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**Study**

**And**

**Recommended Strategy / Plan**

**Phase II Computerization of  
P & D, LG & RD, C & W and FATA-DC**

**For**

**USAID / TADP**

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## 1.0 ACKNOWLEDGEMENTS :

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Special thanks are due to Mr. Nayyer Iqbal for his relentless effort in collecting statistics on the line agencies current status and future computerization needs. His contribution in helping the consultant in understanding the current status of the line agencies computerization and his patience during the data collection phase is also highly appreciated.

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## 2.0 EXECUTIVE SUMMARY :

Tribal Areas Development Project (TADP) of United States Agency for International Development (USAID) provided computer hardware, software, training and skilled manpower to the four line agencies as tools to support USAID / TADP efforts. In the process, the line agencies became more and more aware and demanding to make use of these computers beyond the scope of TADP. USAID / TADP obliged by providing the line agencies with additional computing resources.

Now, many years later, the line agencies have mature applications and computing resources that started with the initial efforts of TADP and were sustained over the years through continuous and relentless efforts of the USAID systems analysts. The line agencies often come up with their computerization requirements to TADP but TADP has limitations in its scope to provide for support that is beyond the scope of TADP.

Computerization efforts by USAID / TADP systems analysts and the resultant outcome is a remarkable achievement. This is in view of the difficult circumstances that they started with including an environment more hostile to change than in a relatively developed province. It was a completely cold start with computer being a totally alien entity in this part of the country.

This study is the result of a Contract No. 391-0471-0-00-1782-00 dated November 1, 1990.

The overall objective of this study was to assess the current state of computerization at all four line agencies and devise a plan for their computerization for Phase II of TADP such that :

- (1) USAID / TADP does not have to give direct support to the line agencies in terms of providing systems analysts except providing advisory service to the line agencies computer centers and funding some of the computerization activities.
- (2) The effort of computerization made to date and its results are sustained in the near future.
- (3) The computer centers are strengthened as institutions by training their manpower, providing them with additional and modern technology and creating senior level posts.
- (4) USAID's support is replaced by a more permanent source of technology i.e the private sector consulting and training organizations in Peshawar.

This study was conducted in three distinct phases i.e data collection, data verification and processing and recommendations.

Data was collected through interviewing top and key officials of the four line agencies and also through forms that were filled out with the help of the line agencies computer center staff. The interviews revolved around the following three questions :

- Q.1 What in your (interviewee's) opinion are the future computing requirements of your line agency ?
- Q.2 What measures can be adopted to make the computer center of the line agency self reliant ?
- Q.3 What assistance can USAID provide in fulfilling the future computing requirements and in helping the computer centers attain self reliance ?

A list of the people interviewed is included as Appendix A.

The current situation is as follows :

- (a) The number of computer center staff is very limited.
- (b) The expertize of the computer center staff is very limited.
- (c) There is only one USAID systems analyst looking after the computerization affairs of all four line agencies in place of four such analysts only a few months ago.
- (d) The computer centers at all four line agencies are used as typing pools by their respective managements.
- (e) The computer center technical staff is often involved in administrative affairs of the computer center.
- (f) The computer centers are having difficulty in hiring technical staff because of the low salary packages and also a very limited career growth path.
- (g) The top management in all four line agencies does not realize its role in the process of computerization.
- (h) A feeling of insecurity exists in the computer center staff as to the future of computerization of the line agencies.
- (i) The line agencies jointly feel that USAID should help / provide consultancy services to conduct a detailed study and devise information systems plan for all four line agencies and also provide extensive training to the technical and management staff the line agencies and advise / supervise these activities so that the line agencies can become self reliant in the future.

Based on this situation a strategy was evolved for further computerization which includes the following main points :

- (i) Development of an Information System Plan (ISP) for all four line agencies.
- (ii) Organizational Relationship Model for future computerization including support from private sector consulting and training organizations and USAID staying in the picture as an advisor / supervisor.
- (iii) Training strategy for line agencies including training for the top management in learning their role in the process of computerization and treating computerization as a process of change and not just automation. Training should not be treated as a skill building media for individuals attending the programs but it should be planned and implemented as an Organizational Development (OD) intervention to bring about improvement in the performance of the organizations.
- (iv) Computer centre employee retention strategy including creating higher level posts in the computer centers to provide a career growth incentive to the younger employees.
- (v) Adopting a structured software development methodology which will ensure software developed to the users specifications, on time delivery of software and easy upgradability and maintenance of older applications.
- (vi) Software standardization effort among line agencies to avoid redundancy of effort at different line agencies and to cater for the inter line agency information exchange.
- (vii) Formation of an independent computer bureau for GONWFP to guide and control all computerization efforts of the GONWFP departments from a central source and also provide a career growth incentive to retain competent high tech manpower in GONWFP.
- (viii) Empowering the end user through decentralized computing. This way, the computer centers will be relieved of the mundane user oriented activities such as data entry and printing of reports and concentrate on more technical activities such as systems planning, design and development and software maintenance of the existing applications.
- (ix) Streamlining the role of the USAID's systems analyst from active participant in computerization efforts to a more catalytic role.

Computerization plan for Phase II is based on the following basic considerations :

- o Consolidate the maintenance and functioning of the existing applications.
- o No further software development should begin until the detailed Information Systems Plan (ISP) is made.
- o No field level computing should be contemplated at present.
- o The integrated approach of information planning, and training given in section 8.0 and shown as an Activity Network should be followed.

Computerization plan for Phase II is based on these considerations because of the current situation summarized in items (a) thru (i) above.

Phase II plan consists of an integrated approach comprising of consolidation efforts for the existing applications through documentation, building of technical expertise at the computer center technical staff and end user level, building of an understanding of the true sense of the process of computerization at the top management level and developing a detailed Information Systems Plan (ISP).

This plan is presented in a detailed implementation schedule and a budget.

### 3.0 SCOPE OF STUDY :

Tribal Areas Development Project (TADP) provided computer hardware, software, training and skilled manpower to the four line agencies as tools to support TADP efforts. In the process, the line agencies became more and more aware and demanding to make use of the computers beyond the scope of TADP. TADP obliged by providing the line agencies with additional computing resources.

Direct support to the four line agencies has been removed and there is currently one systems analyst looking after the computerization affairs of all four line agencies.

In light of the TADP Phase II plans, it was decided to have a study conducted which should help identify ways to sustain the current computerization activities without USAID's direct involvement in activities such as software design and development and provision of skilled manpower.

This study will cover the following :

- (1) Survey the existing computerization achievements in the four line agencies i.e F & D, FATA-DC, LG & RD and C & W in terms of applications development, skill level of the technical staff, computer center staff strength, hardware available, end user computer awareness and future plans of the line agencies.
- (2) Identification of the future computerization needs of the four line agencies.
- (3) Measure the capability of the line agency computer centers at present to further the computerization efforts especially in view of no direct support from USAID systems analysts.
- (4) Identification of ways for the line agency computer centers to achieve self reliance in future computerization efforts and ascertain USAID's role in future.
- (5) Make plan a for Phase II computerization of the line agencies in terms of distinct activities.
- (6) Make a budget for (5) above.
- (7) Identify private sector consulting and training organizations in Peshawar who could provide support to the line agencies for their future computerization.

#### 4.0 OBJECTIVE OF THE STUDY :

The overall objective of this study was to assess the current state of computerization at all four line agencies and devise a plan for their computerization for Phase II of TADP such that :

- (1) USAID / TADP does not have to give direct support to the line agencies in terms of providing systems analysts except providing advisory service to the line agencies computer centers and funding some of the computerization activities.
- (2) The effort of computerization made to date and its results are sustained in the near future.
- (3) The computer centers are strengthened as institutions by training their manpower, providing them with additional and modern technology and creating senior level posts.
- (4) USAID's support is replaced by a more permanent source of technology i.e the private sector consulting and training organizations in and around Peshawar.

## 5.0 STUDY METHODOLOGY :

This study was planned around the following phases :

### (a) Data collection :

Data was collected through :

- o Interviews with the key people of the four line agencies, USAID / TADP systems analysts and senior staff, Computer Science department of University of Peshawar and USAID consultant who previously conducted a similar short study

These interviews were mostly free format but revolved around the following three basic questions :

- Q.1 What in your (interviewee's) opinion are the future computing requirements of your line agency ?
- Q.2 What measures can be adopted to make the computer center of the line agency self reliant ?
- Q.3 What assistance can USAID provide in fulfilling the future computing requirements and in helping the computer centers attain self reliance ?

A list of the people interviewed is included as Appendix A.

- o Data collection forms to gather data on inventories of computer hardware, software and skills. These forms were developed at the beginning of the study and were mainly filled with the computer center staff at each line agency.

Data collected during the study has been collated and presented in section 6.0 entitled 'Study Findings'.

### (b) Data Verification :

Data verification was more or less a parallel process and was carried out simultaneously with data collection. Verification of data included cross checking / verification of the facts / figures and expectations with the USAID systems analyst, information systems manager and USAID senior staff.

(c) Processing of Data and Recommendations :

Processing of data collected and verified during the study was done initially in isolation by the consultant. The recommended strategy for future computerization was then shared with the USAID / TADP senior staff.

The recommendations are such that the current growth potential in terms of computerization of the line agencies is fully exploited and the process of computerization (that was triggered off and made to grow with the help of TADP) is maintained in the future.

## 6.0 STUDY FINDINGS

Data gathered during the data collection phase has been presented in this section as study findings. This section contains the line agencies current situation in terms of its inventories of hardware, software and skills as found by the consultant, the line agencies views on its future computing requirements and the line agencies views on how to make the computer centers self reliant and USAID's role in future computerization of the line agencies.

Current situation and future computing requirements of each line agency are presented separately while the line agencies' views on measures to be adopted in attaining self reliance and USAID's role in future computerization are grouped together as joint response of all line agencies.

The main objective of getting inventories of hardware, software and skills and the line agencies' views on self reliance and USAID's future role was to assess their expectations of the future computerization efforts and incorporate them in future planning for computerization.

## 6.1 Current situation :

Current situation was assessed at each line agency in terms of the inventories of computer hardware, systems software and development tools and applications software developed for the line agency. An inventory of computing skills was also recorded.

Computerization efforts by USAID / TADP systems analysts and the resultant outcome is a remarkable achievement. This is in view of the difficult circumstances that they started with including an environment more hostile to change than in a relatively developed province. It was a completely cold start with computer being a totally alien entity in this part of the country.

