

Implementations in Private Schools – India



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Report prepared with inputs from EY

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Table of Contents

| | |
|---|----|
| 1. Introduction | 5 |
| 1.1. Methodology..... | 5 |
| 1.2. Background of ICT in Schools | 8 |
| 2. Learning Support Services..... | 11 |
| 3. School Administrative Services | 20 |
| 4. Governance of School Education..... | 24 |
| 5. ICT Architecture in Private Schools | 24 |
| 6. Prerequisites for ICT enablement..... | 26 |
| 6.1. Infrastructure Requirements..... | 26 |
| 6.2. Human Resource Requirements..... | 27 |
| 6.3. Feedback from Teachers & School Administrators on ICT Implemented in Schools..... | 28 |
| 7. Challenges of Introducing ICT in Schools..... | 30 |
| 8. Conclusions Relevant to School Education MMP..... | 31 |
| 9. Appendix A – List of Respondents | 33 |
| 10. Appendix B – Brief write up of the schools visited..... | 34 |
| 11. Appendix C - Questionnaire for Schools | 37 |
| 12. Appendix D – Questionnaire for Service Providers..... | 41 |

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1. Introduction

A solution scan of the education solutions implemented in Private Schools in India was carried out to identify the available, relevant and proven products / solutions that are currently implemented in private schools in India that can be considered for use in Government and Government-Aided Schools in India. The solution scan was carried out in the areas of School Management Services, Decision Support Systems (student need assessment, teacher training need assessment, school performance assessment), ICT enabled teaching Services, Self-Learning Tools for teachers and students, Assessment Services, and Content Platform / Delivery Services. The solution scan was carried out to assess the implementation requirements and available business models for implementation.

1.1. Methodology

The study was undertaken with the following objectives:

1. To identify (along with the financials) the available, relevant and proven products / solutions in the indicated areas that are currently implemented in private schools in India that can be considered for use in Government and Government-Aided Schools in India.
2. Scan of the solutions in the education domain in the areas of: School Management Services, Decision Support Systems (student need assessment, teacher training need assessment, school performance assessment), ICT enabled teaching Services, Self-Learning Tools for teachers and students, Assessment Services, and Content Platform / Delivery Services.
3. Identification of products/solutions within each stream, those are relevant and can be considered for Government and Government-Aided Schools in India. For each of the identified products / solutions, collect brief details of the solution, schools where such solution(s) are implemented, implementation details, available business models, and financials.

Primary research was carried out to scan the available products and their usage in private schools in India. Service providers were also included as respondents in primary research to get further understanding about solutions being offered by them. Thus in India both demand and supply aspects were taken into account. Both these have been described in the next section.

Schools, which were making use of ICT for purposes in addition to classroom transaction, were identified. Similarly Education Solution service providers were shortlisted to understand their basket of products, service offerings in the School Education domain.

The team interacted with the following schools and service providers to get their perspective on the use of ICT by schools.

1. The Millennium School, Noida, Uttar Pradesh
2. Step-by-Step School, Greater Noida, Uttar Pradesh
3. Woodstock Villa, Mussoorie, Uttarakhand
4. Vasant Valley School, New Delhi
5. Delhi Public School, Sonapat, Haryana
6. Educomp
7. Education Initiatives
8. Foradian
9. CORE

The following framework was used to collect information that would be relevant for the preparation of the Detailed Project Report.

