



Technische Universität Berlin



Ziik - Report Nr. 10

# Sustainable and Stable IT Supply for Higher Education in Afghanistan

September 2008  
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ISSN 1619-3660

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## 1 Preface

The symposium *Sustainable and Secure IT supply for Area of Higher Education in Afghanistan* is just the most recent one in a long series of conferences and workshops that took place since 2002, all dealing with the subject of IT supply and IT infrastructure for Afghanistan. Within the frame of this symposium as well, experts were invited to talk and discuss about:

- IT Infrastructure
- IT Education and Training
- IT Management

Above all, the notions of sustainability and security in the area of IT was addressed.

A special invitation went to Prof. Babury, Deputy Minister for Higher Education in Afghanistan. The Technische Universität Berlin (TU Berlin) invited him, not only for the symposium, but for a whole week where he met and talked to representatives of the German Federal Foreign Office, representatives of donor organisations like the DAAD (German Academic Exchange Service), with different representatives of the TU Berlin. The Afghan Embassy was asked to arrange some meeting with representatives of the Humboldt Universität zu Berlin and the Freie Universität Berlin as well.

Furthermore, he met and talked with the 25 Afghan lecturers that are currently enrolled at a specially designed Master Study Programme of Computer Science at the TU Berlin. To a great degree, the future of IT in higher education in Afghanistan will soon lay in their hands, and Prof. Babury had the opportunity to meet them several times on different occasions. At the symposium, he presented the current situation of IT at Afghan Institutions of Higher Education.

All in all, his time in Berlin was very fruitfull. Not only information about the current status was exchanged, but cooperations and communication was intensified, and several new projects and plans were drafted and agreed upon.



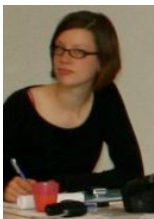
Dr. Peroz, Head of the  
ZiiK

I would like to sincerely thank all presenters for joining the symposium and sharing their thoughts and ideas. At first, I sincerely thank Prof. Babury for presenting the current status of IT in higher education in Afghanistan, Prof. Köppel as Vice President of the TU Berlin for welcoming, Dr. Zadran from the Afghan Embassy and Ambassador Mr. Blomeyer-Bartenstein from the German Federal Foreign Office for their opening remarks, Dr. Gutheil, Prof. Mahr and Mr. Herlitz from the TU Berlin as well as Dr. Kupfer as representative of the DAAD for their presentations. A special thanks goes to Prof. Heiß for moderating the symposium.

I would also like to thank the 25 Afghan students currently enrolled in a Master Study Programme at the TU Berlin, and all other guests and participants from the Afghan German Society, several foundations and other organisations. And I would like to thank all persons involved in organising and realising the conference, and Ms. Steinhilber for taking minutes of the symposium.



audience, participants and presenters at the symposium



Ms. Steinhilber, taking minutes

## 2 Symposium: Sustainable and Secure IT Supply for the Area of Higher Education in Afghanistan

### 2.1 Introduction



Prof. Heiß, TU Berlin

The symposium dealing with the topic of sustainable and secure Information Technology (IT) supply for the area of higher education in Afghanistan was held at the Technische Universität Berlin (TU Berlin) on August 25th, 2008. Guest from in- and outside the university, from donor organisation, NGOs, Embassies, the Federal Foreign Office as well as all people inside the field were invited. A special invitation went to the Deputy Minister for Higher Education in Afghanistan, Prof. Babury.

Institutions of higher education in Afghanistan are in need of strategies that support and coordinate the planning, acquisition, realisation, operation, and service in the field of IT. This new challenge

poses a new task for the Ministry of Higher Education (MoHE) and all Afghan institutions of higher education: the task of providing and maintaining the IT supply at all Afghan institutions of higher education.

The symposium aimed to discuss measures on how to sustainably secure IT supply for Afghan institutions of higher education, with regards to infrastructure, power supply, building engineering, demand-oriented education, and management. Also, the question of how to coordinate and realise these subject areas was to be discussed.

Prof. Heiß, Dean of Study at the School for Electrical Engineering and Computer Science at the TU Berlin, moderates the symposium, he introduces all presenters and facilitates the discussions.

## 2.2 Prof. Köppel: Welcome



Prof. Köppel, Vice  
President TU Berlin

As Vice President of the TU Berlin and responsible for research, Prof. Köppel is pleased to welcome all speakers, participants and guests to this symposium. He especially welcomes Prof. Babury, Deputy Minister of Higher Education in Afghanistan, and the representatives of the Afghan Embassy, Dr. Zadran, and the German Federal Foreign Office, Mr. Blomeyer-Bartenstein. As the title of the symposium clearly states, Information and Communication Technology is of crucial interest in order to meet future challenges posed by society and technology. Thus at the TU Berlin, this is addressed in an interdisciplinary collaborative research centre, a competence centre with joint research projects.

The TU Berlin also aims to share its expertise, and this includes the aim to support and reconstruct the education system in Afghanistan. As can be seen in various achievements, all scientists and members of the centre are strongly committed to this goal.

Just to give a brief overview about the efforts and achievements by the ZiiK, the Center for international and intercultural Communication he mentions three major projects: In 2002, the German Academic Exchange Service (DAAD) sent a fact-finding mission to Afghanistan, including members of the TU Berlin, in order to analyse the academic structures and to develop reconstruction plans and concepts for IT structures, as they did not exist then at all. Even the basic infrastructural needs were deficient, like premises and power supply. The then first and main project was to construct an IT Center in Kabul, the ITCK, which opened in 2003, funded by the German Federal Foreign Office and the DAAD. Members of the TU Berlin planned and realised the centre, and started with a teaching programme. By now, Afghan lecturers have taken over the teaching and management, and the TU Berlin works in advisory function. In 2005, again with the funding by the DAAD and supported by members of the ZiiK, the first Afghan Computer Science Faculty was established at Herat University. Here, since 2007, a Bachelor Programme is offered, and lecturers from the TU Berlin conduct the teaching. And currently, a Computer Science Master Programme is offered at the TU Berlin for 25 lecturers from

six different Afghan universities, qualifying them to be the future lecturers at Afghan institutions of higher education.

