Governance and Management of National Telehealth Programs in Asia

Alvin MARCELO [a,1] Jai GANESH [b], Jai MOHAN [c], DB KADAM [d], BS RATTA [e],
Gumindu KULATUNGA [f], Sheila JOHN [g], Andry CHANDRA [h], Oscar PRIMADI [i],
Athika Abdul Sattar MOHAMED [j], Muhammad Abdul Hannan KHAN [k], Abul Alam
AZAD [l], Portia MARCELO [a]

[a] *University of the Philippines Manila,* [b] *Sri Sathya Sai Central Trust, Prasanthi*
Nilayam, Andhra Pradesh, India,
[c] *International Medical University, Malaysia,* [d] *Telemedicine Maharashtra India,*
[e] *Telemedicine Society of India,* [f] *Suwasariya, Ministry of Health, Sri Lanka,*
[g] *Medical Research Foundation, Sankara Nethralaya, Chennai, India,* [h] *Directorate*
Ancillary and Health Facility, Ministry of Health Indonesia, [i] *Center of Data &*
Information, Ministry of Health Indonesia, [j] *Ministry of Health Maldives,* [k] *GIZ*
Bangladesh, [l] *Ministry of Health, Bangladesh*

Abstract. Telehealth and telemedicine are increasingly becoming accepted
practices in Asia, but challenges remain in deploying these services to the farthest
areas of many developing countries. With the increasing popularity of universal
health coverage, there is a resurgence in promoting telehealth services. But while
telehealth that reaches the remotest part of a nation is the ideal endpoint, such
goals are burdened by various constraints ranging from governance to funding to
infrastructure and operational efficiency. Objectives: enumerate the public funded
national telehealth programs in Asia and determine the state of their governance
and management. Method: Review of literature, review of official program
websites and request for information from key informants. Conclusions: While
there are national telehealth programs already in operation in Asia, most
experience challenges with governance and subsequently, with management and
sustainability of operations. It is important to learn from successful programs that
have built and maintained their services over time. An IT governance framework
may assist countries to achieve success in offering telehealth and telemedicine to
their citizens.

Keywords. Telehealth, telemedicine, IT governance, management, framework

Introduction

Telehealth and telemedicine have been practiced in Asia for quite some time [1,2] but
only recently has there been accessible documentation to evaluate public funded
national programs. The Telemedicine Development Center of Asia [3] has extensively
documented experience providing regional support to countries' need for remote
medical education. Innovative private-sector-led programs also abound [4] but largely

---

[1] Corresponding author: alvin.marcelo@gmail.com.

operate through internal funding. Telehealth programs working nationally with public funds are often unpublished.

The Asia eHealth Information Network (www.aehin.org) is a group of four hundred plus eHealth advocates composed of representatives from ministries of health, ministries of information technology, academe, and non-government sectors with an interest in promoting eHealth in the region and within their respective countries. Since its inception in 2012, the AeHIN has embarked on strengthening the capacity of countries for designing and implementing national-scale health information systems. Recently, it co-organized a conference on measuring and achieving universal health coverage with information and communications technology [5]. In this conference (and in a previous one [6]), telehealth and telemedicine were cited as key technology-dependent activities that can contribute greatly to realizing the benefits of universal health care (UHC). IT governance was also listed as an important enabler for successful national eHealth systems.

Telehealth and telemedicine are complex processes that are dependent on even more complex underlying information technologies. Without an organizing framework like IT governance, implementers of these programs (health and IT professionals) succumb to this complexity and often encounter failure. Adding to the challenge is the lack of experience of many implementers with the sophistication required by systems that need to be deployed nationally.

Many citations can be obtained about telehealth and telemedicine practice in Asia but only a few programs are actually operating (or were designed to operate) at national scale with support and funding from government. This paper aims to collate public funded, national telehealth programs and assess their governance and management systems using an industry-accepted IT governance framework.

COBIT5 is an IT governance framework developed by the Information Systems Audit and Control Association (www.isaca.org). It is considered a best practice framework created and maintained by a global group of experts with experience in governing and managing complex IT environments. The framework is available for free at www.isca.org/cobit .

