Pakistan
Punjab Education Sector Project
Credit No. IDA 5106-PK
Contact No. PMS/44/2012
Assignment Title: DEVELOPMENT, IMPLEMENTATION OF ‘WEB BASED SCHOOLS PROCUREMENT PLANNING TOOL’

The Government of Punjab has received financing from the World Bank towards the cost of the Second Punjab Education Sector Project, and intends to apply part of the proceeds for consulting services.

The Government of Punjab is implementing the Education Sector Reforms Programme (PESRP) with the assistance of the World Bank to support and scale-up specific interventions to improve education outcomes. Under this programme, the Government of Punjab intends to develop and implement ‘Web Based Schools Procurement Planning Tool’ which will provide interface to all concerned users i.e. School Councils to prepare their procurement plans as per the allocated budgets. The tool will also provide interface to users to review/approve the schools procurement plans, monitor the progress and expenditure details etc. By introducing new web based tool, data will be collected timely in regard to any head of account and other related information which would be helpful for the policy makers for better policy decisions and for others as well.

For the above purpose, the Government of Punjab intends to engage a capable and experienced IT/Software development firm which can develop and implement Web Based Schools Procurement Planning Tool for about 50,000 to 54,000 Primary, Elementary, Secondary and High Secondary Schools of 36 Districts of the Punjab Province. The application and the system to be developed will be fully tested and IT/Software development firm is also required to provide support for a period of at least one year in order to resolve any bugs after development/operationalization. The firm will also propose the technical solution for automation of the process.

The PESRP, Program Monitoring and Implementation Unit (PMIU) now invites registered software development firms etc to indicate their interest in providing the Services. Interested firms should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services.

EOI Evaluation/shortlisting criteria is as under:
The attention of interested Consultants is drawn to paragraph 1.9 of the World Bank’s *Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers* [January 2011] (“Consultant Guidelines”), setting forth the World Bank’s policy on conflict of interest.

A consulting firm will be selected in accordance with the Selection Based on Consultants Qualification (CQS) method set out in the World Bank’s Guidelines: Selection and Employment of Consultants (under IBRD Loans & IDA Credits and Grants) by World Bank Borrowers (2011).

A consulting firm may associate with other firms in the form of a joint venture or a subconsultancy to enhance their qualifications.

Further information can be obtained at the address below during office hours *i.e. 0800 to 1600 Monday to Friday*.

Expression of interest must be delivered in a written form to the address below by October 7, 2013:

PMIU-PESRP
School Education Department
8-A, Ali Block, New Garden Town
Lahore
Tel: 042-35867923
School Procurement Planning Tool

kanjum@worldbank.org

Aug 29 (4 days ago)

to me, hwaheed, slatif

Tariq sb.

Can you please give us an update of the tool. The Bank has cleared the TORs and the last update we received that the procurement process has been initiated

Thanks and Regards
SCHOOL EDUCATION DEPARTMENT
GOVERNMENT OF THE PUNJAB

PUNJAB EDUCATION SECTOR PROGRAM (PESP)

TERMS OF REFERENCE (TORs)

FOR
Hiring the Services of IT Firm
For
‘DEVELOPMENT AND IMPLEMENTATION
OF
WEB BASED SCHOOLS PROCUREMENT PLANNING TOOL’

May 2013
1. Background/Justification

Programme Monitoring and Implementation Units (PMIU) of Education Sector Reforms Programme, Punjab is responsible for implementation and monitoring the education sector related reforms initiated by the Government of Punjab. The purpose of these reforms is to improve educational attainment of children of school-going age. School Procurement Planning Tool (SPPT) is to ensure tracking of expenditure, physical progress and funds utilization to enhance the education system delivery.

2. Purpose and Objectives

The Program Monitoring & Implementation Unit (PMIU), is responsible for managing the reforms programme which includes various initiatives. One of the initiates is to engage a capable and experienced software development firm which can establish web-based School Procurement Planning Tool (SPPT) under most likely MS Windows Operating System as the present mechanism is not so congenial for report writing. A number of difficulties are confronted in data collection on any head of account and it takes a lot of time. To avoid the delays and gathering of data/information within the shortest possible time, there is a requirement to introduce such a system which can help generate desired reports immediately for further policy decision and research work. For the purpose, PMIU intends to develop an online web based School Procurement Planning Tool which can provide interface to all concerned users i.e. School Councils to prepare their procurement plans as per the allocated budget and update the plan as per the actual implementation. The tool should also provide interface to users to review/approve the schools procurement plans and monitor the progress and expenditure details etc.