This achievements and success is based on an excellent and highly productive cooperation between the Ziik/ TU Berlin and the Afghan Ministry of Higher Education, especially with their IT Department. On behalf of the TU Berlin, Prof. Köppel appreciates the joint activities and successful cooperation.

Without further ado, Prof. Köppel hopes this symposium will give insights from different perspectives to the goal of sustainable and secure IT supply for Afghanistan in the area of higher education in Afghanistan. He is looking forward to see new ideas arise and future plans develop.

## 2.3 Dr. Zadran: Opening Remarks



Dr. Zadran, Afghan Embassy

Honoured and on behalf of the Afghan Embassy in Berlin, Dr. Zadran gives his greeting to all attending participants and is delighted to state some opening remarks.

Access to education and training is one of the core tasks for the development of a nation. Now, in time of globalisation, there is a steady increase of importance regarding innovations and research. Hence, the institutions of higher education are of great importance, as they provide teaching and research. This embraces academic education, dialogue between students and lecturers, knowledge exchange and networks. All institutions of higher education provide a broad education and cultural openness, as they offer study courses in a variety of fields. Plus, they give room for innovations,

projects, labs, field research and basic research.

Science serves the purpose of mankind and it is the source of all technological progresses like solar technology, Internet, and mars research, hence has impact on the whole society. All scientists are striven by the pursuit of progress and new knowledge. Core subjects like medicine or natural sciences have a special impact on the human society, accompanied by others with cultural and civil influences on society and nation.

In this modern and Internet-affected world, technology plays a crucial role, hence Computer Science has both great influence and responsibility. Everyday life, and all areas of it are influenced through the network and Internet, Computers are everywhere. Hence, a sufficient and qualified academic education is crucial, covering the impacts of a computerised society. Here again, universities as a place of learning, teaching and research enable progress. Therefore, the prerequisites have to be set: infrastructure, premises, libraries and most of all Internet connections – all in all a stable IT supply.

Having said this, Dr. Zadran closes his opening remarks and opens the symposium.



## 2.4 Ambassador Mr. Blomeyer-Bartenstein: Opening Remarks



Ambassador Mr.  
Blomeyer-Bartenstein,  
German Federal Foreign  
Office

Honoured by the invitation and on behalf of the German Federal Foreign Office, Mr Blomeyer-Bartenstein welcomes all attending guests and participants from in- and outside the university. As the title promises an interesting symposium, he gladly opens it with some remarks.

A sustainable IT supply is of crucial importance for the educational system and the rebuilding of a society and nation. Here, he gives his special thanks to the TU Berlin for playing a central part in the process of reconstruction, and their tremendous and long-term efforts to rebuild the academic landscape and establish IT structures in Afghanistan. As cooperation is crucial, Mr. Blomeyer-Bartenstein would like to thank the TU Berlin again and express the strong support for further cooperation.

All projects running since 2002 have been outstanding and promise to be so in the future as well. Thus, they are highly appreciated. Especially the exchange of students and lecturers bears great importance and significance, as they enable and reflect the meeting of people and minds. Equally important, they build up cooperation and friendship.

This symposium fits into the civilian reconstruction and the overall efforts of Germany to stabilise Afghanistan; and it follows the envisioned goal of improving the living conditions, stabilise the region and having a peaceful development. This effort in itself will fight terrorism, as the number of successful reconstruction projects show.

And these efforts will be continued, as Afghanistan still is in need of the international community. Moreover, all projects will focus on Afghan ownership, and follow the notion of help to self support: addressing all Afghans and their duties and challenges. There are four areas of importance where one has to check whether everything is on track: security, corruption and legal laws, energy and agriculture, and poppy seed cropping. Re-

Regarding the plan for reconstruction, everything still is on the right track in Afghanistan.

Regarding the security situation however, a comprehensive approach – both military and civil – has to be followed. An increasing need of military efforts is wever more likey, as there are going to be elections next years.

The population needs access to appropriate education in order to have progress. Education is a fundamental step towards a developed and modern society. There is a close cooperation with the Afghan Ministry of Higher Education (MoHE). As the building of schools leads to higher qualified people, a broad segment is devoted to the educational sector. Since the TU Berlin cannot cover every area, other German universities are of course included into the cooperations.

As for introducing IT into the educational system: it strengthens the chances for the Afghan youth, their prospects and future. This symposium is one building stone unding that goal. Hence to close his opening remarks, Mr. Blomeyer-Bartenstein wishes all participants good luck and a successful outcome, and expresses once again the continuous support on behalf of the German Federal Foreign Office.

## 2.5 Prof. Babury: Current Status of IT at Afghan Institutions of Higher Education



Prof. Babury, Afghan  
Deputy Minister of  
Higher Education

Prof. Babury, Deputy Minister for Higher Education in Afghanistan, expresses his gratitude for being invited to Berlin and the symposium. He also pronounces his warmest thanks on behalf of the Ministry of Higher Education (MoHE) in Afghanistan to the representatives of the German government for their steady support, to the representatives of the DAAD as a donor organisation which has been supporting the educational system in Afghanistan for a long time, and to all attendant professors that are deeply committed to support the academic field in Afghanistan and share their experience, knowledge and expertise to bridge the gap between Afghanistan and the international knowledge society.

As the causes of the war are still virulent, the Afghan society and especially the area of higher education still depends on international cooperation and solidarity. Due to many already successfully realised projects, amongst them many realised with the help and expertise of the TU Berlin, there is great hope for a better future, despite all constraints and problems that one faces on the way.

Before 1992, the educational system and academic landscape in Afghanistan had quite a high quality and could well be compared to international standards. Especially Kabul University was well renowned. The war however destroyed most of the educational infrastructure, especially within the area of higher education. Six years ago, after the end of the war, there were about 5000 students enrolled at a total of then eight universities. Since then, progress can be observed in several fields.

