



Requirement analysis of information technology center at sayed jamaluddin Afghani University

Rafiqullah Baryalai

University of Sayed Jamaluddin Afghani, faculty of Computer Science, Asadabad, Kunar, Afghanistan

Abstract

This paper discusses the fundamental IT requirements of Sayed Jamaluddin Afghani University as well as Information Technology Centre requirements according to the current situation of university. current status of IT related infrastructure at Sayed Jamaluddin Afghani University and all primary and needed tools which is indispensable for designing IT center. such as Infrastructure (Building, power supply, Internet, Hardware and software). will discuss in this paper To standardize University workflow, teaching, study and capacity building of University staff and lecturers, regarding the computer and IT Usage, it is important to estimate the initial needs and requirements of IT Center, As Sayed Jamaluddin Afghani University is young and new. The development of IT is very rare. So the main focus of this paper will be, at the current situation of University the analysis of IT Services as well as IT Infrastructure Requirements. A very less amount of infrastructure requirement is fulfilled. But still, majority requirements are needed to improve and find the solution for it, which will be discussed in this Paper.

Keywords: requirement analysis, information technology center, sayed jamaluddin afghani university, it services

1. Introduction: IT Requirements of Sayed Jamaluddin Afghani University

Sayed Jamaluddin Afghani University require basic IT services such as Email services, trainings for the staff, campus Network for the university, PCs Labs in each faculty, Storage or database system for the University, website for the university, course management system for the students, students online registration system, IT knowledge and computer literacy trainings to the University administrative and academic staff, research center, access to online academic world, etc. some of the Services as following:

E-Mail Services

Regarding E-mail services currently in the university there is lack of email services the letters and other information sending and receiving process is handling by manual and traditional way that means the transfer of data among the faculties of University as well as to Ministry of Higher Education or to other resources are paper base which is really time-consuming and costly, therefore the University of Sayed Jamaluddin Afghani need IT system for the email services to send and receive letters and data electronically among faculties and Ministry of Higher Education which will reduce time as well as cost and make the sending and receiving way compatible and convinible.

IT Education Services

IT education is another service that required for the Sayed Jamaluddin Afghani University. IT knowledge as it is mentioned before that Sayed Jamaluddin Afghani University is new and it needs more about IT knowledge the staff of University does not have IT knowledge, therefore the administrative staff, lecturers, and students need to train, per example the administrative staff needs the basic use of computer and Microsoft Office programs (word processor, excel, database etc.), and lecturers need that, how to use computer and the internet?, how to prepare slides for

teaching? And how to filter correct data from the internet? Same thing goes to students to understand the use of computer and internet to solve the problems.

PCs Labs Services

PCs Labs services, this is another main service that University require, so far, at the university there is lack of PCs Labs, all five faculties of Sayed Jamaluddin Afghani University do not have any PC Lab for the student practical work, student need to solve exercises and practice the given assignment, therefore for the capacity building and to train good quality students there is need as well as mounted PCs Labs for the students.

Campus Network Services

Campus Network services, the campus network is the important requirement of University currently there is no campus network but the university needs to have local area network (LAN) to connect all the faculties and provide secure services for the lecturers, students as well as for the administrative staff of the university.

Storage System Services

Storage system service, this is another crucial requirement of the university in current situation of the University there is lack of storage system, for the academic activities of the lecturers and students registration or keeping the university sensitive data there is need a database system to store all the university-related records, currently the storage system of university is manual and traditional all the records are stored physically on files and documents but it is very complicated when you need some information, then you have to search all the files physically one by one that is very tedious, time-consuming and costly. Therefore the university needs computerized database system services which will be economically good and save time, as well as make the searching system for the data or store the data become easy and compatible.

Website Services

Website services, this is another require services for the university, currently the university of Sayed Jamaluddin Afghani do not have website, so the website for the university is really important issue because every time students and lecturers need information and news about university, such as news about paper publication, books, vacations, information about all university related activities, grades. Beside this the university also needs the course management system services for the student and lecturers, the lecturers and students need to have the access to course management system that means through that lecturers could announce the course and could upload exercises for the students and students can download the exercises and could upload the solution for the exercises electronically, which is good system for the students improvements, it will not only save the time but economically suitable for the students.

