E-Health Futures For Bangladesh

Implications for Prout e-health policy

Can e-health transform the nature of the Bangladeshi health system? If so, how? And who can deliver this vision? To answer this question, the Bangladesh Ministry of Health, and Bangladesh Enterprise Institute in collaboration with the Rockefeller Foundation promoted a three-day foresight workshop on the futures of digital or e-health. Participants came from a number of areas – e-health start-ups, hospital directors, leading physicians, professors of public health, e-health practitioners, international e-health experts, Ministry of Health directors and digital information/business providers.

Three visions of the futures of e-health were articulated by participants.

1 LEAP-FROG 2025

The first was the Leap-frog. In 2025, the smart use of technology through low-cost diagnostic devices such as medical "apps" and bio-sensors created a dramatic transformation in healthcare. The traditional (modern Western) health system was leapfrogged. Individuals throughout Bangladesh gained access to inexpensive interactive technologies. The e-health infrastructure developed from the bottom up. The Ministry of Health provided the standards and other rules to ensure integration and interoperability. The metaphor used by the Leap-frog group was the "fly-over". Given traffic congestion in Bangladesh and the inability of more roads to solve demand, the guiding metaphor was aptly named, "Fly-over." The leap-frog was possible as though an integration of extensive stakeholders, a "fly-over" from the current state of affairs (politicization of health, high demand, but inability to meet health needs, lack of penetration of new ICTs, and high penetration of mobile phones) to a desired E-health future was created. A day in the life of a case worker in this future might consist of the following: (1) Rupa receives an alert on the mobile device; (2) she then retrieves past patient information from the EHR (electronic health records database); (3) Rupa collects recent patient vital statistics using mobile medical devices and bio-sensors; (4) she then forwards the information to the doctors' platform for remote diagnosis; (5) she facilitates a healthy and meaningful relationship between doctor and patient through quality service provision; and (6) helps keep the geo-mapping and profiling of patients and diseases proactively. There is high-tech with meaningful human contact.

In the Leap-frog/fly-over future new mobile smart technologies are used instead of the landline. However, the service provider is the key in this future. The rural or urban community worker is the knowledge health navigator that bridges the world of the patient and the medical system. New applications are created. The health worker is not a passive recipient of new technologies but an active creator.

2 THE HEALTH CLOUD 2025

In this vision of the future, the guiding metaphor is that of the "cloud" referring here to cloud computing, wherein health information and diagnostic applications are available ubiquitously to all. The "cloud" is a public space, however, for administrative purposes. Health is organized through upazilas or sub-districts (currently
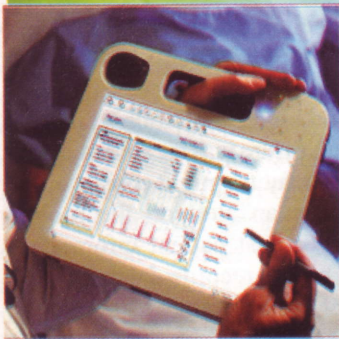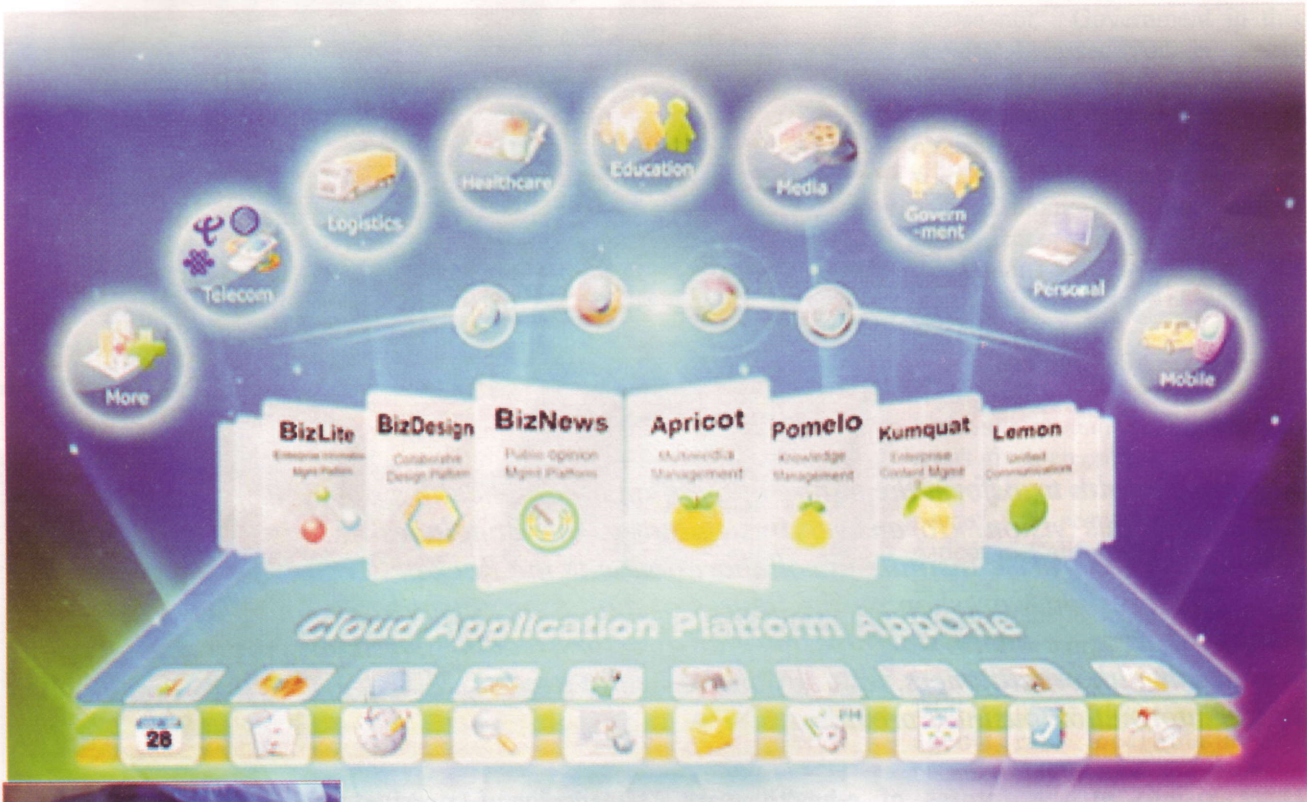
there are 500 in Bangladesh). The beginning of the Cloud health network is through tracking of the birth of every child in Bangladesh. Once the births are registered then their health life-cycles can be tracked, monitored and life stages health-enhanced.