Currently there are 14 public universities and 8 public institutions of higher education, additionally 1 private university as well as 11 private institutions of higher education; all of which incorporate several faculties.

A total of 6.751 people work at Afghan institutions of higher education, including a total of 1.580 working as administrators, 2.568 at the faculty and

2.423 as supportive staff. The female ratio varies, there are 38% female administrators, 16% female faculty staff members and 24% female supportive staff members. 2.568 (38%) are faculty personnel with a graduate degree, out of which 16% are female. One of the high priorities addressed by the MoHE is to enhance the number of female staff members.

55.355 students are enrolled at Afghan institutions of higher education, 70% of them commuting students, out of which 23% are female. There are less resident students, and here only 4,6% are female. In total, almost 18% of the students enrolled are female.

The vision regarding higher education is to provide access to high quality education for all people, in order to enable them to participate and contribute to the development, economic growth and stability of Afghanistan. Hence the MoHE has stated steps that are to be taken in fulfilling this mission:

- Broad access to higher education,
- Honouring culture, religion and tradition, incorporating modern scientific knowledge and methods,
- Educational quality and institutional management meeting international standards, and
- Education to meet the nations economic and social needs

Specifically, the quality is to be improved and secured with the help of a quality assurance system. Plus, the administration and management has to be reformed and will then improve the overall access to education. Behind all, a financing system has to be drafted and installed. With that, service can be provided to promote science and research.

The MoHE can look back on several achievements in the fields of academics, establishing international partnerships, drafting new regulations and legal frameworks, governance, infrastructure and assets, and access to higher education.

Regardless, the MoHE faces some challenges; there are still some financial constraints that have to be overcome, and the cooperation with both international partner organisations and the Afghan institutions of higher education has to improve as well. One objective specified to enhance the educational quality and to increase the number of applicants is to emphasise on private higher education

### **Current Status of IT in the Area of Higher Education**

In 1995, the first computer science department was founded at the Kabul University. After the war, the first computer centre was established at the Kabul University as well: since March 2003 the ITCK (IT Center Kabul) is open and running. In 2004, the first and so far only Computer Science Faculty was founded at Herat University. In the same year, the IT Department at the MoHE was established, and subsequently in the following years IT Departments were founded at Kabul Medical University, the Polytechnical University of Kabul, and at the Nangahar University. And in 2008, a joint Institute of Higher Education was founded by the Kabul University and the Ministry of Communication and IT.

So at present, there is a rapid expansion of IT in all institutions of higher education, and the coming generation of students are ever more interested in IT studies. However, no coherent IT curriculum has yet been developed, the teaching staff is still insufficiently qualified, and there are some deficiencies in IT infrastructure. Hence IT still has a low significance for science, education and administration. To address all these issues, the MoHE is drafting a national IT strategy, and the IT Department at the MoHE started to rationalise all task of references. To support that, an IT working group was formed.

A roadmap was developed on how to achieve the stated objectives within the frame of Human Resource Management. Based on a legal framework that takes data protection and secure measurements into account, and backed by an efficient coordination structure, an efficient IT infrastructure will be further established and expanded. Networks will be developed integrating all institutes of higher education, IT applications will be implemented in higher education and administration. Hence all students, faculty members and employees will be continuously educated and trained.

International donors that support all efforts of the MoHE include the British Council, the DAAD, KOICA, NATO, UNDP, USAid, and the World Bank.

## 2.6 Prof. Mahr: Elements of an IT Strategy for Academic Structures in Afghanistan



Prof. Mahr, TU Berlin

At first, Prof. Mahr, Head of the Department of Formal Logics, Models and Programming at the School for Electrical Engineering and Computer Science at the TU Berlin, expresses his pleasure to talk at the symposium, and addresses the meeting, all attendant guests and participants.

In September 2002, Prof. Mahr first travelled to Afghanistan, in order to analyse the status of the academic landscape. Merely lacks could be observed and a desperate need for help and support, due the many years of war. Whereas now, quoting Prof. Babury, great achievements have been accomplished the student numbers are raising, basic structures have been established, faculties founded. Co-operations between the

TU Berlin and Afghan institutions of higher education have been tied and fruitful relations ensued, several donors are committed to fund projects that aim to support the reconstruction of the academic structures in Afghanistan.

As Prof. Mahr has 20 years of experience in structures and developmental plans, he can safely say that there is an invariance within all problems. So all solution strategies, developed after thorough research, are applicable to not just one region or country, but to any, as each country develops on basically the same roadmap an on the same base. This is especially true regarding the academic field and the establishment of IT structures.

To address this rather complex issue, at first Prof. Mahr defines the notion of IT with all its relations and subsequent notions. He then raises the question of how to deal with IT, and the structures that are based upon IT: obviously IT and Computer Science (CS) is more than just using computers, machines and applications.

In recent developments within the field of Computer Science, a process of extreme miniaturisation of assembled devices can be observed. But even though all devices and applications get ever more sophisticated, in the

end they are all based on bits, bytes, and digital processing, and each one relies on a small set of preconditions: energy, knowledge, organisation, teaching and skills, computer networks and software architecture. Even the now world-spanning digital information highway, the Internet with its entire communication links, is in the end based upon these.

The Information Society in Afghanistan is on its own way and scale to catch up with international standard. The nation's economic growth and wealth strongly depends on Information and Communication Technology (ICT). Hence the need for IT experts and expertise is and will be ever more increasing. In the near future, some level of computer skills will be required for almost every job. So the state, all institutions, the industry and commerce, they will all have to make great efforts and investments into the underlying infrastructure as well as education and further training for all people involved. Only an internal and external change of all hitherto processes, and the re-assembling of the structure of most organisations will enable them to take their place in the Information Society.

The notion of Information Society not easy to define, and there are different approaches on how to measure the status of a nation. The European Union (EU) monitors the national status with the help of 52 indicators and the International Telecommunication Union (ITU) provides an Digital Opportunity Index that measures some points.