Online Registration System Services

Online registration system, this is more require services for the Sayed Jamaluddin Afghani University because this university is located in very remote and rural area when student from other provinces get admission in Sayed Jamaluddin Afghani University, then they compel to go to the university for the registration the students spending more money and also for the university registration staff it is difficult to register 1000 or more than 1000 students manually, therefore if the university has online registration system services then it will be easy for the students, could register them self from them home by a few clicks.

Internet Services

Internet Services, this is another and crucial require service for the university. all the administrative and academic staff of university need to access the internet for the solving problems especially students need to search information to learn update knowledge, likewise lecturers need to get update knowledge for the students and make the quality of student better, other importance of internet the students and lecturers could access on-line research center and library's like academic publications papers, books, journals, and etc. which will improve the capacity building and quality assurance of them.

Digital library Services

Digital library services: this service is important for the academic staff like lecturers and students for the improving teaching-learning process digital library is a good service. So far there is no digital library at Sayed Jamaluddin Afghani University when student writing thesis than they really need books and papers to utilize as well as lecturers need to utilize the digital library for the research purpose. To have the above mentioned IT services for the university, of course, there is need IT Center, so for the establishing IT Center at Sayed Jamaluddin Afghani University, then there are need requirements for the IT Center, which is explained below:

Infrastructure

What is actually IT infrastructure? There are more and different definitions regarding IT infrastructure, to be clear some of them will mention here. Peroz, (2009) defined "the term "infrastructure" is a collective description stemming from the Latin word *infra* (meaning "below" in the French

vocabulary, the word was originally used to identify all the works which needed to be carried out prior to the laying of railway tracks. The term therefore precisely means "substructure", the term IT infrastructure will be used in analogy to the basic infrastructures. These include among others power supply, building services engineering, hardware, software, and the Internet [2, 5].

According to Techopedia definition: "Typically, a standard IT infrastructure consists of the following components:

- Hardware: Servers, computers, data centers, switches, hubs, and routers, etc.
- Software: Enterprise resource planning (ERP), customer relationship management (CRM), productivity applications and more.
- Network: network enablement, Internet connectivity, firewall, and security.
- Meat ware: Human users, such as network administrators (NA), developers, designers and generic end users with access to any IT appliance or service are also part of an IT infrastructure, specifically with the advent of user-centric IT service development [1].

As the infrastructure is the base and crucial requirement for the IT Center which compasses: building, power supply, hardware, software, and network. The concept of IT infrastructure (ITI) conveys the use of various components of Information technology (Hardware, software and network Infrastructure). Upon which IT services are provided [9, 15]. Currently, in Afghanistan, the physical infrastructure is in developing stage, which needs more struggle and efforts to maintain the infrastructure for the IT Center. To have a well-organized IT center and provide the University all necessary and basic IT associated facilities, requires some arrangements to be made along with an efficient infrastructure. The infrastructure includes of place, power supply, hardware and software, Internet availability, equipment and human resources to drive these technologies [14, 18]. Thus, the infrastructure requirements are indispensable and mandatory for the establishing IT Center. Therefore I am going to analyses all above-mentioned infrastructure components one by one according to the current situation of Sayed Jamaluddin Afghani University.

Building

As the building is the first requirement for IT infrastructure, therefore, there should be some consideration points which are important for IT Center. The building design should be according to the need of IT there should be a good security system, protection from internal, external and another risk like dust, cold, heat. The building for the use of computers and servers which are quite sensitive must be secured and protected against dust, coldness, heat and theft[2][1][3].

So at Sayed Jamaluddin Afghani University in the current situation one very suitable building is available which the United Nations Assistance Mission in Afghanistan (UNAMA) handed over to the University. That building dedicated to IT Center. but it needs renovation and repair, Thus for it some security/protection measures to be considered too. Which Peroz, (2009) stated:

- Security of the building,
- Protection against lightning,

¹ Source: "Techopedia", www.techopedia.com/definition/29199/it-infrastructure, para-3, June 2016.

- Grounding of electrical appliances,
- Building specialist,
- Internal security,
- Protection against dust,
- Protection against burglary,
- Protection against fire,
- Ventilation,
- Lighting.