Table: Framework used for review of ICT in private schools in India

| Area of Inquiry | Service Providers | Schools | Planners |
|--|--|---|--|
| Mapping the evolution of ICT in school education | Which schools/states were more receptive to introducing ICT in school management Preparedness of the schools/education system to make use of ICT in education | Preparedness of the school to make use of ICT in education | What were the key areas considered at the planning stage Preparedness of the education system to make use of ICT in education |
| Use of ICT for School Management | Examples of use of ICT for school administration – different models in use | Specific examples of how ICT is being used in their school for school administration – student performance management, follow up of students in need for remedial | Examples of different usages of ICT for school management e.g. utilization of school funds, student tracking, MIS |
| Learning support | Examples of learning | Specific examples of | Feasibility of making use |

| | | | |
|------------------------------|---|--|--|
| services | support services being used by different schools | use by students, teachers, principal | of ICT for self assessment, tool for capacity need assessment |
| Governance | Not required | Not required | Examples of different usages of ICT for school e.g. teacher attendance, school/ teacher rationalization, regulation of teacher transfers |
| Good practices | Good practices in schools | Good practices in schools | Good practices in schools |
| Challenges in implementation | What challenges they faced in introducing ICT in schools and measures taken to overcome these Customization of software to suit different requirements | Changes that were required to be made in school to introduce ICT for school management | Nature of barriers they encountered while planning/implementing the use of ICT in school education e.g. openness of teachers, familiarity with technology, is transparency helpful |

Tools were developed to collect information from them (Refer - Appendices C and D). Visits were made to the schools and detailed interactions held with the concerned IT personnel. The service providers were sent questionnaires to seek information about the products and their perceptions about the usage. It was found that the service providers were reluctant to share the cost of their products. At least 2 organisations, which had earlier given their consent to participate in the study, backed out when they were requested for financial information about their products.

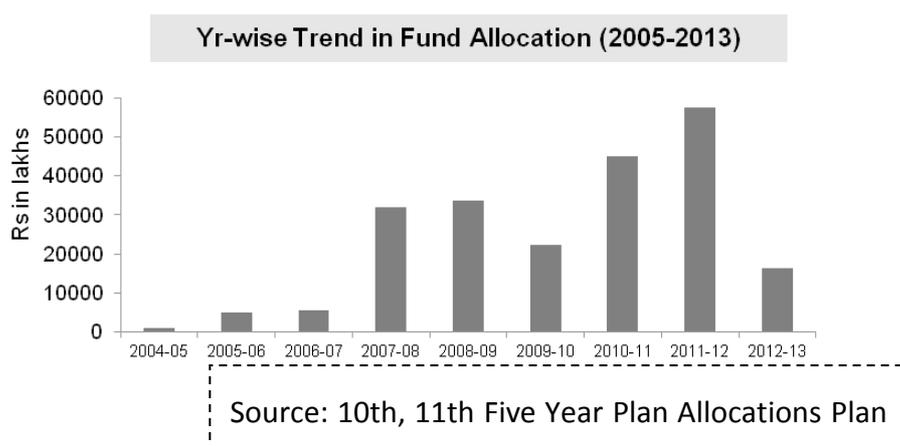
1.2. Background of ICT in Schools

In today's world where acquiring knowledge is not merely a personal choice but almost a necessity, there has been increased focus among all stakeholders to use different means to provide more of enriched knowledge to individuals. ICT has an important role to play in this regard. There has been recognition of the need to introduce ICT at the school level so that students get an early start in using IT. The National Policy on ICT in School Education, 2012 outlines the vision and use of ICT in school education and management. Education being a subject in the concurrent list, roles and responsibilities have been defined for the Centre as well as States. It provides a roadmap for development of infrastructure and digital resources and capacity development at pre-service and in-service levels.

The Government of India has been promoting the use of ICT in many ways. Ministry of HRD has a specific ICT School Scheme which extends support to the states .