ISO/IEC 38500 *Information technology – Governance of IT for the organization* is an international standard on corporate governance of IT released by the International Organization for Standardization Organization (ISO) and the International Electrotechnical Commission (IEC). It is a framework for the effective governance of IT at the highest levels of the organization. The standard is downloadable at www.iso.org for a fee. As the two frameworks are comparable, COBIT5, which is freely downloadable, will be used for this study.

A key principle of COBIT 5 is to separate **governance** from **management**. This separation serves to clarify the lines of accountability (governance) and responsibility (management) for key processes in the whole enterprise information technology program. Governance requires "evaluating stakeholder needs; setting direction through prioritization and decision making; and monitoring performance, compliance and progress against plans" [7]. Management on the other hand, takes the "results, guidance and output from these governance activities, and plans, builds, runs and monitors activities (PBRM) to ensure alignment with the direction set by the governance body". This alignment of governance and management is aimed at achieving the enterprise objectives. The hypothesis is that when strategy is aligned with operations, then stakeholder needs will be met.

1. Objectives

The objectives of this article are: to enumerate the various national telehealth programs in Asia, assess their underlying governance and management structures, and identify factors that may contribute to their success or failure from the governance and management perspectives.

2. Methodology

A search of Pubmed for *"national telehealth programs"* AND *"Asia"* was conducted followed by specific searches per country (replacing *"Asia"* with *"country name"*). Requests for information were also released in the AeHIN general mailing list. A Google search was also performed for the same query strings. Regional telehealth activities such as those conducted by the Telemedicine Development Center of Asia (TEMDEC), which are beyond national scope, were excluded. Programs that have reached national-scale but not yet formally endorsed by the ministry of health were also excluded from the study.

3. Results

The search yielded a total of nine national/state-wide telehealth programs from seven countries (Table).

3.1. National Telehealth Programs

Seven countries have national telehealth programs collected from the review of literature and from the request for information.

A review of the state of governance and management of these national telehealth programs was done from the following sources: published articles, official websites, and personal communications with key informants. Where possible, information was obtained from the focal point of the management body of the national telehealth program.

Table 1. State of governance and management of publicly funded national telehealth programs in Asia

Country (program)	Governance	Management	Reference
Bangladesh (Health Information System, e-Health and Medical Biotechnology)	Ministry of Health and Family Welfare	Management Information System, Director General of Health Service	www.dghs.gov.bd/index.php/en/data/84-english-root/ehealth-eservice/490-telemedicine-service
India (ISRO Telemedicine Program)	Development and Education Communication Unit (DECU)	Devolved to inter-institutional-level coordinators	isro.gov.in/applications/tele-medicine
India (Sankara	Sankara	Department of	www.sankaranethralaya.org

Nethralaya Teleophthalmology Program (SNTOP)*	Nethralaya	Teleophthalmology	
India (Telemedicine Maharashtra)*	Byramjee Jeejeebhoy Government Medical College and Sassoon General Hospitals, Pune	Telemedicine Department	www.bjmcpune.org
Indonesia (National Telemedicine Program)	Ministry of Health	Directorate of Ancillary Services, Ministry of Health	buk.depkes.go.id
Malaysia (Telekesihatan)	Ministry of Health	Telehealth Division, Ministry of Health	telekesihatan.moh.gov.my
Maldives (Telemedicine Kiosks Project)	National eHealth Steering Committee	Ministry of Health	
Philippines (National Telehealth Service Program)	National eHealth Steering Committee	UP Manila National Telehealth Center	one.telehealth.ph
Sri Lanka (Health Net [Suwasariya])	Ministry of Health	Health Education Bureau, Ministry of Health	suwasariya.gov.lk

* state-wide

Either the Ministry of Health (MOH) alone or a multi-sector group led by MOH governs the national telehealth programs listed. Of the nine programs, formal units within the MOH structure manage six, academic institutions manage two, and a non-government organization operates one.

4. Discussion

Varghese and Scott [8] had conducted a survey on telehealth policies in 2004 and discovered wide variance in policy maturity and readiness of countries in the region. Ten years after, these policies have evolved into concrete implementations as summarized in this paper. This paper's high-level analysis, which focused on governance and management, revealed several interesting facets about national telehealth programs in Asia.

