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Part XIV: IT Strategic Plan for Afghanistan**

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Introduction

This conference was the fourteenth in a series of conferences on Information and Communication Technology (IT) that has been taking place in Kabul, Afghanistan, on an annual basis since 2005. It was hosted by the Ministry of Higher Education (MoHE) with technical assistance from the IT Competence Center (ITCC) Afghanistan and the Center for international and intercultural Communication (Ziik) of the Technische Universität Berlin (TU Berlin), with funding from the German Federal Foreign Office and with support from the German Academic Exchange Service (DAAD).

Following up the IT Conference in 2017, where H.E. State President Dr. Ashraf Ghani initiated the development of an IT strategy for Afghanistan, the topic of this IT conference was "IT Strategic Plan for Afghanistan".



Technological progress is the driver of the Afghan economy, science and society. However, this progress depends on fundamental requirements such as qualified IT professionals, stable IT infrastructures (power and Internet supply, building services), modern management structures, IT laws and IT policies, extensive and solid demographic data and statistical information on Afghanistan, as well as available

funding. Modern technologies, especially digitalization, today create a globalized, intelligent, information-based, highly productive and highly networked world. In the long term, it is shaping the economy and science, the labor market on a large and small scale and the communication between people.

Therefore, the objective of this three-day conference was to develop an IT strategy and to deal with the following questions:

- What does Afghanistan want to gain from technological development?
- Which role does Afghanistan want to play in a digitized and globalized future?
- How can Afghanistan build and secure its economic and scientific location by means of digital technologies?
- What arrangements must be made for a more stable, secure and functioning digital landscape?

During the conference three workshops were organized about various topics of **IT Strategy for Education, IT Infrastructure Strategy and IT Management Strategy, IT Law and IT Regulation**. The results of these workshops were presented on the third conference day.

First day: Monday, December 17th, 2018

Reception and Opening

Prof. Azim Noorbakhsh, Head of Public Relations and strategic planning of the ITCC Afghanistan



Prof. Noorbakhsh welcomed all contributors and guests to the 14th conference on Information Technology for Higher Education in Afghanistan. He stated that the conference will be opened with the recitation of a few verses of the Holy Quran, followed by the national anthem of Afghanistan. In the following, Mr. Noorbakhsh gave the word to the Minister of Higher Education Prof. Dr. Najibullah Khawaja

Omary.

Dr. Najibullah Khwaja Omary, Minister of Higher Education Afghanistan



Dr. Khwaja Omary welcomed all honorable guests to the 14th IT Conference. He said that this conference is the outcome of 14 years of academic effort that has been done in the field of IT in Afghanistan, for which he thanked TU Berlin and Dr. Nazir Peroz and the IT Department of the Ministry of Higher Education of Afghanistan. He continued his speech with a review on growth of IT

in the 20th century and the impact on human life. He stated that internet has played a vital role in the improvement of communication. He mentioned that a vast of research has been done in the field of IT in the world. Considering the experience of other countries, it can be said that conducting and implementing such researches in Afghanistan will lead to social, political and economical improvements.

Dr. Khwaja Omary noted that technological improvement requires both internal and external factors. He explained the internal factor as national determination for the improvement of the society and external factor as international investment. He stated that, to have technological improvements, the plans and policies need to be inlined with internal and external factors. In the continuation of his speech, to insist on the importance of IT on development of a society, he noted that not considering digital vulnerabilities lead to serious failures in developing countries. He counted technological knowledge as an important factor for their productivity and improvement.

As further required applications of IT in the academic field, Dr. Khwaja Omary named access to network, development of information systems, video conference system development, implementation of fiber optic network, creation of national library network and e-learning systems. He appreciated the creative ideas of computer science students and mentioned that the Ministry of Higher Education is committed to provide the environment for their further improvements.

Dr. Khwaja Omary finished his speech by stating that he hoped the results of this conference will help the development and implementation of a national IT strategy plan for Afghanistan.

Message from Mr. Prügel, Ambassador of the German Federal Republic in Kabul

Subsequently, Dr. Nazir Peroz, Head of ZiiK at TU Berlin read the following message from **Mr. Prügel**, Ambassador of the German Federal Republic in Kabul to the guests of the 14th IT Conference in Afghanistan:

Dear Excellencies,

Dear graduates,

It would have been my pleasure to attend today's conference and to hand you your degrees in person. What you have achieved is remarkable and will contribute greatly to the future of your country. With your work and the flagship projects that you have developed, you enable Afghanistan to modernize its administration and the country as a whole.

Your efforts have not gone unnoticed. Whenever H.E. President Ghani talks about the potential and the capabilities of Afghanistan, the IT graduates from TU Berlin are always one of the first assets that seem to come to his mind. Just recently, during the Geneva Conference, he proudly mentioned you and your success story.

What I am particularly fond of is the fact that you are not only the drivers of digitalization and modernization but that you are also Ambassadors of the German-Afghan friendship. With your studies in Germany, you have strengthened the ties between our two countries and are now part of a new generation of young Afghans and Germans that are bound together in friendship.

I sincerely hope that you will be able to maintain your friendships with your German colleagues and I wish you all the best for the bright future, which now lies ahead of you.

Mr. Shahzad Aryobee, Minister of Communications and Information Technology of Afghanistan (MoCIT)



Mr. Aryobee began his speech by congratulating the ITCC and thanked Dr. Nazir Peroz for his commitment and dedication for all his efforts in the field of computer science in Afghanistan. He congratulated the students who have participated at the IT exhibition and presented their projects. He promised that the Ministry of communication and Information Technology is committed to help in the implementation process of those projects. He mentioned that there

have been investments in the IT sector that lead to lots of job opportunities. In continuation of his speech regarding the investment he mentioned that the fiber optic network which connects 25 provinces and 9 other provinces are under process. From the efforts of the Ministry of Communication and Information Technology, he pointed the implementation of an internal network so called NEXA to which 9 ISPs are connected. This intranet leads to an economic, efficient and secure way of data exchange among governmental organizations.