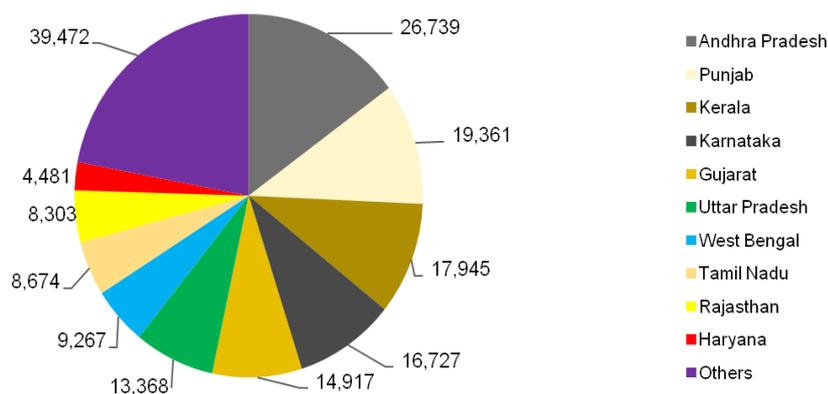
1. to provide computer aided education in secondary and higher secondary schools,
2. to set up smart schools where use of technology is demonstrated,
3. capacity enhancement of teachers and
4. e-content development

As maybe seen in the following figure, there has been a steady increase in the extent of support being provided by the Government of India. The year FY2011-12 has witnessed the highest amount of funds being released to states for ICT in schools (INR 57,573 lakhs).



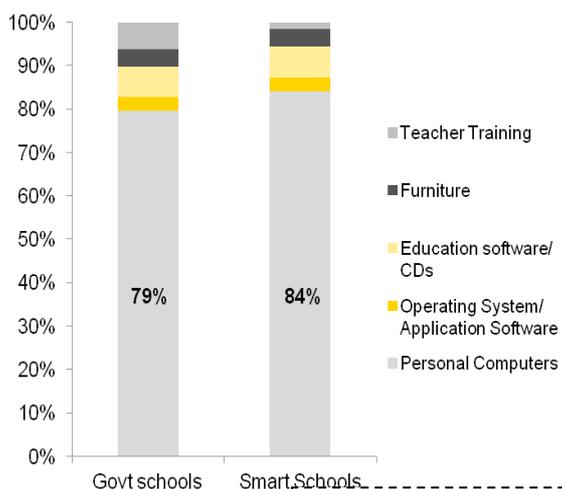
The total fund released was INR 2187 Cr and following are the top 10 states (Below figures in Lacs). A large part of expenses are being used towards teacher salaries.

Fund Release to States under ICT Schools Scheme during 2005-13 (Rs. In Lakhs)

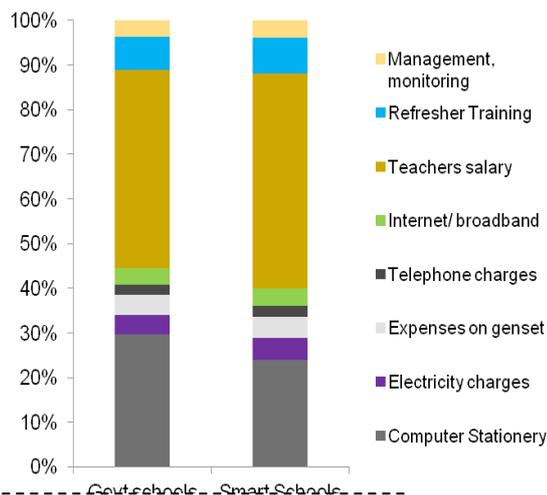


Source: 10th, 11th Five Year Plan Allocations

Capex / non-recurring expenditure (Rs. In lakhs)



Recurring expenditure (Rs. In lakhs)



Source: 10th, 11th Five Year Plan Allocations

The use of ICT is not all pervasive across all government schools. In its efforts to bridge the social and digital divide, the need to extend ICT to all government schools has been recognised. This study explored different options that are available for students, teachers and school for more effective and efficient use of ICT. As shared in the section on methodology, primary research was undertaken in some elite schools in India as well as responses from some key stakeholders were taken into account.

This report is based on the information collected through visits to 5 private schools and perceptions of the service providers who provide school related solutions to the schools. Before providing details about the use of ICT in schools, a profile of the schools is presented. Needless to say that these schools have much better infrastructure; favourable student teacher ratio and class size than the counterparts in government schools. The intent is not make comparisons but to examine the range of products available or being used by schools and see what can be adapted to meet the requirements of students studying in government schools.