If Afghanistan aims to become a part of the global Information Society, a distinct level has to be reached, and the gap is most likely reduced with the help of international partners. The Afghan government already recognised the importance of ICT for the nations development and reconstruction goals, and has stated 4 key areas where support is needed: a policy and legal framework; IT infrastructure; building local capacities, application and knowledge; and network and data security.

As of now, Afghanistan has a lack of basic structures: no computer-trained people or IT professionals, no IT applications for the government and administration, no IT infrastructures that support the collaboration and integration of resources, and specialised software. Here, action plans can be drafted, but in order to realise them, at first experts, teachers and lecturers have to be educated and trained. Instead of completely relying on and be dependent upon outside expertise, the education should focus on establish both basic qualifying standards as well as an elite education in science, research and leadership.

To avoid unnecessary costs and dependency from foreign countries, a thoroughly elaborated strategy and its implementation is needed: based on a clear vision, managed properly and funded securely. The vision should aim on capacity building to cover the countries needs in education, research and economy. All Afghan institutions of higher education will then be acknowledged and equal members in the international scientific community. So the goal is to educate the students, impart knowledge and skills, teach the ability to learn and work in the field of their profession and the knowledge to judge according to professional and academic standards. Applicable study programs reflecting on the countrys needs have to be developed and implemented according to international accreditation regulations. Then students and researchers can participate in international exchange and scientific cooperation.

This approach, as mentioned before, is as universal as the subsequent planning procedures, concerning technology, education, finance, culture and politics. All actions have to be synchronised and checked with regards to their balance. Clear structures can then be enforced, quality control measures defined, and all work can be coordinated by defining powerful roles and clear mandates. Especially in planning IT structures, the progress relies on basic principles like cooperation, decentralised structures, interaction, mutual interest and common goals, as well as underlying strategic planning and thinking.

For sustainable and secure (IT) strategies, avoiding dependencies is of overall importance: Afghan experts and authorities must own all strategies and their implementation. All respective actions should strive for sustainability; hence values for Afghan organisations and for Afghanistan as a whole are to be created.



## Questions and Discussion

Asked about his view on how many years the Afghan educational system and its IT infrastructure will need to meet international standards, Prof. Mahr states that in 2002, when he first visited Afghanistan, he presumed it to be 10 years. Today his assumption is different, because he falsely took an idealised environment for the implementation of projects as basis. Prof. Babury agrees with Prof. Mahr, and stresses the fact that there is still only a low basic standard regarding basic education. Hence in his opinion, the first task is to analyse the situation in terms of quality, and then to make plans and take action to get ready for international accreditation according to international quality levels. Prof. Heiß remarks, that at the TU Berlin as well, within the frame of a 5-years-plan, takes measures to account to assure quality measures and procedures: in order to measure quality and get accreditation, you always at first have to be aware of the facts.

As additional remark, Prof. Babury states that the private institutions of higher education pose a concern, as they have to be monitored and should be incorporated while still remaining autonomous. Here, the main problem is the funding, and measures have to be taken to control the money and assure the quality with the help of a system.

A question from the audience: How can capacity building be secured, and expertise handed over, to achieve Afghan ownership? As an answer, Prof. Mahr once again points out the importance of a synchronisation process: Think big, start small, and scale fast. Hence, the necessary prerequisites have to be there. Already now it is necessary to include the opportunity of each Afghan expert to account with his or her experience to contribute to the Afghan society, to take their role and responsibilities.

Prof. Babury agrees with him and adds that the culture of society is as important as expertise, and these two have to be synchronised as well. The mentality of the Afghan society is quite damaged due to the several years of war, so human resource development is crucial. The hitherto misorganisation is due to this lack of maturity and moral criteria and professionalism, so there is a lot of work to be done.

## 2.7 Dr. Kupfer: Establishing Academic Structures in Afghanistan



Dr. Kupfer, DAAD

On behalf of the DAAD, Dr. Kupfer thanks the TU Berlin and here especially Dr. Peroz, Head of the Ziik, for the invitation to the symposium, and addresses all invited guests and participants. At the DAAD, Dr. Kupfer is project coordinator for Afghanistan, and he will give a short overview and survey of some projects done in Afghanistan, as well an insight into the philosophy behind all reconstruction efforts.

There has been a strong commitment for Afghanistan in the last 7 years by the DAAD. Recently there has been a change in responsibility, as Mrs. Krüger-Rechmann has now been assigned as the head of the unit responsible for Afghanistan, replacing Mrs.

Schlottman.

The DAAD was founded in 1925, initiated by students and aiming to facilitate and promote international exchange. By now, almost all German institutions of higher education participate in this non-governmental and independent umbrella organisation, the true capital of it being the combined expertise and knowledge of all professors and lecturers participating.

The international exchange relies on understanding, friendship and trust that has to be built between the various cultures in the world. Especially as the main objective is capacity-building, not merely investments into infrastructure but investments into persons' skills and knowledge.

The DAAD itself is funded by governmental donors, and is free to use the money according to their own strategies.

The DAAD has been supporting and cooperating with Afghanistan for a long time, the main focus today however will be the years since 2002. Then, the DAAD conducted two fact-finding missions to Afghanistan, in the frame of the Stability Pact for Afghanistan which was initiated in Bonn in 2001, with the objective to develop tailored programmes to rebuilt and reconstruct the academic landscape in Afghanistan. Tailored programmes

where necessary, facing the devastated status of all matters in the academic field: infrastructure, equipment, expertise.

At first, several winter and summer academies for Afghan academic staff members were organised in 2002 and 2003, all of which took place in different universities in Germany. In each respective field of study the Afghan professors and lecturers were introduced to the current status of knowledge, and they were offered the opportunity to build networks and exchange knowledge and experiences. In addition, all academies were funded with a budget to acquire the most urgently needed equipment for the participating institutions of higher education.

After that, individually designed programmes for each field of study were conducted, e.g. designing curricula or improving the quality of teaching.

Until the end of 2007, Bachelor curricula were developed and introduced in most disciplines, only some have yet to be approved by the Ministry of Higher Education. With that, Afghan students can now apply for the regular DAAD scholarships, graduating with a Master or PhD degree in Germany and return. Parallely, master programmes and curricula are currently developed in Afghanistan.

