



## National Digital Health Mission – Health care and Tech Challenges

In the last Independence Day address to the nation, the PM announced launching of the NDHM. Various news channels have covered it to the extent possible but finer details are awaited. It appears that every Indian citizen would get a health id, his/her records would be instantly available on demand through the app and health care workers can access it on a need basis.

Only time will tell the degree of success, but it certainly has some promises and many challenges! These challenges could be the opportunities for businesses to innovate! We would categorize these as tech challenges, management of technology implementation and delivery challenges. We – at **Intedent** and **SoftN** – tried to analyse these from functional & technological perspectives.

Tech challenges are strictly technological in nature, e.g., designing the right kind of database to capture data of 130cr citizens, storage & retrieval, security & access, user interface with so many local languages and so on and so forth! But the government has prior experience with Aadhaar and PAN databases to manage technology implementation of such a size. However, in the case of the NDHM, the database is bigger and ever increasing unlike those of Aadhaar & PAN. From service delivery standpoint, the NDHM must share relevant details of patients to doctors / hospitals / insurance companies etc. on time. The security and access control mechanism must be very robust.

The biggest of all are ‘management of technology’ issues. This category addresses management of all the issues - right from database design to developing apps and analytics and delivering the system to delivering health care services. We have identified five of them and tried to visualize challenges from functional (health care) and technological perspectives.

### 1. Multiple Health Sciences

We have many people using alternative health sciences conveniently, e.g., Allopathy, Ayurveda, Homeopathy, Naturopathy etc. How does the NDHM help in tracking such people and getting their health info from one source?

**Functional Perspective (FP)** -Modern medicine has many objective measurable case history recording methods compared to other health sciences such as Ayurveda and Homeopathy, which are more subjective in capturing data. Even then, there is no universally accepted case history format in modern medicine. Even if there is, it is not followed as a rule. This is an even less objective exercise in other health systems, because by design they are subjective and therefore provide unique, customized and individualized treatment plans.

**Technological Perspective (TP)** – Assuming that out of 100 patients in India seeking health care, perhaps 75 may go to allopathy doctors, 15 prefer Ayurveda and the remaining 10 would leverage other health sciences. In the current system there is no provision to get data from other health sciences. Now the irony here is – for the same patient, the diagnosis may be similar, but it will not be the same, and irrespective of the similarity of diagnosis across health care sciences, the treatments would differ vastly. This may help patients directly but from a tech perspective the data are less useful except when someone tries to establish a co-relation between health sciences. Data of people having more faith in Ayurveda and Homeopathy would never make it to this kind of system unless they need emergency care. This deprives the nation of measuring and comparing efficacy and efficiency of parallel health sciences. Ultimately what matters is how patients remain fit and healthy! The NDHM



can bring about a paradigm shift in the health care system as the government becomes an active player.

## **2. Standardizing Diseases and Enforcing Code**

**FP** - At the diagnosis level, the ICD (International Classification of Diseases) has been in place but how many medical professionals write the codes of diseases as per the ICD is debatable. Then there are separate ACD codes for Ayurveda and so on for other health sciences. Integrating all of them, implementing and capturing mandatory codes for the diagnosis may become an unpleasant exercise. Without this exercise, the data captured cannot be analysed.

Also, how do we identify health and wellness of a person across health sciences? A way around can be a set of clinical features, signs and symptoms to be captured mandatorily for data analysis. There is no consensus among the scientific community in the world about definitions and grading of severity of many disease conditions. This would complicate the analysis.

**TP** – Standardization of data is fundamental to AI, BI and analytics. If not done, it can fail or give wrong results. This is a well-known fact. Also, mapping of diseases across health systems to a single code is a monumental task. As we understand it, the biggest challenge is in standardizing the disease code as per international standards. In the draft document on the NDHM, we notice that there is very little about standardization of data. The information given pertains only to equipment and devices used in health care. There are other entities that add to the PHRs, e.g., labs, doctors, health care workers and pharmacies. Human intervention is unavoidable in health care and it could be the weakest link.

## **3. Making Hospitals Leverage New Platform, Data Quality & Governance and Training**

**FP** – Given the fiduciary relationship between doctor and patient, utmost importance should be given to biomedical ethics and safety of the doctors, Especially when a doctor is aware that the case history, diagnosis and treatment entered for a patient can be accessed by others, and if misunderstood, can result in professional catastrophe. Hence the system should ensure that health care workers are safeguarded against medico-legal issues. This can give rise to delicate situations. We need to establish a fine balance between right to healthcare (for a patient) and right to safety & security for a healthcare provider. There have been many cases of sabotaging hospital/clinic property, just because the outcome of the treatment did not meet the patient's expectations.