For example, a day in the life of an end-user could look like this:

Rahima Begum just delivered a baby boy in Shadullapur health complex. Within 25 minutes, she and her family received a birth certificate and national registration number. Baby Zahir receives a baby bracelet with an embedded RFID tag, which will allow any health worker to check and update his health record. When baby Zahir's vaccines are due, his family, and his community health worker will receive an SMS notifying them of the vaccine and the near test health centre where the vaccine is in stock. After the first week of life, Rahima Begum receives a visit from the health extension worker who delivers her postpartum vitamin A, which is registered, using the RFID bracelet, to update the cloud health record. Her cloud health record is updated, and the district civil surgeon's statistical flat panel screen is updated, so he can plan with the District Education Officer the probable size of the incoming primary school class in that village. Rahima

Begum's husband, who is a migrant worker in Dubai can access on the internet, with a secure password, the updated health record of his family, and motivate the family to ensure they get vaccines on time, and to make sure baby Zahir receives only exclusive BF. He has used the Cloud Learning function to learn about infant nutrition, and insists that the grandmother not feed any animal milk.

In the Cloud, persons do not need to move; only data does. Health information, expertise and wisdom come to the patient. Multiple stakeholders support the system.

3 SUSTAINABLE PUBLIC PAYMENT FOR HEALTH 2025

In this third vision of the future, the other scenarios are accepted, but the primary question is the payment mode of future systems, their financial sustainability.

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This future is centralized with individuals provided financial incentives to stay healthy via public disbursements. This system had already begun to occur in 2009. Thus, prevention as a worldview has become dominant. Donors and insurance agencies, along with the government and health professionals, have a major role to play in this future. Information is not just one way, i.e., giving citizens health education but through the financial incentives and new mobile technologies it has become two-way. Citizens use new digital devices or work with local health case workers to enhance their own understanding of their personal tailored health futures. They are empowered and thus costs are lowered. While inequity may become a problem, the system does not negatively discriminate against those that are unhealthy due to genetic or environmental factors. These are taken into account.

A day in the life of Hassan may look like this in 2025

Hassan gets up in the morning with a stomach ache. The e-health bracelet on his arm is buzzing, notifying him about an anomaly in his body structure and that an automated interview has been set up with his doctor, complete with his bio-data and current symptoms. Hassan can sense trouble; the overdose of samosas last night is going to cost him a hike in his insurance premium, which also means another visit by the insurance guys shortly. As he got up from his bed, he also realized that he had to notify his landlady to receive the medications, which automatically would be sent over to his house, immediately after his visit to the doctor. The phone bell rang up; it was his HR manager at office, who had requisitioned a half-day leave for him, as his sickness had been notified to his workplace. As his health costs have gone up, Hassan is far more careful about over-eating. And he knows he should have used the applications on his health phone to monitor his diet but ...he did not. In the future, he will be more careful.

