Innovation and Technology Research Center of Afghanistan

Recommendations on Public Sector ICT Service Delivery for Afghanistan

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May, 2018

1.1.   Background:

Since 2002, the Afghanistan ICT Sector and technologies in general has developed significantly. MCIT (2017) reports that the population coverage on mobile has reached to more than 80% through the mobile operators with more than 5.7 Million 3G customers, the establishment of ATRA, the establishment of the directorate of e-governance in MCIT and its policies are just a few of the major gains to exemplify. Social Media plays a big role in war-torn Afghanistan is successfully challenging the norms for citizens to get information and share their thoughts. Also, a few basic service areas have also started to make big promises for the future including the use of ICT for local services, global networks, finance and entertainment. That being said, there is a long way ahead for Afghanistan to truly use ICTs to its potential.

In the past few years, many projects implemented in Afghanistan's ICT sector have been flagged risky or have completely been abandoned by the private sector, donors and the government agencies due to the lack of security, maintenance and sustainability. While high-class and sophisticated systems and initiatives such as the National Data Center, the Afghan Satellite and digital TV have been implemented to provide a high-level success story of the ICT sector; in practical terms, the sector still face major hurdles with basic things such as accessing the internet and email systems. The same could be said for internationally backed projects of all scales. Projects such as making an incubator and training academy for ICT in Herat (CISCION, 2011), to the implementation of mobile-money in Afghanistan that has been supported for many years by many institutions with a total investment of around $160 million that has still not produced any sustainable results (Gault, 2017).

Meanwhile, there is no institution within the public sector of the country that can provide high-level guidance except the newly started Asan-Khedmat which has just started rolling out basic services, non-tech focused entities are in desperate need of ICT Training, implementation support and maintenance. For instance, the educational MIS system (eMIS) implemented by the Ministry of Education (MOE), highly supported by donors such as the World Bank and USAID are yet to provide back with basic accurate data on schools and teachers. Sadly, in contrast the reports are widespread that the MIS system was also used for reporting ghost schools and ghost teachers (Adili, 2017). Other institutions in the provincial level lack basic level ICT infrastructures to conduct their businesses, they are not equipped with basic tools to conduct their business efficiently. These institutions and majorly are not specialized in the field of ICT and innovation, and for them to try to get a system up and running gets to be their least area of strength and in many cases priority too, i.e. Ministry of Education's focus is on Education and municipalities focus on services; likewise, Ministry of Education's expertise is in education and municipalities are ought to succeed in engineering and basic public services.

1.2.   ICT Development Index (IDI)

In order to understand the way forward for Afghanistan's technology sector, we look at International Telecom Union (ITU) ICT development index (IDI); the IDI provides with the basic

connectivity, access as the basic tools that should be focused on for every country, then a few model ICT centric institutions in other countries.

The UN Sustainable Development Goals agenda does not have a direct indicator for ICT. However, in many instances technology could be used to achieve the 17 sustainable goals. UN (2015) to reinforce the use of ICTs states that 'The spread of information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies, as does scientific and technological innovation across areas as diverse as medicine and energy'. The International Telecommunication Union (ITU) plays the lead role on ICT indicators for SDGs, in cooperation with the partnership on measuring ICT for development (Vall, 2018).

Posted by ITU annually since 2009, the ICT development index (IDI) is a composite index that combines 11 indicators into one benchmark measure that is used to measure and compare development in ICT between countries over time. IDI can be used to understand the level of evolution over time in ICT development within a country, the progress of ICT development, the digital divide and the development potential of ICTs for growth within a country.

