

MAHESHWARI PUBLIC SCHOOL, JAIPUR

A Case Study of Inhouse Computerisation of School System

Prepared by

Dr.A.K.Pandey, Principal, Gyan Vihar, Jaipur

*Former Principal, NMDC, Panna (M.P.),
Education Director, Herman Gmeiner Schools, New Delhi,
Faculty, Institute of Educational administration, Kolkatta
Consultant, UNICEF Education Project &
Principal, Maheshwari Public School, Jaipur*

Dr A K Pandey was Principal of Maheshwari Public School (MPS) from 01.12.1998 to 30.06.2005. Maheshwari Public School promoted by Shri Maheswari Samaj was established in July 1977 in Jawahar Nagar area of Jaipur. It is affiliated to CBSE and it is also an accredited institute of National Institution of Open Schooling. The school has currently student strength of 3000 and teacher strength of 145. In +2 stream, it offers both science and commerce streams. The school campus is of 11,400 square yard with a carpet area of 1.25 sq. ft. There are altogether 62 sections with classes from I to XII. Well equipped Physics, Chemistry and Biology labs are established. The school has also installed closed circuit television (CCTV) so that principal sitting in his/her room can to find out what's happening in which classes. Similarly a 2-way public address system to address one/more/all rooms has been installed.

In his last assignment as Education Director of Hermann Gmeiner Schools, Faridabad, Dr Pandey had taken interest to popularize information technology (IT). Though he does not consider himself as an IT expert, he has still acquired some basic skills in IT through his personal efforts. He is fond of e-mailing and loves to be in touch with his old students and friends through e-mails. He can also word process a document without any external effort, and his current passion is to learn PowerPoint presentation well. After joining the school he realized that Maheshwari Public School has been a leader in IT implementation in Jaipur with computer education being imparted in the school since 1986. In April 1986, MPS had set up a computer lab with 30 PC-386 systems. MPS was also the first school in Rajasthan to implement Bharatiyavidya; a computer based teaching (CBT) aid with a large screen TV¹. The school had invested quite a bit in setting up a good IT infrastructure.

Dr. Pandey also found out that the previous principal, Mr. Handoo was a progressive person and had encouraged some interested teachers to develop small software to automate various functions of the school. The process of software development started with Mr. E V Ajay Simha a Geography teacher trying to develop a payroll system as part of his hobby. Slowly with the support of Ashish Bhargava (Personal Assistant to the Principal), Mr. Naveen Mandhan (teacher in Comp. Sc. Dept.), Preeti Saxena (computer teacher.) and Ritu Sareen (computer teacher) this process got converted into a full fledged and formal software development activity. Even, Ms

¹ The large screen TV substitutes a LCD projector and thereby reduces the overall cost. The system and the CBTs are supplied by Jay Prakash Industries Ltd.,Shababad,(U.P.)

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Abhilasha Sharma, head of computer science department helped the team in the conceptualizing some of the software.

In 1993, the first software to be developed in house was the Payroll System followed by the Fee Collection System and Student Registration System in 1994. Examination department software was developed in 1995. Three years later the time table software was developed. In 2000, leave record of staff was computerized using an in-house software and in 2001 a software for Allocation of Streams for Class XI was developed. In 2002 Teachers Performance Monitoring System was brought into use. Since 1995, some limited computerization of seating plans for board and external examinations are being done by the Examination department using Lotus 1-2-3 program. The latest software is the Student Attendance System.

Dr. Pandey decided to continue this process and in fact tried to formalize the process little bit by recognizing the efforts of the teachers and rationalizing their workload. He also initiated a comprehensive training program for his staff members. Three kinds of computer training programs were organised: 1) for computer teachers to learn the emerging technologies 2) for administrative staff in office automation work 3) subject teachers in use of computers in teaching and other routine work. One week training program for computer teachers is conducted by external experts every year. The other two programs for teachers and administrative staff are conducted by in-house staff members. All these have resulted into various benefits. Teachers at MPS have been trained to use computers as teaching aids. Staff members have become comfortable is using computers for entering data, generating reports and doing a little bit of word processing. The school software team has been able to develop and implement a number of programs that take care of various functions of the school (*See Exhibit-1* to know more about various programs developed at MPS). In fact, besides MPS, its other sister schools (Shri Maheswari Senior Secondary School, Maheswari Girls Senior Secondary School, and Maheswari Girls Public School) are also using the programs developed by software team of MPS. For example, Library and Fee Collection System developed by MPS are being used by sister schools since last 4 years. Examination System would be used by them from this year while Attendance System would be brought into practice from the next year.