The above-mentioned security/protection measures will be very important for the Information Technology Center So currently as I mentioned above at Sayed Jamaluddin Afghani University the building is available for IT Center, Which I have seen and design the map of the building and collected data during my paper Writing. You can see the detail of the building, map, and structure for the Sayed Jamaluddin Afghani University IT Center as following:

This building has 11 Rooms in total, a kitchen, a veranda and three bathrooms. The main Entrance is to the south and the Veranda is located at North of the building. While entering the main entrance which is at the South West corner of Building, the bathroom is at the left and the Kitchen is a few steps ahead on the Lobby on the left and the Adman room in front of Kitchen on the other side of Lobby which is also attached and is the entrance to Server Room which is located to the North of Adman Room it is also attached to and the Windows of Server Room are in the

Veranda and server room location is at the North West corner of the Building. The Security Room is located to the right of the Adman Room which is in front of the Main Entrance and its own entrance is in the lobby. Going to the Right of Security Room there is The IT Room which would be on the Left while walking in the Lobby. A few steps forward to the Right of the IT Room there is the Head office which is also on the left of the lobby. And so is the Conference Room which is on the Right of Head Office. A few steps forward to the right of the Conference Room there is a passage and the Tutor Room is to leave in the corner of that passage which is also the North East corner of the Building the Entrance to the PC Lab A is also from Tutor Room and this PC Lab is located behind Security, IT Head Office and Conference Rooms which is also the North of Building and the windows of the PC Lab A are to the Veranda. Coming back to the main lobby there is Multimedia Room to the East of the Lobby and Building, the PC Workshop Room is to the right of Multimedia Room and the Technician Room is in the South East corner of the Building. The PC Lab B and Waiting Rooms are to the Right of the Lobby and at the South of the Building such that; Waiting Room is to the right of the Main Entrance and PC Lab B is to the left of Waiting Room and PC Lab B has two Entrances which are both on the right of the Lobby, see in figure IT Center Building Map.

