right. People went crazy over the tactile typing experience BlackBerry phones provided.

Last but not least, BlackBerry phones had strong security features and encryption. Government agencies, in the business sector, and the enterprise sector people preferred BlackBerry phones for secure mobile communication.

Nevertheless, BlackBerry couldn’t evolve with the rapidly developing tech world. In the face of strong competitors like Apple and Androids, BlackBerry didn’t innovate enough, especially when the mainstream of touchscreen phones was forming. iOS and An-



droid offered a huge range of app diversity to attract mass consumers. On the other hand, BlackBerry had a limited app ecosystem. So, people diverted towards Apple and Androids.

BlackBerry launched its first touchscreen phone, Storm, in 2008 to tackle the situation. Due to the prevailing reputation of BlackBerry, there were high initial sales. But complaints started to form soon. For the first time in a long time, investors started to worry about the future of BlackBerry, and analysts and media started to worry about the business prospects.

In 2009, RIM was announced first among the top 100 fastest-growing companies, and in September 2010, according to Comscore, RIM held the largest market share in the US smartphone market. This was the highest point of success for RIM and BlackBerry ever. From here, their business went downhill.

The fall was more drastic than you can imagine. In 2010, RIM had a 37.3% market share, the highest of that time. Within only two years, in 2012, the share dropped to 7.3%. Still, BlackBerry was globally successful at that time. Soon, that was over, too. The year 2011 brought the worst fate for BlackBerry. The would-be game changer, BlackBerry 10, failed drastically. Several attempts to restore the previous image were made, which contributed little. In 2014, BlackBerry transformed itself from a mobile company to a mobile solution company.

BlackBerry is now a software-focused company providing cybersecurity and IoT services. Besides, BlackBerry Limited was formed to implement the secure encryption process of BlackBerry in protecting data for various industries. BlackBerry’s QNX software is used in various automobiles.

This year in May, the movie ‘BlackBerry’ was premiered across Canada. The movie depicts the astounding story of the birth of the first smartphone company, its unpredictable fortune, and its final downfall. It remains a great example of the unpredictability of the highly dynamic tech sector. ■

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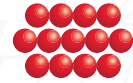
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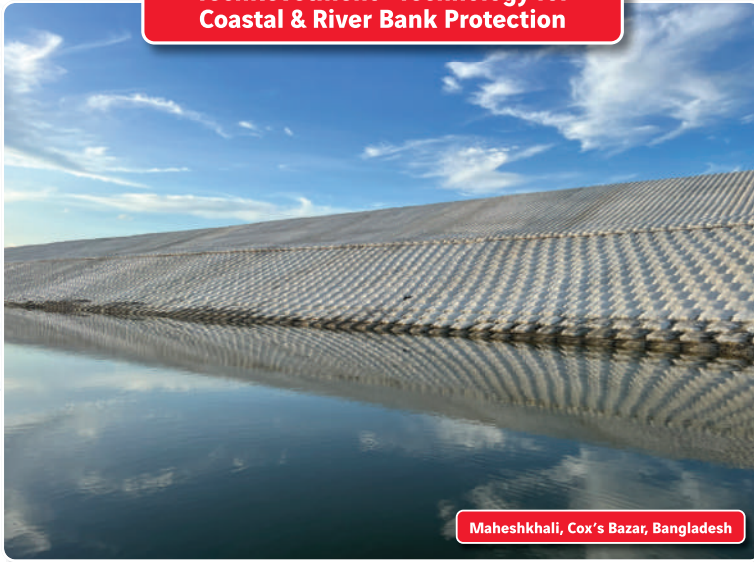
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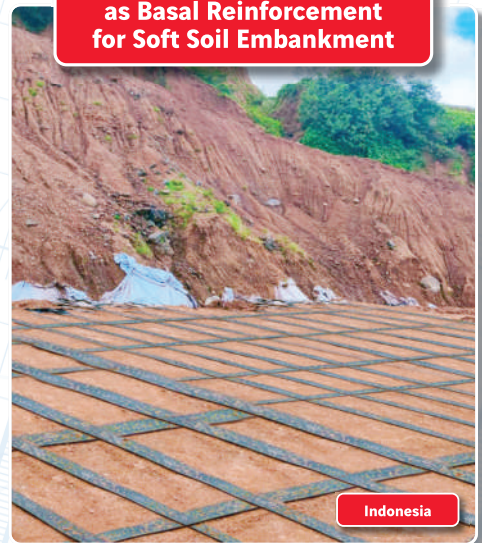
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