The purpose of this document is to provide a Software Requirement Specifications for the proposed development of SPPT. This document will provide an overview of the current system which will help in better understanding and development of the proposed system.

The new mechanism will serve as a record of formal requirements for the SPPT project and will outline the project's details, requirements, interface, design issues, and components. Since the information regarding School Procurement Planning Tool is very important, the immediate objective of the SPPT project is to improve the School demand and expenditure records service delivery of the Province of Punjab, contributing to long-lasting tenure security and more efficient functioning of school education department, and to establish a basis for complete integration of information associated with Schools. The software development firm will propose the technical solution for automation of the process. The detail is as under:

3. Overall Description

This section will provide a high-level overview of the characteristics of SPPT. It will specify the environment; it will be used in, the anticipated users of the SPPT software, the known constraints, assumptions and dependencies. The overall architecture of the system can be summarized as:

Design and implementation constraints

This section will cover design and implementation constraints that will be encountered during the development of SPPT.

Software Constraints

- The web access module should be interoperable with all major browsers.
- This web facility to track the status of application will be available at the kiosk level e.g. a user at kiosk can see the status of his budget, allocation, demand and expenditure status. However, this facility is not provided to general public through Internet.
- All the business processes should be as prescribed in Punjab School Education Department rules and procedure.
- Developed application should not be client software dependent. For example, if the user’s browser has a high security level, it should not breach it. The developed applications should have its own installation module that should take care of all the initial requirements and the end user should not be concerned about this aspect.
- The design should follow UML standards and should be documented at every stage.
- Developed application should not be tightly coupled with the database layer. If in a future date the current server is replaced by some other server e.g. ORACLE to SQL Server, the code should be portable.
- The developed application should have a high degree of cohesion such that each module deals with a separate task. Modules should not be highly dependent on other modules such that changes in a related module necessitate major changes in the main module.
- Developed application should be upgradeable, configurable and easily maintainable.
- The SPPT Software should have capability to replicate the data on a specified schedule or on an as-needed basis.
- The system should be able to apply FIFO (First in First Out) as to handle applications queue base on the priorities assigned to the transactions e.g. if 20 applicants applied for mutation and the last applicant required the mutation on urgent basis. If that applicant offers to pay the amount of the remaining relevant 19 applicant then SPPT Software should facilitate this feature accordingly.

**Hardware Constraints**

The developed SPPT software should be designed to efficiently interoperate with the highly heterogeneous hardware currently available. The current hardware setup ranges between state-of-the-art servers and desktop PCs in the provincial headquarters to low-end computers for data entry at the School/Markaz/Tehsil/District level.

The developed SPPT software should leverage the hardware used by SPPT and make transition to the new system in a phased schedule. This in turn means that, while phasing the transition, the application should be backward compatible as well as account for performance enhancements resulting from emerging hardware.

Moreover, all the transfer of data between Kiosk(s) to Tehsil(s) / District HQ Tehsil(s) will be through dial up connection.

**Security**

Given the sensitivity of the information managed by the proposed SPPT software, the design of the SPPT system must play special attention to the security of the system. The proposed SPPT software architecture must address the following security considerations:

- Authentication: The system must implement role-based access control. There must be different levels of security and privileges according to the use, department and authority of a user.

- Online Security Certificates: For highly sensitive information, for instance right of modifying an existing entry over the Internet, the system provision for the use of Internet security certificates in web browsers.
• Encryption: In order to protect sensitive data on the network, the system must use encrypted connections for all network traffic.

• Integrity: The system must include mechanisms for ensuring integrity of sensitive data by digital checksums and digital fingerprinting.

• Persistent Versioning: The system must be designed to maintain persistent and retrievable versions of all data entered in the system.

• Ability of the system to detect any manual tampering of the data at DB level by someone with systems level access.