As current projects of MoCIT he named the following activities: Connecting schools through fiber optic, establishment of IT centers in schools, implementation of digital library, connection of hospitals through Tele Medicine, works on E-agriculture that the contract has already been signed, integration of e-passport and e-tazkera, and postal money service. He pointed out that the number of internet users in Afghanistan increased from 7 million in the year when he was appointed, to 9.7 million in 2018. He ended his speech with the good news of a Research and Development Center establishment, and once again thanked the ITCC Afghanistan and Dr. Peroz for holding the conference.

Message from Dr. Mohammad Najeeb Azizi, Chairman of Afghanistan Telecom Regulatory Authority of Afghanistan (ATRA)

Mr. Ata Yari technical advisor of ATRA talked, on behalf of Dr. Azizi, chairman of ATRA, who was currently traveling. He started his speech welcoming all honorable guests and insisted on the importance of the IT conference. He stated that Afghanistan is still at the level of having poor connectivity that even in Kabul the capital, there is no communication among organizations. He pointed that despite having the IT infrastructure, it is not being used in an efficient way in use and management of data. According to him, another important point to be done is the inclusion of people and organizations in addition to/other than MoCIT. At the end of his speech, he congratulated the organizers of this conference and requested the participants to have active participation and share heir knowledge and experience.

Dr. Nazir Peroz, Director of the ZiiK at TU Berlin



Dr. Peroz welcomed all participants of the IT conference and expressed his thanks to the ministers, deputy ministers, deans of computer science faculties, lectures, students, and representatives of other organizations for their participation. He stated that the IT strategic plan, the topic of this conference is selected based on the request of H.E. President Dr. Ghani. He pointed

out that the suggestion of the topic from H.E. President Dr. Ghani was based on the survey that has been done by the ITCC team at the ministries in 2017. The survey showed the lack of human resource in the IT field, as well as a lack of power supply, awareness and management. Dr. Peroz mentioned that although the MoCIT has an IT strategy plan, it has some weaknesses that should be discussed during this conference. He stressed that Afghanistan needs a tailored IT Strategic Plan which takes into account the particular situation of the country.

He went on to explain that technological progress is the driver of the Afghan economy, science and society. However, this progress is depending on **basic requirements** like qualified IT professionals, reliable IT infrastructures (power and Internet supply, building services engineering etc.), modern management structures, IT laws and policies, comprehensive and thorough demographic data and statistic information about Afghanistan, as well as available funding.

According to Dr. Peroz, the questions are now: What does Afghanistan want to gain from this technological development? Which role does Afghanistan want to take in a digitized and globalized future? How can Afghanistan secure and strengthen its economic and scientific location through digitization? Which requirements have to be met for a stable, secure and effective digital landscape?

Dr. Peroz stated that he studied the IT strategic plans of other countries within the scope of his seminars, and he came to the conclusion that these strategic plans cannot just be re-used for Afghanistan. However, experiences from other countries show that key elements for the success of digitization in the long term are the basic requirements and the acquisition, processing, connection, integration and protection of data. These aspects form the foundation for an effective use and development of IT systems, algorithms, big data, artificial intelligence, mobile devices, and applications in areas such as e-government, e-commerce, e-health, e-education, cloud services etc.

There are currently only few institutions which have qualified IT professionals, operational and secure IT infrastructures, IT systems and networks, and in most cases, isolated IT solutions are implemented. Such developments and bad planning lead to

- high costs for troubleshooting and debugging,
- violation of privacy, availability and integrity of data and information,
- harm for the future economic and scientific location, and
- dependencies and falling behind innovative development of digitization.

Thus, Dr. Peroz finished his speech by proposing the development of an IT Strategy Plan for Afghanistan which provides answers to these issues.

Keynotes

On the first day of the conference, in addition to the opening speeches, four keynote presentations were given on the subject of the IT strategy plan:

Data and information management strategy

Mr. Bahadur Hellali, Deputy Director General for Information Systems Management and Development of the Central Statistics Organisation of Afghanistan



Mr. Hellali started his speech by thanking the organizers and continued by pointing out the existing problems in data management and communication which are listed below:

- No organized data sharing among ministries and directorates
- No coordinated and organized system for data gathering and

sharing

- Scarce of data for the research purposes
- No plan and policy for gathering organizational data
- Data duplication

In the continuation of his speech he suggested the creation of a unified framework being coordinated by the Ministry of economy and using a unified formate of data.

Then he pointed out some of the works which have been done in this field: Providing access to data by working on an open data concept which helps the researchers. He shared the website (data.gov.af, start.gov.af) with the IT conference participants. As an infrastructure for data storage and maintenance he named HMIS (Health Management Information System) from which the data can be accessed directly. He also added that they plan to establish a center for obtaining geographical data. He stated that gathering data in different fields lead toward big data and machine learning. In the end of his speech he answered questions of participants.

2018-2022, eGov implementation roadmap & strategy

Mr. Matten Hejran, head of National Data Center, Ministry of Communications and Information Technology of Afghanistan



Mr. Hejran gave an introduction about the services of the MoCIT and continued his speech with explaining the IT roadmap towards eGovernment. He stated that the steps towards eGovernment are connectivity, regulatory, data infrastructure and information security, enterprise service bus, government data and service share, and eServices respectively. In the next part of his speech he talked about the achievement of the MoCIT in regard of IT roadmap steps through e-government.

For the connectivity part the MoCIT is currently working to connect with China through the Wakhan corridor and with Iran from Chabha corridor through

Digital CASA.

The MoCIT is working to establish secure layers of connectivity (internet) through existing fiber cables to connect the entire government organizations, for data and service sharing between all government organizations.

In regard of the infrastructure he pointed the enhancement of the existing MoCIT National Data Center ANDC. He pointed that based on MoCIT's new plan all government data and services, will be host (place) in ANDC as primary or secondary infrastructure to manage government big data and services. In continuation of his speech he mentioned that there has been progress in cyber security. Currently, the MoCIT is working to implement secure layer of connectivity between the government and public to ensure data security and data integrity through NIXA and Forensic Lab projects. Also, the MoCIT is working on a Cyber Security Law which includes different sections of eTransaction, eSignature, e-Commerce, etc...