In 2005, the DAAD together with the Ministry of Higher Education developed a special programme designed for persons who do not yet hold a Bachelor degree, who would normally not be addressed. The MoHE selects the best 100 Afghan students, out of which 40 will be invited to participate in a computer course at the Bochum University. These so called "Luckies" are invited not only to be trained in using computers, moreover they are offered the opportunity to meet other students, create networks or join existing ones. They can participate in courses like soft skills, project management, PC use and foreign languages. They are offered German summer courses in Engineering, Public Health, Public Management and Intercultural Communication. So, after finishing their Bachelor degree, they can apply for regular DAAD fellowships, and it is them who will be responsible to lead the future progress in Afghanistan.

This highlights the DAAD's emphasis on the reconstruction process and international exchange: knowledge transfer, qualification and skills to use equipment and machinery.

Some projects in the field of IT in the area of higher education are spectacular. First to mention: the ITCK, the IT center at Kabul University. It is Afghanistan's first Computer Center that was installed with the help of the TU Berlin, funded by the DAAD, and opened in 2003. Until now, more than

2000 persons were trained. Then there is the German-Afghan University Guesthouse on the grounds of the MoHE, not only a guesthouse but a forum for international academic exchange, meetings and conferences. Not at last to mention, there is the first and so far only Computer Science Faculty, at the University of Herat, which was established with great efforts by the team of the TU Berlin.

Nevertheless, there is still much work to do. A new initiative has just started: Master Scholarships in the field of "Good Governance".

The philosophy behind all activities can be summed up into simple principles:

- (1) Education is crucial for civil reconstruction: the reconstruction and shaping of Afghanistan into a democratic, peaceful society relies on investments into education and knowledge.
- (2) Quality: any contributions have to be put in the context of a continued and sustainable advice and help. The task is not just sending donated goods, but to educate persons using them. This is why subject coordinators for each supported academic disciplines are appointed, German professors who are not paid at all but dedicate their knowledge to help Afghanistan. Only these long-term concepts and a continued attention will make the quality last.
- (3) Sustainability and Afghan Ownership: the overall aim is to support the Afghans in helping themselves. With constant and close communication, sustainable solutions can be developed. Only then Afghanistan will not remain endlessly dependent on foreign inputs, Afghan people will get involved and take over responsibilities, and a genuinely Afghan-made better future will come. Afghan ownership is a keyword here. For example: educating people, training and qualifying them to become the future lecturers is only one step - providing them work opportunities and appropriate salaries is the other, and this along with the full responsibility and management has to lie in Afghan hands only. Institutions like the ITCK should at some point be run by Afghans alone, independent of outside help and funding.

## 2.8 Dipl.-Inf. Mr. Herlitz: Establishing IT Structures at Afghan Universities – Project Reports



Mr. Herlitz, ZiiK/ TU Berlin

As scientific assistant of the ZiiK at the TU Berlin, Mr. Herlitz presents some of the projects that were and are still realised with the goal of establishing IT structures in the area of higher education in Afghanistan.

All projects are in line with a coherent concept aiming to establish sustainable and stable structures rather than isolated solutions. At the TU Berlin Dr. Peroz, Head of the ZiiK, is the driving force for all projects with Afghanistan, as he was born in Afghanistan, and has gathered quite an amount of knowledge and expertise in the field of IT and developing countries.

Sustainability can only be achieved by working on infrastructure, education as well as concepts and management. The presentation is grouping the projects by their special focus.

To name just a few projects in the field of *infrastructure*: Soon after the fact-finding mission to evaluate the Afghan academic landscape after the war, plans to establish an IT Center at the Kabul University (KU) were drafted and approved later on. The administration at the university provided the premises, the DAAD provided funding, and the team of the TU Berlin organised and realised the project. In 2003, the ITCK was opened, and today there are 45 PC Workstations running on Windows, and 2 servers running Linux. The Internet connection is provided via satellite dish offered by the NATO. To protect the inventory, USPs are installed, and a generator backs up the supply system. ITCK is today the network backbone and IT competence center of KU and is slowly becoming the university computing center by providing central e-mail and web services. Following the overall plan to establish IT structures at Afghan institutions of higher education, connections to future faculty networks are ready.

In 2005 and 2006, PC Labs were designed and implemented at the German Departments of both the Herat University (HU) and KU, and at the HU Computer Science Faculty, taking the specific needs of each univer-

sity and subject into account. Following a thin client concept integrating 40 workstation PCs running on Windows and 2 application servers running on both Linux and Windows, an Internet connection is secured as well as a network-attached storage. Due to the deficiency of the power supply, UPS, a generator and power stabilisers are installed.

On August 25th, 2007 a PC workshop at the ITCK was opened. People are educated and trained to repair or re-assemble broken computer, reuse hardware and keep the IT equipment running. Faculty networks at the Kabul University were also installed. Plus, Computer Science Libraries at HU and KU have opened in November 2005, filled with English and Persian scientific CS books. The layout of the furniture and the organisation of the book system were carefully planned according to local needs and requests on behalf of the respective university and its members. Currently, an IT Center at the HU is being established, similar to the ITCK.

All infrastructure projects follow the same basic yet important rules: Sustainable and stable IT designed according to the specific needs, securing power supply and including buildings protection measures. The long-time goal is to provide each institution with an IT Center similar to the ITCK, and the possibility to interconnect all networks aiming to achieve an coherent academic network system.

Regarding *education*, all past and present projects aim to train and qualify students, lecturers and staff members at the Afghan institutions of higher education and the MoHE. The goal is to educate people and make them capable and responsible to operate the IT structures on their own, so there will be no dependency from international organisations. Until now, about 1800 lecturers, employees and students have been trained at the ITCK – first by members of the TU Berlin, now running the training on their own, with advise and support by the TU Berlin if needed. Additionally, during five winter and summer academies between 2002 and 2007 at the TU Berlin, lecturers from different Afghan universities, employees from the MoHE and the universities as well as students were trained in basic computer skills, different aspects of computer science and network administration.