Dr Pandey keeps attending various training programs organized both in Rajasthan and at all India level (*Exhibit 2* shows various programs attended, research paper published by Dr Pandey and other activities of Dr Pandey *Exhibit 3*). He is also member of some committees related to course fixation and other education related issues. With his exposure, he feels that MPS is still to achieve a lot in school automation. For example, most of the software at MPS is stand alone with some facility of data exchange. This means there is still a lot of data duplication that hogs space and breeds inaccuracy and inconsistency in data. Most of the programs have been developed using FoxPro on DOS, an old software tool (*See Exhibit-4* to know which programs are developed by whom and on what platform). These programs can be made to operate faster or in friendlier manner if they can be remade using newer tools like Oracle² or Visual BASIC³.

Though some articles in the net, Dr. Pandey also discovered that some schools abroad have started making available some appropriate school data like the performance of the students,

² Oracle is powerful database management software. It is used as a backend tool for large database projects.

³ Visual Basic is front end interface software. This provided the user interface through which a user puts data into the Oracle database or retrieve data from there.

school schedule, and circulars to the parents through the school websites. Dr Pandey believes MPS can also establish similar facilities for its parents. Though MPS has established two LANs (one for computer lab and the other for school information system), the school is yet to establish a campus wide network with supporting SIS to become an information rich school. All these goals and challenges encouraged Dr Pandey to think of establishing a long term IT strategy for the school. For this purpose, he invited a well known IT consultant from Delhi who could look at the school systems and help to devise a strategy. The consultant was shown the existing IT infrastructure (**See Exhibit-5** for the IT infrastructure of MPS) and the software currently being used in MPS. The consultant also talked individually to vice principal, some subject teachers, computer teachers, students and office staff to get an overview of the perception of different stakeholders regarding the existing school information system (**See Exhibit 6** for observations of different stakeholders).

Dr. Pandey has to resign from Maheshwari Public School due to differences with the management on the point of this project. He wanted that neighboring schools must be benefited by using such developments. At present he is the Principal of Gyan Vihar, a co-educational English Medium School at Malviya Nagar, Jaipur affiliated to CBSE. Gyan Vihar is a six year old school with strength of nearly 900 students. It runs its Engineering, Management and several PG Courses having its affiliation to University of Rajasthan and approval of AICTE.

Exhibit-1 **Various School Management Software at MPS**

All the software in school management system of Maheswari Public School use Exam Roll Number as the primary key for data storage and retrieval. Besides Exam Roll Number, a student also has an Enrollment Number which is a serial number followed by the last two digits of the year of admission (XXXX/YY). Exam Roll Number consists of first two digits representing the class a student is currently in, the next one digit representing the section and two more digits representing the class roll number (e.g. 01.1.12). Each year with the payment of first installment of fee, the new Exam Roll Number for the student is generated. Enrollment Number is used only when a student is tracked across academic years.

All Databases in use are usually in shared mode. However, the rights to read/write/scan/modify/erase etc. are set partially through FoxPro program and mostly through Novell Netware user rights. Access to different directories/files is also set according to the username of Novell Netware.

a. Student Registration System

It is the first system that school's customers (parents and students) come across. It starts with the buying of an application form where the data such as the student's name, his/her parent's name, address, application number and the class to which admission sought is recorded. This system generates the admission test list. After the admission test, results are entered and a list of successful candidates is prepared. This system completes its work with the completion of the admission process. The data from this system is exported to Fee Collection System and Student Information Database in order to avoid duplication of efforts and data entry errors.

b. Fee Collection System (FCS)

Fee is collected 4 times in a year. Parents can pay all the four installments in one go. The FCS gets its database from the Student Registration System. The system generates various reports like collection by operators (for reconciliation), collection by day, defaulters' list, fine details because of late payment, etc. It also has the provision to accept bus fee and parking charges etc. The number of transactions has increased from 150-200 in manual system to 400-450 per operator in this automated system. The *Exhibit-6* shows the increase in number of students in the school. *Annexure-1* shows a sample of fee receipt and *Annexure-2* shows Summary of Fee Collection Report (operator wise).

c. Examination System

Marks obtained in various examinations are captured and stored in the Examination System. Some activities and behavioral subjects have grades rather than marks. These grades are also inputted to the system. Attendance data is also inputted currently. Soon the attendance data will be imported from the Student Attendance System. The system generated Grade cards are sent to parents. Besides this, report cards of section toppers (first 3) and class toppers (first 3) are generated and displayed on the notice boards for the benefit of the students. The system has 8 years of data in its archives. This is used for verification when students seek admission to foreign institutions.

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Subject wise, teacher wise and section wise comparative reports also can be generated. Performance report of a teacher for a subject over a period of 3 to 5 years also can be generated to evaluate the growth of a teacher. Performance evaluation report containing students above 90%, between 70-90% (both the numbers and %age) can also be generated. The database of the system provides a good opportunity for data mining to look at different patterns in students' and teachers' performance. *Annexure-3* shows a sample Grade Card.

d. Time Table Management System

Parameters like teachers' names, number of periods and subjects taken by teachers are fed into the system. Constraints like block periods (2 periods together), lab teachers not to be given theory classes, two computer teachers in the computer practical etc. are also input into the system. Thus a time table is generated for each section and teacher. The system is still not very perfect and requires manual intervention in case of clashes (e.g. same teacher in two classes at the same time or two subjects for one section at the same time). Similarly, a comprehensive time table for the school is prepared manually.