He also introduced GRP (Government Resource Planning) as a solution enterprise management. In continuation to progress in e-government he mentioned Asan Khedamat service that has provided solution for some of the existing problems at a few of the Ministries of (Finance, Commerce, Foreign Affairs, Interior..). He ended his speech with giving thanks to the organisers of the IT conference and gave him the opportunity to present the services of the MoCIT.

Development and achievement of IT in MoHE

Ms. Shukria Jamal, Director of the IT Department of the MoHE



Ms. Jamal started her speech with welcoming to the honorable participants of the conference and continued with an overview of the achievements of the IT Directorate of MoHE in 2018:

Seven functional IT Centers have been established by the MoHE with support of the HEDP including the Shahid Ostad Rabani Education University (completed), Faryab University

(completed, requires evaluation), Saikh Zaid University (fiber contract signed), Takhar University, Paktiya University, Ghazni University, Kunar University (fiber contract signed). Nine universities have been provided with IT equipment and Internet connectivity is planned for 38 public universities and higher education institutions, from which 28 are completed and 10 other are under process. For the MoHE, services have been enhanced and made more reliable, e.g. with an equipped server room and a solar power system, the renovation of the NOC, as well as capacity improvements of the internet bandwidth.

Ms. Jamal stated in her speech that there is a visible change in increase of internet bandwidth from 2015 to 2018. As part of the future plan she mentioned internet service, fiber optic network, and computer lab projects.

She stated that the IT directorate has made progress in information systems including improved coordination with NSIA, MoCIT & IARCSC, Student Information system development & Implementation (Public & private), HRMIS, and a Statistics System by ITCC Afghanistan.

She continued with the progress in the capacity building programs, some of which are training of technicians/managers of IT-Centers by HEDP, organizing TEIN workshops for Afghan engineers and IT employees, KOHA training for librarians, Website training for webmasters (in two levels), 4 edX workshops (India, MoHE), etc. She ended her speech by giving thanks to the organizers of the IT conference and ATRA for their support in providing internet connection.

Regulatory compliance in the telecommunication marketplace in Afghanistan

Ata Mohammad Yari, Technical Advisor, ATRA



Mr. Yari started his speech with insisting on the importance of regulation. He pointed that regulatory intervention is vital for supporting competition and for creating welfare of consumers. The responsibilities of ATRA include: development of laws for regulating telecom services, control and audition on service quality and illegal activities, frequency auditions, statistics and standardizations, tackling network

disruptions, certification and legal issues.

Then he listed some of the works achieved so far by ATRA, including open access projects, which use up to 2% of the overall budget, creation of a policy and guidelines for open access to communication services, connecting 30 universities using fiber optic and provision of internet bandwidth, running 9 projects for providing network coverage for 1,200 sites in 34 provinces of Afghanistan, from which 660 sites have been completed and activated, connecting 22 schools using fiber optic connection and providing them the Internet access.

Mr. Yari talked about the current state of the fiber optic network in Afghanistan and stated that fiber optic cables with a total length of 4,700km along the highway from Kabul, Qandahar, Herat and Mazar-e-Sharif are renewed and functional. This fiber optic network has 7 connecting points to neighboring countries including Iran from Islam Qala, connection to Pakistan in Spin Boldak and Torkham, connection to Tajikistan in Shirkhan Bandar, connection to Uzbekistan in Hairatan, and connection to Turkmenistan in Aqena and Torghandi is completed and functional.

He continued his speech by pointing out the need for having open access to national infrastructure and services. He said that on one hand, based on the current licensing system, Afghan Telecom is the only operator who has the right to own the invariable cable networks and fiber optic networks. On the other hand, there is a day to day increase in the number of customers and users of the communication services, which in long-term, it is impossible to afford the required service by a single operator.

He closed his speech by pointing out the main challenges towards improvement of communication in Afghanistan which are:

- Lack of basic services in lots of areas, specially lack of power in out of the cities
- Lack of basic infrastructure for directing the internal traffic
- Low level of resources, information systems, lack of inclusion policies compared to other countries
- Lack of policy for digital inclusion from other sectors
- Security challenges

Awarding ceremony for the winner projects of the 3rd IT exhibition of faculties of Afghan universities at the ITCC Afghanistan



Handing over of computer science master's certificates to TU Berlin graduates



Further images of the ceremony can be found in the appendix.

End of the first day

Second day: Tuesday, December 18th, 2018

Organization and introduction to the workshop topics

Mohammad Zia Sana, Vice President at Kabul Polytechnic University and Assist. Professor of the Computer Engineering and Informatics Faculty at Kabul Polytechnic University



Mr. Sana introduced the three workshops, “IT Strategy for Education”, “IT Infrastructure Strategy” and “IT Management Strategy, IT Law and IT Regulation” that were to be held during the second day of the conference. Mr. Sana repeated the questions Dr. Peroz posed in his speech the day before and asked all participants to discuss these questions and to find answers

during the workshops:

- What does Afghanistan wants to gain from technological development?
- Which role does Afghanistan wants to play in a digitized and globalized future?
- How can Afghanistan build and secure its economic and scientific location by means of digital technologies?

Workshop: IT Strategy for Education

Moderated by: Dr. Hassan Adelyar, Dean of the Computer Science Faculty at Kabul University

Introduction



Dr. Adelyar presented the schedule of the workshop about a “strategic plan for IT education”. He stated there were four keynotes in the morning.