In 2005, the Computer Science Faculty at the HU was established with the help of the TU Berlin, including a specialised library and a PC Lab. There are still lecturers from the TU Berlin conducting teaching within the frame of the implemented Bachelor study course. The establishment of more Computer Science Faculties is planned, and the MoHE is supported in developing a nation-wide Computer Science curriculum.

At last to mention, in January 2008, a Master Program for Afghan Computer Science Lecturers was introduced. 25 lecturers from 6 different Afghan universities are currently studying at the TU Berlin. The curriculum developed consists of special modules within a regular Master programme, designed to meet the Afghan needs on an international comparable standard. The participants are trained for their future role as lecturers in Afghanistan.

All education projects aims to provide trainings that are adopted to the needs of each target group: lecturers, students, administrative employees. Plus, all trainings follow the headline of training the trainers, hence to enable each participant to educate others.

To support the establishment of IT *structures*, the IT Department within the MoHE was founded in 2005, supported by the team of the TU Berlin and funded by the DAAD. It is responsible to develop a national IT strategy for the area of higher education and coordinates the realisation of IT projects within the institutions of higher education.

On a regular basis, IT conferences and workshops are organised addressing different aspects of IT in the area of higher education in Afghanistan, discuss IT strategies, exchange experiences and coordinate future activities. Since 2002, 22 conferences took place both in Berlin and in Afghanistan.

One goal is to nominate IT advisors in each institutions of higher education, as a central contact person within the institution and responsible for the communication and cooperation with the IT department of the MoHE. The TU Berlin here acts in an advisory function. A solid and modern management system to support IT structures in the area of higher education shall be established, as well as an IT strategy for higher education shall be drafted, embedded in a national IT strategy.

All projects and the achievements have been realised in close cooperation with the MoHE, Afghan institutions of higher education, the DAAD and the World Bank. To establish sustainable and stable IT supply for all institutions of higher education in Afghanistan, the ZiiK can provide expert solutions in IT projects based on technical knowledge and experience. The team can provide teaching of Computer Science, training of IT skills and development of IT concepts.

## Questions and Discussion

Asked by Prof. Heiß about his personal opinion about the most urgent and important issue regarding the establishment of IT structures at institutions of higher education, Mr. Herlitz stresses the importance of education. This will enable Afghanistan to identify the most urgent needs by the Afghans themselves.

Addressing the attending Master students, Prof. Heiß asks about the situation on their respective home university when they will return after graduating. A member of the students from Herat University states, that they already have the core IT infrastructure. To help other Afghan institutions of higher education he suggest to facilitate the information and knowledge exchange between all institutions, coordinated by the MoHE. Experiences made at the Herat University when establishing basic IT infrastructure can help if shared with other students and lecturers. Prof. Babury approves this idea, especially because the level of infrastructure varies greatly between the institutions of higher education, and the use of local knowledge is crucial for a successful, sustainable and stable effect of all projects. He will support this idea and the need to push forward the internal communication.

This raises the question on how to get IT infrastructure to educational institutions. Is it the right time for big plans? How can a coherent IT supply at all institutions of higher education be achieved?

Prof. Mahr stresses the need of a synchronisation process. And while the vision of a Computer Science University might be too utopian, establishing Computer Science Faculties at all major or even all institutions of higher education should be possible. And as soon as decentralised networks are built, they can be coordinated by the IT Department at the MoHE, but have to stay partially independent and self-controlled: each PC Lab has to be designed according to the special local needs and demands, balanced by outside knowledge to fill the gaps. Relying on autonomous units is necessary, even though qualification and classification from the outside is helpful to have an overview. The level of each unit allows for a level of participation, and all initiative should come from the inside.

The vision of the ZiiK in Afghanistan is to introduce Computer Science to every university, which requires a lot of IT infrastructure that has to be built. So it is the projects like the ITCK, supported and financed by the DAAD in a truly committed and unbureaucratic way, that build the core of any IT



infrastructure. In the future, other projects and approaches to coordinate them are necessary, as well as enough funding to secure the sustainability.

Dr. Kupfer adds, that the current Master Study course is funded by the World Bank. He invites the MoHE to indicate their demands, and the local institutions should indicate their needs to the MoHE in order to get funding for their projects.

## 2.9 Dr. Gutheil: Chances and Challenges of a Modern Campus Management at Institutions of Higher Education



Dr. Gutheil, Chancellor  
TU Berlin

As Chancellor and hence member of the Steering Committee at the TU Berlin, Dr. Gutheil expresses her pleasure to be invited to give a talk on this symposium, and gives her greetings to all participants.

For a better understanding of all following issues, two handouts are given to the audience, one showing the administrative structure of the TU Berlin, the other one depicting the IT structure and its coordination. Both figures can be found in the appendix.

As chancellor, Dr Gutheil also holds the position of the Chief Information Officer (CIO). It is her responsibility to moderate the integration of so far decentralised IT networks and IT centres at the TU Berlin. Moderation is

necessary, as all the different departments and units at the TU Berlin have their own network and work procedures, and the transition into a consistent, overall structure and administration needs to be smoothed, not only from the technical approach, but with the viewpoint of the human perspective as well.

A coherent online approach is necessary for the whole university, as all everyday needs and work processes have to be available online. Efficient study programmes also rely on online and consistent services. As CIO, she addresses this change of approach to services by integrating all human needs, fears and sensitivities.

The main reasons why the TU Berlin decided to nominate the chancellor to be CIO, rather than installing a CIO board or appointing one of the president or vice presidents, were her expertise, her longer term of office compared to the (vice) presidents, and her responsibility for the budget: she has to account for all IT projects anyway.

The tasks within the envisioned transition are manifold: all users (all members of the TU Berlin) have to be considered, each unit has its special

requests and working environments that have to be integrated, and on each level quality and security have to be secured. Most crucial and core starting point for a successful transition is to build up trust. Therefore, all responsibilities have to be clarified, and mutual acceptance of the appointed rights and liabilities has to be established. Only then a standardisation of all processes and procedures is possible, and the neutral position of the CIO will support that.