Handling substitution for teachers on leave is also part of this system. It allots substitution classes to teachers who have taken least substitution classes so far. A monthly list of substitution classes taken by various teachers can be generated. The system is still not able to handle constraints such as substituting a teacher from the same discipline. *Annexure 4, 5 & 6* show Class-wise Time Table, Teacher-wise Time Table and Schedule of Arrangement Classes.

e. Leave Record System

It is an independent system and not part of the payroll system. A teacher is allowed three kinds of leaves: EL (Earned Leave), CL (Casual leave) and ML (Medical leave). When a teacher wants to obtain leave s/he has to fill in an application form and mention the kind of leave s/he intends to take. The person in charge of this system then fills in the kind and amount of leave still due for the applicant. After the leave has been sanctioned by the Principal the person in charge enters the kind and number of leave taken by the applicant into the Leave Record System. This system can generate anytime the leave status of all employees. However, the leave encashment procedure is done manually.

f. Payroll System

It is comprehensive software and performs all functions like any commercially available software. Though, the school has no system of giving loans, the software can handle loans if necessary. The software calculates income tax to be paid by each staff member and generates Form 16A. It also takes care of arrear. *Annexure 7* shows a sample Pay Slip.

g. Staff Performance Monitoring System

Tasks given to each individual staff member are entered into the system and monitored. This system is handled only by the Principal. Monthly report of all tasks allotted, teacher wise tasks allotted, and date wise task allotted are generated. When a task is given, principal enters the teacher's name, task given and expected finish date and when the task is completed the actual finish date is entered against the task.

h. Library Management System

The school library has over 12000 books. The database for the books is divided into 5 or 6 small data files with reference to accession number in order to enhance the access speed. Each student

is allowed 2 books at a time. The system takes care of issue, receipt, fine (if any) and searching by category of topic/ author/ accession number. Accession number is entered manually though the system has a provision to generate accession number. This is because the accession number is generated subject wise and not bill wise. Reports such as overdue books (class wise/ section wise/ alphabetically with respect to a student/ accession number) and complete accession registers (author/ subject/ accession number) are generated.

i. Allocation of Streams System

This system takes total percentage of marks, average of percentage in Mathematics & Science, and preference of the student as inputs and prepares a stream allotment chart for the students. It takes into consideration the constraints like number of seats available in each section. It also generates various statistics like how many opted for what and how many were allotted and the subject they wanted etc.

j. Student Attendance System

After noting who were absent on a particular day, each class teacher enters that data for a particular section and day into this system. The system then generates monthly attendance report. It also calculates shortfalls for each student and generates a report accordingly. This system has been made part of the Lab Network as each class teacher has to enter the data as soon as the classes are over. Office Computer Network does not have that many of workstations available at a time. *Annexure 8, 9 & 10* show input form for Daily Attendance, Month wise Attendance Report of a Section and Consolidate Attendance of a Class.

k. Staff Attendance System

This system was bought from COMDEX and implemented in August 2000. At the time of entry and exit a staff member has to swipe his/her ID card containing unique bar code. The time of entry and exit are recorded and a monthly statement is generated.

l. Accounting System

The school uses Tally for its accounting operation. This system was bought in 1999.

Exhibit 2

Training Programs attended and research papers published by Dr. Pandey

A: MEMBERS OF PROFESSIONAL BODIES:

1. Life Member of Psycho-Linguistic Association of India.
2. Life Member Indian Psychological Association.
3. Life Member of Indian Journal of Psychometry & Education.
4. Life Member of Psychological Association.
5. Life Member of Prachi Psycho-cultural Research association.
6. Life Member of HRD, Jaipur Chapter.

B: RESEARCH PAPERS REFERENCES:

1. Risk Taking and Some of the Correlates of Educational Administration, JIE, March 1991.(RTSCEA)
2. Problems of Educational Administrators – Parikshak, M.P.Education Board, April, 1991 (PEA)
3. Study of Relationship Between Socio-economic Status and their Attitudes towards School, BAS, October 1991. (RSESAS)
4. Open Classroom, A New Experiment – PT, October 1991. (OC)
5. Divergent Thinking in Relation to Scholastic Achievement, Cognitive Style, Self-concept and Interest Pattern, JER, January 1992. (PHDTA)
6. Effect of Socio-Economic Status on the Decision Making Capacity of Principals, BAS, October 1992. (ESES DMCP)
7. Impact of Head of the Institution and Teachers relationship on Public Schools Examination Results, Jnl.of Psychometric & Education, May 1994. (IPEDRP)
8. Relationship of Self – Concept & Academic Achievement of Abandoned & Destitute Children, Psycholingua, March 1995. (SCAAADC)
9. Administrative Effectiveness, Administrative Style and Decision Making of Educational Administrators, National Conference, Management of School Education in India, April 16-17,1998,NIEPA, New Delhi. (AESDMEA)
10. Study of Academic Achievement and Socio Economic Status of SOS Children, Psycholingua, July 1998. (AASESSOSO)
11. Mental Health and some of the Correlates of Decision Making Capacity of Educational Administrators, Journal of Psychometric & Education, February 1999. (MHCDMCEA)
12. Reforming School Education by Professional Training of School Principals, Paper Presented at National Seminar Cum Workshop on Management Challenges for Quality School education for All (EFA) in the 21st Centaury, organized by Indian Institute of Rural Development, Jaipur from 12-14 November 1999. (RSEPTSP)
13. Training for our Educational Administrators, Paper Presented at 2nd Round Table conference. The Content of Education, CMS Education, Luck now, November 29 to December 6,1999. (TFOEA)