Participants of this workshop were from the Ministry of Education, the Ministry of Communication & Information Technology, the Institute for Technical & Vocational Training (TVETA), and lecturers of computer science faculties from different public and private universities. The workshop was moderated by Dr. Sayed Hassan Adelyar. The main objective of this workshop was to discuss the key issues for IT strategy in secondary education, technical and

vocational training, and higher education. The workshop activities were divided into three sessions: the first session was allocated to presentations with the following topics:

- **Policy for IT education in schools**, presented by Irfanullah Safi, IT Director, Ministry of Education
- **Policy for IT education in vocational trainings**, presented by Mr. Jalaudin Atayee, Head of policy and planning Department of TVETA
- **Policy for IT education in higher education**, presented by Assistant Prof. Qudratullah Omerkhail Lecturer at the Computer Science Faculty of Shaheed Rabani Education University
- **Impact of e-Learning on education**, presented by Assistant Prof. Farangis Jamalzade, Lecturer at the Computer Science Faculty of Kabul University

The second session of the workshop was for discussion. During this session, the participants of the workshop shared their ideas regarding the appropriate IT strategy for education. The current situations, challenges, and future plans were discussed in detail. During this session the related issues were noted. The third session was in the last day of the conference and during this session the results of the workshop were presented by Assistant Prof. Qudratullah Omerkhail to the conference participants.

In the afternoon, concrete measures about the workshop topics and their implementation have been discussed. Altogether, 45 persons participated in this workshop.

Keynotes

Policy for IT education in schools

Irfanullah Safi, ICT Director, Ministry of Education



Mr. Safi began his presentation by asking the question, „what is IT in education?“ and explained it as the use of computers and electronic communication facilities to support teaching, learning, and educational management practices.

In the following, he stressed the importance of IT in education, as it provides advantages in terms of

access, quality, and management.

Mr. Safi then described the current situation and that the MoE has initial capacity for starting IT in Education program. The challenges in Afghanistan, as he went on, are mostly lack of electricity, poor IT infrastructure and Internet facilities at schools, lack of teacher’s capacity to use IT equipment in teaching practices, lack of awareness about the importance of IT, etc.

As a policy to improve the situation, he then proposed a framework for spreading digital literacy across schools in Afghanistan in order to provide Afghan citizens with the required skills.

The next steps, as he suggested, should be to organize workshops with donors, CSOs, and the private sector, and to develop guidelines and a strategy for IT in education.

Policy for IT education in vocational trainings: Current Teaching Materials

Jalaudin Atayee, Head of policy and planning Department of TVETA



Mr. Atayee began his presentation by stating that technical and vocational trainings in Afghanistan are provided by the TVET Authority. TVET targets students of both formal and informal education.

TVET offers trainings in agriculture and animal sciences, technical studies, engineering, oil and gas

sciences, industrial studies, management and business studies, special education, art and literature studies and IT studies.

Mr. Atayee then reported about the current IT situation and the challenges of TVET. In the above sectors, 69,000 students are studying at 301 institutions (at institutes and schools, 29 central and 272 provincial). 18% are female students, and lectures are offered by 4,000 teachers.

Currently TVET has one MIS and one IT department which collect, clean and report institutional data and are offering software and hardware solutions to the offices and staffs.

35% of institutions at national level have access to computers, and less than 3% of the provincial institutions have access to Internet. Almost at all institutions, there are equipment and electricity problems. All schools and institutions are offering IT basics courses, and computer science institutes are offering training in areas of database systems and software development, network and server systems, web design and computer hardware.

Mr. Atayee explained that the current main challenges of TVET institutes and schools are the strong focus on theory and teaching books only, and that they are lacking practical exercise and skill development. Students are not having access to computer lab and internet facilities. At some institutions, computer labs exist, but IT teachers are often not using these labs as they lack skills to use it properly.

Mr. Atayee continued to outline his policy statement that the TVET Authority is planning to expand the area of IT and the field of management in schools and institutes. The emphasis will be on practical oriented trainings and application of IT rather than paper-pencil based trainings. A specific curriculum of IT has been developed in cooperation with the industry.

He finished his presentation by stating that TVET is planning to introduce modern technologies like Internet-based services and educational software in schools and institutes in order to support digitalization processes in teaching and learning.

Policy for IT education in higher education

Assistant Prof. Qudratullah Omarkhail, Lecturer at Computer Science Faculty of Shaheed Rabani Education University Kabul



Mr. Omarkhail first gave an insight of the education and higher education in general in Afghanistan. Then he focused on blended learning, which he considered an innovative concept that embraces the merits of both traditional teaching in the classroom and IT supported learning, with both offline and online learning. It has scope for collaborative

learning, constructive learning and computer assisted learning. Blended learning needs strict efforts, right attitude, enough budget and highly motivated teachers and students for its successful implementation. As it incorporates diverse modes, it is complex and organizing it is a difficult task.

Mr. Omarkhil then discussed how IT can help in e-learning. E-learning is implemented at the Afghan universities since 2015. According to him, the policy is to be modernized and various methods are to be used in schools and universities.

Impact of e-Learning on education and development

Assistant Prof. Farangis Jamalzade, Lecturer at Computer Science Faculty of Kabul University



Mrs. Jamalzade first stated that e-learning has become one of the fastest growing fields of the modern society as it provides means for students to improve their knowledge in any subject independent of location, time and budget with the use of modern digital technologies. She emphasized that e-learning has a great impact on the global delivery of knowledge, as there

are no boundaries and limitations for people to achieve their educational dreams.

Mrs. Jamalzade went on to praise the advantages of e-learning in all areas of education, and the society. Therefore, as she concluded, respective facilities are to be established at all universities and institutions across Afghanistan.

Discussion: Proposals, measures and implementation

In the afternoon, all 45 participants of the workshop “strategic plan for IT education” controversially discussed the issues of curriculum, infrastructure, e-learning, communication and IT access policy, as well as research development. The results were presented and discussed on the third conference day.



Workshop: IT Infrastructure Strategy

Moderated by: Prof. Mirza Mohammad Mirza, Dean of the Computer Engineering and Informatics Faculty at Kabul Polytechnic University

Introduction



Prof. Mirza, Dean of the Computer Engineering and Informatics Faculty at Kabul Polytechnic University, presented the schedule of this workshop to the participants. He explained there were four keynotes in the morning.