Computerization efforts were started with the assistance of USAID / TADP to support the TADP activities but it spread beyond its scope because the line agency end users and staff started to exploit the surplus power of the machines that were already available to them.

All line agencies got full support from TADP as a resource pool in terms of provision of computer hardware, software and skills and an intense, unrelenting and dedicated effort on the part of the USAID systems analysts deputed at the line agencies. The USAID systems analysts initiated the process from motivating the end users to consider the usage of computers to training them, getting them to spell out their user requirements, designing and developing software applications for them, training them in using the applications and implementing the applications in the respective line agencies.

Efforts had been started by USAID / TADP for preparing the line agency computer centers to attain self reliance while the four systems analysts were still with the line agencies. Posts for computer staff including systems analysts, computer programming officers (also known as programmers), data processing supervisors and computer operators for the line agencies had been created with a lot of effort on the part of the USAID / TADP despite difficult bureaucratic hurdles.

It was observed during the study that phasing out of the USAID systems analysts, though necessary, was much too sudden and has left the computerization efforts at all four line agencies in a limbo. A general feeling of insecurity in terms of the future of computerization in the line agencies exists especially among the computer staff. This is primarily because they are not yet prepared technically or management wise to deal with the current computerization efforts or future planning for computerization.

What USAID and the line agency top management is looking at now is the institutional strengthening of the line agency computer centers and their self reliance which is the next step from where

they have reached over the past few years.

Computerization efforts in GONWFP line agencies, although a by product of TADP has produced better results than similar efforts in any of the other three provinces of Pakistan.

The process is now rolling and it is time now that GONWFP plan strategically to sustain functioning of the existing applications, level of computer awareness and enthusiasm among the end users and devise plans to organize, control and monitor all computerization efforts in all line agencies of GONWFP.

USAID systems analyst's direct support in software development and related activities is close to negligible at present. There is currently only one USAID systems analyst looking after the computerization affairs of all four line agencies in place of four systems analysts only a few months ago.

The current USAID analyst is being stretched in all directions by all four line agencies to cater to their problem resolution with the existing applications. He is often involved in the line agency computer center administrative matters. There is no way that one USAID analyst can provide direct support in terms of software development and training to the line agencies.

Posts have been created at the computer centers for systems analysts, programmers, data processing supervisors and computer operators but not all have been filled yet primarily due to insufficient salary package / benefits and a very limited career growth path. The private sector on the other hand offers very attractive salary packages, rapid growth of the individual and relative freedom to switch jobs.

This predicament of the line agency computer centers will remain until drastic measures are taken in reorganizing the structure of the computer centers as proposed in the recommended strategy for computerization in this report (please see section 7.0 for details).

An organizational relationship model including private sector consulting organizations and USAID's future role has been presented in section 7.0 of this report.

The consultant observed that the computer centers were being used as a word processing pool by the line agencies and the non-existence of any senior staff post at the computer center was the main reason to prevent this routine. This practice mainly occupies the computer professionals' time in non technical work and software development, planning for computerization and training etc. are all left as second priority.

The technical staff of the computer centers has also been

entrusted with and is expected to carry out administrative duties alongside the technical work. This environment is not conducive to systems development and will endanger the sustenance of the existing computerization let alone further software development.

Awareness in some quarters of the top management exists in terms of what the actual use of computers should be but this awareness is limited and needs to be spread through training programs for senior officials of the line agencies. Some senior officials have attended professional training programs on a one off basis but a concentrated effort towards intensive training of senior officials has not been initiated.

It may be noted that two high level training programs were offered under the sponsorship of USAID / TADP in December 1987 for C & W, FATA - DC, P & D and LG & RD. These programs were not followed through with similar programs and / shorter programs later. This resulted in a very limited awareness raising among the senior management of the line agencies.

It was observed that no awareness in the top management exists in treating computerization as a process of change and that impacts of computerization are far greater in scope and intensity than what a few machines and software appear to bring about. Also, that computerization is an Organizational Development (OD) effort and the management of line agencies needs to prepare itself and its staff to plan and deal with the results of this effort.

The level of technical skill available at the computer centers is not enough for meeting future computerization requirements at the line agencies as is apparent from the inventories of skills presented in section 6.1.1.

**6.1.1 Inventories of Computing Resources  
of Line Agencies**

Inventories of computer hardware, systems software and development tools, applications software and skills are presented in this section for each line agency.

**(a) P & D Department**

**(i) Inventory of computer hardware / systems software for P & D:**

S.No.	No./Configuration of computers	Usage	Funding Organzn.	Operating System	Development Tools
1.	2 IBM A21 computers	ADP WP	P & D	DOS 4.0	Dbase III P1 Dbase IV WP Rel. 5 Lotus 123 PC Word BASIC
2.	4 IBM PS/2 Model 80 computers	-do-	-do-	-do-	-do-
3.	6 IBM PS/2 Model 50 computers	-do-	-do-	-do-	-do-
4.	2 External Disk Drives				
5.	1 Akhtar IBM PC/AT compat. computers	-do-	-do-	-do-	-do-
6.	3 IBM PC/XT computers	-do-	USAID	-do-	-do-
7.	2 IBM PC/XT computers	-do-	-do-	-do-	-do-

(ii) Inventory of applications software for P & D :

The following applications have been developed at P & D department :

- (1) Annual Development Plan (ADP).
- (2) Quarterly Review Monitoring.
- (3) Rural Settlement Survey.
- (4) Monitoring of Unapproved Schemes.
- (5) Re-appropriation of ADP.
- (6) Selection of Sites Statements.
- (7) Chief Minister's Directives.
- (8) District Briefs.

(iii) Inventory of Skills for P & D :

S.No.	Name	Designation	Education	Computer Training	No.of yrs.in comp. field	Strength
1.	Mohammad Shafique	Programmer	M.Sc.(C.S)		2	Systems Analysis/programming
2.	Shakirullah	DPS	B.A	1 Yr.	6	WP, Dbase
3.	Raziqa Yasmin	DPS	B.A	-do-	5	WP, Dbase
4.	Haroon	EI	B.A	-do-	6	Supervisory.
5.	Zaheeruddin	Operator	B.A	-do-	1	WP, Dbase Fontasy
6.	S. Mahmood	-do-	B.Sc	6 Mo.	1	WP
7.	Khan Mohd.	-do-	B.A	1 Yr.	6 Mo.	WP
8.	Shahid Mamoon	-do-	-do-	6 Mo.	-do-	WP
9.	Akhlaque Ahmd	-do-	-do-	-do-	-do-	WP
10.	Shaheen yousf	Asstt.	-do-	1 Yr.	3	WP

Computer center at the P & D department is better staffed, equipped and managed out of all four line agencies. This is because computerization efforts began here and it was the first line agency to receive the attention and resources in terms of computer hardware, systems software, training and direct support from the USAID systems analysts.

(b) LG & RD Department

(i) Inventory of computer hardware / systems software for  
LG & RD :

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S.No.	No./Configuration of computers	Usage	Funding Organzn.	Operating System	Development Tools
1.	7 Everex computers  5 - Mono. 2 - Color  40 MB HD each		USAID	DOS 3.3	Dbase III Pl Dbase IV WP Rel. 5 Lotus 123 WS 2000 MS Project

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(ii) Inventory of applications software for LG & RD :

The following applications have been developed at LG & RD department :

- (1) Local Development Fund.
- (2) Chief Ministers Directives (CMD) (LDF) 88 - 91.
- (3) Community Uplift Program (CUP), 89 - 91.
- (4) CMD (CUP) 89 - 91.
- (5) CUP 90 - 91
- (6) Black Topping (B/T) of Existing Rural Roads 89 - 91.
- (7) Special Federal Funded Program (SFFP) 89 - 91.
- (8) Rural Works Program (RWP) 89 - 91.
- (9) Special Educational Program 89 - 91.
- (10) Drinking Water Supply System.
- (11) Special Program Rural Roads 89 - 91.
- (12) Detailed report of various projects under USAID.
- (13) Major contracts for Peshawar Division.

(iii) Inventory of Skills for LG & RD :

S.No.	Name	Designation	Education	Computer Training	No.of yrs.in comp. field	Strength
1.	Mohammad Salim	Programmer	M.Sc.(C.S)		5	Systems Analysis/ programming
2.	Abdul Hamid	DPS	B.Sc.		3	WP, Dbase Lotus
3.	Faisal Naeem	-do-	-do-	Diploma	2	-do-
4.	Kamran Murad	Operator	B.A	-do-	3	-do-
5.	Bilal Ahmed	-do-	B.Sc.	-do-	2	-do-
6.	Ahmed Sultan	Steno	B.A	Cert.	3	WP, WS Lotus

(c) C & W Department

(i) Inventory of computer hardware / systems software for  
C & W Department :

S.No.	No./Configuration of computers	Usage	Funding Organzn.	Operating System	Development Tools
1.	4, 286 based computers		USAID	DOS 3.3	Dbase IV WP Rel. 5.1 WP Rel. 4.2 Lotus 123 WS 2000 Framework
2.	1, NEC 286 based computer		C & W	DOS	

(ii) Inventory of applications software for C & W :

The following applications have been developed at C & W department :

- (1) Schedule of rates.
- (2) Personnel data of Grade 17 and above.

Computerization at C & W is almost negligible whereas there is tremendous scope and need for computerization at this line agency. Computers along with the computer center staff are mostly used for word processing.

There is an acute need of Computer Aided Design and Drafting expertise at the Central Design Office (CDO) of this department. The senior management realizes this need but it does not have the know how in planning such training activities.

There is only one computer in the CDO office which is occasionally used for word processing.

(iii) Inventory of Skills for C & W :

S.No.	Name	Designation	Education	Computer Training	No.of yrs.in comp. field	Strength
1.	Khaziqur Rehman	DPS	B.Sc.(Engg.)	1 Yr. Diploma in C.S	6 Mo.	WP and Lotus
2.	Miss Naureen	Data entry Operator	F.A	6 Wks.	8 Yrs. as D.E Oper.	WP
3.	Miss Shahida Anjum	-do-	B.A	Short courses in Dbase, Lotus, WP	6 Mo.	-do-

There is an acute shortage of skills in C & W computer center and is felt at all levels of the management. No development work is being done or attempted due to the non availability of technical staff at the computer center.