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14. Role of Educational Managers in New Millennium, Paper Presented at Second Indian Education Science Congress, University of Kalyani, Nadia (W.B.), 21-23, January, 2000. **(REMNM)**
15. Impact of Primary Education on Developing the Rural Poor, Paper Presented at National Conference on Behavioral Management in Rural Development, Organized by Haryana Institute of Rural Development, Nilokheri, in Collaboration with Prachi Psycho-cultural Association from 03-05, August, 2000. **(IPEDRP)**
16. Education and the Challenges in the First Millennium of 21st Centaury, Paper Presented at Golden Jubilee Conference of International Schools Association held at Jaipur from 5-8, July 2001. **(EDUCATION AND CHALL)**
17. Effect of Self-Esteem and Human Relationship on Decision Making Capacity of Educational Administrators **(ESEHRDMCEA)**.

C: NEWSPAPER PUBLICATIONS

1. The Changed Role of Educational Administrators-Amrita Bazar Patrika, 27, Feb., 1990 **(CROEA)**
2. Educational Administrators Needs Training Programme – Amrita Bazar Patrika, 30 April, 1990 **(EANTP)**
3. Educational Administrators & School Environment – Deshbandhu, 27 June 1993. **(EASE)**
4. Bachho Ko Sahi Shiksha Do – Deshbandhu, 11 July, 1993 **(BKSSD)**
5. Social Change & Role of School – Deshbandhu, 17 July 1993. **(SCRS)**
6. Public Schools – For Names Only- Deshbandhu, 31 August 1993. **(PSFNO)**
7. Society and Education – Deshbandhu, 1 September 1993. **(SE)**
8. Traits Needed for Educational Administration –Hindustan Times, Jan, 13, 2002 **(TNEA)**

D: WORKSHOP, SEMINARS ATTENDED:

1. Attended 07 **days residential** course for improving **managerial qualities** of Public Sector Undertaking Employees by **National Productivity Council** at Hyaderabad, India.
2. As a **Resource Person** for training **Principals of + 2 Schools**, a Course for 20 days, organized by **Directorate of Public Instruction, M.P.**
3. Attended **15 days** residential Training Programme at **IAS Academy, Mussorie** for improving **Managerial qualities of Educational Administrators**.
4. Attended **3 days** Seminar on National Convention on Meeting HRD Challenges in the 21st Centaury Organized by **Jaipur HRD Network Forum**.
5. Attended **3 days** workshop on **ISO – 9000** in Education Sector, Organized by **Indian Institute of Quality Management, Jaipur**.
6. Attended **6 days Entrepreneurship residential Training** Programme at Calcutta Organized by **NIFTE, USA**.

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7. Attended **7 days Strategic Leadership** Residential Training Programme conducted by **IIM, Ahmedabad** for the CBSE Principals.

E: RADIO TALK:

1. Role of Educational Administrators in shaping School Environment, AIR, Chattarpur (MP), 26th June 1992
2. Creative Materials & School, AIR, Chattarpur, 23rd May 1992.
3. Grand Master: Dr. Virandawal Lal Verma, AIR, Chattarpur, 3rd June, 1992.
4. Grand Master: Swami Ramkrishan Pramhanas, AIR, Chattarpur, and 3rd October 1993.
5. Preparing Students Towards Examination, AIR, Jaipur, and 20th February 1999.

F: PUBLICATIONS OF BOOKS & RESEARCH MONOGRAPH:

1. Cognitive and Affective Correlates of Divergent Thinking.
2. A book on Education Management under publication.

Exhibit-3
Social work done by Dr Pandey

Pandey Education Trust (PET) – a non-profitable charitable trust was conceptualized by Dr Pandey in 1995 in the memory of his late father Sri S.N.Pandey who was a great educationist and a social worker of repute to further the cause of quality education in general and quality school education in particular across the country. Dr A.K.Pandey is the CEO of Pandey Education Trust.

Formerly registered with the Government of Rajasthan in 2001 (Reg. No. 4084/58/11 dated: 4th May 2001), it has also qualified for 80G Exemption with the CIT, Jaipur up to 31/03/2007.