The first presentation of the day was from Dr. Mohammad Hassan, Senior Technical and Communication Advisor of Ministry of Communication and Information Technology of Afghanistan, about **“IT Infrastructure”**. The second presentation came from Assistant Prof. Mohammad Nazim Kabeeri, Lecturer at the Computer Engineering and Informatics Faculty at Kabul Polytechnic University, and was about a **“Cloud**

Readiness Assessment in Afghanistan”. The following speech was from Assistant Prof. Mohammad Najim Wahedi, Lecturer at the Faculty of Construction at Kabul Polytechnic University, about **“Building Facility Requirements in Afghanistan”**. The last presentation was from Assistant Prof. Mohammad Amin Amin and Assistant Prof. Gul Ahmad Loadin, Lecturers at the Faculty of Electromechanic at Kabul Polytechnic University about the **“Effect of power quality and reliability on operation and development of IT/Data centers in Afghanistan”**

In the afternoon, measures and their implementation have been discussed. Altogether, more than 30 persons participated in the workshop.

Keynotes

IT Infrastructure: Afghanistan readiness for acting as a transit route

Dr. Mohammad Hassan, Senior technical and communication advisor, Ministry of Communications and Information Technology of Afghanistan



In this presentation, **Dr. Hassan** introduced the current situation and the future plan of the IT infrastructure of the MCIT. According to him, IT infrastructure has two parts: network and software. In the network part, there is regional, national, and metropolitan connectivity. Afghanistan has a national fiber network infrastructure owned by national telecom companies (i.e. Afghan Telecom or AFTEL).

Currently, the national fiber network spans over 25 provinces and in the next one to two years this network will connect all 34 provinces. Meanwhile, the AFTEL has connected 23 ministries via 168 points all over the country (including universities, schools, hospitals, etc).

In regional connectivity, Afghanistan has connection with 5 neighboring countries in 7 points. Therefore, AFTEL purchases internet connectivity from neighboring countries, for relatively high prices.

In the future, Afghanistan has a plan to extend its connectivity to China through Wakhan corridor via the Digital Silk Road, as well as through Chahbahar port to reach the submarine cables. Likewise this country will be connected to Europe via Turkmenistan. These new points of connections will provide a number of advantages to the country, such as lower internet costs, establishing of transit routes between south-north, China, and to Middle East countries. In addition to these new connections, the MoCIT and in particular the AFTEL will replace the Synchronous Digital Hierarchy (SDH) fiber technology with Dense Wavelength Division Multiplexing (DWDM) to optimally use the existing fiber infrastructure. Thus, AFTEL can extend its fiber services to more customers. Fiber To The Home (FTTH) is one of the possible service which can be supplied. In terms of systems (software), to better manage Internet service provider activities, the MoCIT has set up an Internet Exchange point (IXP) in Afghanistan called National Internet Exchange Point of Afghanistan (NIXA).

Dr. Hassan closed his speech by stating that at the same time, the MoCIT plans to offer e-platform form services such as e-passport, e-taskira, e-voting, e-traffic, etc.

Cloud Readiness Assessment in Afghanistan

Assistant Prof. Mohammad Nazim Kabeeri, Lecturer at the Computer Engineering and Informatics Faculty at Kabul Polytechnic University



Mr. Kabeeri first stated that nowadays, higher education institutions (HEI's) have become more dependent on Information and Communication Technologies (IT's) than ever before. In Afghanistan, as he explained, most of the HEI's are having amateur IT infrastructure and limited IT experts and resources which makes it difficult for them to offer efficient and reliable IT

and educational services to their stakeholders. However, the recent evolvement of cloud computing as a new IT paradigm has been recognized as an efficient and cost-effective solution for facilitating educational services.

Though, putting IT services/resources to third party cloud platforms has some pitfalls that need to be carefully considered prior to the migration. Thus, Mr. Kabeeri aimed at assessing the cloud readiness level of Afghan HEI's and analyze the affecting factors towards its adoption from the perspective of a Technology–Organization–Environment (TOE) framework. A survey was conducted targeting IT staff in public and private HEI's in Afghanistan. Findings indicate that most of the HEI's are currently in the evaluation or early stage of cloud computing adoption, while others are planning to adopt cloud computing in the future.

He went on to explain that Software-as-a-Service (SaaS) is the most commonly used cloud service model. Based on his analysis, poor IT infrastructure, data concerns, regulatory compliance, lack of cloud expertise and compatibility with current IT infrastructure are the main barriers towards adoption of cloud computing. Therefore, building in-house cloud service is highly recommended, but due to lack of proper IT infrastructure, lack of cloud experts and huge investment, it is not going to be possible very soon. Hence, utilizing public cloud services remains the only option for HEI's in Afghanistan, as of now.

Building Facility Requirements in Afghanistan

Assistant Prof. Mohammad Najim Wahedi, Lecturer at the Faculty of Construction at Kabul Polytechnic University



In the beginning, **Mr. Wahedi** stated that technology plays a vital role in every work environment. IT facilitates and accelerates the process of working and increases the productivity in every place including universities and academic centers. Specially, internet as a source of knowledge, communication and

digital library is used by academic staff in universities and serves them as an information provider and connector worldwide.

He pointed out that providing computer labs and delivering IT trainings for students are prominent for an academic institution. IT centers on an academic campus are an essential requirement, that cannot be ignored. Hence, Afghanistan as a third world countries need to complete its path of maturity for IT infrastructure in future, which is good right now, and must be developed for future. Afghanistan universities are poor in viewpoint of IT infrastructure, especially of buildings, except few of them that have it, and need to establish basic and standard IT centers in coming years to meet the demands of students and staffs. Hence, prior to construction, there need to be instructions how to start this mission. By example of the IT Centers of the universities, Mr. Wahedi proposed basic and standard requirements, floor plan, and detailed plans for networking and ducting systems for IT centers in the context of Afghanistan that will be located within campuses of universities.

Effect of power quality and reliability on operation and development of IT/Data centers in Afghanistan

Assistant Prof. Mohammad Amin Amin and Assistant Prof. Gul Ahmad Loadin, Lecturers at the Faculty of Electromechanic at Kabul Polytechnic University



Mr. Amin and Mr. Loadin first explained the electric power service problems in almost all data centers relate to two main concerns namely power reliability and power quality. Hence the success of data centers and IT centers in today's competitive business environment depends on providing good quality and continuous service. Unreliable and poor-quality power supply to IT/Data centers can cause

many challenges such as equipment damages, increasing maintenance and operation costs, malfunctions of various protection devices, electromagnetic incompatibilities, decreasing overall efficiency and performance of the system. As IT/Data centers, as they went on, are the key infrastructures in most of the organizations, a special attention should be paid to their electric power supply with standard reliability and quality.