Top management of C & W including the Secretary and Deputy Secretary were very enthusiastic about future computerization and also felt that their computer center needed more attention from the USAID systems analyst than it was getting.

(d) FATA-DC.

(i) Inventory of computer hardware / systems software for FATA-DC :

S.No.	No./Configuration of computers	Usage	Funding Organzn.	Operating System	Development Tools
1.	4 IBM 286 computers 3 - Mono. 1 - Color 30 MB HD each		USAID	DOS 3.3	Dbase III Pl Framework WP Rel. 5 Lotus 123 WS 2000 Printmaster AUTOCAD
2.	2 Multitech 286 comp. 30 MB Hard Disk each		FATA	DOS 3.3	
3.	4 Dot Matrix Printers		USAID		
4.	1 Plotter		USAID		
5.	4 UPS units		USAID		

(ii) Inventory of applications software for FATA-DC :

The following applications have been developed at FATA-DC :

- (1) Special Development Program
- (2) Annual Development Program
- (3) Staff Payroll
- (4) Officers Payroll
- (5) Monthly Expenses Statement
- (6) Gauges
- (7) Provident Fund Schedules
- (8) Tube wells monitoring system
- (9) FATA-DC Budget in Lotus 123
- (10) Year wise Allocations of P & D, FATA-DC and MNA / Senator Program.

Applications development process has been set in an orderly fashion primarily due to the USAID systems analyst support and hard work. All applications developed previously are functioning well but this effort can only be sustained if higher level expertise is hired immediately.

(iii) Inventory of Skills for FATA-DC :

S.No.	Name	Designation	Education	Computer Training	No.of yrs.in comp. field	Strength
1.	Farman Ali Shah	Computer Operator	F.A	1 Yr. course	4	Lotus Wordstar WP
2.	Nisar Ahmed	-do-	-do-	-do-	3	-do-
3.	Fazal Subhan	-do-	Matric	-do-	3	Lotus Wordstar
4.	Hashim Ali	-do-	Diploma in Commerce	-do-	3	-do-

## 6.2 Future computing requirements of the four line agencies :

Future computing requirements of the four line agencies are presented below. Please note that these are future requirements as the line agencies' key people view them. The line agencies might not be ready for all these requirements.

Future computerization plan (please see section 8.0) is based on these requirements but does not necessarily include all of them primarily because the line agencies are not in a state of readiness in terms of their technical skills, staff requisition and the actual staff strength and the technology available.

### (a) P & D Department.

Key people in P & D Department view the following activities as the future computerization requirements of their line agency :

- (1) Purchase and installation of a Geographic Information System also known as GIS to chart the geographical maps of various locations in the province and have this information readily available both graphically and in tabular form.
- (2) Extension of the present applications of P & D at the field level.
- (3) Training of computer center staff as well as the line agency's end users and management in computing skills -- from the use of computers to developing systems.
- (4) Training to staff of SDU in computer based project management.
- (5) Extension of scope of the existing applications to perform analysis rather than using them as data storage and retrieval mechanisms. This can be achieved by augmenting the existing applications systems with additional modules.
- (6) Conducting an overall study to work out in depth requirements of each line agency and its integration with the computerization plans of other line agencies.
- (7) Formulation and implementation plan of a policy for maintenance of all computer equipment at the line agency.
- (8) Development of computer models for project appraisal.
- (9) Standardization of reports and other outputs from the existing applications of all line agencies.

- (10) Provision of security features in the existing applications to prevent unauthorised access to government data.
- (11) Expert advice in selection, acquisition and installation of computer hardware, systems software and development tools and selection of consultants for other departments of GONWFP.

(b) LG & RD Department

Key people in LG & RD Department view the following activities as the future computerization requirements of their line agency :

- (1) Design, develop and implement a Budget system for foreign aided development schemes.
- (2) Data compilation of existing applications to be shifted to field level.
- (3) Design, develop and implement a Financial Accounting system for the line agency giving Trial Balance and General Ledger.
- (4) Training on Computer Aided Design and Drafting (CADD) for the line agency's engineers.
- (5) Training on computer based project management skills.
- (6) Training to top management on their role in computerization process.
- (7) Conduct an overall study of all line agencies to evaluate all computerization activities performed to date and remove redundancies / duplication of efforts in their computerization efforts.
- (8) Arrange field trips for line agency computer center staff and end users to peer departments in other provinces to share their experience in similar computerization efforts.
- (9) Plan for computerization of the Local Councils.

(c) C & W Department :

C & W Department requires computerization at the Central Design Office and at the C & W main office. Computing needs that exist at C & W Department are listed below :

- (1) Roads Inventory System consisting of a database of road data and all maintenance activities carried out on them. This system should generate annual maintenance plans for different roads for planned maintenance of the roads.  
  
C & W is in the process of getting technical help from National Transport Resource Center (NTRC) on developing / tailoring an existing system to their needs.
- (2) Traffic Count System to be designed and developed and integrated with the Roads Inventory System.
- (3) Computer Aided Design and Drafting expertize to be developed at the Central Design Office.
- (4) A detailed computerization plan is required with time tables, budgets and written commitments from P & D and Finance Departments alongwith the line agency.
- (5) Comprehensive study to give direction to the computerization efforts at all line agencies.
- (6) All fresh engineers to go through a computer orientation course at the time that they are inducted in C & W.
- (7) Provide an in-house training facility at C & W for continuous and sustained efforts in training of C & W staff and management.
- (8) Train engineers in some modern scientific programming language such as C or PASCAL.
- (9) Training needs to be given to one engineer of the C & W Department to coordinate all computerization affairs of the department and act a user representative.
- (10) Training in computer based project management needs to be given to management handling project management, evaluation appraisal etc.
- (11) Billing System to be implemented at the field level.

(d) FATA-DC :

Following computerization activities need to be performed according to FATA-DC's management and key officials :

- (1) Design and development of an Inventory Control System.
- (2) Identification, design and development of engineering applications for FATA-DC.
- (3) Develop expertise in selection of scientific software packages for special engineering applications.
- (4) Training in computer orientation for all engineers of FATA-DC.
- (5) Training in Computer Aided Design and Drafting (CADD) to be given to engineers.
- (6) Local Area Network within FATA-DC and modem links with the field offices should be provided and implemented.
- (7) Develop an overall plan / strategy for computerization of FATA-DC and its integration with other line agencies.
- (8) Design and develop a Financial Accounting System with tight security features.

6.3 How to make computer centres self reliant ?  
-- A Line Agency's view :

This section contains suggestions from key people of all line agencies to make the line agencies computer centers self reliant. Responses from all line agencies have been grouped together and are presented below :

- (1) Develop complete documentation of all existing applications.
- (2) Provide intensive training as follows :
  - (i) computer orientation skills to all staff including top management, operational staff, stenos etc.
  - (ii) role of management in computerization process training to all line agency management.
  - (iii) technical training on systems analysis and design and programming to the computer center staff.
  - (iv) technical training to engineers in using computers for engineering problem solving tools.
- (3) Expedite the process of hiring technical staff at all computer centers.
- (4) Create high level posts in the computer centers to better manage the computerization process and also provide career growth path for the computer center staff.
- (5) Involve private sector consulting organizations based in and around Peshawar to substitute for USAID's direct support.
- (6) USAID to continue its support in an advisory capacity.

6.4 Role of USAID in future Computerization efforts  
-- A Line Agency's view :

- (1) Provide consultancy either directly or fund such consultancy efforts to devise a comprehensive training plan for all line agencies and suggest ways of implementing it.
- (2) Provide funds to carry out training of line agency staff, management and computer center staff.
- (3) Provide consultancy either directly or fund such consultancy efforts to develop detailed information systems plans for the GONWFP line agencies.
- (4) Assist in an advisory role to select computer center staff and software consultants.
- (5) Provide consultancy help in institutional building of the line agency computer centers.
- (6) Provide advice, funds and supervision of purchase of computer hardware, systems software and development tools.

## 7.0 RECOMMENDED STRATEGY FOR FUTURE COMPUTERIZATION :

Computerization at all line agencies has been carried out by USAID systems analysts. Now that direct assistance from USAID analysts does not exist, the line agencies will have to prepare themselves both technically and management wise to carry on the already rolling process of computerization.

This strategy is the result of interviews conducted at various levels of the line agencies, USAID / TADP and related professionals (please see Appendix A for a detailed list of people interviewed).

This strategy has the following objectives :

- (i) The computer centers of the line agencies become self reliant in terms of all future computerization needs.
- (ii) Dependence on USAID / TADP in terms of direct support such as providing systems analysts for software development, purchase of hardware, systems software and development tools and hardware maintenance is minimized and eventually phased out.
- (iii) Computer center at each line agency is strengthened as an institution by assisting in developing their in-house capabilities in software development, purchase of hardware, software and utilities, hiring of consultants and conducting vendor analysis for purchase of hardware and conducting training programs.
- (iv) Private computer organizations including training institutes, vendors and consultants local in and around Peshawar region are called upon to provide services to the line agencies for their computerization efforts. This will result in development of these private organizations as well. This will also ensure that the line agencies will always be able to tap on these permanently available resources.
- (v) Computerization of each line agency is done as an integrated whole covering the agency's total requirements and not just those that fall under TADP.
- (vi) Future computerization is a change that brings about improvement in the performance and development of the line agencies and not just a high tech effort that needed to be done.
- (vii) Reduce computer center staff turnover to a minimum.

- (viii) Raise awareness in the top management of the line agencies on the process of computerization as a process of change and prepare them to cope with the change effects.
- (ix) Ensure on-time delivery of the applications according to end user specifications.

A detailed Information Systems Plan (ISP) needs to be developed covering each line agency's individual information needs and also looking at all line agencies as a whole. Each line agency will also need to make an integrated effort covering training, standardization in software development and reports / other outputs, software development methodology, software project management and computer center employee retention strategies.

## 7.1 Development of an Information Systems Plan (ISP) for all four line agencies.

A common trend in building computerized information systems is to start with a few microcomputers and add onto the existing hardware as and when the need arises. This way organizations tend to invest more and more in extension of the existing hardware to achieve more efficiency whereas, infact, they are getting caught in a vicious loop of adhoc expansion of their computer facility spending more and more in hardware, software, training and dependency on a system that will reach its limits just another time. User awareness in benefits of computerized systems also increases during this time and the need for integration is felt very acutely but at this point in time, the only choice available to most organizations is to scrap the whole system and develop all applications afresh on a newer, larger computer system to achieve an integrated Management Information System.