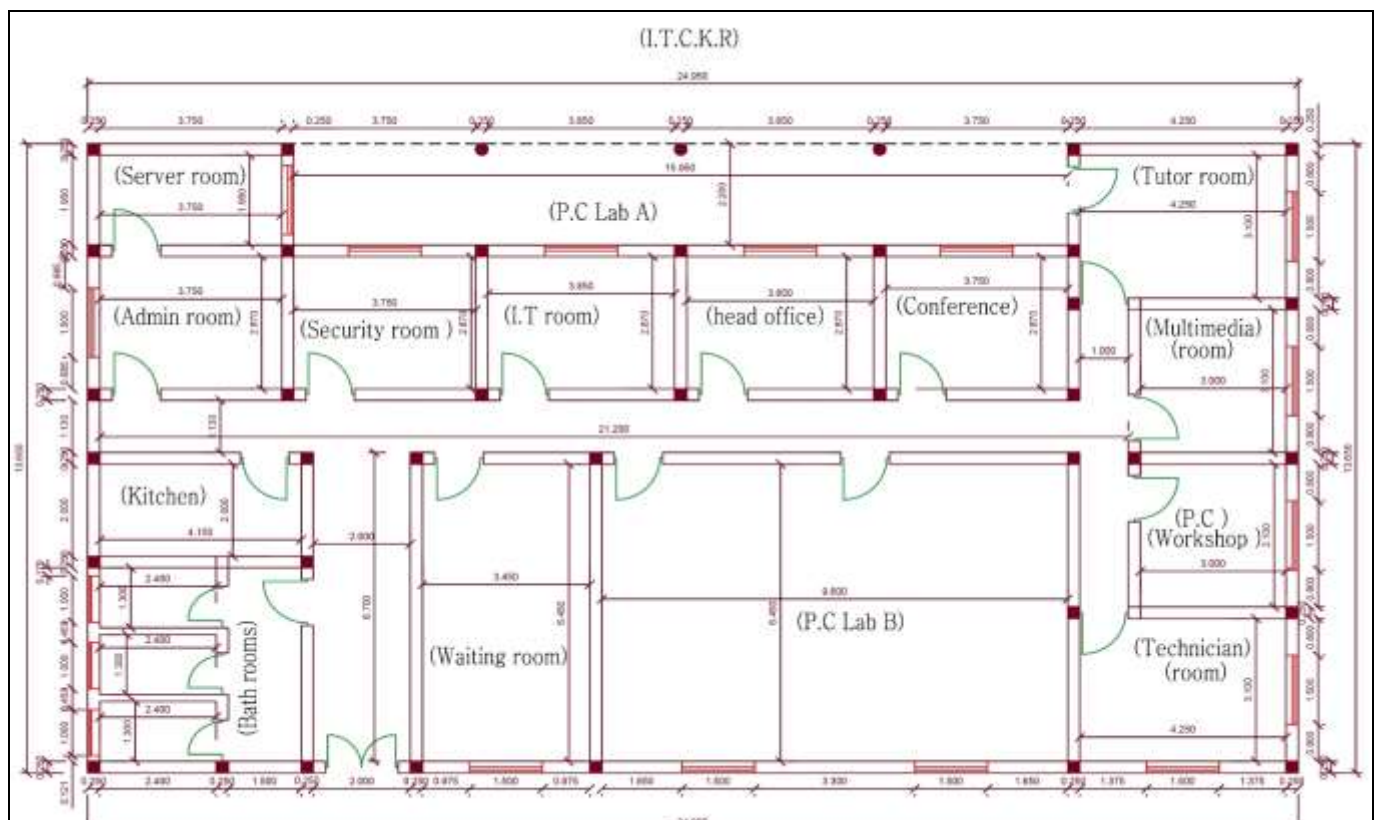


Fig 1: IT Center Building Map

Rooms’ usage explanation

To make the building map a bit clear the following is the short explanation of the room usage and above mentioned map,

Waiting Room: While a visitor or someone visits the IT Center for registration or for technical advice, one should wait in Waiting Room until the response from the adviser or

administration,

PC Labs: These rooms are selected to place the Computers that would be used while teaching or practicing by students or other users,

Technician Room: This room it to place batteries of Solar System along with UPS (Uninterrupted Power Supply) and other required tools needed to troubleshoot the electricity

problems. And the Electricity Technician will also be in this room so one can contact him or her while needed,

PC Workshop Room: Since we are dealing with huge number of Computers and the machine often generates or faces some problem so we need to fix this hardware and computers as soon as possible and for the reasonable price. So PC (Personal Computer) Workshop Room is responsible for that and it will also provide a practical environment for hardware learning and workshops,

Multimedia Room: This room would be equipped with the projector and other equipment needs to present a presentation while implementing or taking a workshop,

Tutor Room: In other words, Teachers Rooms this room will have lockers in which teachers would place their materials of teaching and other staff will take a break while they have the break time,

Conference Room: In other words, Meeting Hall this room will be used while the administration or Head of IT Center holds a meeting among staff or while they need a technical advice or idea,

Head Office: This is the main office, the office of IT Center Head, The one who is managing the whole IT Center,

IT Room: In this Room, the IT Assistance will be available who would be responsible for troubleshooting of a network,

Security Room: This room is for the Security personnel,

Admin Room: This room is for the Administrator of Server, who is responsible for maintaining and control of servers,

Server Room: In this Room, Servers would be placed ^[1, 2, 4]. As you know for the IT Center the special building is required which fulfill all the requirements for the IT Center by modern and standard way but According to the current situation of Sayed Jamaluddin Afghani University the above mentioned building is suitable for the IT Center because there is no any other option because it is impossible to construct new specialized building for the IT Center it need more budget and Ministry of Higher Education and the university do not have budget for it but it strongly recommended that in future there should be new modern and standard building for the IT Center. But for the time being the above mention building is the possible solution to establish IT Center.

Power Supply

The very basic and indispensable requirement for IT Center is stable and reliable power supply. The stable power supply will keep the IT Center well-functioning ^[4]. without stable power supply it will be impossible to establish or run the IT Center, it should be strongly consider that as you know the hardware devices of IT Center is very sensitive if you have unstable power supply system then it can create problem and can damage the hardware devices and besides this the server need to run 24 hours and there should not be electricity interrupt otherwise all the IT system will get down the users may lose the data. therefore the stable power supply is the top priority for the IT Center. To give and example, the use of high capacity local computer systems for teaching, research, and administration, and of Network-based forms of communication at the universities is strictly dependent on a stable power supply. The current mode of a power supply by the use of generators must be seen as an insufficiently isolated solution. A nationwide supply of energy is of utmost importance ^[6, 3]. The power supply is the challenge for Sayed Jamaluddin Afghani University because