After that, they focused on the effects of power quality and reliability on operation and development of several IT/Data centers in Afghanistan. They discussed the reliability indices and security due to poor power quality including the effects of harmonics and inter-harmonics on the operation of IT/Data centers. Based on the results of their research some power quality and reliability enhancement methods are proposed. The results of this research, they recommended the following: Awareness and capacity building of engineers, technicians, and system operators via conferences and workshops. Furthermore, Improving Power quality and reliability in IT/Data centers should be an important objective of the to-be-developed IT strategic plan.

Discussion: Proposals, measures and implementation

In the afternoon, all 30 participants of this workshop discussed the issues which have been presented in the keynotes and the topic of “IT Infrastructure Strategy”. The results of this discussion were to be presented and discussed on the third conference day.



Workshop: IT Management Strategy, IT Law, and IT Regulation

Moderated by: Mohammad Sharif, Dean of Faculty of Computer Science, Balkh University

Introduction



Mr. Sharif, Dean of Faculty of Computer Science, Balkh University, presented the schedule of this workshop to the participants. He stated there would be four keynotes in the morning.

The first presentation was from Assistant Prof. Rahimdad Faisal Safi, Lecturer at Computer Science Faculty of Balkh

University, about the **“IT Laws and Regulation in Afghanistan”**. As next speaker, Mr. Abidullah Zarghoon, Computer Incidents Response Expert, MoCIT, spoke about **“Challenges and implications of cybersecurity legislation in Afghanistan”**. The next speaker of the day was Abdul Hai Alamyar, General MIS Manager at Kabul University, about **“Involvement of the Private Sector in IT Management”**. As last presenter, Mr Sharif introduced Assistant Prof. Bismillah Hussaini, Lecturer at the Computer Engineering and Informatics Faculty at Kabul Polytechnic University, who spoke about **“Cloud Computing: legal and regulatory issues”**.

In the afternoon, measures and their implementation were discussed. Altogether, more than 30 persons participated in the workshop.

Keynotes

IT Laws and Regulation in Afghanistan

Assistant Prof. Rahimdad Faisal Safi, Lecturer at Computer Science Faculty of Balkh University



Mr. Faisal began his speech by stating that IT has revolutionized the way, in which people live and work. Most organizations in all sectors of industry, commerce, non-profit, and government are fundamentally dependent on IT.

However, as he went on, an undesirable side effect of organization' reliance on IT to support the delivery of different services to users is a greater exposure to a diverse set of IT security risks. Therefore, IT law has become a matter of national and global interest and importance. Most of the countries have officially published a set of IT law and regulations in order to reduce the undesired side effects of IT when it is misused. The Afghan government has also formulated a set of IT law and regulations, since some of the governmental organizations have been targeted by several severe cyber-attacks, as Mr. Faisal explained.

The IT related law and regulations in Afghanistan are divided into two categories: 1. the law and regulations that are enforceable and published in official gazette, 2. the law and regulations that are only drafted, but they are neither enforceable nor published in any official gazette. Therefore, according to him, IT related laws and regulations in Afghanistan are not sufficient and drastically need to be enriched. within the scope of an IT Strategy Plan.

Challenges and implications of cybersecurity legislation in Afghanistan

Mr. Abidullah Zarghoon, Computer Incidents Response Expert, MoCIT



Mr. Zarghoon started his speech denoting the current challenges of installing an effective IT Law for Afghanistan. Mr. Zarghoon urged that there is no research center for the development of such laws and regulations for Afghan IT. To define the scope of IT Laws and regulations in Afghanistan, an appropriate feasibility study and research is

required on current state of Laws and regulations.

Mr. Zarghoon emphasized that research is important in every section. He stated that all Afghan authorities agree that there is a lack of IT laws in the country, and also of roles and responsibilities. For developing an IT law, as he went on, it is important to include the Ministries of Interior, Defense, and Justice. This will make the cyber security more durable. Making IT or cyber laws must be made a priority, and professionals need to be hired. Also, the support from higher level authorities such as the State President is required. Policy making is not the task of only one organ such as MoCIT, it can be task of every ministry and governmental organ. He stressed that international cooperations are needed for support during cyber attacks, as such cooperations currently do not exist. A respective awareness is required for all users of IT.

Mr. Zarghoon stated that currently, NIXA is being implemented, which requires a strong security concept covering data protection, privacy, data classification, and IT laws. According to him, this is the challenge for the next five years.

Involvement of the Private Sector in IT Management

Abdul Hai Alamyar, General MIS Manager at Kabul University



Mr. Alamyar first explained that involvement of the private sector in IT management in Afghanistan is a mandatory task. For any national plan, the importance or role of the private sector cannot be ignored. It is creating job opportunities, economic growth, and establishes competition in the market.

On the other hand, IT management services provide day-to-day management and operation of IT assets and processes. He claimed there should be a policy for each and every aspect of IT management. In general, IT Strategy is the overall plan which consists of objectives, principles, laws, and regulation of IT and politics relating to the use of technologies within a particular organization. This involves private and public sectors as well in a government, so we must consider their role as an active organ.

Finally, he stated that there are a number of private IT sectors in Afghanistan today which provide high-quality services to the end users. As an example, he mentioned NetLinks, which has 2800+ clients, and more than 250 employees.

Cloud Computing: legal and regulatory issues

Assistant Prof. Bismillah Hussaini, Lecturer at the Computer Engineering and Informatics Faculty at Kabul Polytechnic University



In the beginning of his speech, **Mr. Hussaini** explained that cloud computing provides the delivery of IT and computing services over the networks, particularly through the Internet. It has many potential advantages and enterprise applications.

However, it also introduces its own issues and challenges to be considered. In cloud computing, the data centers and servers are located in various locations all over the world. So, the customer data is no longer under the complete control of the customers themselves. This raises the question of legal governance over the data, conflict of laws, and jurisdiction.