This way what appeared to be a cheap, immediate result oriented way of computerization ends up as a very expensive exercise not just in terms of finances but also in terms of the time and effort spent.

Development of an Information System Plan (ISP) is the first and the most crucial step towards information automation. An ISP is analogous to a building's architectural drawings.

### 7.1.1 Scope of ISP Study :

This study will analyse in detail the organizational and information systems goals and objectives and the inventory of current capabilities and resources of the line agencies. The corporate plans of the line agencies will also be discussed in detail during the study to ensure that the Management Information Systems (MIS) can grow with the agency's growth without costly alterations in the already developed software or in replacing the existing hardware configuration.

Based on this data, a complete plan for the computerization of the line agencies covering the requirements for hardware, systems software and utilities, application software, human resources, alternatives for the structure of software development team and training will be developed. It will also contain the financial plan and an implementation phasing strategy.

This study will precipitate the line agency's expectations into a working set of requirements. This study can be treated as a frame of reference for verification at a later stage to ascertain whether the requirements set forth originally have manifested as the real system.

This study will identify problems in the existing information handling procedures of the line agencies and suggest ways to circumvent these problems.

All inputs and outputs for each application system will be worked out in detail in consultation with individual department heads and their staff. Functional requirements of each application will also be worked out and approvals obtained by the respective department. Data preparation, data entry, data validation and data backup procedures will be worked out for each application.

The result of this study will be an Information System Plan (ISP). Detailed outline of the ISP is given in section 8.0 of this proposal.

## 7.2 Organizational Relationship Model for Future Computerization.

The computer centers at the four line agencies are currently having difficulties in carrying out further applications development because of the following reasons :

- (a) Withdrawal of direct involvement of USAID systems analysts.
- (b) Limited computer staff posts and even more limited post occupancy.
- (c) Continuous work load of the current computer applications.
- (d) Additional development work on the existing applications.
- (e) An ever increasing demand for new applications by the end users / senior management.
- (f) Users are more aware of the capabilities of the computer now and subsequently demand more sophisticated results out of the computer applications.
- (g) Demand for increased sophistication and consequently complicated applications requirements.
- (h) Lack of technical as well as software project management skills to take on medium to large scale applications development.
- (i) Inability to take on end user training in computer concepts and in computerization process due to lack of skills both in the content to be imparted and in the art of training.

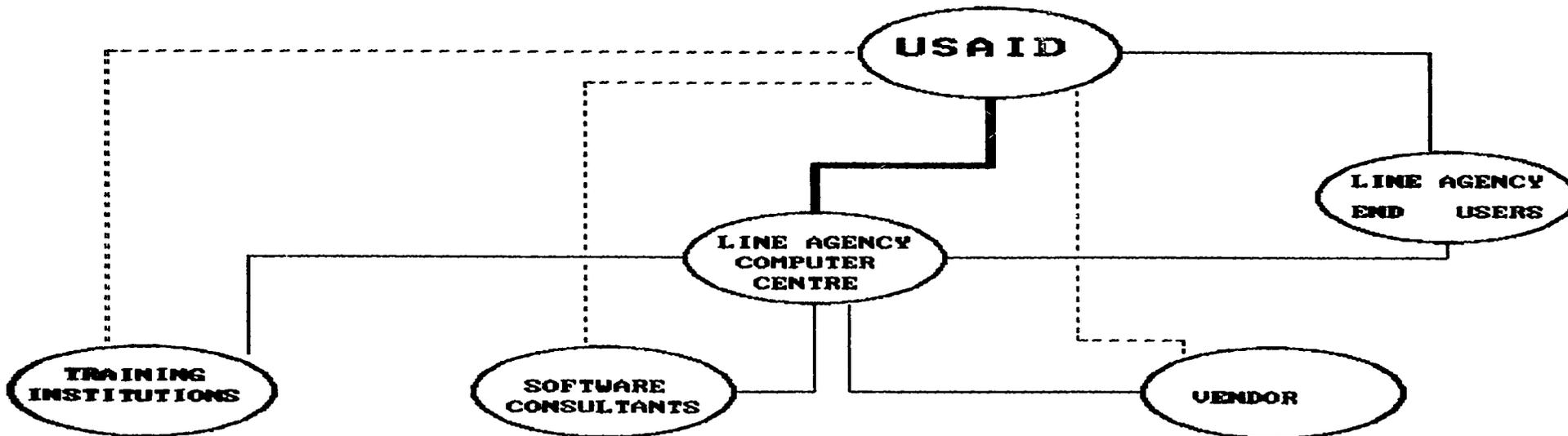
A suggested organizational model is shown in Exhibit 7.1. This model shows six entities and their interaction with each other. The six entities, their roles and their relationships are described below :

### (1) USAID / TADP :

USAID / TADP already has one systems analyst deputed for all four line agencies. It is obvious that this analyst cannot perform the development activities at all four line agencies. The role of USAID will be as a guiding and supervisory body ensuring that all computerization efforts are being performed technically functionally in accordance to the line agency's requirements.

USAID / TADP shall :

- o fund, mobilize and supervise the Information Systems Plan (ISP) study for all line agencies.
- o provide supervisory and advisory assistance for computerization and training to each line agency
- o guide the computer center staff in determining the user



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**LEGEND**

<b>EXHIBIT : 7.1</b>
<b>TITLE : ORGANIZATIONAL RELATIONSHIP MODEL.</b>
<b>—— Direct / Full Time Interaction.</b>
<b>—— Direct Frequent Interaction.</b>
<b>- - - Occasional Interaction.</b>

requirements of the future applications, documenting them and having them signed off by the end users.

- o assist the computer center staff in selecting and hiring outside consultants for development of software.
- o assist the computer center staff in devising and implementation of a software project management system.
- o assist the computer center staff during implementation of the newly developed software.
- o assist the computer center staff in conducting a training needs assessment for the operational as well as senior management staff of the line agency.
- o guide the line agency computer center staff in ascertaining the training needs of the line agency in technical and management subject areas.
- o sponsor training programs for the line agency end user as well as computer center staff in technical, management and training skills areas.
- o help build training capability of the line agency computer centers by funding purchase of training aids, some additional computer equipment and building of a training facility within each line agency so that the line agencies have in-house training capability to train their end users.

## (2) Line Agency Computer Center :

Post for computer staff have been created in all four line agencies as a result of the TADF initiative. These computer centers have been functional under the direct supervision of USAID systems analysts until recently. The role of these computer centers will now have to be enhanced now.

These computer centers do not have the technical capability to take on the entire load of future applications development. The number of posts allocated are not enough for medium to large scale software development. Not just that, it is very hard for the line agencies to attract technically highly qualified and competent staff at senior level to fulfill some of the sophisticated computerization requirements for the end users. Therefore, the role of computer centers with their existing staff strength has been defined in this section.

The computer center staff shall :

- o work under direct supervision and advice of the USAID systems

analyst.

- o assist in conducting user requirements analysis at the respective line agency and get end user sign off with USAID analyst and the outside consultant at the time the Information Systems Plan (ISP) is being made (please see section 7.1 for details of the ISP).
- o ensure that the software consultants follow acceptable standards of software design.
- o develop parts of computer applications alongside the software consultants.
- o monitor the progress of the software consultants according to the agreed schedule.
- o prepare test data for the software consultants to test their applications after development.
- o ensure that applications developed by the software consultants conform to the agreed technical as well as functional specifications.
- o play the lead role during implementation and parallel run of the applications for the end users.
- o conduct computer orientation courses for end users to maximize their involvement and interest.
- o carry out occasional meetings with other line agency counterparts to share experiences and standards.
- o ensuring that all stages of software development are well documented by the software consultants / computer center staff.

(3) Line agency end users and senior management :

Line agency end users and senior management can speed up and facilitate the entire process of computerization by :

- o providing cooperation and dedicated time to the computer center staff and the software consultants in determining the user requirements for their line agency.
- o disregarding the grade levels of the computer center staff / systems analysts of the software consultants and providing them with full information regarding the manual procedures of information handling in their line agency.

- o helping the computer center staff in precipitating / interpreting the not so clear procedures of information handling.
- o creating an awareness that computerization is a process of change and that the entire organization has to prepare itself for coping with this change.
- o taking an initiative in learning how to operate the computer and encouraging their junior staff as well.
- o building their communications skills to communicate the manual procedures and computerization requirements to the analysts in a clear, precise and complete form.
- o devising and implementing some reward mechanism for the computer center staff as extra incentives to curb manpower turnover.
- o helping in formulation of an organizational structure in which the computer centers operate as autonomous bodies within the line agencies and are under the direct control of the top management of the line agency. This will ensure that the services of the computer center will be evenly used across the line agency and not in concentrated corners.
- o helping in building an in-house training capability / facility for training of end users as well as computer center staff.
- o encouraging computer center staff to go for advance courses within and outside Peshawar in technical courses.
- o arranging industrial tours for the computer center staff in other provinces to share experience, knowledge and skills in similar efforts.
- o holding meetings with counter parts in other line agencies to standardize the report formats and information handling procedures across line agencies. This will be a big step towards saving man hours on development of similar applications in different line agencies.

#### (4) Training Institutes :

There are a number of computer training institutes in Peshawar. These institutes offer some basic training programs which can be of use to the line agencies. Training programs for senior management on process of computerization and computerization as a change process etc. may not be within the scope of the local training institutes. Training expertise for such programs can be called in from outside Peshawar.

Training institute selected for conducting training programs for the line agencies should ensure that :

- o all training programs will be preceded by a training needs assessment exercise.
- o trained trainers should offer these programs.
- o training sessions must use modern training techniques such as case studies, simulations and role play.
- o extensive training materials should be given to the participants as reference material.
- o a good trainer / participant ratio should be maintained (1 : 5 is an acceptable standard).
- o all training programs must follow through with projects given to participants to be done in their organizations to internalize the knowledge and skills learned during the training program.
- o all training programs should be evaluated by the participants regarding the level of skills learned, level of skill of the trainer and quality of logistic support.

(5) Software Consulting Company :

Role of the software consulting company will be to design, develop, test and implement applications according to the end user requirements. Software consultants will work with the computer center staff and under the supervision of USAID systems analysts.