It presently comprises of eleven members, five Technical members (specializing in school education) along with a large team of advisors and well wishers.

Since its inception, ***PET*** has undertaken many projects and has been an advisor to numerous upcoming institutions. PET work in the field of

- Preparation of a DPR (Detailed Project Report)
- Liaison with State Government for registration / NOC
- Liaison with CBSE/ICSE/State Boards for affiliation up to Secondary and +2 stages.
- Computerization of the administrative and academic fields of work
- Development of Reporting Systems
- Planning of publicity campaigns
- Building of the school image
- Conduct of Entrance exams
- Staff Recruitment
- Orientation and training of academic staff in various fields
- Academic Audit
- Development of Evaluation systems for students
- Development of performance analysers for academic staff
- Organization of School transport systems

The field of education is today's environment has become very specialized. This requires the service of the people knowledgeable with practice experience and educational background to develop the standards needed to maintain that competitive edge for school owners as well as for the maximum development of the child.

The money earned by executing these projects is utilized for quality education of the inhabitants of Village Gangwali in Chapra District of Bihar, the native place of Dr Pandey. Till date an amount more than Rs. 10 lakhs has been given as grant to individuals as well as to organizations.

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Exhibit 4:
Software & Developers:

S.No.	Software Title	Language/OS	Developer(s)	Brief Description
1	MPSINFO	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	The main program comprising mostly of menus and links to different modules developed at different times.
1. a.	Rollenq	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	An enquiry system which allows searches based on different parameters and displays student bio-data+report card on screen/printer. Also gives class/section roll-lists-strength etc.
1. b.	Empenq	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	An enquiry system which allows searches based on different parameters and displays staff details and performance on screen/printer.
1. c.	Mpsfee	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	A set of fee programs to collect school fees under various heads / terms
1. d.	Vehicle Fee	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	A set of fee programs to collect parking fees of scooter/cycle as well as of 19 bus routes, choose alternative routes, generate seat nos./tickets, bus-lists etc.
1. e.	Notice/ Bulletin Board	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	An all purpose bulletin board to inform all/specific user(s) generate alerts etc.
1. f.	Exam Report Cards	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	Prints term-wise report cards of classes I to XII, calculates pass/fail, ranks etc.
1. g.	Result Analysis	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	A set of more than 50 programs offering result analysis / comparative result analysis across years....correlations etc.
1. h.	Time Table Substitution	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	Set of programs to enter a teachers time-table, generate class-wise TT, make substitutions etc.
1. i.	Tracking of Late Going to Periods	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	Helps track and fix responsibility for late arrival of teachers in periods, generate alerts etc.
1. j.	Staff Vacancy	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	Programs to keep track of applications for various posts and help fill vacancies.
1. k.	TC / Char. Certificate	FoxPro 2.5 / 2.6 MS-DOS/ Novell	Mr. E.V. Ajai Simha & Mr. Ashish	Programs to keep issue TC / CC, update Scholar Register.

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		Netware	Bhargava	
1. 1.	Misc. Modules	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	Small modules developed on the fly using main databases but not put on the menus of MPSINFO
2.	Library	Visual FoxPro 5/6 Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	A full-fledged Library program designed to simultaneously maintain TWO libraries
3.	Poll	Visual FoxPro 5/6 Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	A network based feedback program for eliciting opinions of staff and students and presenting detailed analysis of responses
4.	Lottery	Visual FoxPro 5/6	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	A program to generate/store/print/display lottery results held during school fair.
5.	Subject Allocation	Visual FoxPro 5/6	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	A module developed to help in allotting faculty/subject for students of Std. XI and Std. IX. Has also been adapted for selections in Entrance Tests
6.	Unit Tests	Version-1 FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware Version-2 Visual FoxPro 5/6 Novell Netware	Mr. E.V. Ajai Simha & Mr. Ashish Bhargava	Essentially an MCQ bank with a front end of setting subject/class/blueprint by teacher and answering on line by students and updation of marks to the marks database of Exam Dept. Developed for conduct of paperless exams, “nil” evaluation time.
7.	Student Attendance	Visual FoxPro 6 Novell Netware	Mrs. Ritu Sareen	Maintains on-line student attendance, generates letters and monthly reports.
8.	Employee Leave	Visual Basic 6	Mrs. Ritu Sareen	Maintains on-line different kinds of staff leave (CL, ML) & generates reports.
9.	Task Scheduler	Visual FoxPro 6	Mrs. Preeti Saxena	Maintains a record of staff tasks assigned/completed and generates reports/alerts on over-due tasks.
10.	Visitor Record)	Visual FoxPro 6	Mrs. Preeti Saxena	Maintains a record of visitor complaints/requests – action taken and generates reports/alerts on over-due complaints/requests.