He went on to outline the key legal and regulatory issues associated with cloud computing. The aim is to provide useful information for organizations which are using the cloud services or preparing to migrate to the cloud.

Discussion: Proposals, measures and implementation

In the afternoon, all 30 participants of this workshop discussed the issues which have been presented in the keynotes and the topic of “**IT Management Strategy, IT Law and IT Regulation**”. The results of this discussion were to be presented and discussed on the third conference day.



End of the Second day

Third day: Wednesday, December 19th, 2018

Moderation: Prof. Mukamil Alokozai, President of the Balkh University,
Ms. Shukria Jamal, Director of the IT Department of the MoHE,
Dr. Nazir Peroz, Director of the ZiiK at TU Berlin and Director of the
ITCC Afghanistan

First, Prof. Mukamil Alokozai, President of Balkh University, welcomed all participants to the third conference day and wished all a successful day. Ms. Jamal and Dr. Peroz briefly presented the schedule of this day and stated that the aim of the last conference day was to discuss the results of the three workshops from the day before.

The results of the workshop "IT Strategy for Education" were presented by Mr. Qudratullah Omarkhel, Kabul Education University. The outcome of the workshop "IT Infrastructure Strategy" was presented by Mr. Niaz Mohammad Ramaki, Kabul Polytechnic University. And the conclusion of the workshop "IT Management Strategy, IT Law and IT Regulation" was presented by Mohammad Mustafa Naier, Kabul Polytechnic University.

Results of the Workshop: IT Strategy for Education

Mr. Qudratullah Omarkhel summarized the results of the workshop



Mr. Omarkhel began with a short summary of the presentations from the previous day. He mentioned that the presenters of this workshops were Irfanullah Safi, IT Director MoE; Jalaludin Atayayee, Head of Policy and Planning of TVETA; Qudratullah Omarkhel, Computer science faculty of Shaheed Rabani Education University Kabul; Farangis

Jamazada, Computer science faculty Kabul university; The topics they represented were policy for IT Education in Schools, policy for IT Education in vocation trainings, Blended learning, Impact of e-learning on education and development respectively.

He stated that the participants discussed on integration of IT in our curriculum, to upgrade our IT equipment in schools, TVETA and higher education. He listed the challenges of IT in education discussed in the workshop, as follows:

- Lack of Electricity
- Awareness
- Weak Infrastructure of IT in Education
- Lack of Internet facility at schools
- Lack of teacher's capacity to use IT equipment in teaching practices
- Un-digitized education curriculum, teaching and learning materials
- Non-functional computer labs in schools

In continuation of his speech he added that, as discussed in the workshops, the elements of IT in education are IT in curriculum, professional development, E-learning, IT culture, and IT infrastructure. In the workshop it was discussed that for the integration of IT in the curricula at schools, the following points were recommended:

- Students need to experience IT activities regularly.
- Typing practices for high school students.
- Teachers encouraged to share tried and tested sites.

For vocational training, he listed the following recommendations as result of the workshop:

- Teachers Training
- Capacity building
- IT training center
- Technology literacy

For higher education, he stated that scientific research plays an important role.

During the discussion, the workshop participants discussed about the use of e-learning in schools and vocational schools, as well as in higher education. The results were as follows: Enrichment, Blended learning and Virtual, as well as the following items:

- Local MOOC
- Sharing of teaching materials
- Digital books

For IT Culture, the recommendations were as follows:

- Mind set
- Awareness
- Video-conferencing project with another school
- To initiate new projects with partner schools

Last but not least the recommendations of the workshop for IT infrastructure part were:

- Computer labs
- Digital library
- Recording studio
- portal
- Local campus intranet
- RND center

Results of the Workshop: IT Infrastructure Strategy

Mr. Niaz Mohammad Ramaki summarized the results of the workshop



The summary of the workshop “IT Infrastructure Strategy” was presented by **Mr. Ramaki**, Kabul Polytechnic University. The summary included the conclusion of the workshop’s presentations and the results of the discussions.

Mr. Ramaki explained that this workshop had two parts. The first part was the presentation session in the morning and the second part was questions and

discussions in the afternoon. In the presentation session, there were four speakers from the MoCIT and university lecturers.

The first presentation contained the current IT infrastructure of Afghanistan in terms of connectivity and e-platform application and the future plan of the Afghan Government regarding to the IT infrastructure.

The second presentation was about cloud services for Afghanistan Higher Education Institutions (HEIs). The speaker conducted an assessment to see are the HEIs ready to deploy cloud services? Finally the presentation concluded by proposing a cloud deployment model for HEIs.

The third presentation was about building requirements for IT centers and server rooms of each institutions/organization. In this talk some construction’s guidelines and requirements were suggested for the government to consider when building an IT center or a server room.

The fourth presentation was about power sustainability requirements for a data center or an IT system. The speaker had performed a survey regarding the power system of some IT centers in some governmental organization. He indicated major challenges that these IT infrastructures within organizations are facing today.

In the second part, questions and discussions, some of the participants had raised their questions and concerns regarding current challenges within current IT infrastructures, cloud solutions, IT building and power system. Their questions were either answered by the presenters or meanwhile put to open discussion. The workshop speakers and the participants, after long discussion closed this session with some suggestions as a proposal. Some of the major suggestions were the followings:

- The departments of Curriculum within each computer science faculty should include subjects about building requirements and power requirements of an IT system in their bachelor curriculum.

- When designing new building for any organization by a construction expert, the IT systems building and power requirements should be considered by involving an IT expert and power expert.
- The participants welcomed the establishment of a National Internet Exchange (NIXA) and added that respective security measures should be implemented for it.
- To improve the power supply situation, a stronger focus on renewable energies is to be established.

It should be worked on the plan to provide local/private cloud services to each governmental organization by optimally using the National Data Center of Afghanistan. To achieve all these goals, a strategic plan is to be developed.