At first, an appropriate organisational structure has to be designed and integrated. The internal structure of the departments with their own hierarchy has to be reassembled, the walls between the faculties and the administration have to be tore down, and synchronisation secured. The goal is to provide services from one hand, where everything is completely integrated: all different software approaches and applications, the various data storage systems, and all other isolated solutions. To gather up all IT structures, an external coordinator was hired, who had no history whatsoever at the TU Berlin and could build up trust easier. To help bridging the gaps due to different departmental structures, IT coordinators are appointed. Synergetic effects will be achieved, and binding decisions will be advocated by authorised persons at each respective faculty.

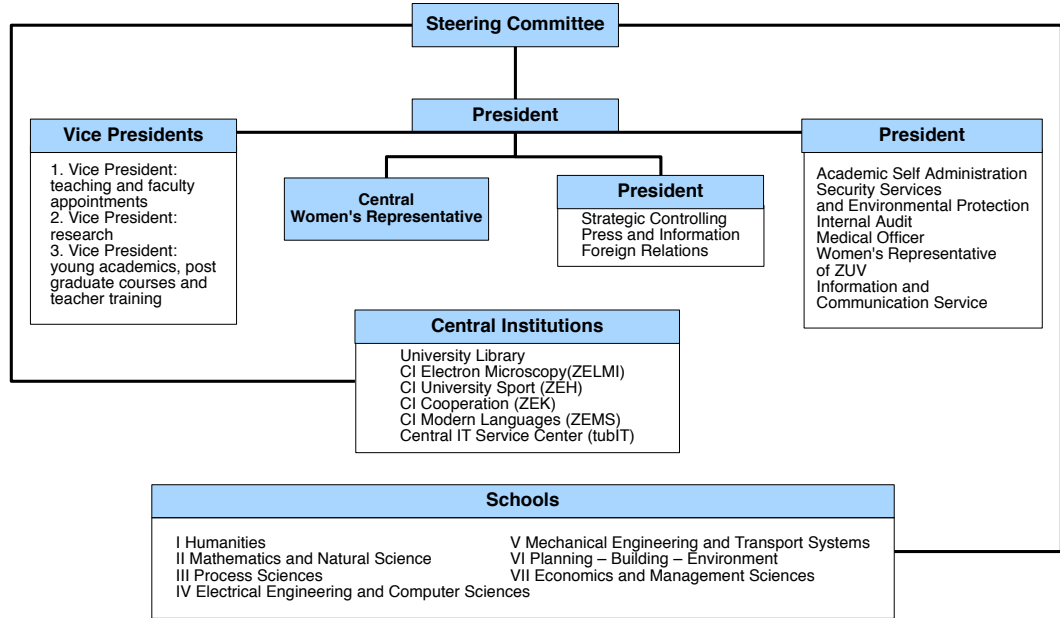
Despite some problems, the first results are encouraging: each TU member can clearly be identified, there is an overall access for all from everywhere, at the university or abroad, rights are assigned based on the role of each member, and a coherent and clearly arranged introductory page was designed. No proprietary software solutions and tools were used as no applicable one could be found. Hence, several Open Source solutions were used to develop an own service solution: TUBIS, the TU Berlin Integration Service. TUBIS integrates all different and differing databases and IT services, and follows the approach of a role-based registration of all TU Berlin members. Remodelled after the real world, it is a decentralised system. All units are concentrated and underlying there is a consistent security concept. All daily used application are integrated and can be reached via a portal, so all routine services are covered. Overall, it offers a direct, time-saving and flexible access for every member of the TU Berlin.

Thee TU Berlin by now has consistent internal IT structures, but the opportunities to establish IT structures interconnecting all German institutions of higher institutions have not yet been grasped. There is no coordination between the different university networks, and no information and knowledge is exchanged to prevent other universities from making the same

mistakes. Bundling all institutions of higher education with a standardised IT infrastructure would provide excellent benefits for all.

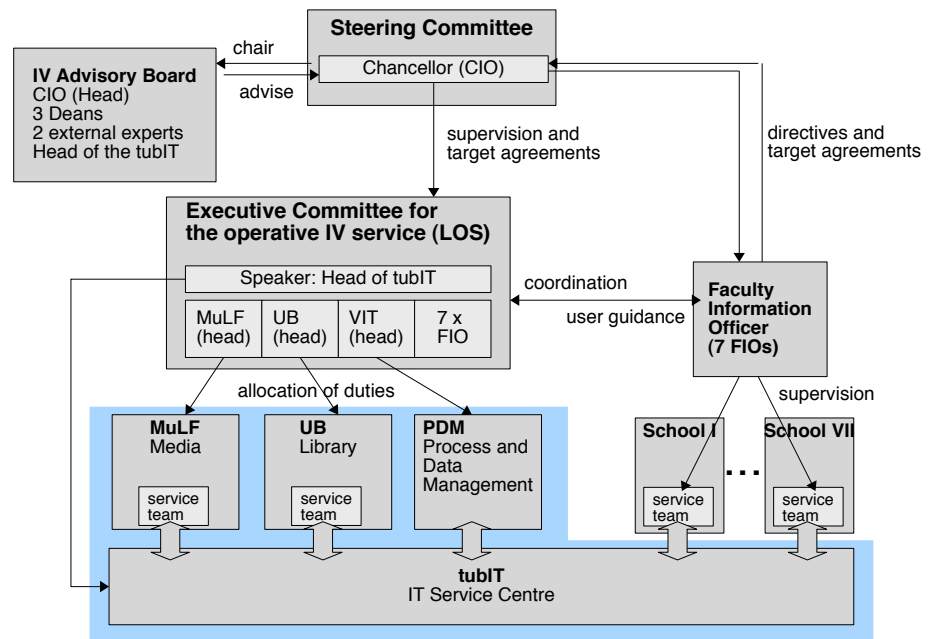
To summarise: establishing new IT structures is a long, interesting and difficult process and building up acceptance and trust to new IT structures is complicated – however, the TU Berlin is on a good way and all efforts already show positive outcomes, that will increase even more in the future.