Employers thus provide incentives to workers to stay healthy via wellness programs and mobile health solutions. They monitor their own health, and thus have incentives to stay empowered.

DIGITAL HEALTH SUCCEEDS – Data comes to the patient.

Digital health in Bangladesh is likely to succeed

E-Health Scenarios 2025	Leap frog	Health cloud	Sustainable public payment for health
Litany or headline	Smart use of technology Usage of low-cost diagnostic devices	Every birth in Bangladesh is registered	Paying people to stay healthy through public disbursement of health expense funds
System	Integrated and interoperable universal e-health system	Shared Public Utility Cloud	Data collection and data management for public disbursement
Main stakeholders	Public health sector, private firms, NGOs, donors, community citizen associations, rural and urban citizens	Government, ICT companies, digital natives, public health NGOs, international agencies and donors	Government, Insurance agencies, donors, patients, and health professionals.
Dominant worldview/deep structure	Decentralized systemic governance promoting participation and collective ownership	Universal right to health and information	Welfare-based model of public funds transfer for inducing health consciousness in people
Metaphor	Fly-over	Connectivity cloud	Raise the price of vice, lower the cost of virtue

because of technological advances and because the current health system is faltering (low doctor/patient ratio, low public access to health services) and the leadership exhibited by the numerous stakeholders. E-health visions promise futures wherein patients are more empowered; community health workers use health diagnostic devices to monitor, link with medical professionals and track individuals. Revolutions in e-records, e-pharmacy, e-diagnosis and e-prevention transform Bangladesh health leading to greater wellbeing and economic productivity. The Ministry of Health provides the standards and safeguards to ensure public health benefits. Medicine – data, information and wisdom – come to the patient. This system is especially important given potential future shocks such as dramatic climate change (and an ageing society). Because of the success of e-health initiatives, the health of Bangladeshis was transformed. Specific outcomes were: (1) increased life expectancy, (2) lower mortality, (3) the elimination of

maternal and infant mortality, (4) universal healthcare, (5) economic growth and (6) increased wellness.

PROUT HEALTH POLICY AND IMPLICATIONS

Prout unlike many other spiritual movements takes a progressive view of technologies and considers health a basic human right. Health is defined broadly to include physical, mental and spiritual health. In the Prout model of the health system, the patient is first. As Sarkar writes:

"The object of the art of healing is to cure a patient, both physically and mentally. The question is not to uphold any particular school of medicine; rather, the key task is the welfare of the patient." Prout thus:

(1) Encourages the use of new technologies in the health sector in all arenas (information storage, diagnostics and identity recording).

(2) Encourages local specific solutions, as in the Bangladesh scenarios above, that use local health workers as bridges between rural citizens and the medical system. Solutions must not be "one size fits all" but designed for local conditions.

(3) Overtime Prout encourages citizens to use health diagnostic systems themselves. New technologies are progressive when they enhance equity and create cycles of innovation.

(4) However, and this is crucial, Prout does not support the reduction of wages as new technologies are adopted; rather, more time for work/family balance is recommended for medical professionals. This aids in overall quality and safety for patients and medical professionals.

(5) Prout supports a multi-door health system where a number of traditions have voice: the western, traditional Ayurvedic, Chinese medicine and, local traditions. But the centre piece is the empowered patient, who can use technologies and the advice of medical professionals to take charge of her health.

(6) Prout considers health a foundational human right, and as part of the responsibility of the collective to the citizen. However, the responsibility of the individual is toward prevention, to pursue health behaviour that does not bankrupt the medical system. Thus Prout supports a general prevention health strategy: for example, high taxation for tobacco, the encouragement of diets consisting of vegetables and fruits, creating supportive systems for exercise, ensuring vaccination against major diseases, and creating health equity. And, with cardio-vascular diseases dramatically rising in the developing world, lifestyle changes are paramount for a broader strategy of prevention.

(7) Finally, even though Prout encourages multiple health traditions, the base of health is the spiritual. A society that is balanced: physical (diet, yoga, exercise, ensuring basic health services for all), mental (meditation, work/life balance) and spiritual (inner purpose) is a healthy society.

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Health is the greatest gift, contentment the greatest wealth, faithfulness the best relationship. Without health life is not life; it is only a state of langour and suffering - an image of death. To keep the body in good health is a duty... otherwise we shall not be able to keep our mind strong and clear. To enjoy good health, to bring true happiness to one's family, to bring peace to all, one must first discipline and control one's own mind.

- Buddha