• Ability of the system to detect and block any unauthorized machine from getting on the network.

• Ability of the system security supervisor to block any user, machine on the system. Or to approve the registration of a new machine or user at one level below i.e. Tehsil / District HQ Tehsil(s) needs to authorize any user or machines at Kiosk.

• Ability of the system to detect any tampering with log files.

Due to the critical nature of data the system should provide:

• **Data Security**
  As the data is highly classified field level encryption should be provided in the database for storage as well as in the communication.

• **Data Integrity**
  The SPPT software must ensure persistence of records and log updates to track changes in the system; the system must ensure that no record is ever deleted, while changes to the database must always be traced back to an authorized person.

  Due to the critical nature of data, secure online transactions are required; the digital signature mechanism (or any other security mechanism for secure online communication) for the secure communication.

• **Data Authenticity**
  Once the data has been entered no one can modify the original entry; digital checksum or message digest mechanism should be used for data authentication.

**Customization**
Since the operational users can increase therefore expansion of the systems should be seamless.

The System should be flexible and modular, changeable as per requirements since SPPT is operational from the head office to the School level. The SPPT software must be customizable at user language level it means it can be operated in Urdu as well as English language. It is desirable to develop all the School Record forms and reports in Urdu language however some statistical and summary reports pertaining transactions should be in English Language. The report formats will be provided during the analysis phase of SPPT. The, customized updates patches of the product can be integrated in the system during the Maintenance phase.

**Performance**
Response time for this application is critical as BOR deals with highly sensitive and important information.

The areas where response time is critical are as under:
• Reporting Process.
• Communication (Data Transfer) between Kiosks, Tehsil / District HQ Tehsil(s) and Provincial Data Centre.
• Query Processing.

Assumptions and dependencies
Currently, the SPPT software does not have any assumptions and dependencies.

System Requirement

Design Requirements
This section specifies the high-level design requirements for the development and implementation of SPPT.

Operating Environment
The operating requirement of SPPT will be distributed, may comprise of heterogeneous hardware, a diverse set of users and evolving user requirements.

Architectural Environment
The architecture of the developed SPPT software system should be modular, extensible and portable. Specifically, the developed software system must meet the following requirements:

• Server-side application should not be dependent on client software. For example, if the user’s browser has a high security level, it should not breach it.
• The developed software should be based on a layered architecture decoupling the application software and the database. For instance, if in a future date the current server is replaced by some other server e.g. ORACLE to SQL Server, the code should be portable.
• The developed SPPT software must be based on a clearly delineated object-oriented design. Each module in the SPPT software must have a clean, well-defined interface with other modules in the system, permitting separation of concerns and modular updates.
• The developed SPPT software should have a comprehensive and easy to use installation mechanism, capable of installing, configuring and trouble-shooting the installation of the SPPT software on a variety of platforms.
• The developed SPPT should be designed for a smooth transition from the current system to a fully automated solution, permitting phased upgrades without disrupting the operation of the system.

Software Requirement

Functional Requirement
Basic System Operations
• The SPPT software should be able to store scanned images of all documents, maps and registers, and link them accordingly.
• The instantaneous synchronization of databases would not be required for the pilot phase. The synchronization of database at various levels should be done at least on weekly basis.
• Support for Geo-Coordinates.
• Support of attaching scanned documents to transactions
• Indexing and attaching of scanned images with original records. Here the link will be many-to-one because there are multiple records against each scanned page.

Hard Copies
The SPPT software should be able to produce printed copies (hard copies) of documents and registers digitized in the prescribed format. The printed copies may be used for validating the data entered in the system by concerned School officials.

The system must be able to generate hard-copies (printouts) of any digitized record such that they can be used as certified copies.

Storage and Retrieval of data
- The SPPT software must provide a facility to store, retrieve and analyze data. The Consulting Firm system must provision for interfacing with a third-party data warehouse.
- The system must have a facility to generate a consolidated database which can be used by the School and district administrations to monitor analyze and evaluate the system.
- The system must provide a flexible and extensible interface to retrieve and present data to the users.
- It must be possible to generate summarized reports of the system for management purposes.
- The system must be able to export raw data in a portable format for interfacing with external systems and for special reporting requirements.