Governance has been cited in the literature as an important factor in successful telehealth programs [9,10].

COBIT5 emphasizes, as a matter of principle, the importance of separating governance from the management of enterprise IT [11]. They claim that with this separation, there is an easier check and balance between the two domains resulting in better performance for both.

In this study, while most telehealth programs claim that they have governance and management structures, a few admit that their governance bodies have not been as active as desired. These admissions are further corroborated by the lack of accessible

websites to obtain references about the activities of the governance body or even how to access telehealth services.

These websites are sensitive indicators of the state of governance and management, as they serve as mechanisms for disseminating information about the programs as well as portals to the actual telehealth services. These are important knowledge products especially if the target audience is the general public.

Realizing that most members of the highest decision-making body of a national telehealth program may not have the comprehensive knowledge about IT, COBIT5 emphasizes five processes that they should own to empower the rest of the complex processes underneath them to move in accordance with their desired strategy and directions.

The five key processes for the governance bodies of national telehealth programs are: "ensure governance framework setting and maintenance, ensure benefits delivery, ensure risk optimization, ensure resource optimization, ensure stakeholder transparency." [12]

4.1. Ensure Governance Framework Setting and Maintenance

From all the sites studied, there were no explicit statements about any overarching IT governance framework being adopted by the national telehealth program. Although this lack of information does not mean that there is no underlying framework, its absence on program websites suggests that it is not being communicated explicitly to the stakeholders. In such cases, there is practically no governance framework being maintained.

In the Philippines, while the National eHealth Steering Committee had adopted COBIT5 as their governance framework [13], the National Telehealth Service Program has not yet formally aligned with it.

Ensuring governance framework setting is a leadership function that triggers the rest of the framework into action.

4.2. Ensure Benefits Delivery

Where available, the programs expressed similar benefits: access to quality health information, good governance, equity, and improved health outcomes [14]. Many of the countries have formally expressed aspirations for UHC and cited telehealth as an important tool to achieve that. Key performance indicators (KPIs) however are not evident in most programs and are difficult to elicit from their official websites. With IT governance, these KPIs are ideally formalized at the outset and are publicly announced.

4.3. Ensure Risk Optimization

Risks were not explicitly mentioned in the program websites although some have mentioned privacy, confidentiality, and sustainability in scientific publications describing the program. Risk registers are often proprietary and it is usual for most enterprises not to divulge them due to the sensitive nature of their contents. However, high-level statements on key risks (privacy and confidentiality) are indications of the programs' awareness of these risks and of their efforts to take a proactive stance to prevent these risks from converting into problems.

4.4. Ensure Resource Optimization

All of the programs reviewed are funded by the national government through public funding. Financial statements were not readily accessible from the programs but a few had cited the difficulty of sustaining their efforts without a guarantee of constant regular resources from national government. In general, most programs are challenged by the lack of funds to sustain their programs which may suggest poor resource optimization.

4.5. Ensure Stakeholder Transparency

In the review of official documents, websites, and key informant interviews, stakeholder transparency is still implicit and is not formally expressed. While some programs have clear published organizational structures, most do not explicitly inform the public about their prevailing governance mechanisms, minutes of meetings, or formal agreements.

Governance is ideally established by the highest decision-making body in the country which takes accountability for evaluating the needs of stakeholders, for setting directions, and for monitoring progress. Aside from defining the expected benefits from the national telehealth program, they also determine acceptable risks and provide the necessary resources to operate it. Since most benefits will redound to the health sector, the ministry of health is the natural leader of the national telehealth program. But because risks and resources are often shared with other agencies (e.g., ministry of ICT, national health insurance agency, clinical professional associations, health providers, sub-national governments, academe, etc.), a multi-sector structure is the ideal form for governance. Unless this structure is created and its members perform their governance tasks, the national telehealth program will be confronted with obstacles often beyond management's ability to surmount, resulting in failure.