The IDI provides a conceptual framework in 3 steps made up of 11 indicators in order to evolve into an information society as described in the below figure 1.
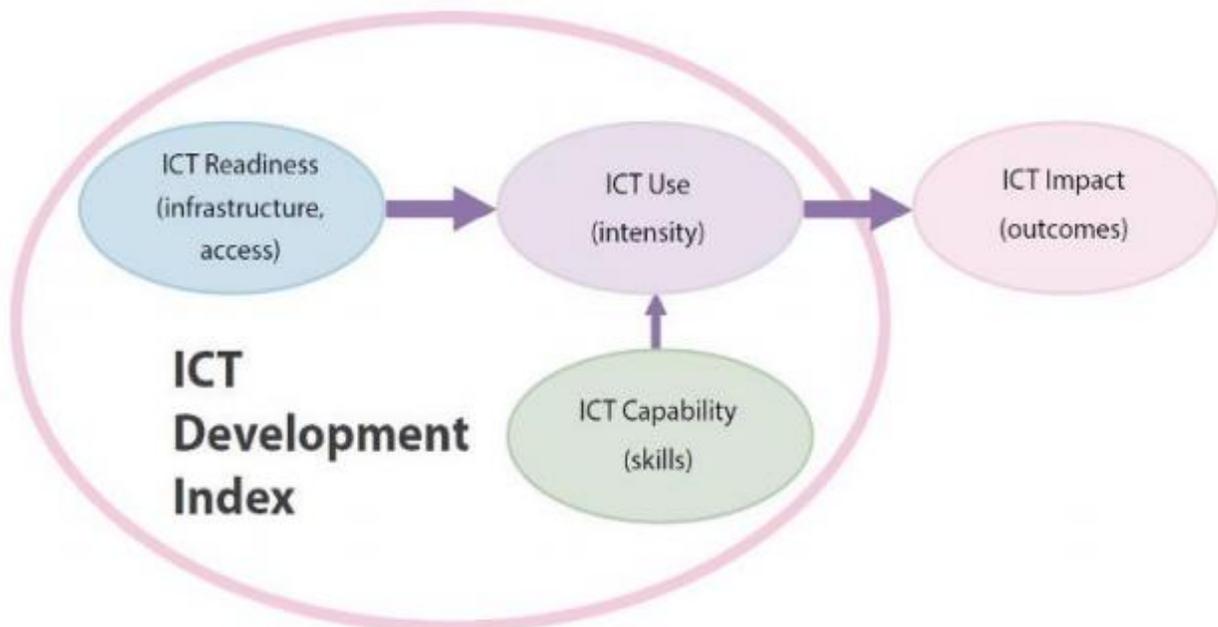

Figure 1: ICT Development Index. Source (ITU, 2017)

The 11 indicators can be split in to ICT access, ICT use and ICT skills sub-indexes, they are references and weighed to provide a total that would measure the ICT development index of

different countries. Figure 2 provides information on the IDI buildup using indicators, reference values and weighs.

ICT access	Reference value	(%)
1. Fixed-telephone subscriptions per 100 inhabitants	60	20
2. Mobile-cellular telephone subscriptions per 100 inhabitants	120	20
3. International Internet bandwith (bit/s) per internet user	976'696*	20
4. Percentage of households with a computer	100	20
5. Percentage of households with Internet access	100	20

ICT use	Reference value	(%)
6. Percentage of individuals using the Internet	100	33
7. Fixed-broadband subscriptions per 100 inhabitants	60	33
8. Active mobile-broadband subscriptions per 100 inhabitants	100	33

ICT skills	Reference value	(%)
9. Mean years of schooling	15	33
10. Secondary gross enrolment ratio	100	33
11. Tertiary gross enrolment ratio	100	33