The software consultant shall :

- o design, develop, test and implement applications according to the technical as well as the functional specifications laid down in the Information Systems Plan.
- o work out and follow a software project management system.
- o follow the principles of structured systems design and programming.
- o develop documentation at each step of the development process such as software design, coding / debugging / unit testing, system testing and implementation / parallel run.

- o provide training as follows :
  - oo end user training on using the applications.
  - oo computer center staff on maintaining and modifying the applications.
- o ensure availability of trained manpower to remove any bugs or other problems that might arise in the software on a minimum time delay basis.

(6) Vendor :

Most leading vendors have offices in Peshawar.

Responsibilities of the vendor in this organizational model are as follows :

- o provide alternative solutions to the hardware specifications laid out by the line agency.
- o provide maintenance and after sales support for the supplied computer equipment.
- o provide loaner machines in case of breakdown of the supplied computer equipment.
- o provide training to the computer center staff for effectively using the equipment.
- o liaison with the software consulting company, the line agency computer center staff and the USAID systems analyst for problem resolution etc.

### 7.3 Skill building strategy for line agencies.

Extensive training is needed at all levels in all four line agencies. This fact was highlighted by practically every person interviewed during the data collection phase of this study.

Training is generally conducted out of 'canned' training programs. These programs impart certain skills to the participants which are quickly forgotten once the participants are on their job.

The training strategy that we have suggested is aimed at organizational development as well as development of the individual participants.

Objectives of this training effort for all line agencies will be :

- (1) Internalization of the knowledge and skills learned during the training programs by the participants.
- (2) Substantial improvement in the performance of the organization sending the participant for training.
- (3) Institutional development of the line agencies computer centers to continue the skill building effort of the line agencies independently.
- (4) Institutional development of the private sector training institutes in and around Peshawar region to provide a permanent, long term resource for training in computers.

These objectives will be realized by following the essential steps given below :

#### (a) Training Needs Assessment :

Training Needs Assessment (TNA) will be an essential and first step towards conducting any training program for the line agencies. This is an expectation sharing exercise and mainly consists of interviews with the potential participants of a program and the management of the particular line agency. Reasons for holding the training program are identified through these interviews. Specific objectives of the potential training program are established and shared with the participants and their management. These objectives then lead to the design of the training program.

TNA ensures that the right contents for the participants go into the design of the training program and they cater to

a particular group's specific needs.

(b) Design of the training programs :

During the design phase of the training programs, presentations, exercises, case studies, simulations and role plays etc. will be prepared according to a particular group's specific needs.

Reading material to be used during the workshop and for reference is selected and collated as a workshop manual.

Lesson plans for each lesson / session are prepared during this phase as well.

Design of the training programs should include exercises and case studies / mini-projects out of the job environment of the participants so that at the end of the program, the participant has either solved his / her problem completely or partially in which case he / she can carry on working on it even when the program is over.

(c) Conducting the training programs :

Training programs should be conducted according to the lesson plans and program objectives. It should be noted that sometimes the lesson plans need to be changed during mid-course of the training program. The lesson plans and general design of the training program should be flexible enough to incorporate such changes.

(d) Evaluation of the training programs :

Each training program should be evaluated at the session level and at the program level by the participants for :

- (i) effectiveness of content.
- (ii) effectiveness of the delivery.
- (iii) quality of reading material.
- (iv) skill of the training team.
- (v) preparedness of the training team.
- (vi) quality of logistic support.

These evaluation statistics should be analysed occasionally and passed onto the line agency management for progress monitoring of the training effort.

- (e) Short booster programs as follow throughs of the main programs :

Each main program should have a follow through. This should be a short training program after a pre-determined period of time after the main program.

The objectives of these programs are to :

- (i) Ensure that the knowledge and skills imparted during the main program have been internalized by the participants. If not, suggest ways and means to bring about this internalization.
  - (ii) Assess the progress of the mini-project given out at the time of the main programs.
- (f) Conduct 'Training of Trainers Programs in Computers' to train computer center staff as trainers.

Training sets off a change process in organizations. The line agency management has to prepare itself to deal with this change. Training efforts needs to be continued by building 'change agents' within the line agencies. These 'change agents' are computer center staff who have been trained as trainers in computer knowledge / skills at different levels. Training services hired from outside training institutions on a permanent basis is expensive and creates dependency on these institutions. Moreover, in order to strengthen the line agency computer centers as institutions, internal training capability needs to be built into the line agency computer centers.

Training will be conducted at the following levels :

- (1) Top management of line agencies in process of computerization, role of management in computerization, communication skills to communicate user requirements to the analysts in a clear, precise and complete manner.
- (2) End user staff (actual users of the applications) in how to use the applications.
- (3) Engineers to be trained in use of scientific packages and some scientific programming language.
- (4) Computer center staff in computer programming, systems analysis and design, database management systems, local area networks etc.

- (5) Computer center staff in art and science of training to impart training in computers to the line agency staff.

Please note that professional training is only one type of Organizational Development (OD) intervention. Immediate and large scale organizational performance improvement should not be expected at the initial stages. However, if the steps mentioned above are followed closely, substantial improvement in performance of the organization will be experienced.

#### 7.4 Computer centre employee retention strategy.

High tech manpower turnover is rated high around the world and is basically due to a great demand of high tech skills.

Computer centers in the four line agencies have recently hired some programmers, supervisors and computer operators while some posts exist for systems analysts, programmers, data processing supervisors and computer operators. All of these posts have not been filled yet because of low salary and a lack of career growth path for the programmers and analysts. Moreover, the private sector organizations pay well and have a great demand for competitive high tech manpower.

The line agencies will eventually face the problem of their computer staff turnover. Some measures to minimize this problem that can be taken immediately are suggested below :

- (1) Provide organizational independence to the computer centers within the line agency's structure and have them report to the top management of the line agency. This way, the professional staff of the computer center will find that they are not being driven by a certain section of the line agency and they can work in a more independent environment.
- (2) The computer center staff should have a career growth path. Efforts should be made to create a senior level post (Grade Level 19) in each line agency to look after the computerization. This gives a sense of protection to the junior level staff of the computer center and they can concentrate more on their professional work rather than fulfilling the individual needs of some senior official of the line agency. The senior level computer official of the line agency will also give a general sense of direction to the computer staff. Creation of such a post will also be an incentive for the younger staff members to rise upto that post (the career growth path).

During requirements analysis, analysts need to know the corporate and strategic plans in order to incorporate them in their software design and future computerization planning. This would also be facilitated when a senior official exists in the computer centres.

- (3) It was observed during the study that most computer centers were providing word processing services to their respective line agencies. In the presence of a senior official in the computer centers, this can be prevented and word processing skills can be imparted to the end users / their staff. Word processing can be phased out of the computer centers leaving the staff with more professional tasks of software development / maintenance / training, thus bringing more

job satisfaction.

## 7.5 Structured software development methodology.

Software development at the line agencies has been carried out in a more or less ad hoc basis. User and systems documentation in most applications does not exist. No formal documentation exists in terms of user requirements with user sign offs for the applications developed.

For future applications development, a structured software development methodology is suggested.

Objectives of following this methodology are as follows :

- (1) Sufficient proof must exist as to the users commitment in terms of having defined his requirements with user signoffs of the technical and the functional specifications of the applications requested.
- (2) The development process must not be impeded by the departure of any key programmer or analyst in the software development team.
- (3) Modifications or incorporation of additional requirements in the existing software applications should be easy and traceable at a later stage.
- (4) New applications can be integrated with the older applications to provide an integrated Management Information System.

Clearly defined phases of software development process are given below :

- (a) User Requirements Analysis / User signoff :

This phase will be dealt with in development of the Information Systems Plan (please section 7.1 for details).

- (b) Software Design / user department signoff :

In our organizational relationship model, software design is the responsibility of the software consultant. Line agency computer center staff under the guidance of the USAID systems analyst will signoff the software design document prepared by the software consultant.

The software design document will consist of :

- (i) Screen Layout Forms for all input screens.

- (ii) Report / Query Layout Forms for all reports / queries.
- (iii) Program Description Forms for all programs that are envisaged to be written.
- (iv) Data Model for the Database.
- (v) Functional Specifications description of each application.

Test data for the applications is also generated at this stage and should be carefully prepared by the computer center staff under the guidance of the USAID systems analyst.

(c) Coding / Debugging / Unit testing :

During this phase individual programs are coded according to the software design specifications worked out during the software design phase.

The line agency computer center staff under the guidance of the USAID systems analyst shall ensure that the generally followed principles of structured programming are adhered by the software consultant. Recounting these principles in this report will be rather academic and are quite well understood in the computer professionals community.

(d) System testing :

During this phase all programs individually written and tested are tested as a system in order to ascertain that they work together as a system.

This testing is carried out on the basis of the test data prepared during the software design phase to ensure that the actual results of these systems are those envisaged during the design phase.

(e) Implementation / Parallel run :

During this phase, the newly developed application will be run on actual live data alongside the manual system. This phase will consist of the following activities :

(i) Data preparation :

Live actual data is prepared manually to be entered into the computer for processing.

(ii) Data entry :

Manually prepared data is entered into the computer through the data entry screens.

(iii) Data Verification :

Entered data is printed out as edit list and verified against the manual data to verify its correctness.

(iv) Data Posting :

Verified data is posted into the master files through posting programs.

(v) Report Generation :

Reports can now be generated on the posted data.

Items (i) thru (v) are the responsibility of the line agency computer center staff. Software consultants have to be on the alert during this phase to rectify any bugs in the programs or identification of errors in data preparation or data entry resulting in undesired results in the reports.

(f) User Acceptance Testing :

This phase will be the responsibility of the line agency computer center staff. They will test the application to ensure that the application works according to the signed off user requirements both technically (computation wise) and in functionality.

Please note that the software consultant cannot be held responsible for any errors once the computer center staff has cleared the application through user acceptance testing.

(g) End user training / Documentation / Signoff :

End user training is the responsibility the software consultant and is more or less a continuous process. It starts from the day that the user requirements start being identified and continues throughout the software development process.

Line agency computer center staff can participate in this

activity by being part of the software consultant's team of trainers.

This training consists of hands-on sessions on the application for the end user and some discussions. It also consists of hands-on sessions for the computer center staff in data entry, data verification, data posting and report / query generation.

## 7.6 Software standardization effort among line agencies.

During data collection phase of this study, it was discovered that applications software development efforts at various line agencies were made in isolation of each other. This isolated development of applications has led to incompatible standards of applications in terms of their outputs, inputs and documentation.