User Role Management
Centralized user role management will be done at the Provincial Data Centre Level. The rights of the users can define / changed by the user higher in the hierarchy in the system.

User Interface
- The SPPT software should be able to produce printouts and user interfaces based on UNICODE to support URDU font and all other user-friendly fonts.
- The SPPT software should minimize the tedium of data input from the users. Similar data entry fields in various forms and registers should be consolidated, and automatically cross-referenced.

4. Scope of Work

SPPT will serve the purpose of automating the tasks and processes that are involved in implementing the school procurement reforms policy of the Education Department, Government of Punjab. Punjab School Education Department has around 58,000 schools in 36 Districts, 131 Tehsils and around 1000 Markaz (Sub-division) of different level and category as under:

- Masjid Maktab School (MMS) = 1,922
- Primary = 42,142
- Middle = 7,756
- High = 5,590
- Higher Secondary = 588

(List of District, Tehsil, Level, Gender and Location wise Schools attached at Annex – ‘A’)

The scope of the SPPT project is to provide an automated system that will enable the generation and management in respect to the following:

- School Based Budget
  - Allocation
  - Execution
  - Transactions
  - Recording/Reporting

- Funds Allocation for Missing Facilities and Furniture
  - PESRP and other Departments/Agencies Allocation
  - Funds Releases
- Execution
- Transactions
- Recording/Reporting

- School Council Funds
  - Balance B/F
  - PESRP Allocation
  - Grant from other Govt. Sources
  - Grant from non-Govt. Sources
  - Expenditure during the Fiscal Year

- Faroughe Taleem Fund (FTF)
  - Balance B/F
  - Funds Collection during the Fiscal year
  - Expenditure during the Fiscal Year

Eligible Expenditure Program (EEP) which includes procurable items is non-salary budget to school, school council grants and the grants to PEF for supporting public-private partnership with low-cost private schools. Procurement arrangements and procedures for these EEPs have been agreed with School Education Department SED/Program Monitoring and Implementation Unit (PMIU). Under Punjab Education Sector Reform Program (PESRP), fiduciary guidelines for school council grants were developed and distributed to school councils; these guidelines will be revised if needed and redistributed under PESRP II. These fiduciary guidelines will also be adapted for use by the low-cost private school supported by Punjab Education Foundation (PEF). Main features/process of Scope of Work is following:

- Defining of Procedure and System for EEPs
- Identification/Definition of Procurable Items
- Provision for Allocation of Classification wise Budget
- User Demand for EEPs (Scheme Profiling)
- Fund Allocation for Approved Demand
- Inspection of Physical Progress and Quality
- Tracking of Funds releases and utilization
- Performance of School Procurement
- Establishment of MIS and Efficient Reporting System
- User defined Role-based Access through extensive security System

**Deliverables**

Following deliverables shall be delivered by the Consultant to The Client.

**Requirements**

- The developed application will be web based and desktop. The web access has limited permissions e.g. the user can only view and search the records through web access but cannot change or have the authorized copy of the record.
- The Consultant shall produce a maximum of 100 customized reports in English / Urdu Font as and when required by the Client during the SPPT Project.
- The Consultant shall install the complete SPPT Software application at the Data Entry Consultant(s) / Vendor(s) site(s) selected by the Client. There shall be no additional licensing and installation charges (other than the price quoted in the financial proposal of the Consultant) for the Client and the data entry Consultant(s) / Vendor(s). Also, the
Consultant shall train the relevant technical staff of the Client in installing the SPPT Software Application and provide all the source code and third party tools (if used in the SPPT Software application) to the Client. There shall be no additional charge to the Client and Data Entry Consultant(s) / Vendor(s) for this service given by the Consultant.

- The SPPT Software Application must be developed on the latest version of tools, technology(ies) and database(s) (for example .Net, Java, SQL Server, ORACLE etc). The Consultant shall be required to substantiate the stability of the version used to develop the SPPT software.
- Any third party application development tool(s) and database(s) used in the SPPT Software application must be supported by the original third party Vendor(s). The SPPT Software developed on an older / de-supported version of the application development tool(s) or database(s) shall not be accepted.