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Exhibit-5
IT Infrastructure:

Computer Labs

In Maheswari Public School, there are three computer labs with each having 30 computers. All these computers are networked through a campus network. Dial-up internet facility is available in one of the labs and proxy server is used to extend net connectivity to around 30 computers. Each lab has one 29" TV connected to a computer for Bhartiya Vidya program. The server is located in the attached small room which also serves as a staff room for computer teachers.

Departmental Library & AV Room

The computer department has a departmental library that houses about 300 CDs on various subject matters. An AV (Audio Visual) room is located on the third floor where the CDs can be screened. It is equipped with a whiteboard, a screen, a PA system, a TV, a VCR, a slide projector and an OHP projector.

Office Computer Network

Sixteen computers under a LAN form the Office Computer Network (OCN). OCN has been functioning since 1994. Workstations of the OCN located in various departments are shown as *Exhibit-7*. The server is a P4 system with 256 Mb RAM and 40 GB hard disk. Workstations are either P2 or P4 system. The server and some workstations like the ones in Fee Counter, Principal's room, VP (Discipline)'s room and the machine connected to COMDEX time system have power backup through UPS. The entire set up has a generator backup. There is also a generator for the computer lab

The workstations which have printers are shown in *Exhibit-7*. The printer arrangement is made in such a way that all of them are located in the ground floor except the one in VP (Discipline)'s room (See *Exhibit-8* for the organization structure of the school). There is a plan to acquire one more system with a printer in Exam Department, 3 more systems in 3 staff rooms (ground, first and 3rd floor) and one system in the Chemistry Lab. In the Physics or Biology lab, subject teachers use computers for making worksheets. After every unit of a course a teacher has to give a worksheet for students to try. Teachers are also required to prepare sample answer sheets, which are given to students after the examination.

Time Record System (COMDEX is the supplier) is connected to one of the machine in PA's office (Personal Assistant to the Principal). The system in the PA's office is connected to a copy printer (Gestner) which is used to print multiple copies of circulars and other documents. Other sister schools also use this copy printer.

A combination of star and bus topology has been used to connect the workstations to the server. CAT-5 cables are used for connectivity. Net connectivity has been taken from the local ISP, Data Infosys. Using a proxy server, the connectivity has been given to the systems of Principal, PA and Accountant (this is besides the net connectivity in computer lab). The OCN will be eventually connected to the Computer Lab LAN.

The School Management System is runs on OCN and handles a lot of administrative activities except the printing of question papers.

Exhibit-6
Observations of Different Stakeholders

Most of the teachers involved in software development spent more than the required number of hours in the school as they spend the extra time in developing software systems. When asked about the reward for these efforts, they were happy about the recognition they received. The following paragraphs record observations by some stakeholders regarding school management system of Maheshwari Public School.

Ms. Abhilasha Sharma, HOD, Computer Science Department

“ We plan to establish a question bank which can be used to generate question papers. Each question will have parameters like chapter, weightage etc. that can help in question paper generation.

Total work load of office staff has been reduced because of fee collection, student information system and progress card to a significant level. Attendance and progress card systems also help teachers; it makes their tasks easier. In two-third of the time the collection is doubled by the Fee Collection system. Security is a major concern in the present system. There are two aspects to teachers developing the software: 1) it develops the programming skills of the teachers 2) it adds to the workload of the teachers

Higher cost and unsuitability are the two reasons for opting for in house software development. For example, the school evaluated some 15 odd time table software from various vendors, but still it could not find a suitable software. On the other hand the in house developed time table software handles most of the school requirements.”

Mr. Naveen Mandhan (Teacher, Computer Science department, working since 1997)

“By developing software, I could learn new things. No doubt extra time was required, still a level of satisfaction was there. I got cooperation from all staff members. Time was always a constraint. I prefer own software as we could modify them as and when necessary. Also, it is as per our needs. Ready made software does not suit our requirements, e.g. time table software. Software for student activities is being planned that can be used by the Dean (Student Welfare). It will record activities and performance of each house.”

Preeti (Teacher, Computer Science department, working since last two years)

“We need to move from the old platform to the new one. We update ourselves through online help. We also went through training on VB conducted by Tata InfoTech person. Now, we want to develop a software which can convert numbers to grades and can automate teachers’ diary.”

Ashis (PA to the Principal)

“Need based module wise development was done. Gradually it is being integrated and it is also slowly being updated with inputs from all stakeholders. Time table system is not yet fully complete. We are planning to go for Windows based Management Information System and we have already started converting old systems into Visual FoxPro platform. Student profiling system will be developed and similar system for staff will be also developed. Security part has to be taken care of as unauthorized persons may make changes and that can create problems. The challenge is to generate several analyses as required by the Principal. Many times the database may not be designed for the needed analyses. People fail to understand - they think if it is

computer it must be done. Users appreciate getting things done through computers, e.g. Rajesh in fee collection system finds it easy. Vinod Agrawal after initial training is happy with using Staff Leave record System.”