It is recommended that all aspects of the different applications developed at various line agencies be reviewed and standards evolved in the format of outputs, inputs and documentation acceptable to all line agencies.

## 7.7 Formation of an independent computer bureau in GONWFP.

Formation of an independent computer bureau to in GONWFP seems to be the need of the future. This could be included in the long term plans of computerization of GONWFP line agencies.

Computerization has been and is still treated as a support function and is generally housed within a certain department of an organization. It is seldom realized at the very initial stages that this is a large scale effort involving not just computers but procedures, people and their attitudes towards change. Bringing in a few computers usually triggers off a process of change whose magnitude and impact is not realized by neither the user organization nor the people introducing computers.

The result is systems development in isolation of each other and duplication of efforts, lack of standardization and ad hoc growth.

However, it is to be noted that in certain cases cold start of this process does end up this way; at least triggering off a process which otherwise would have been an unknown territory.

Please note that the computerization efforts by USAID / TADP systems analysts and the resultant outcome is a remarkable achievement from the point of view of the circumstances that they started with and the environment that they faced. The computerization efforts in GONWFP have produced better results than similar efforts in any of the other three provinces of Pakistan.

The process is now rolling and it is time now that GONWFP form a body to plan, organize, control and monitor all computerization efforts in all line agencies of GONWFP.

The aims and objectives of this body would be as follows :

- (1) To ensure proper planning of information systems in all GONWFP line agencies.
- (2) Formulation of and adherence to applications development standards.
- (3) Formulation and implementation of a policy for selection, acquisition and installation of computer hardware.
- (4) Formulation and implementation of a policy for maintenance of computer hardware across all line agencies of GONWFP.
- (5) Formulation and implementation of a policy for selection and promotion for computer professionals for the bureau as well

as for the line agencies, providing a career growth path to the computer staff. This could be a major incentive for retention of quality high tech manpower.

- (6) Act as a hub and a pool of resources -- manpower, skills, technology and training for all GONWFP line agencies.
- (7) Stream line and remove redundancies in efforts of computerization in various line agencies of GONWFP.
- (8) Conduct training needs assessment for all line agencies for nominating suitable participants for training programs.
- (9) Provide a central training facility for training line agency staff and senior management in computers.

## 7.8 Empowering the end user through decentralized computing .

All computing activities including, data entry, report generation etc. at the present are done at the respective computer centers at all four line agencies. This results in a high pressure and work load at the computer centers. The situation is further aggravated when the computer centers are used as typing pools.

It is suggested that in the future, computerization should be designed around a decentralized system of applications. This would involve providing for computer networks commonly known as Local Area Networks or LANs. LANs involve microcomputers with additional LAN cards and networking software that comes as a LAN package.

In addition to this the end users should be empowered by providing them with the necessary know how and skills in operating the applications from their own office premises.

## 7.9 Streamline USAID system analyst's role :

The systems analyst deputed by USAID for the four line agencies needs to streamline his role and budget his time to provide support to all four line agencies.

Computerization at P & D has been more effective than the other line agencies and some of the applications are fully live. The computer center at P & D is very demanding in terms of the USAID's systems analyst time and attention. This would need to be curtailed in the future and the computer center staff would need to be given more time and independence in running their computer center on their own so that they can learn to solve their own problems.

The computer center at C & W is in great need of the USAID's systems analyst's time and attention since they have only one Data Processing Supervisor at the moment on their technical staff and he too has very limited experience for planning or organizing for the department's computerization. Both LG & RD and FATA-DC have more technical staff and expertise compared to C & W to solve their day to day problems.

Therefore, it is strongly recommended that the USAID systems analyst should devote more time to C & W than LG & RD and FATA-DC. The computer center at P & D should be allowed to run more or less on its own with the USAID analyst paying occasional visits to them.

It is recommended that the USAID's systems analyst's role should revolve around the following activities :

- o Provide a consultant's role to the line agencies computer staff in terms of giving advice in :
  - oo studying the user requirements of the line agency's applications.
  - oo guiding the software design process.
  - oo create awareness among the computer centers staff in new methods of structured systems analysis, design, coding and testing.
  - oo transfer technology for assessment, evaluation and procurement of computer hardware, systems software and development tools.
  - oo developing a schedule for training of line agencies computer staff, end users and management and ensuring implementation.

- oo assist in developing documentation standards for the existing as well as future computer applications for the line agencies.
- oo assist in developing software design, testing and implementation standards for the existing and future applications for the line agencies.
- oo develop a unified methodology for standardizing the software development efforts in all four line agencies to curb redundancy in applications development across all line agencies.
- oo provide liaison between external software consultants during the Information Systems Plan (ISP) development.
- oo spend more time in C & W<sup>r</sup> department compared to the other line agencies.
- oo assist the line agencies' management in planning staffing of the computer centers and assist the line agencies in hiring the required staff.

It is highly recommended that the USAID's systems analyst provides advice in an advisory and consulting capacity and DOES NOT get involved in active systems analysis, design or development for the line agencies.

## 8.0 COMPUTERIZATION PLAN FOR PHASE II :

Computerization plan for Phase II for all four line agencies is based on the following basic considerations :

- o Consolidate the maintenance and functioning of the existing applications.
- o No further software development should begin until the detailed Information Systems Plan (ISP) is made.
- o No field level computing should be contemplated at present and concentration should be focused at the computer centers.
- o Expertize building is needed more in the line agencies than purchasing equipment or further software development at present.
- o The computer centers of the line agencies become self reliant in terms of all future computerization needs.
- o Dependence on USAID / TADF in terms of direct support such as providing systems analysts for software development, purchase of hardware, systems software and development tools and hardware maintenance is minimized and eventually phased out.
- o Computer center at each line agency is strengthened as an institution by assisting in developing their in-house capabilities in software development, purchase of hardware, software and utilities, hiring of consultants and conducting vendor analysis for purchase of hardware and conducting training programs.
- o Computerization of each line agency is done as an integrated whole covering the agency's total requirements and not just those that fall under TADF.
- o Future computerization is a change that brings about improvement in the performance and development of the line agencies and not just a high tech effort that needed to be done.
- o Raise awareness in the top management of the line agencies on the process of computerization as a process of change and prepare them to cope with the change effects.
- o The integrated approach of information systems planning, documentation and training presented in this section should be followed.

Phase II plan consists of an integrated approach comprising of consolidation efforts for the existing applications through documentation, building of technical expertise at the computer center technical staff and end user level, building of an understanding of the true sense of the process of computerization at the top management level and developing a detailed Information Systems Plan (ISP).

Phase II plan is presented in the shape of a project schedule showing each activity and the duration associated with it. Please note that these activities have not been scheduled in calendar time but this plan can be started at any given date assigning start and finish dates to each activity.

Care has been taken that the inhouse resources of the line agencies such as their computer centers staff are not loaded too heavily with parallel activities. This schedule also allows the computer center staff to avail maximum opportunity to learn through the courses designed for the technical users.

This plan consists of the following major groups of activities :

(a) Development of an Information Systems Plan :

Need for an Information Systems Plan (ISP) has been discussed in detail in section 7.1.

The Information Systems Plan (ISP) to be prepared for the line agencies will be in the form of a report and will be followed by an audio - visual presentation to the senior officials of the line agencies.

This report will contain but will not be limited to the following items :

- o Organizational set-up of Line Agency.
  - oo Organizational Goals and Objectives
  - oo Organizational structure
- o Evolution of the Current Information System
- o Current Information System Inventory
  - oo Current Hardware, System Software and Utilities and their utilization
  - oo Current applications software and their status / utilization
  - oo Current Human Resources and their utilization
  - oo Existing plans for near future

- o Limitations / Constraints of Current System
- o Proposed Management Information System
  - oo Long term objectives
  - oo Short term objectives
  - oo Description of proposed computerized system at system, subsystem, and applications level
  - oo Hardware Specifications with various configuration alternatives
  - oo Networking trade offs between the line agency and its field offices.
  - oo Query requirements
  - oo Proposed input forms
  - oo Proposed menus
  - oo Proposed report formats
  - oo Proposed Human Resources requirements
  - oo Proposed Data Input procedures
  - oo Proposed Data Backup procedures
  - oo Proposed Electronic mail facility / procedures
  - oo Proposed Documentation standards
- o Major Changes in Current Information System
- o Impacts of proposed system
  - oo Organizational Impacts
  - oo Social impacts
  - oo Strategies to cope with these impacts
- o Training Needs Assessment at various levels of the line agency.
- o Consultant's role in post study activities
- o Development Plan
  - oo Alternatives for procurement of Hardware
  - oo Choice of Systems Software and Utilities
  - oo Overall approach for software development
  - oo End-user training strategy
  - oo Detailed project schedule
  - oo Project team structure
  - oo Project team monitoring mechanism
  - oo Project cost and payment schedule
  - oo Phasing strategy
- o Description of end products and services.
  - oo Applications programs
  - oo Users Guide
  - oo Systems Programmer's Guide
  - oo Configuration Guide

- oo Built-up database
- oo User Training for

- ooo DP Staff
  - ooo End Users

- o Quality parameters for applications software.

The estimated time duration for this ISP study is six months.

(b) Documentation of existing applications :

All existing application software systems at all four line agencies need to be documented. Two types of documents need to be developed namely, Users Guide and Systems Programmers Guide for each application.

Development of both types of documentation is shown as one activity on the attached bar chart.

Outlines of these documents are given below :

(i) Users Guide :

Users Guide of an application should give details of how to operate the application and perform some housekeeping functions such as data backup and restoration functions.

This guide should be written in a simple language keeping the user in mind and it should be void of difficult computer terms.

A typical Users Guide shall have the following contents :

- o Executive Summary
- o Description of the system
  - oo General features of the system
  - oo Capabilities of the system
  - oo Security features
- o Menu Hierarchy and Description
- o Input
  - oo Input Screens
  - oo Data Input Procedures
- o Data Posting Procedures
- o Output Procedures
  - oo Output generation options / priveleges
  - oo Reports and their usage
  - oo Queries and their usage
- o Data backup and restoration procedures

(ii) Systems Programmers Guide :

A Systems Programmers Guide is analogous to a machine's workshop manual. This guide must have all details necessary to incorporate any changes or build on the existing system.