Management on the other hand requires a thorough understanding of the benefits, risks, and resources set forth by the governance structure. Aside from ensuring smooth operations, they also constantly communicate with the decision-makers on the state of the program and provide feedback that all components needed to deliver the benefits are operating as expected. The lack of websites for some programs indicates that their core governance process of stakeholder transparency has not yet been activated.

Conclusions

National telehealth programs are one of the most complex enterprise information systems around the world due to the number of stakeholders and components involved in its design and operation. Such complex systems can benefit tremendously from the systematic organization offered by IT governance frameworks. Although the maturity and sophistication of each program studied varied widely, they all shared in the vision of better access to health information towards an empowered and healthier citizenry. A clear vision is a good starting point for the application of IT governance for national telehealth programs. But in order to concretize this vision into actual benefits to relevant stakeholders, alignment of governance and management is required.

The lack of clarity on the state of governance for the national telehealth programs suggests that most of the threats they face such as sustainability and stakeholder

adoption are rooted on this problem. Unless addressed explicitly through the application of IT governance frameworks, these programs will continue to be susceptible to the challenges posed by their complex environments.

References

[1] Durrani H(1), Khoja S. A systematic review of the use of telehealth in Asian countries. J Telemed Telecare. 2009;15(4):175-81. doi: 10.1258/jtt.2009.080605.

[2] Dadlani R(1), Mani S(2), Jai Ganesh AU (3), Mohan D(4), Rajgopalan N(4), Thakar S(4), Aryan S(4), Hegde AS(4). The impact of telemedicine in the postoperative care of the neurosurgery patient in an outpatient clinic: a unique perspective of this valuable resource in the developing world--an experience of more than 3000 teleconsultations. World Neurosurg. 2014 Sep-Oct;82(3-4):270-83. doi: 10.1016/j.wneu.2014.05.027. Epub 2014 Jun 2.

[3] Shimizu S(1), Kudo K, Antoku Y, Hu M, Okamura K, Nakashima N. Ten-year experience of remote medical education in Asia. Telemed J E Health. 2014 Nov;20(11):1021-6. doi: 10.1089/tmj.2014.0018. Epub 2014 Oct 1.

[4] Joshi R, Thatte U. Dynamic Intelligent Blood Donor Network. http://aehin.hingx.org/1512 last accessed January 31, 2015.

[5] Proceedings from the Measuring and Achieving Universal Health Coverage with Information and Communications Technology. http://bit.ly/uhcict last accessed January 31, 2015.

[6] Proceedings from the Second General Meeting of the Asia eHealth Information Network. http://aehin.hingx.org/1819 last accessed January 31, 2015.

[7] COBIT5 Principles: Where did they come from? ISACA, 2014. http://www.isaca.org/Knowledge-Center/Research/Documents/Cobit-5-Principles_whp_Eng_0714.pdf Last accessed January 31, 2015

[8] Varghese S1, Scott RE. Categorizing the telehealth policy response of countries and their implications for complementarity of telehealth policy. Telemed J E Health. 2004 Spring;10(1):61-9.

[9] Lluch M(1), Abadie F. Exploring the role of ICT in the provision of integrated care--evidence from eight countries. Health Policy. 2013 Jun;111(1):1-13. doi: 10.1016/j.healthpol.2013.03.005. Epub 2013 Apr 12.

[10] Villalba E(1), Casas I, Abadie F, Lluch M. Integrated personal health and care services deployment: experiences in eight European countries. Int J Med Inform. 2013 Jul;82(7):626-35. doi: 10.1016/j.ijmedinf.2013.03.002. Epub 2013 Apr 12.

[11] COBIT5 Enabling Processes. http://www.isaca.org/COBIT/Documents/COBIT5-Ver2-enabling.pdf Last accessed January 31, 2015.

[12] Governance and Management for the Philippine eHealth Strategic Framework and Plan. http://bit.ly/ehealthgovernance last accessed January 31, 2015.

[13] Mohan J, Suleiman AB. E-Health Strategies for Developing Nations. IMIA Yearbook of Medical Informatics 2005.

[14] Mohan J, Yaacob R. The Malaysian Telehealth Flagship Application: a national approach to health data protection and utilisation and consumer rights. International Journal of Medical Informatics, 73, 217-227, 2004.