ICT access weight: 40
ICT use weight: 40
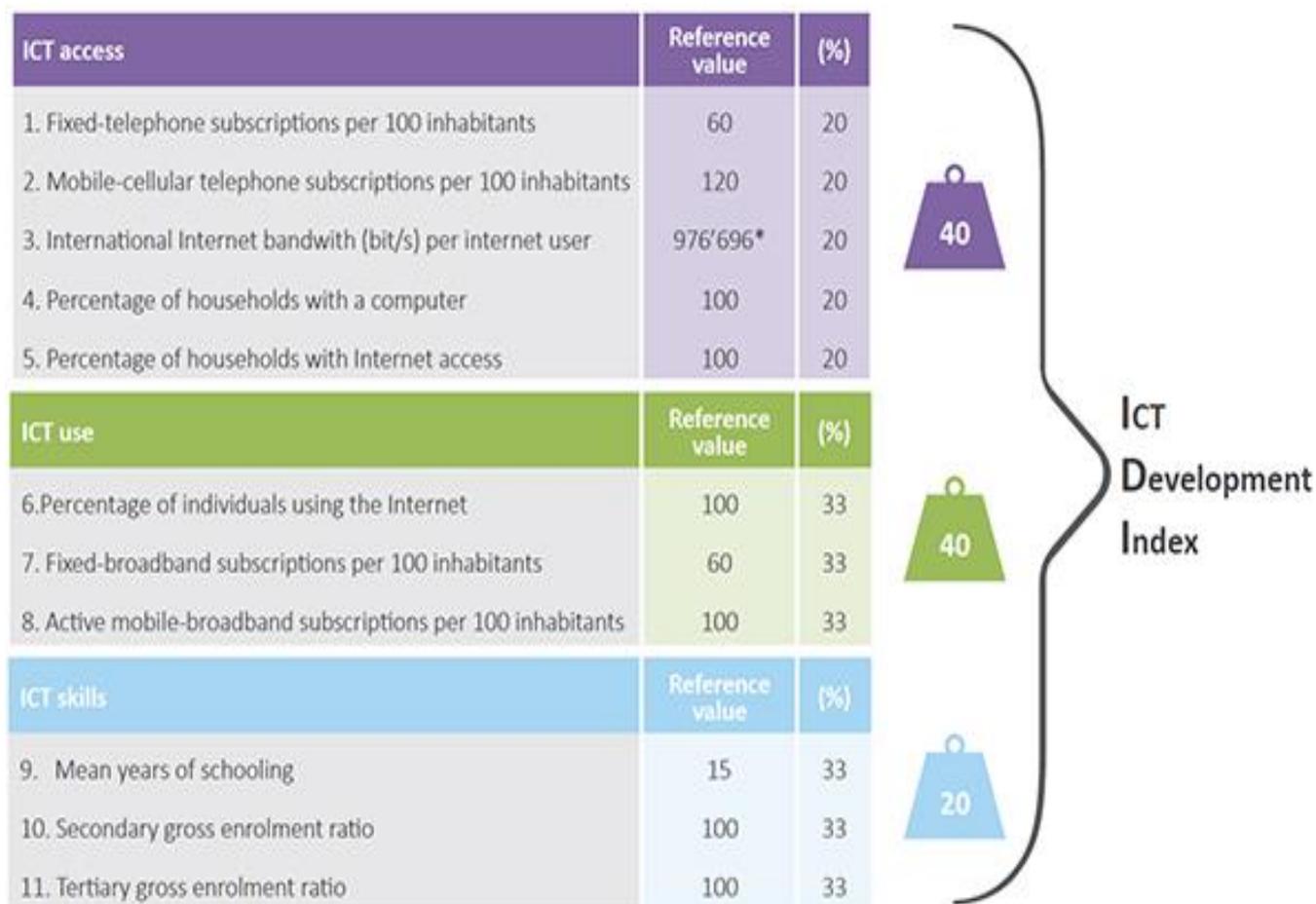ICT skills weight: 20
ICT Development Index

Figure 2: ICT Development Index: indicators, reference values and weights.
Source (ITU, 2017)

It is important to understand that it is critical that the data submitted to ITU creates a complete data set for measurement. In case the data is not complete a process of imputation is applied to estimate missing data.

In 2016, Afghanistan climbed by 6 ranks from 165 to 159 in the ITU IDI rankings going ahead of a few African and other underdeveloped countries. Despite challenging economic, social, geographic and security environment, Afghanistan has a competitive mobile market with a relatively high level of GSM coverage states ITU in the Measuring the Information Society 2017 report that was published in WSUS 2017 in Tunisia (ITU, 2017). We are lagging behind our neighbor countries such as Iran (81), and Uzbekistan (95) and Pakistan (148). The IDI index is usually topped by western European countries and a few other countries in Asia pacific. Figure 3 compares Afghanistan's IDI with that of the average of Asia/Asia Pacific and the World.