**Deliverables**

- Complete developed software application with Source Code. Source Code (“Source Code consists of all the procedural code with comments along with dependant libraries of the developed software application.”)
- The Consultant shall carry out a detailed system analysis prior to the presentation of the ‘Functional Specifications (FS)’. The FS document may inherit from the ‘Software Requirement Specifications Document’ prepared by the Consultant and approved by the Client after the detail analysis of existing business process of the Client.
- The Consultant shall present a Detailed Project Schedule Prior Software Design.
- The Consultant shall present a Detailed Software Design comprising of Object Model, Dynamic Model and Physical Data Model.
- The Consultant shall provide Development Status Report and Unit Test Metrics report during the Deployment Phase.
- The Consultant shall provide Detailed Test Plan and Detailed Test Cases before the start of System Test Phase.
- The Consultant shall provide Test Status Report after the completion of System Test Phase.
- The Consultant shall perform User Acceptance Testing along with Client personnel and submit the report at the end.
- The Consultant shall install the Application Software on the production site(s) to perform data entry, scanning and other activities related to SPPT project.
- The Consultant shall provide training to the relevant technical staff of the Client Resources for the Software wherever (in Punjab Pakistan) the Client desired.
- The Consultant shall provide a SPPT project Status Report on daily basis and when requested by the Client Management. Complete Functional Specification Document of the developed software application with each and every parameter/function calls from each page along with functions logic (separately). The following deliverables will also be provided for this document.
- As-Is Analysis Document: - This document will describe the AS-IS infra structure and software. It will also include the As-Is Business process documentation.
- To-Be MAP of IT and Business Processes
- Data flow diagrams.
- Logical Data Model.
- Functional and non-functional Requirements.
- Constraints and Assumptions.
- Use Case diagram and narrative Use Cases.
- Perspective users along with their roles and responsibilities.
- Test cases.
- Risk Analysis
  (Note: All the major stake holders must be identified and interviewed in this stage. All the meetings and requirements from the stake holders must be properly documented and reviewed regularly by the concerned stake holders. Minutes of the meetings must also be submitted to the concerned person of PMIU.)
- Any tool or component, produced by a third party that is used in the development of SPPT software application must be provided along with documentation. Any usage of third party material can only take place after getting prior approval from the Client.
- Class Diagram of each class with its member functions and properties.
- User Manual, Quality test plan and test cases.
- High Level Technical Architecture with process flow chart and DFD etc.
- Complete Database Design with data dictionary and relationship diagram.
- Complete Higher Level Detail of Database including the stored procedure, views, trigger etc.
- Domain Knowledge Document.
- All the deliverables including the SPPT Software source code shall become the exclusive property of the Client and Government of the Punjab. Two hard copies of all the documentations related to the SPPT project shall be submitted to the Client by the Consultant.
- Any other belongings of the SPPT project that has not mentioned above.
- The Consultant shall submit all the documentations and deliverables related to the SPPT project, in hard copy and electronic format (editable format), to the Client.
- Update patches of the software application for the customization should be provide as per requirements.

5. Timelines

The assignment will provide the following end products within the timelines given against each:

- Inception Report 1 weeks after signing of contract
- Analysis Report 1 week
- System Design (Software Requirement and Functional Specifications) 1-2 weeks
- Software Prototyping 1-2 weeks
- Development of software 3 weeks
- Implementation Plan 2 weeks
- Operational Manual 1 week
- User Training, Testing and Debugging 2 weeks
- Job Completion Report 1 week

5. Timeframe

The timelines for the assignment will be around 3-4 months after signing off the contract
6. The Other Software Features, Functional and General Requirements

6.1 Functionalities

- Decision support/performance analysis tools
- Standard or pre-defined reports
- Management portal for access to system data
- Progress status tracking
- Adhoc Reporting

6.2 Open Systems Orientation

- System runs multi-user, multi-task over a WAN, and LAN-to-LAN
- System supports a central Provincial server
- System supports relational data base structures
- System relies on referential integrity within the database (foreign keys and primary key constraints are enabled)
- The data model is published to allow direct extraction of data into a data warehouse. If the data model is not published then a set of views must be available.
- All information fields can be displayed or printed as needed throughout the system
- Data can be updated from multiple locations by authorized users
- Updates to data can be made in real time and are immediately visible through all modules