Subhranshu Gaur & Mukul Gupta (Students, XII A3)

“We get complete information in our grade card in comparison to other schools and also all the information is there in one single page (not 3 folds etc.). If any student wants any book and is not getting it, s/he can go to the librarian who can use the Library System to locate that book. In attendance system errors are reduced and innocent students are not bashed. In fee collection system less time is spent with respect to the experience in the earlier school (of Mukul).”

Rajesh Gupta (Accounts department)

“I am using fee collection system since 1996. It saves time and I am able to reconcile accounts easily. It gets slow if more than two/ three persons are using the system. It takes 30 seconds to complete a transaction. I can generate defaulter list/ daily collection list easily. In a way the system takes care of all my requirements. Though I did not have computer background, it took 15 minutes to learn the system.”

Vindo Agarwal (Office Superintendent)

“I use leave record system and have been using this system since last 2 years. It takes less time. Usually spend 10 minutes a day on this system. I can generate leave status report between a range of dates. It can be linked with the accounting system.”

Ritu Sarin (Teacher, Computer Science department, working since ??)

“I took 4 months to develop attendance system. I have used Visual FoxPro to develop this. I took help from class teachers and the existing register to develop this system. Recognition has been my greatest reward.”

Madhu Soni (teacher, Social Studies department)

‘I am class teacher of XX. I did not find any difficulty is using computer. Here you need not erase and write again unlike in a paper register. It is fast also. Using computers means fast, efficient and being oriented to the latest technology. One day training was sufficient to learn the system. It takes 2 minutes to fill the data.’

R C Boghel (Vice Principal)

“Students are recognized by their Exam Roll Number. As soon as a parent comes to the reception, we find about the concerned student through the student information database. This helps us to handle the parent in a better way. Parents are also impressed to find that management knows so much about their wards. We even have photos of the students in the database. In the manual system it used to take a lot of time to find information about a student. There used to be a lot of files. We still maintain some files as backup. Teachers enjoy developing software as they want to do something. There is also some incentive in terms of recognition. We even give some extra increments for doing extra work. For us, work is the main criteria.

We are planning to develop a question bank. All teachers are computer trained. Question bank can help students to do well in the IIT entrance test.

We don't have clerks and we do everything by ourselves on computers. I did not know computers earlier and learnt it from our own computer teachers. I now use the student database quite a bit.”

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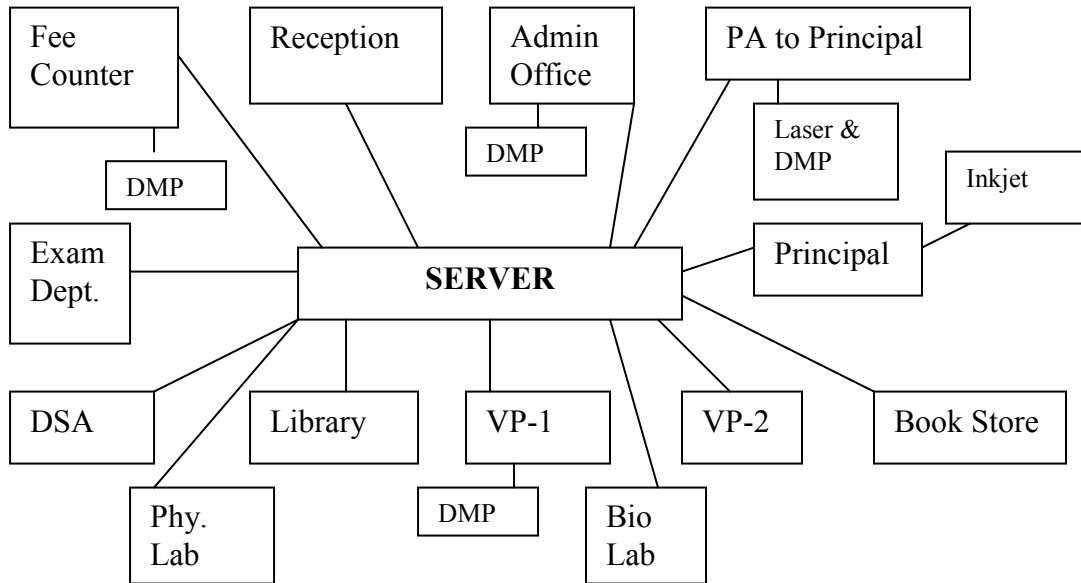
**2, Puran Badi, Model Town C, Malviya Nagar, Jaipur-302017, Rajasthan (India),
E-Mail: edustrust@rediffmail.com, Ph/Fax :(0141) 2750765, Mobile: 94140 47977**