Key indicators for Afghanistan (2016)		Asia & Pacific	World
Fixed-telephone sub. per 100 inhab.	0.3	10.0	13.6
Mobile-cellular sub. per 100 inhab.	66.0	98.9	101.5
Fixed-broadband sub. per 100 inhab.	0.0	11.3	12.4
Active mobile-broadband sub. per 100 inhab.	14.3	47.4	52.2
3G coverage (% of population)	40.0	87.6	85.0
LTE/WiMAX coverage (% of population)	0.0	73.6	66.5
Mobile-cellular prices (% GNI pc)	9.4	3.2	5.2
Fixed-broadband prices (% GNI pc)	29.0	14.5	13.9
Mobile-broadband prices 500 MB (% GNI pc)	10.1	2.7	3.7
Mobile-broadband prices 1 GB (% GNI pc)	10.1	5.4	6.8
Percentage of households with computer	3.4	37.8	46.6
Percentage of households with Internet access	4.8	45.5	51.5
Percentage of individuals using the Internet	10.6	41.5	45.9
Int. Internet bandwidth per Internet user (kbit/s)	12.0	48.0	74.5

Figure 3: Afghanistan comparison with Asia & Pacific, World IDI metrics.
Source: (ITU, 2017)

It is understandable that a bigger amount of investment be put in to the ICT access indicators for Afghanistan in the next few years by the telecom sector, government and the international donors; so has been the case in the last few years as well. New projects such as the Digital Central-Asia South-Asia (CASA) are good steps to get more people connected. However, practical ideas should also be put in to action from all the parties mentioned above and the general public in terms of ICT use and ICT skills.

2.1. Public Sector Service Delivery through ICTs

As pointed out, the lack of ICT serving public institution leave a blank space which points that while the current institutions are focusing on their primary work areas, who is responsible for providing them with the modern tools that could enable them to efficiently conduct their business? The obvious response is set to be the leading public sector technology institution the ministry of communications and IT or Afghanistan's technology regulatory authority (ATRA). However, the core role of MCIT is to facilitate communication and postal services to the Afghan people (MCIT, 2018) and ATRA is responsible solely to regulate the market. Apart from their focus area of telecom, even in their extended role with the plans of e-government and a central data center they have not been able to demonstrate that they may provide the basic services to their peer ministries yet. The lack of a central standards authority and repository for systems development, communications, systems training, and ICT physical infrastructure is one of the biggest hurdles

that Afghanistan has to tackle before a modern set of tools are provided to all the institutions to ease conducting their businesses efficiently and in a proactive manner. On a positive note, the recent establishment of Asan Khedmat, a one-stop shop for public services such as passport, tazkira, marriage certificate and similar services has automated a few functions of the government entities to the public (Asan Khedmat, 2018). Also, The E-Government Resource Center (EGRC) under MCIT provides advice and guidance to chief information officers of key ministries and agencies for development and deployment of digital systems and services across the government (MCIT, 2016).

In order to further understand the improvement areas that could be brought in to different areas, the author visited India and Pakistan in 2016 and 2017 to get a first-hand experience in understanding how they may have filled the gap or not in these countries. Furthermore, research on the Singapore model to understand the structure and get a first-hand flavor of the support provided to the public organizations and any lessons that could be applied.

Before we get in to understanding the different models implemented by other countries. In order to over simplify and provide a basic platform for the understanding of the current ICT status of the country, the author has provided the below model derived from the Gartner's IT Infrastructure Maturity model (Gartner, 2017) to help with the mental visualization of the roadmap.

2.2. Gartner's IT Infrastructure Maturity Model:

The Gartner's Information Technology and operations maturity model has defined five overall levels of Infrastructure and Operations maturity, with the following objectives for each level:

Level 0, Survival — Little to no focus on IT infrastructure and operations.
Level 1, Awareness — Realization that infrastructure and operations are critical to the business; beginning to take actions (in people/organization, process and technologies) to gain operational control and visibility.
Level 2, Committed — Moving to a managed environment, for example, for day-to-day IT support processes and improved success in project management to become more customer-centric and increase customer satisfaction.
Level 3, Proactive — Gaining efficiencies and service quality through standardization, policy development, governance structures and implementation of proactive, cross-departmental processes, such as change and release management.
Level 4, Service-Aligned — Managing IT like a business; customer-focused; proven, competitive and trusted IT service provider.
Level 5, Business Partnership — Trusted partner to the business for increasing the value and competitiveness of business processes, as well as the business as a whole.

The levels may vary in different institutions in the country but from a with the models presented in the next chapter Afghanistan and the study of the model **Afghanistan stands in Level 1 (Awareness)**. This is considered a big loss in the current age and urgent plans for implementation should be put forth in order for the institutions to advance which will result in infrastructure gains and efficiency improvement on service delivery.