at the current situation there is the lack of stable power supply. More than two decades of war in Afghanistan has destroyed almost all sort of infrastructures of Afghanistan and power supply was one of them ^[18, 14]. Kunar province capital Asadabad city Hydropower plant was partially destroyed during the Russia war it is not repaired but still it is producing a little amount of electricity which is insufficient to the city and there are more loads shedding on it. Therefore the majority of the city people use small generators and solar panels for them own electricity requirements. That is why Sayed Jamaluddin Afghani University has no local electricity. It has two diesel generators which are running in the formal time just for three hours in a day but not always some time with the lack of budget it remained idle. It is insufficient for the University. the alternative solution will be possible such as Solar power supply system, there are more water resources for electricity but unfortunately due to the security and inconsideration of Afghanistan government there is lack of electricity but in future, if Government considers this issue and builds water dams on Kunar River, then this problem may over forever. but currently the possible solution of Power supply is Solar power supply system.

Internet

The Internet is the another requirement for Information Technology Center (ITC), to operate or activate ITC then there is need for Internet connection which is the main and crucial component of IT infrastructure To connect the University to the all over the world, then there is indispensable need for Internet. to update and improves the capacity building of the lecturers and students, it will provide a good atmosphere for better learning and research purpose. the Internet also provides the good opportunity to the students and lecturers for E-learning platform and distance learning. The University will connect to national and international Universities and could take part in on-line teaching programs and classes in order to enhance their capacity and quality assurance ^[14, 18, 5]. The use of Internet in the education environment has enabled easy access to many resources, and information sharing has, therefore, significantly increased. Moreover, the prevalence of this sharing has brought additional benefits in that these resources can be used in any location and anytime ^[11, 12]. the most effective communication resources, computers, and the Internet are part of our daily life and have become one of the important tools in the education the Internet helps transfer information between different points, therefore, this situation makes the Internet a very powerful information system. People in different age groups and Jobs, students and academicians who do scientific research and prepare projects prefer using the Internet because it is the easiest, fastest, and cheapest ways of accessing necessary information ^[3, 12]. The current situation of Internet connection in Sayed Jamaluddin Afghani University: as the Sayed Jamaluddin Afghani University is new everything related to IT infrastructure is needed to establish regarding Internet connection recently the Sayed Jamaluddin Afghani University got 2 MB Internet connections from the Afghan wireless communication Company (AWCC). that has very low bandwidth which is insufficient for the University and for current Users.. just some of the University administrative staff uses this connection but the speed is very slow even some time remains disconnected because of the shortage of

power supply. Voice chancellor of University contacted with many national and international Organizations about Internet connection but so far University did not get any positive response the lecturers and students are using their own personal modems or activating monthly package in the smart phone or laptop and solving the problems through that. Which is costly and the poor students cannot afford. The problem is the university of Sayed Jamaluddin Afghani and Ministry of Higher Education do not have special Budget for the IT especially internet which is really important for any academic organization.

Hardware

Hardware is the main requirement of IT infrastructure all physical and tangible parts of IT Center such as PCs, keyboards, mouses, projectors, monitors, cables, Routers, Switches, UPS, Hubs, Firewalls, adapters, Regulators, stabilizers. To setup well-functioning IT Center and connect the campus network then the above mentioned Hardware equipment are the main needed requirements for the IT Center. one of the important prerequisites of IT infrastructure is Hardware which includes several types of equipment and media like PCs, printers, projectors, scanners, keyboards, mouses, monitors, Routers, switches, hubs, etc to make the ITC activities functioning. The IT infrastructure includes Hardware, power supply, building, services, software, and the Internet [6, 5, 18]. The required hardware such as workstations, printers, keyboards, mouse, projector, Monitor, network supplies such as the switch, sockets, hub, router, etc ... are the common requirements and must be available within an IT Center [14, 18]. Currently in Sayed Jamaluddin Afghani University according to hardware equipment very rare Hardware equipment are available, which is insufficient for IT Center. During the Writing of this paper, I have interviewed all University staff as well as the student all the lecturers and students were complaining they said: that they do not have Computers, projectors, and other hardware devices for the study purpose, they said: that some of them have their own laptops but it is not the solution. Now we came to know that how IT hardware is important for the University and without hardware it will be impossible to establish IT Center, so from the result of interviews I found out that there was lack of Hardware in the University, thus, when the university establishes the IT Center, there should be consideration to purchase update, latest version and good quality hardware according to the requirements of the situation because in today's time second generation or third generation computer will be not a suitable hardware for the IT Center, currently there are some software which will be impossible to operate on second or third generation computer, the same idea for any type of hardware, in this regard it will be better to consult with hardware expert during the hardware purchase time for the IT Center.