A typical Programmers guide should have the following sections :

- o Executive Summary
- o System Walkthrough with heirarchy of menus
- o Input Screens with detailed support sheets giving the conditions of data entry and description of all fields.
- o Database Structure including the conceptual and logical models.
- o Database Protection and security features
- o Data Dictionary.
- o Program Description Forms for all programs of the application.
- o Report Layout Forms with the approved formats of all reports including Edit lists.

(c) Upgradation of computing facilities at LG & RD and FATA-DC :

The computer centers at LG & RD and FATA-DC require Local Area Networking in order to decentralize the operation of their applications at the end user level.

Novell Netware is already installed at P & D computer center. Selection, acquisition and installation of a LAN at these two line agencies could be carried out together.

Installation of a LAN is a simple exercise but we are allocating about one month for procurement and installation of LANs for both the line agencies due to the the official procedures involved to go about purchasing the LAN systems. We have estimated one more month for conversion of the existing DOS based applications to the LAN environment.

(d) Training at top management level :

Training programs will be organized for the top management of all four line agencies. These training programs will be as follows :

(i) Computer orientation course for top management.

(ii) The computerization process  
-- Role of top management

Course details sheets of both the programs are included in the following pages.

Please note that the participants will need to have taken the first course or equivalent to qualify for the second.

Both the courses have short follow up courses scheduled some weeks after the courses are over (Please the attached schedule).

## COURSE DETAILS SHEET

COURSE TITLE : Computer Orientation for top management

DURATION : 25 Hours.

DATES : To be decided

TIME : To be decided

VENUE : To be decided

POTENTIAL PARTICIPANTS : Top management of all line agencies

OBJECTIVES : To familiarize the participants with the general concepts, applications and power of computers, MIS concepts and Issues. Hands on Sessions on computers on different packages.

CONTENTS : Introduction to Computers

- o Functional characteristics
- o History and computer jargon
- o Categories of computers
- o Working of a computer
- o Hardware and Software
- o Applications of computers
- o Benefits of computers

Introduction to Spreadsheets and Word Processing

Introduction to Data Base Management Systems

Introduction to Management Information Systems and Computer Networks

Exercises and a mini case study

## COURSE DETAILS SHEET

**COURSE TITLE** : The Computerization Process  
-- Role of top management

**DURATION** : 15 Hours.

**DATES** : To be decided

**TIME** : To be decided

**VENUE** : To be decided

**POTENTIAL PARTICIPANTS** : Top management of all line agencies

**OBJECTIVES** : To familiarize the participants with the process of computerization, roles of the vendor, consultant and the user with special emphasis on the role of top management in this process.

**CONTENTS** : Management Information Systems (MIS)

- o Basic definitions
- o Components of MIS
- o MIS Design Issues

Issues in Computerization

- o Computerization as a process of change
- o Impacts of computerization
- o Strategies to cope with impacts of computerization
- o Present System Audit, hardware selection, Vendor / consultant evaluation
- o Case Study

(e) Training at end user level :

Training at the end user level consists of a mandatory computer orientation course for all officers of Grade 17 and above. This course should also be offered to all such staff in the line agencies who could be involved with typing or operating the computer applications.

A course details sheet for this course is attached.

Title of this course is "Computer orientation course for end users".

## COURSE DETAILS SHEET

**COURSE TITLE** : Computer Orientation for end users

**DURATION** : 25 Hours.

**DATES** : To be decided

**TIME** : To be decided

**VENUE** : To be decided

**POTENTIAL PARTICIPANTS** : All officers of Grade 17 and above.

**OBJECTIVES** : To familiarize the participants with the general concepts, applications and power of computers, MIS concepts and Issues. Hands on Sessions on computers on different packages.

**CONTENTS** :

- o Introduction to Computers - Functional characteristics, history, computer jargon, categories of computers, working of a computer, hardware, software, applications of computers, benefits of computers.
- o Hands-on sessions on PC-Tutor, Basic Tutor, MS-DOS
- o Introduction to Wordprocessing - Hands-on Word Star 2000
- o Introduction to Spread sheets. Hands-on sessions on LOTUS 1-2-3 .Using Lotus commands, worksheet handling , using the graphic capabilities of Lotus 1-2-3 - generating the Comparative Income statement, using Graph procedures, print graph
- o Database management with LOTUS 1-2-3
- o Database management systems  
Introduction to dBase III plus. Hands-on session. Creating database, designing inputs, report generation etc.
- o Introduction to MIS and Computer Networks
- o MIS design issues  
tant evaluation.

(f) Training at technical users level :

Technical users are engineers, designers and project managers who will use the computers beyond the scope of the programmed applications. This would include engineers, designers and project managers of all four line agencies. The training programs organized for these technical users are as follows :

- (i) Computer Aided Design and Drafting.
- (ii) Structured Programming for Engineers using PASCAL.
- (iii) Structured Programming for Engineers using 'C' language.
- (iv) Computer Based Project Management.

Please note that a basic computer orientation course or equivalent knowledge will be a prerequisite for taking any of the above courses.

Each of the above courses shall be followed through with a refresher workshop.

## COURSE DETAILS SHEET

COURSE TITLE : Computer Aided Design and Drafting

DURATION : 30 hrs.

DATES : To be decided

TIME : To be decided

VENUE : To be decided

POTENTIAL PARTICIPANTS : Design engineers at CDO (C&W) and other line agencies.

OBJECTIVES : At the end of this course participants would be able to design drawings of electronic, electrical, civil and mechanical engineering applications, architectural designs of all kinds, interior designs, and plot drawings using a general Computer Aided Design Package called AutoCad.

CONTENTS : Introduction to Computer Aided Design (CAD). Computer Aided Design Process. Applications and Benefits of CAD. CAD Technology. Work Station and its Components. CAD Software including Functions of graphic package, Functions of Application software, and Features of AutoCAD. Entity Drawing which includes Line, Point, Circle, Arc, Trace, Point to Point Line, Solid Texts. Editing Techniques which covers, Erase, Oops, Move, Copy, Mirror, Change, Breaks. Measuring CAD drawings which includes Distance, Area, Position, etc. Various Display Controls including Zoom, Pan, View, Fill. Using Multiple Layers, Colors and Line types. Basic and Advanced Drawing Aids including Snap, Grid, Axid, Ortho, Isophore, Isoplane Osnap. Cutting and Pasting including Blocks, Nested Blocks, Insert, Wblock. Learning to use Tablet to assist CAD. Three dimensional Entity drawing aids including Visualizing drawings from different view points in space, Placing entities on different Z planes, Assigning extrusion thickness to

entities. Using Elev, Vpoint and Hide.  
Advanced Features of CAD system including  
Dimension, Hatch, Shell. Configuring CAD  
system, including configuration of  
Plotter, Digitizer and Printer Plotter.  
Plotting CAD drawings. CAD system  
Utilities which cover Help, Status,files.

## COURSE DETAILS SHEET

COURSE TITLE : Structured Programming for Engineers using PASCAL

DURATION : 24 hours

DATES : To be decided

TIME : To be decided

VENUE : To be decided

POTENTIAL PARTICIPANTS : Engineers and designers of all four line agencies.

OBJECTIVES : To introduce participants to programming Principles and problem solving in PASCAL.

CONTENTS : o Variables and Constants

- o Read, Readln, Write, Writeln statements and concept of Begin and End statements
- o Legal and illegal identifiers and scope of identifiers
- o Assignments and Expressions
- o Subprograms including procedures and functions
- o CASE and IF - THEN - ELSE constructs
- o LOOPING STRUCTURES including FOR, WHILE-DO, REPEAT-UNTIL
- o DATA STRUCTURES including Arrays, Records and Files
- o Hands-On Exercises
- o Case Study

## COURSE DETAILS SHEET

- COURSE TITLE** : Structured Programming for Engineers using 'C' Language
- DURATION** : 20 hours
- DATES** : To be decided
- TIME** : To be decided
- VENUE** : To be decided
- POTENTIAL PARTICIPANTS** : Engineers and designers of all four line agencies.
- OBJECTIVES** : At the end of the course, the participants should be familiar with structured programming principles and be able to write programs in 'C' language.
- CONTENTS** :
- o Fundamentals of Structured Programming.
  - o Fundamentals of C language including identifiers, keywords, comments and constants.
  - o Variables, constants, declarations initialization, conversion, operators and expressions in C language.
  - o Flow of Control including relational, equality and logical operators, IF - ELSE statements, WHILE and FOR loops, DO WHILE loop, switch, Goto, labels, break and continue. Data types including char, integral types such as short, long and unsigned, float and double. Using Mathematical functions. Functions, arrays, strings and pointers including function arguments and returning values, relationship between arrays and pointers, pointer addresses, using pointers to process strings etc. Structured Programming in C language including top - down design, functions and their prototypes, and the return statement. Use of Macro including

`#define` and `#include`. Use of recurring statements. Structures including declaration, initialization, and accessing a member. Using structures with functions, arrays and pointers. Input and Output File maintenance including the functions `Getchar`, `Putchar`, `Printf`, `Scanf`, `Stderr`, `Exit` etc.

Case Studies.

## COURSE DETAILS SHEET

COURSE TITLE : Computer Based Project Management

DURATION : 30 hours

DATES : To be decided

TIME : To be decided

VENUE : To be decided

POTENTIAL PARTICIPANTS : All project planners and managers of all four line agencies.

OBJECTIVES : At the end of the course, the participants should be familiar with the basic concepts of project management and be able to apply these concepts in running their projects using a computer based project management tool.

CONTENTS :

- o The project cycle
- o Work Breakdown Structure
  - oo Subprojects
  - oo Groups of Activities
  - oo Activities
- o Building an Activity Network
  - oo Precedence Diagrams
  - oo Concept and practice of Activity Numbers, Activity Durations
  - oo Earliest Start, Earliest Finish and Latest Start and Latest Finish
- o Network Scheduling
- o Computer Based Project Management using INSTAPLAN
- o Exercises
- o Case Studies

**(g) Training at computer center staff level :**

Technical training is needed at the the computer center staff level. Following courses have been designed for the computer center staff :

- (i) Systems Analysis and Design.
- (ii) Communications Skills for the Systems Analyst.
- (iii) Introduction to Local Area Networking.
- (iv) Advance Database techniques.
- (v) Advance course in Dbase III Plus.
- (vi) Training of Trainers in Computers.

Course details sheets of each of these courses are attached in the following pages.

Each of these courses will be followed through with a refresher course as shown on the attached schedule.