Exhibit 7

MPS - Growth in Strength over the Years (Approx. Figures)					
	Students			Staff	
1977-78	187		1977-78	7	
1978-79	399		1978-79	29	
1979-80	580		1979-80	45	
1980-81	660		1980-81	46	
1981-82	753		1981-82	47	
1982-83	855		1982-83	57	
1983-84	935		1983-84	61	
1984-85	1069		1984-85	62	
1985-86	1155		1985-86	65	
1986-87	1260		1986-87	68	
1987-88	1415		1987-88	75	
1988-89	1533		1988-89	79	
1989-90	1639		1989-90	85	
1990-91	1756		1990-91	93	
1991-92	1710		1991-92	95	
1992-93	1733		1992-93	94	
1993-94	1783		1993-94	96	
1994-95	1872		1994-95	97	
1995-96	2302		1995-96	98	
1996-97	2465		1996-97	115	
1998-99	2621		1998-99	120	
1999-00	2681		1999-00	122	
2000-01	2758		2000-01	124	
2001-02	2777		2001-02	125	
2002-03	2872		2002-03	126	
2003-04	2913		2003-04	130	

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Exhibit 8
Office Computer Network



Questions:

- Which is better – buying ready made software, getting the complete software developed by a software house or getting the software developed in-house?
- How to train teachers to be able to develop software in-house?
- What about the reward system for teachers involved in software development?
- What are the other areas that can be computerized?
- Should Management persuade Dr Pandey not to resign as the school was progressing during his tenure?
- Should Dr Pandey continue in the system forgetting his self esteem in order to get a global recognition in near future?
- What according to you made Dr Pandey to achieve all these in a field where he himself was new?
- What do you feel about the social work undertaken by Dr Pandey? Can this model is of any use in the larger interest of the society?
- What have you done in case you would have been in place of Dr Pandey?

In house Developed Software

S.No.	Software Title	Language/OS	Brief Description
1	MPSINFO	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	The main program comprising mostly of menus and links to different modules developed at different times.
1. a.	Rollenq	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	An enquiry system which allows searches based on different parameters and displays student bio-data+report card on screen/printer. Also gives class/section roll-lists-strength etc.
1. b.	Empenq	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	An enquiry system which allows searches based on different parameters and displays staff details and performance on screen/printer.
1. c.	Mpsfee	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	A set of fee programs to collect school fees under various heads / terms
1. d.	Vehicle Fee	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	A set of fee programs to collect parking fees of scooter/cycle as well as of 19 bus routes, choose alternative routes, generate seat nos./tickets, bus-lists etc.
1. e.	Notice/ Bulletin Board	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	An all purpose bulletin board to inform all/specific user(s) generate alerts etc.
1. f.	Exam Report Cards	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Prints term-wise report cards of classes I to XII, calculates pass/fail, ranks etc.
1. g.	Result Analysis	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	A set of more than 50 programs offering result analysis / comparative result analysis across years....correlations etc.
1. h.	Time Table Substitution	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Set of programs to enter a teachers timetable, generate class-wise TT, make substitutions etc.
1. i.	Tracking of Late Going to Periods	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Helps track and fix responsibility for late arrival of teachers in periods, generate alerts etc.
1. j.	Staff Vacancy	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Programs to keep track of applications for various posts and help fill vacancies.
1. k.	TC / Char. Certificate	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Programs to keep issue TC / CC, update Scholar Register.
1. l.	Misc. Modules	FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware	Small modules developed on the fly using main databases but not put on the menus of MPSINFO
2	Library	Visual FoxPro 5/6 Novell Netware	A full-fledged Library program designed to simultaneously maintain TWO libraries
3.	Poll	Visual FoxPro 5/6 Novell Netware	A network based feedback program for eliciting opinions of staff and students and presenting detailed analysis of

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**2, Puran Badi, Model Town C, Malviya Nagar, Jaipur-302017, Rajasthan (India),
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			responses
4.	Lottery	Visual FoxPro 5/6	A program to generate/store/ print/display lottery results held during school fair.
5.	Subject Allocation	Visual FoxPro 5/6	A module developed to help in allotting faculty/subject for students of Std. XI and Std. IX. Has also been adapted for selections in Entrance Tests
6.	Unit Tests	Version-1 FoxPro 2.5 / 2.6 MS-DOS/ Novell Netware Version-2 Visual FoxPro 5/6 Novell Netware	Essentially an MCQ bank with a front end of setting subject/class/ blueprint by teacher and answering on line by students and updation of marks to the marks database of Exam Dept. Developed for conduct of paperless exams, “nil” evaluation time.
7.	Student Attendance	Visual FoxPro 6 Novell Netware	Maintains on-line student attendance, generates letters and monthly reports.
8.	Employee Leave	Visual Basic 6	Maintains on-line different kinds of staff leave (CL, ML) & generates reports.
9.	Task Scheduler	Visual FoxPro 6	Maintains a record of staff tasks assigned/completed and generates reports/alerts on over-due tasks.
10.	Visitor Record	Visual FoxPro 6	Maintains a record of visitor complaints/requests – action taken and generates reports/alerts on over-due complaints/requests.
11.	Parent’s Problem Solution	Visual FoxPro 6	Maintains a record of Parents complaints/request and their solutions

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