Results of the Workshop: IT Management Strategy, IT Law and IT Regulation

Mr. Mustafa Naier, Kabul Polytechnic University



Mr. Naier presented the results of the workshop from the previous day. He referred to the first presentation with insisting on the need for an IT law and regulations policy. He added that the current IT-related law and regulation in Afghanistan was discussed. Mr. Naier stated that in the second presentation the challenges toward implication of cyber-security legislation in Afghanistan was discussed as

listed below.

- Lack of Research (Laws)
- Allocation of roles and responsibilities
- Capacity
- Prioritization
- Limitation and Scope
- Considering international collaboration
- Awareness
- Other challenges (funding, keeping up with technology...)

The third presentation urged on importance of private sector as it is important regarding the following points:

- Economic growth
- Jobs opportunities
- Private sector involves in providing services for government organizations (MIS, E-GOV)
- Based on experiences, the private sector is more advanced than government
- Competitions (High quality with less cost)

He referred to the fourth presentation and stated that the presentation discussed an overview of the cloud computing and its regulatory issues.

After the presentations of this workshop, the participants agreed on the following recommendations:

- Writing a general IT Law with the help of related organs including private and governmental sectors.
- Completion of draft IT Laws and Regulations
- Completion of appropriate and required list of IT Laws and Regulations
- Providing the technical drafts by an authorised association such as ITCRC.
- Composition and completion of general drafts by the Society for IT in Afghanistan.

- Creation of an authorised organ, which is composed of related and required organs in order to implement and monitor legitimate documents that have been created.
- Taking into consideration the rapid changes of IT on the Laws and Regulations with respect to globalisation and cultural sensitivities in editing legitimate documents.
- Expansion and development of IT centres

Discussion



After this summary, questions were asked from the audience (see pictures of the discussion) to Mr. Omarkhel, Mr. Ramaki and Mr. Naier, the three presenters.

The questions were about the areas of education, infrastructure, management, IT laws, and IT security.

Regarding education, participants asked if there are concepts for the implementation of IT at schools, and how teachers could be qualified and acquire IT skills. Some universities still have issues with their IT equipment and are lacking IT centers. Also, the role of e-Learning was discussed controversially. Education in Afghanistan is affected by violence and corruption, especially in the IT sector. Brain drain was also an issue.

In the field of vocational trainings, it was mentioned that teachers are to be further qualified. Another problem which was discussed is the poor power supply in Afghanistan, which hinders the development of IT. As a solution, a reliable and effective power supply was proposed using renewable energies (water, wind, and solar power). The extension of Internet supply has to be pushed forward depending on the location, and under the supervision of experts.

In the field of management, the term responsibility was discussed. The collection of data, as was stated by participants, is an independent source of information in Afghanistan.

The participants were very concerned about the security of the IT systems, as there are daily attacks to IT systems all over the country.

It was the general opinion among the participants that responsibilities need to be clearly assigned by an IT legislation. This will create a foundation for the implementation of measures in all areas and also support a sustainable development.

About the final discussion towards the end of the conference, it can be said that it is of great importance that each particular institution develops their own IT plans. Based on this and on the international development, a long-term IT strategy plan for Afghanistan is to be developed which considers reliable demographic data and statistical information about Afghanistan, a country-wide digital education, reliable power supply, available Internet connectivity, solid building services engineering, a modern management system, modern administrative and management structures, cyber security, IT laws and policies, as well as financial means.

Pictures of the discussion







After the discussion, there were concluding speeches by Prof. Alokozai, Mrs. Shukria Jamal, and Dr. Peroz:

Prof. Mokamel Alokozai



Prof. Alokozai, President of Balkh University expressed his gratitude to participate in a conference that builds the fundamental bases of Afghanistan. He stressed that this conference has a high value for us, and he complained that MoCIT is not fulfilling its tasks as it should. He went on and praised Dr. Peroz, who initiated these IT projects in Afghanistan when

Prof. Alokozai was deputy chancellor of Kabul University, and he expressed his hope that this 14th IT Conference will provide a vital impulse for the development of the IT landscape of Afghanistan.

He went on to thank MoHE as well as TU Berlin for their support and cooperation.

Mrs. Shukria Jamal



Mrs. Jamal, Director of the IT Department of the MoHE first talked about the opportunities that exist in the Afghan government for the Ministry of higher education and especially for the development and support of IT. This shows that there is progress and developments in various sections such as infrastructure, academic working, and other IT related issues. Within these two days

of IT Conference, as she went on, many presentations and workshops were held, and effective outcomes have been achieved. The innovation and creativities are demonstrated in various parts such as infrastructure, education, and legislative documents that have been mentioned by Mr. Mustafa Naier. She suggested to discuss some of the proposals of the workshops at the Ministry of Higher Education. This conference, as she went on, was an order from H.E. President Dr. Ghani in order to establish an IT strategy plan. This strategy plan is to be implemented by the MoHE, MoCIT, CSO, and ITCC Afghanistan.

Mrs. Jamal finally thanked TU Berlin for their support and cooperation during this conference.

Dr. Nazir Peroz



Dr. Peroz began his speech by welcoming everyone to the third day of the conference. However there were many discussions during the three conference days, and also many results, he emphasized that the core questions of the conference remained unanswered and were not discussed extensively during the workshops: What do we want from IT in Afghanistan?, What

should be the position of Afghanistan in Central Asia in terms of IT?, How can we utilise IT development in economic, knowledge, culture, government, education, and health in Afghanistan?

He emphasized that based on his experience and analysis of the situation in Afghanistan, the following strategies are required:

- IT infrastructure strategy, which includes Internet connectivity and power supply, and building services engineering
- IT education strategy, which includes school education, vocational training and higher education
- IT management strategy, which determines roles and responsibilities
- IT law and regulations
- IT security strategy

Each of these strategies should to be developed in cooperation with the responsible organizations. Once this is achieved, a base for a sustainable IT development in Afghanistan is created.

Dr. Peroz closed his speech by giving thanks to the IT Department of the MoHE for the smooth cooperation, as well as the speakers from the universities for their contributions. He also thanked the German Federal Foreign Office for the funding.

End of the third day and of the 14th IT Conference



14th IT conference