Participants of these courses are Data Processing Supervisors and above including the systems analysts hired by the line agencies.

## COURSE DETAILS SHEET

**TITLE** : Systems Analysis and Design

**DURATION** : 30 hrs.

**DATES** : To be decided

**TIME** : To be decided

**VENUE** : To be decided

**POTENTIAL PARTICIPANTS** : Data Processing Supervisors and Computer Programmers of all four line agencies.

**OBJECTIVES** : To learn different techniques in Systems Analysis, System Design & Database Design.  
To develop communication skills for fact gathering for User Requirement Analysis.  
To learn Software Engineering Principles.

**CONTENTS** : Overview of Systems Analysis

Feasibility Study

User Requirements Analysis

- o Framework for fact gathering
- o Techniques for gathering and analysing facts
- o User requirement report writing

MIS Design

- o Design Process
- o MIS Design Techniques
- o MIS Design Forms and their usage

Database Design and Development

- o Database Concepts
- o Conceptual Designing
- o Logical Designing

Software Engineering Principles

Case Study

## COURSE DETAILS SHEET

**TITLE** : Communication Skills for the Systems Analyst

**DURATION** : 15 hrs.

**DATES** : To be decided

**TIME** : To be decided

**VENUE** : To be decided

**POTENTIAL PARTICIPANTS** : Data Processing Supervisors, Computer Programmers and Systems Analysts of all four line agencies.

**OBJECTIVES** : To learn different communications skills for fact gathering for User Requirement Analysis and communicating with clients.

**CONTENTS** :

- o Overview of the communication process
- o Active Listening
- o Feedback
- o Interviews
  - oo Types of interviews
  - oo Preparing for interviews
  - oo Conducting interviews
  - oo Processing interview data
  - oo Feedback
- o Questionnaires
  - oo Types of Questionnaires
  - oo Constructing Questionnaires
  - oo Administering Questionnaires
  - oo Feedback
- o Exercises
- o Role Plays

## COURSE DETAILS SHEET

- COURSE TITLE : Introduction to Local Area Networking
- DATES : To be decided
- TIME : To be decided
- DURATION : 25 Hours
- POTENTIAL PARTICIPANTS : Data Processing Supervisors and Computer Programmers of all four line agencies.
- OBJECTIVES : At the end of the course the participants will be able to
- o Identify Computer Networking applications in their environment
  - o Work out a Local Area Network (LAN) configuration most suited to them
- COURSE CONTENTS :
- o Introduction to Data Communications/ Computer Networks
    - oo Role of communications
    - oo Advantage of electronic data transfer
    - oo Business applications
    - oo Local Area information exchange etc.
  - o Communication not a mystery
    - oo Communications fundamentals
  - o Computer Communications hardware (with demonstrations)
    - oo Standard
    - oo Pins
    - oo Cables
    - oo Connectors
    - oo Cards
  - o Communications Software
    - oo Software layers
    - oo Characteristics and Capabilities

- oo References models
- o Local Area Networks (LAN)  
(with demonstrations)
  - oo Fundamentals of LANs
  - oo Network types
  - oo Hands on session on a LAN
- o Current and future applications on IBM PC  
based LAN
  - oo Electronic mail
  - oo Distributed processing etc.
- o LAN versus one Multiuser System
  - oo Economics
  - oo Trade-offs
- o Case Study

## COURSE DETAILS SHEET

COURSE TITLE : Advance Database Techniques

DURATION : 25 hrs.

DATES : To be decided

TIME : To be decided

VENUE : To be decided

POTENTIAL PARTICIPANTS : Data Processing Supervisors, Computer Programmers and Systems Analysts of all four line agencies.

OBJECTIVES : To familiarize the participants with the advance techniques of database design and its interface with a host language.

COURSE CONTENTS :

- o Review of basic Database concepts
- o Overview of systems design techniques
- o Input and Output design
- o The Database Environment
- o Database versus File Environment
- o Common Data Dictionary
- o Database Administration
- o Database Design
  - oo Conceptual Model Design
  - oo Logical Model Design
- o Relational DBMS data manipulation language and its interface with a host language.
- o Relational DBMS data retrieval and Query language and its interface with a host language.
- o Database Security
- o Database Integrity

## COURSE DETAILS SHEET

COURSE TITLE : An Advance Course on Dbase III Plus.

DURATION : 25 hrs.

DATES : To be decided

TIME : To be decided

VENUE : To be decided

POTENTIAL PARTICIPANTS : Data Processing Supervisors and Computer Programmers of all four line agencies.

OBJECTIVES : To familiarize the participants with the elements of database management techniques using a standard database management package called Dbase III Plus.

COURSE CONTENTS :

- o Review of Database concepts : entities attributes, key data elements, primary and secondary keys.
- o Database vs. Datafile environment. Data Independence. Database design - Conceptual and logical models. Database management system. Design techniques. Relationships. Database modelling. Relational databases.
- o What is Dbase III + database management system?.
- o Review of basic DBase III + concepts - datafiles and variables. Dbase file types. Running Dbase. Help and Assist menus. Creating a database structure. Modifying a database structure. Adding records to the structure. Editing, Appending and deleting records. Display, List, Retrieve and Dir commands. Copying, Renaming, Erasing and Closing a file. Sorting Data. Find, Seek and Locate data. Indexing a file. Count, Sum and Total numeric functions. Using more than one database file.
- o Create, view, modify and display a query.

- o Create and Retrieve reports using the report generation.
- o Interface of Dbase files with Lotus 1-2-3 spread sheet package.
- o Screen designing using Screen painter
- o Automatic program generation
- o Menu generation
- o Programming techniques for databases
- o Using Foxbase
- o Case study

## COURSE DETAILS SHEET

COURSE TITLE : Training of Trainers in Computers

DURATION : 30 hrs.

DATES : To be decided

TIME : To be decided

VENUE : To be decided

OBJECTIVE : To familiarize the participants with Adult learning principles and Action Research and Training, and apply these methods in developing training modules on computers.

CONTENTS :

- o Adult Learning Principles, Action Research and Training Cycle.
- o Presentation and Facilitation skills
- o Developing training modules for senior, middle and operational management on Computer Orientation.
- o Developing training modules for senior, middle and operational management on popular software packages such as Lotus 1-2-3, dbase III Plus, Wordstar 2000 etc.,
- o Developing training modules on special topics such as computers in Project management, Local Area Networking etc.

(h) Budget for Phase II Computerization.

The following budget estimates have been made for all activities planned for Phase II computerization plan of TADP / USAID. These estimates are based on the following assumptions :

- (i) Information System Plan (ISP) will be made by an outside consultant.
- (ii) Documentation of the existing applications will be done by the computer center staff.
- (iii) Charges for the training programs have been worked out as follows :
  - o Average course has a maximum of 15 participants.
  - o The courses are held in a five star hotel.
  - o Outside training institutes are employed for training programs.

## BUDGET

S. No.	Activity Description	Budgeted Amount (Rupees)
(a)	Development of an Information System Plan (ISP)	600,000/-
(b)	Documentation of existing applications	--
(c)	Upgradation of computer facilities at LG & RD and FATA-DC	100,000/-
(d)	Training at top management level	
	o Computer Orientation for top mgmt.	160,000/-
	o The computerization process	100,000/-
(e)	Training at end user level	
	o Computer Orientation course for end users	225,000/-
(f)	Training at technical users level	
	o Computer Aided Design and Drafting	160,000/-
	o Structured Programming for Engineers using Pascal	100,000/-
	o Structured Programming for Engineers using 'C' language	100,000/-
	o Computer based project management	100,000/-
(g)	Training at computer center staff level	
	o Systems Analysis and Design	50,000/-
	o Communications skills for the systems analysts	30,000/-
	o Introduction to Local Area Networking	80,000/-
	o Advance Database Techniques	50,000/-
	o Advance course in Dbase III Plus	100,000/-
	o Training of Trainers in Computers	160,000/-
T O T A L		2,115,000/-

**APPENDIX A : LIST OF KEY PEOPLE INTERVIEWED :**

A list of key people interviewed during the data collection phase is given below :

**(a) Planning and Development Division :**

1. Mr. Khalid Aziz Additional Chief Secretary
2. Mr. Suleman Ghani Secretary
3. Mr. Tipu Mohabbat Khan Chief, SDF
4. Mr. R. D Williams Chief, Computer Section
5. Mr. Mukhtar Chief Economist
6. Mr. Asif Khan Director, TADP
7. Mr. Mirza Ziwwar Baig (Former USAID Systems Analyst at P & D)
8. P & D Computer Center Staff.

**(b) Local Government and Rural Development Department :**

1. Mr. Hifzur Rehman Director General
2. Mr. Laiq Khan Secretary, LCB
3. Mr. Khattak Deputy Secretary, LCB
4. Mr. Abdul Latif Khan Secretary (Local Govt.)
5. Mr. Mohammad Ehtasham Secretary to Governor, NWFP (Former Secretary of LG & RD)
6. LG & RD Computer Center Staff.

**(c) Communications and Works Department :**

1. Mr. Adam Khan Secretary
2. Mr. Abdul Qayum Deputy Secretary
3. Mr. Tariq Saeed Principal Engineer, CDO
4. Mr. Aqil Niazi (Former USAID Systems Analyst to C & W)
5. C & W Computer Center Staff.

**(d) Federally Administered Tribal Areas Development Corporation :**

1. Mr. Mohammad Javed Secretary
2. Mr. Taj Mohammad Afridi Director, Technical
3. Mr. Noor Hassan Jan Director, Industries
4. FATA-DC Computer Center Staff.

**(e) United States Agency for International Development,  
Peshawar :**

- |                           |  |
|---------------------------|--|
| 1. Mr. Tariq Durrani      | Acting Deputy Chief, ARD   |
| 2. Mr. Ziauddin           | Information Systems Manager  |
| 3. Mr. Nayyer Iqbal       | Systems Analyst  |
| 4. Mr. Iftikhar Hussain   | Acting Project Officer,<br>USAID / TADP  |
| 5. Mr. Jamshedul Hasan    | Chief Engineer   |
| 6. Ms. Christine Sheckler | Program and Narcotics<br>Manager, RDD/ARD, USAID, Ibd.<br>(Former consultant,<br>USAID / TADP) |

**(f) University of Peshawar :**

- |             |  |
|-------------|--|
| 1. Dr. Abid | Professor, Computer Science<br>Department. |
|-------------|--|