	Survival	Awareness	Committed	Proactive	Service-Aligned	Business Partnership
People	No organizational focus on IT infrastructure and operations	Defined, technology-centric organization for IT infrastructure and operations	Technology-centric organization; investment in IT service desk function and staff	Process-centric organization, defined IT governance structure	Customer- and business-focused, IT service and delivery centric organization, formal governance	Business optimization and entrepreneurial focused culture
Process	No formal IT processes for IT infrastructure and operations	Ad hoc, but aware that processes are necessary; dependent on tools to implement de facto processes	Defined processes for IT service support and project management	Repeatable and individually automated; focus on IT service delivery-related IT processes	Integrated, automated and extended beyond I&O; focus on all service and business management processes	Dynamic optimization of IT services, implement processes fostering business innovation
Technology	No formal strategy or execution on technology investments	Basic management tools; no formal infrastructure hardware or software standards	IT support and project-related management tools; desktop hardware/software standards defined; begin infrastructure standardization/rationalization	Formal infrastructure standards and policies; process and domain-centric management tools; virtualization foundation in place	Formal IT management process/tools architecture; shared services; aggregated capacity management	Proactively promoting new technologies and impact to business; real-time infrastructure
Business Management	No formal IT business management functions	Very little outside of budgeting	Project management office	Financial management, formal key performance indicators	IT service cost metrics, competitiveness	Business contribution metrics
Level:	0	1	2	3	4	5

Figure 4: Gartner's IT Infrastructure Maturity Model (Gartner, 2008)

In the next section the implemented models in India, Punjab and Singapore will be discussed.

2.3.   Example Institutions formed for public sector ICT needs

2.3.1. Digital India:

The Digital India program is a flagship program of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy (Digital India, 2018). With a budget of INR 30.73 Billion for FY18 (Kurup, 2018) and a Given the vast population and density of India and the governance structure many States/UTs started various ICT projects in order to serve the people. Though these projects were citizen-centric, they could make lesser than the desired impact and there was a lot of disconnect between the institutions. Government of India launched National e-Governance Plan (NeGP) in 2006. 31 Mission Mode Projects covering various domains were initiated. Despite the successful implementation of many projects across the

country, e-Governance as a whole has not been able to make the desired impact and fulfil all its objectives.

It was further felt that a lot more thrust is required to ensure e-Governance in the country to promote inclusive growth that covers electronic services, products, devices and job opportunities. Moreover, electronic manufacturing in the country needed to be strengthened. In order to transform the entire ecosystem of public services through the use of information technology, the Government of India has launched the Digital India program with the vision to transform India into a digitally empowered society and knowledge economy. After the successful steps taken by digital India as stated by Sharma (2016) 'The Government took out the Department of Electronics and Information Technology (the implementer of Digital India) from the remit of the Ministry of Communications and Information Technology, and made it a new Ministry'. The approach of digital India is highlighted below:

- The common infrastructure will be leveraged by all ministries, departments and states. Support is provided by department of electronics and technology regardless of location but on priority basis.
- Streamlining initiatives to be aligned with best practices from similar projects, process re-engineering and use of integrated systems while given the ability to customize.
- Different states are to be given the ability to customize as per their needs but through the standard platform and after keeping the interpretability and making sure the systems talk to each other.
- Using different contractual instruments and keeping Public Private Partnerships as the preferred way where feasible to implement projects with adequate management and strategic control.
- Developing champions in different public sectors that work as a bridge between the IT/technical and the operational elements.

In terms of governance and program management, Digital India is managed by the monitoring committee which is headed by the prime minister of India. The structure also includes an advisory board that is chaired by the minister of communications and IT and a working committee chaired by the cabinet secretary for overseeing the program and providing policy and strategic directions for its implementation, a finance committee to oversee the budget and execution. Institutional mechanism of Digital India at State level would be headed by State Committee on Digital India by the Chief Minister. State Committees on Digital India headed by Chief Secretaries would be constituted at State level to allocate required resources, set priority amongst projects and resolve inter-departmental issues at State level (Channa, 2017).