6.3 Audit Features

- Ability to identify which fields will be tracked
- Ability to track user id, date, and time for selected fields
- Ability to track prior and revised field contents
- Ability to produce and print auditor reports of specified audited field information
- Ability to revise and monitor which fields are part of the audited set on-line
- Ability to attach free form note fields to audited fields

6.4 On-line Help Features

- System generated on-line help information for all fields
- List value selections available for all table driven fields
- Ability to generate a printed list of any table values requested
- Ability for the user to access online help regarding screen or field description and its intended use.
- Ability for the user to access online help regarding valid table values for appropriate fields.

6.5 Custom Screens (future use for Administrator only)

- Ability to create user defined screens
- Ability to create user defined tables associated with fields
- Ability to define properties and edits for user defined fields
- Ability to add user defined fields to a system defined screen
- Ability to add system defined fields to a user defined screen
- Ability to perform all standard query and reporting functions
- Ability to restrict data entry by assigning automatic data entry checks to fields
needed.
• Ability to designate any field as required/mandatory
• Dynamic sizing of windows to eliminate scrolling
• The system has the ability to assign business logic to fields and processes.

6.6 System Utilities

• Ability to view and correct software problems from remote sites on the network. Indicate platform dependence, if any.
• Ability to monitor system performance across the WAN and be warned of possible developing problems
• Applications are site independent (i.e. based on security level data can be viewed/manipulated from any location)
• System data can be recovered from backup without losing any updates from backup to the point of failure

6.7 System Back-ups

• The system provides back-up capabilities.
• The system provides capability for selective and full back-ups and recoveries of the database.
• Ability to either restore the entire data or any specified level/tier
• The system remains accessible during back-up processes

6.8 Support and Training

• Support and Documentation
• Vendor presentations at User Group Meetings
• Complete user manuals for all modules included
• User Documentation available on-line
• User Documentation available in printed text format
• Ability to reproduce documentation without restriction
• Complete error message documentation included
• Complete error message documentation available on-line
• Complete error message documentation available in printed text format
• New user training manuals for all modules included
• Comprehensive, fully documented data dictionary included
• File and Table layouts included
• System Flow descriptions included
• Program Descriptions/Narratives included
• Cross References for use of files, tables, and programs included
• Operations manuals and procedures included
• Administration & operations manual included
• District assigned staff (multiple users) permitted to call toll free support

6.9 Training

After the finalization of the software, training will be imparted to the specified officers/officials in who will subsequently lead as master trainers and will impart training to the concerned stakeholders. However, the firm will continue providing the feedback on the contemporary issues observed during the launching/implementation period of the software. The firm will also provide technical assistance in case any difficulty is noticed in its proper operations etc.
• Ability to establish a "train the trainer" model
• training for appropriate client service staff during implementation and also when new or updated releases of software are to be implemented

6.10 Queries

• Ability to create Fully Functional queries without knowing any programming language.
• Ability to display context-sensitive help features throughout.
• Ability to save and use again, modified, or copied and change queries.
• Ability to allow the results of executing a query to be accessible on screen, on paper, or transferable in ASCII format for loading into another package or tool. (e.g., MS Excel, Access or Word)
• Ability to sort of rows in multiple orders.
• Ability to graph and chart results of query where appropriate.

6.11 Security Features of the Application

• Application must provide inherent data security features and authorized security control system
• The system allows a periodic "forced" password change and comprehensive authorized password control system
• Ability to support different "views" of records based on security for different user categories.
• Ability to define user/groups/school level profiles across schools/Tehsil/Markaz/District/Province
• Access to the report level
• Access control by task/functions/screens/fields/modules/user department level etc.
• Access control log for system manager

7. Selection Method
7.1. A consulting firm will be selected in accordance with the Selection Based on Consultants Qualification (CQS) method set out in the World Bank’s Guidelines: Selection and Employment of Consultants (under IBRD Loans & IDA Credits and Grants) by World Bank Borrowers (2011).
7.2. A consulting firm may associate with other firms in the form of a joint venture or a sub consultancy to enhance their qualifications.

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