The time taken to capture this information is also a very important criterion. The more time a doctor spends in entering patient information, the smaller the number of patients he can see. In India, average sized hospitals have 800 to 1000 OPD patients per day. Hence a doctor cannot spare time in writing long case history sheets. Capturing data of the in-patients may have its own challenges. Generally, the treating doctors go on rounds of the wards to examine their patients and advise on the next plan of treatment. They move from one patient to another with an assistant doctor and a nurse most likely. At that time, it becomes difficult to examine the patient, change gloves/ wash and sanitise the hands, enter the findings on the device and move to the next patient quickly. This could reduce OPD timings or affect the number of surgeries one can perform in a day. The data capturing can be outsourced, but the doctor would still be required to go through it and approve.

**TP** – Looking at the document and goals of the NDHM, it does not appear that huge a technical challenge (the government having managed data collection for Aadhaar) for big hospitals in cities to get hooked to the NDHM network. Extending this to PHCs, hospitals in small towns, clinics, and



charitable trust hospitals (particularly in remote areas) will be a huge challenge. Here too, more than electricity, networking and internet related issues, the challenges are in capturing the right quality of data, e.g., a patient comes with 5 complaints and only 3 or 4 are captured, or partial details of procedures are entered etc. Let us not forget that the doctors are more accustomed to writing on paper than keying data on a screen.

Implementation of technology (especially data driven) results in a change in the way of working (including laptop, desktops, mobiles or tabs), and processes are so intertwined in the functions that without using these gadgets, nothing much can be done (e.g., banks, retail industry, aviation etc.). This aspect must be managed carefully as we cannot suspend delivery of health care services due to technical issues and still ensure health care professionals use the system and generate data.

Data governance could be the single biggest challenge in the whole scheme. This gets compounded due to:

- multiple entry points for data,
- data spread over a vast area,
- less control and
- lower prioritization for the entities generating data since their prime interest is delivery of health care services.

Maybe the medical transcription industry has the answer and could play a key role.

#### **4. Overall Cost and Measurement of Success (success criteria)**

**FP** - The success criteria would differ for the government, people and healthcare providers. As a patient, if I can get data about my health/diseases, share them with another doctor of my choice, at a different place without hassle, for me the NDHM is a successful mission. As a doctor, if I can give faster and accurate services because I have access to a patient's past healthcare data, I would consider it a success. If I can reach out to more patients with the help of technologies like telemedicine, apps and AI, NDHM is successful for me as a doctor. As far as the government is concerned, there may be many criteria for success, which need to be clearly defined.

Also, another point is that there are people with habits like smoking, drinking, consuming tobacco etc. These habits have a direct impact on their health. Will the NDHM help in ensuring that costs of health care for such people are not shared by those who have avoided such habits?

**TP** - While perusing the NDH draft document, we did not come across explicit and measurable success criteria. Yes, large scale adoption is one of them but as a nation we must clearly define the situations when we call implementation successful. During one of the technology implementations for social sector projects, it was observed that initially many people adopted the system, but the novelty factor started reducing soon. Also, people tried their level best to bypass the system. How do we prevent such tendencies here?

#### **5. Local Language Support**

**FP** – Multiple local languages pose unique challenges. However, there are other aspects to this problem. For example, the case history format of an Ayurveda doctor would contain Sanskrit words. Their meanings in English and their pronunciation can create mistakes while analysing the data, when written in English. Similarly, Unani may have Arabic words and Sowa Rigpa may have words from the



Tibetan language. For all these doctors from other healthcare systems, translation of each detail into English can be a tedious & frustrating task and could defeat the purpose.

**TP** – This aspect is not to be taken lightly. Since the NDHM involves people from various states knowing the local language only, the data need to be stored in the local language and English. Not only that there would be people with native languages different from the local language, e.g., Gujarati origin person living in Karnataka would like to see his/her data in Gujarati. Data of such citizens need to be stored in Gujarati, Kannada and English. We hope the complexity due to languages stops here. Even if only two languages are used – i.e. local and English, the complexity on the technology side is still significant. It considerably increases the size of the database, processing, retrieval and back up time. Some may argue that we have many apps where linguistic variety in the country has been managed. Yes, true, but most such apps and systems do not have as many transactions as expected here.

To conclude from health care and technology perspectives, the NDHM can be a good platform to launch. The real fruits of today's efforts would be reaped – perhaps 10-12 years from now.

### **About the Article and Authors**

The purpose of writing this blog is to highlight some of the challenges to the stake holders in this critical but very important national mission of making digital health care available to ordinary citizens of India. We have taken reference of National Digital Health Blueprint published in April 2019.

This article is jointly written by **Dr. Vaibhavi Joshipura** and **Neerav Joshipura** based on their deep experience in their respective areas. Dr.Vaibhavi Joshipura – Founder & CEO of Intedent Health Care ([www.intedent.co.in](http://www.intedent.co.in)) – works in the area of integration of health sciences for oral health care. She has worked in a variety of roles in oral health care, integration of health sciences and implementation of technology in health care. Neerav Joshipura – Founder & Director of SoftN Enterprises ([www.softnenterprise.com](http://www.softnenterprise.com)) has a wide range experience of working in technology (IT & Digital), BI & analytics in various industry verticals across the globe.