Figure 5 describes the 3 major pillars of digital India and further describes the action items required to service each pillar.
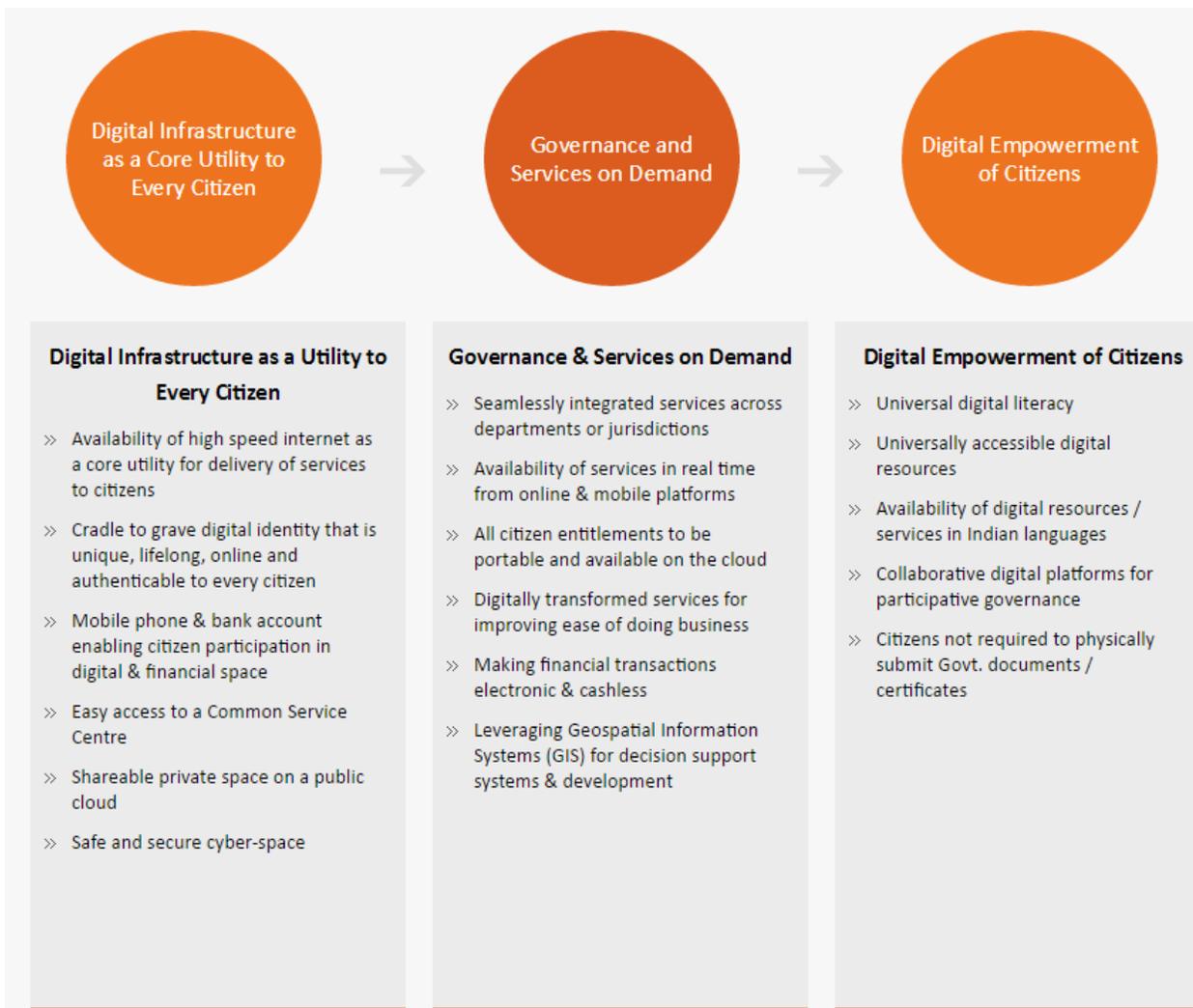
Figure 5: Vision Areas, Digital India (2018)

http://www.digitalindia.gov.in/content/about-programme

2.3.2. Punjab IT Board:

The Punjab Information Technology Board, an autonomous body set by Government of the Punjab, provides the foundation for Punjab's innovation economy. The Board aims at not only modernizing the governance techniques through transparency induced methods but also at increasing the digital literacy of the citizens among many other services (PITB, 2018).