Software

One of the important requires component of IT infrastructure is software which plays very crucial role in IT infrastructure. Software activating hardware and making hardware on work, according to the instructions of the software [6]. The software is the soul for IT and without software, IT will be idle and it will be impossible to run and function IT related activities. software making the hardware alive and function. Therefore beside hardware, the software

is the indispensable and crucial requirement for the IT Center. "Computer hardware is only as effective as the instructions we give it, and those instructions are contained in software, software not only directs the computer to manage its internal resources but also enables the user to tailor a computer system to provide specific business value" [2].

For the IT Center the Computer hardware is the key element of IT infrastructure but without Software the computer hardware would be impossible to function. Unless there exists required software, therefore software is also considered in the list of infrastructure for an IT Center [14, 18]. the use of software in Afghanistan most of the users use close source software as (Baryalai,2020) found out that 93% of users use close source, 6.9% use Mac software and 5.4% use Linux software you can see the finding diagram of that as following:

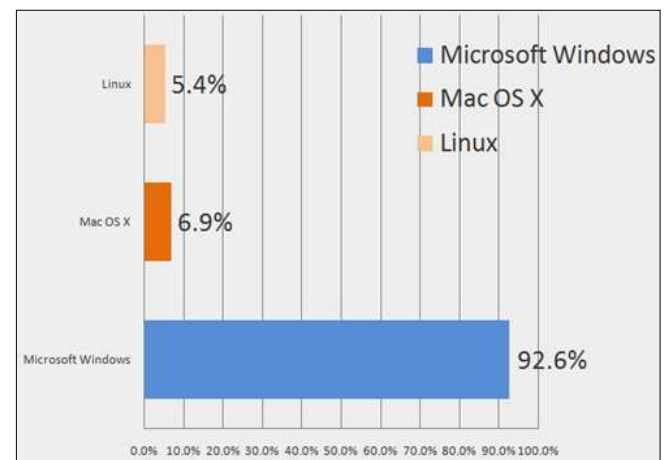


Fig 2: Statistics of OS usage in Afghanistan [13].

Due to many reasons the commercial software occupied Afghanistan one reason is the users have lack of IT knowledge that means they do not know that commercial software is insecure, another reason is they are unfamiliar with open source software but commercial software is user friendly and easy to use that is why Currently Afghanistan is occupied by commercial software and majority of computer users are using the pirated and cracked copies of software which are available in the market just for 30 or 40 AFN per CD or DVD. This may have very bad and illegal consequences in the future because without license fee it is illegal. Most of Afghanistan universities users are using unregistered and unlicensed copies of commercial software [14, 18, 13]. Unfortunately, same thing is going on in Sayed Jamaluddin Afghani University all the students, as well as lecturers, are using unregistered and unlicensed copies of commercial software even all over Afghanistan organizations doing the same. During my paper Writing, I have interviewed the administrative staff, lecturers, and student about software use. The result which I got that all of them were using commercial software, the reason was easy to use and user-friendly, but they did not have any idea about security awareness of commercial software; this was a problem. What I realized about software use for Sayed Jamaluddin Afghani University according to current situation it will be impossible to replace commercial

² Source: "Computer software"
wiley.com/college/turban/0471073806/sc/ch04.pdf,pp,1-1,May2016

software by open source software because they are unfamiliar with open source software, it needs time. The possible solution will be the training of open source when IT center established then there should be IT education teams who are responsible for providing require training to the users. For the server side of IT Center I recommend open source software because of security, and it would not be a big challenge because for the Server side, of course, there is need of expert staff and expert staff could operate the open source software. but for the client side according to the current situation I recommend close source software because all the client side users are already familiar with it, but in future it will replace with open source software with the help of training. The benefit of Open source software, it is secure and free of charge, which is economically efficient for the all over Afghanistan especially for the universities of Afghanistan.