### TU Structure



modified in form and content after Dr. Gutheil

### IT Structure and Coordination



modified in form and content after Dr. Gutheil

## Questions and Discussion

As an additional remark, Prof. Hei refers to the isolated solutions that existed before and which had to be integrated and transformed into consistent structures. For example, a Content Management System for all webpages is now used to push forward corporate identity, replacing all the different layouts that were implemented before. He suggests, that it might be easier to establish consistent IT structures when you have to start from scratch like in Afghanistan, than integrating existing structures.

In answer to a question raised by Prof. Babury, Prof. Hei clarifies that all chosen software solutions were standard software products which were then adapted and tailored according to the special needs of the TU Berlin, rather than fully implemented from scratch.

As one student from the Herat University points out, there is no IT infrastructure available at his home university just yet. Even so, when establishing IT structures, coordination is necessary when building them up, to avoid double structures. Choosing the right technology and approach is crucial.

Here, Prof. Hei raises the question whose responsibility it is or it should be to design and decide about the approaches and solutions.

In an answer, Prof. Babury underlines the necessity to give more autonomy to the institutions of higher education, still under coordination of the MoHE and backed by a legal framework. Guidelines have to be approved by the MoHE, and more computer science faculties have to be established, as there is only one now, at Herat University.

Prof. Hei supports this view, but points out that administrative decisions and solutions should not come from any faculty, only suggestions should.

Prof. Mahr states once again that there are no simple solutions. Even when starting from scratch, without guidelines there will be chaos, or at least competing and incompatible structures. This is the problem between local and global approaches: there will be no cooperation when there is only local authority, some overview is always necessary. This however is rather a social and not a mere technical or technological problem. Hence, an open and distributed concept on the technical level linking all compatibilities and assigning all small tasks is needed, and standards have to be adopted according to time, goals and diversity from a superior level.

Dr. Gutheil supports this by stating that coordination is crucial, as well as the obligation for standards. Space for decision-making should be given, but the leadership has to set standards and coordinate them.

## 2.10 Closing Remarks



Prof. Heiß, Prof. Babury, Prof. Mahr,  
Dr. Kupfer, Mrs Krüger-Rechmann

Prof. Heiß closes the symposium by thanking all presenters, contributors, the audience, all organisers and especially Dr. Peroz and his team. On behalf of the Faculty of Electrical Engineering and Computer Science as well as the whole TU Berlin he is proud to have a Center for international and intercultural Communication and such a dedicated team of scientific assistants, lecturers and students all working together to support the reconstruction of Afghanistan. Here especially he thanks Dr. Peroz, head of the ZiiK, for his initiatives, expertise and being the driving force in all projects. Addressing the master students currently enrolled in their second semester, he wishes them a pleasant stay and a good time at the TU Berlin. To round the symposium off, he gives the word to Dr. Kupfer, Prof. Mahr and Prof. Babury for some closing remarks.

### **Dr. Kupfer, DAAD**

Dr. Kupfer points out that especially in the talks with various participants during the breaks, he got the encouraging impression about the interest, eagerness and the dynamic behind it all to “do something”. A great part of the future and the opportunities of and in Afghanistan lie in the hands of those 25 Afghan lecturers currently enrolled in the Master Study Programme of Computer Science at the TU Berlin. As he reminds again, In all approaches and projects self-dependent and future-oriented concepts are of great importance, and not to lay back and rely on others. Sustainability and Afghan ownership are the crucial principles for a successful future.



### **Prof. Mahr, TU Berlin**

Prof. Mahr states that for him it is wonderful to see the Afghan themselves telling about their needs and demands. The last years have proven a successful way for the MoHE and the Afghan institutions of higher institutions in establishing IT structures. Regarding the present situation and the future it is clear however, that every success is accompanied with an increasing potential of complication – because of size, structures and authority issues. Hence, the MoHE has to define the roles and their changes in due course, and has to envision the future. All institutions of higher education will have to get some autonomy, supervised by consistent coordination. As the MoHE will still need some guidance to enhance their level of quality and qualification, hence support from the outside. Consistent and standardised grounds are ever more important with ever more complicated structures. All international donors and their funded projects have to be coordinated, means need to be found to realise IT projects according to a strategy. And despite support from the outside, it all has to be done with the aim of Afghan ownership.

### **Prof. Babury, MoHE**

Following Prof. Mahrs remarks and underlining his points, Prof. Babury adds that during this symposium he as well experienced much positive and constructive input, making him very optimistic about the future progress in the institutions of higher education and IT. Sustainability is crucial, as well as Afghan ownership and independence, so all approaches should be drafted on the basis of domestic needs and demands. Prof. Babury assures that all visions and every commitment are highlighted in the national IT strategy. Cooperations are necessary, therefor the MoHE relies on the commitments and contributions from outside, here especially from German professors and their expertise. On behalf of the MoHE, Prof. Babury appreciates these contributions, interest and support and with that in mind, he is honoured to close the fruitful symposium.

### 3 Epilogue

Afghanistan needs a stable IT structure. To achieve this goal, especially in the area of higher education, coordination is crucial, as well as a consistent strategy. Here, the MoHE is responsible and has the authority to define roles and manage the process, and to integrate and coordinate outside help and expertise. To establish sustainable structures, the following tasks have to be addressed:

- coordination of all IT projects,
- establishment of IT action plans and programmes,
- stable power supply throughout the whole country,
- education and training for all members of the academic area,
- management and administration.



Group picture with participants

With the 25 Afghan lecturers currently enrolled in the Master Study Programme of Computer Science at the TU Berlin, there is a great potential and opportunity for Afghanistan to promote and coordinate a consistent IT structure and IT education in the academic field on a high level of quality, comparable to international standards. They are currently trained and educated to identify the national and local needs, to analyse

the opportunities and challenges, to draft and realise projects, to conduct teaching and education, and to organise and management all tasks in the field of IT. They will form the basis of future development and will multiply the expertise and knowledge in Afghanistan.