With a total development and non-development budget of PKR 1.85B for FY17 (PITB, 2017b); PITB focuses on efficiently while provide IT services and infrastructure to Punjab, and other states such as Baluchistan (ITU, 2018) and local and international businesses (that it bids for) in past PITB has tried to collaborate with Dubai Police (Dawn, 2017). As a basic role, PITB is responsible for maintaining the foundational IT infrastructure and system of Punjab i.e. a data center for hosting services along with managing official email identities. In addition, PITB has provided systems and solutions that have positively impacted the Health, Education and Law and Order sectors of the province; They have implemented more than 270 projects from in the last 5 years (PITB, 2018), On top of that, PITB also works on the entrepreneurship culture in the country along with capacity building of both professionals (public and private sector) and students from across Pakistan.

- PITB has initiated cloud-based services hosted in their premises which can cater to the Public Sector but has the ability to facilitate private sector in order for SMEs to be able to manage their own IT infrastructure over a secure cloud with a lower cost.
- The Citizen Contact Centre (CCC) is a shared platform providing Call Centre solution for the government departments.
- PITB has had major gains in automation and digitalization of many systems serving other government entities as its clients in the areas of counter-terrorism, education, transportation, agriculture, religious entities to automate the management of Haj, medicine and judiciary.
- In order to support entrepreneurship in the state of Punjab and beyond; PITB has launched initiatives such as Plan 9 (an incubator to facilitate tech entrepreneurship) and Plan X (a tech accelerator for mid-stage startups that provides a 6 months' acceleration cycle for selected startups.
- PITB also support capacity building through its IT Academy to both government and non-governmental clients, the youth internship program is designed to provide skills to youth and PITB also holds seminars, talks and conferences to discuss ICT related activities.

In terms of governance and program management, PITB was established as a board in 1999 with by an ordinance that required at least 33% women participation in board. The board was to be chaired by a chairman who would then create a team of experts, scope and initial budget. A board fund was also created at the time for transparency whereas the funds were to be provided and approved by the government (Punjab code, 1999). PITB has since then also for sustainability been

able to bid on international projects and the private sector as a corporate entity that reports to the Punjab government.

2.3.3. Government Technology agency (GovTech) of Singapore:

GovTech is tasked with harnessing info-communications technology and related engineering for public sector transformation, it's role role includes deploying a wide range of ICT solutions within the public sector, growing new capabilities and talent to support digital service delivery, and developing the Smart Nation infrastructure and applications (Govtech, 2018). In FY17, Govtech employed more 1800 people and the government allocated a budget of SG$2.4 billion for FY17 to Govtech.

GovTech and the Information and communication Media Development Authority (IMDA) were formed as a result of a re-structuring between the Information communication and Development Authority (IDA) and the Media Development Authority (MDA). The institution has a long history from when it started in 1980 as the national committee for computerization with an initial IT masterplan that looked at computerization of the civil servants. Since then, dozens of organizations, conferences, strategies and plans have been created and implemented with major achievements. Singapore was ranked number one in 2016 the world economic forum report on global information technology in categories of network readiness, IT Usage, Impact, and environment (WEF, 2016). In terms of e-governance Singapore was ranked number 4 as an e-government leader with very high e-government development index (UNDESA, 2016). Similarly, Singapore is ranked top 10 in other areas such as e-readiness, IT industry, competitiveness, ease of doing business, and business environment (Govtech, 2018).

The government in Singapore understands for long that as the digital age is now under way. Digital technologies are acting as agents for change in everything from business to government, disrupting established industries and giving rise to new companies that dominate their fields (Lim, 2016). And so, Digital transformation within the public sector is at the heart of what Government Technology Agency of Singapore does by harnessing the best info-communications technologies to make a difference to the everyday lives of people in Singapore. Today's government digital services are held to the highest standards by users. Not only must they be safe, secure and accurate, they have to be easy to use and empowering. This means business is not as usual anymore for the government seeking to connect more closely with citizens. Unlike, India and Pakistan where the agencies focus is mainly on specific areas and portfolios, Although, Govtech provides more than 1600 online services, they look at the concepts at the core of what they do and have a slightly different model to improving government services.

- Govtech works on co-creating for value, by working with the private sector, non-government organizations and the citizens Govtech makes solutions that fit the purpose and the demand of the society. This approach of engaging with everyone is being used to deliver user-centric services e.g. the Singapore data portal (Data.gov.sg) to benefit citizens, businesses and Singapore as whole (govtech, 2017).