Results and Discussions

Sayed Jamaluddin Afghani University which established in 2010 is a public university located in Kunar province, north east part of Afghanistan. The university has two main campuses located at Yargul Bela and Salar Bagh covering 100 acres of land. Currently, the university is offering 18 different programs under 18 departments and five faculties i.e. agriculture faculty, computer science faculty, economics faculty, Sharia faculty and education faculty. Approximately 90 teachers and 120 administrative staff members are currently working at the university. To date, the university has presented 5 batches of graduate students to the community and about 4000 students are currently studying at different departments. As the university is a new one, wants and need for improvement can be seen at various parts of it. Especially in the field of Information Technology(IT).as result of this Paper find out that the University has Many problems and many things, it needs to improve especially in the field of IT services such as: E-mail services, IT Education Services, PCs Lab services, Campus Network Services, Storage system services, website services, online Registration system services, Internet services, Digital Library Services and infrastructure (Building, Power supply, Internet, Hardware, Software, Networks and IT Users),to solve the above problems the university need to established Information Technology Center, to established ITC therefore there is need IT Infrastructure (premises. power supply, Internet. Hardware and Software) in case of IT Building there is need IT Professional Building To have strong IT security system Beside IT Building Information Technology Center needs stable Power supply, stable Power supply can run and function ITC well-functioning. unstable Power supply can damage all the hardware therefore the power supply is the big challenge but currently the best solution is Solar system, Internet is another important factor for the ITC without internet ITC will not processed ahead, because all lecturer, administrative staff as well as students for the teaching learning process, research purpose and for official processes need secure and high speed Internet connection, Hardware is another physical valuable base for the establishment of Information Technology Center such as: Routers, Switches, access points, Firewall, Servers, Different type of Cables, Computers, Security system devices Projectors, scanners, Printers, Storages Cooling and ventilations systems etc are needed.in the part of Software this is another important

aspect for the establishment of ITC. in this case my recommendation is Open source software's it is secure and free of charge for county like Afghanistan Open source software's are good idea because our country economically state is not that much good, other reason is that in Afghanistan majority of the Users Using pirated and craft illegal close source software's which has very bad consequences, and many Governmental and nongovernmental administrative loses them important data because of the pirated illegal close source software's, the another important requirement of ITC is professional staff, professionalism is the important issues for the IT, non-professional staff could case tremendous damage to the ITC because IT Hardware and software are very sensitive the wrong usage could dysfunction the IT, therefore professional staff are important to hire for the ITC to well manage and control the ITC beside this to provides IT and computer literacy trainings for all University staff, troubleshoot university IT technical problems, build local area Networks and control and mange all IT Related Requirements that is discussed above elaborately,then it will be possible to Improve University in part of Information Technology(IT).

Conclusion

The university of Sayed Jamaluddin Afghani is new it require IT services for the improvement of education and capacity building of university academic and administrative personnel, such as Students, Lecturers as well as administrative staff,they require IT Services for instance, E-mail services, internet services, digital library services, website services, computer and IT literacy trainings services for the staff, Campus network services, PCs Labs Services, Storage or database system services, Course management services, Research Center services, on-line Registration system services etc.to have these IT services then there is need of IT Center and the requirement and prerequisite for the IT Center is IT infrastructures (premises, Power supply, Hardwar, Software and Internet)other requirements like Human resources like organization structure, Budget, etc. before establishing IT for the Sayed Jamaluddin Afghani University the IT infrastructure and requirements must be fulfill that means there must be suitable building, stable power supply, hardware, Software, the internet and other requirements. to conclude and summarized that according to current situation of Sayed Jamaluddin Afghani university it is possible to establish IT center because the building is available for the IT Center, for the power supply the solution suggested solar power system which possible, good quality hardware also suggested, software for the clients side close source and for the Server side open source suggested, as well as the internet and other requirements are possible to fulfill and establish the IT Center at Sayed Jamaluddin Afghani University.

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