- GovTech is the implementing agency of the Smart Nation and Digital Government Office (SNDGO). Collectively, they will continue to build Smart Nation infrastructure, platforms and services by deploying info communications and related engineering technology such as sensors and the Internet of Things. One of these platforms is a nationwide sensor network — the Smart Nation Sensor Platform (SNSP) — which GovTech is working on, in collaboration with public agencies and the industry.
- Technology policy for government is another area that govtech works on by providing standards, resources and guides. Namely, the digital service standards (DSS) and the ministry family digitalization guides are important tools to equip other ministries and their staff with the requirements to deliver quality services through ICTs.
- There are multiple efforts by Govtech to implement agile methodologies throughout their portfolio. As mentioned in the Agile manifesto, Agile development is a methodology that stresses on constant improvements, collaboration and working software instead of putting too much focus on the process, documentation, contractual negotiation and other unnecessary fog (Kent, Beedle, Hunt et al, 2001).

Govtech's governance and portfolio management is done by the Smart Nation and Digital Government Group (SNDGG), under the Prime Minister's Office. This move was done in 2017 to enable a more centralized and focused approach to delivering on a Digital Government in a Smart Nation. Figure 7 provides more information.
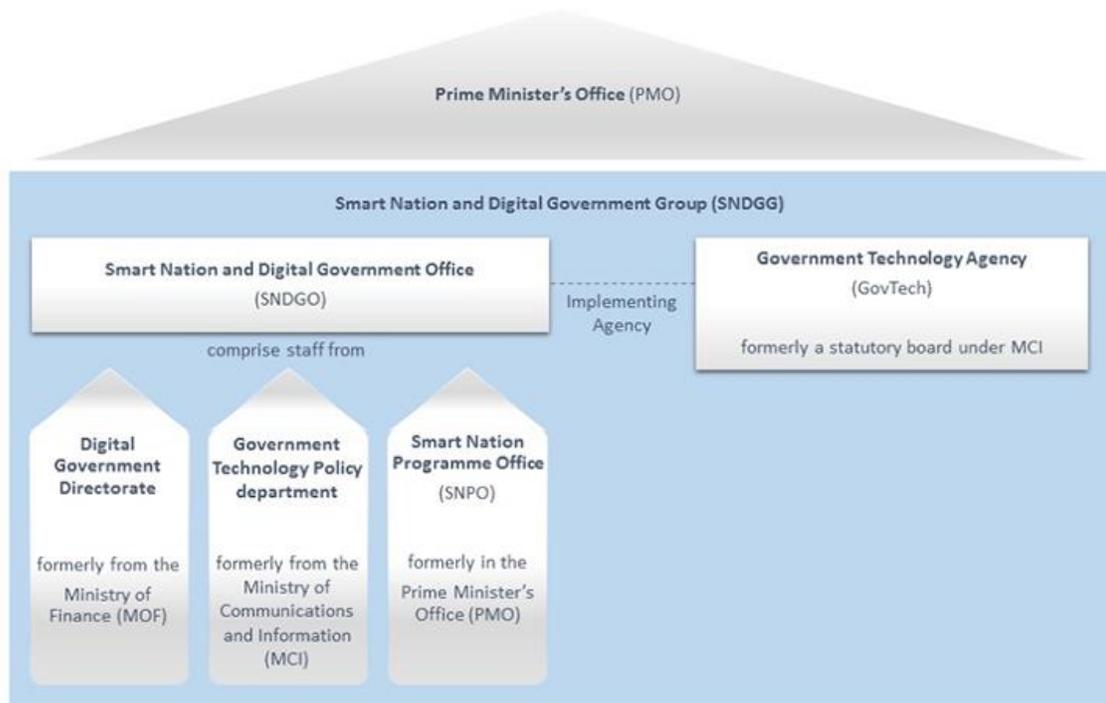

Figure 7: Organizational chart for Smart Nation and Digital Government Group (SNDGG) in the Prime Minister's Office of Singapore.

3. Conclusion

The author provided three different examples of public sector institutions that are trying to assist efficient service delivery in different locations and also briefly examined the current state of technology in Afghanistan. There is a need to further understand, improve and propose a better model of service delivery to the Afghan public institutions in order to improve on providing efficient services to the Afghan population.

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