Table: Profile of the Schools Covered

| Name of the School | No. Of Students | No. Of Teachers | Student Teacher ratio | Average size of class | Student Computer ratio |
|--------------------|-----------------|-----------------|-----------------------|-----------------------|------------------------|
| Millennium | 800 | 80 | 1: 10 | 25 | 1:1 |
| Step by Step | 2050 | 238 | 1:9 | 25-30 | 1:1 |
| Vasant Valley | 1300 | 160 | 1: 8 | 30 | 2:1 |
| Woodstock | 500 | 70 | 1: 7 | 15-25 | 1:1 |
| DPS | 1600 | 90 | 1: 17 | 30 | 1:1 |

2. Learning Support Services

There is greater emphasis on using ICT as a learning support device. The role of ICT in education has evolved over a period of time. Earlier it was regarded as imparting of Computer Education to students which then started getting used in the form of computer aided education where IT was a means to help students learn better.

There are many ways in which the use of ICT can help in improved functioning of the education system. These could range from providing opportunity for lifelong learning by enhancing learner's autonomy, conducting learning assessments, capacity development of teachers, providing mass education through distance learning. All the schools visited by the team have used ICT to its best to increase learning outcomes among children as ICT has primarily been seen to improve, increase learning standards. Some ways in which ICT is being used in schools are placed in Annexure B

Some other activities related to providing learning support are uploading homework for students, creation of knowledge banks, maintaining online school library, portals for learning resources and self-learning tools for teachers. Details of some specific products being used by schools for providing learning support are given as under.

Table: List of various ICT products used in private schools

| S.No | Name of the Product/ Solution | Details | Category | Cost (INR) |
|------|-------------------------------|---------|----------|------------|
|------|-------------------------------|---------|----------|------------|

| S.No | Name of the Product/ Solution | Details | Category | Cost (INR) |
|------|-------------------------------|--|---------------------------|------------------------|
| 1 | Smartclass | <p>The classrooms are converted to smartclass enabled classrooms, equipped with the state-of- the-art smartclass Digital Teaching System, the first of its kind in the world with integrated computer, interactive white board, UPS and a green chalk board, a short throw projection system all operating with a one touch functional control switch panel. The contents are mapped to curriculum. CTS paves the way for academic excellence of every learner. With this teachers are empowered with a whole range of ready to display resources. Animations apart CTS has simulations, mind maps, worksheets, weblinks, diagram maker, graphic organiser and a lot more. Resources that help out teachers to reach out to every child and ensure an inspired participation in the journey of discovering new concepts.</p> <p>www.educomp.com</p> | Digital learning resource | Licensed per classroom |
| 2 | English Mentor | <p>English Mentor as the name suggests, is an English Learning Programme that guides or mentors learners to acquire meaningful proficiency in English. And surprisingly, though it is called English Mentor, it requires only very limited intervention by a teacher in person. Rather, it is designed as a self-exploratory learning programme for learners and the programme’s mentorship role stems from its sound pedagogic design and perhaps, the most innovative use of technology in a language learning programme. Truly comprehensive on skill development and with a balanced focus on Speaking, Listening, Reading and Writing skills, English Mentor will empower learners to become competent and confident communicators.</p> <p>At the heart of English Mentor are four</p> | Digital learning resource | Annual License Fee |

| S.No | Name of the Product/ Solution | Details | Category | Cost (INR) |
|----------|-------------------------------|--|---------------------------|---|
| | | <p>modules that use a step-by-step process to help learners sharpen their reading, writing and speaking skills.</p> <p>Main features consists of Spoken English, Read & Write Tutor, Fluency Tutor, Listening Comprehension, Games</p> | | |
| 3 | 3D Lab | <p>Educomp 3D Lab- a collaborative 3d learning platform was introduced on the lines that “learning is fun with 3D”, however there is much more to it. The communication does not just need to have a fad value; it should also have some substance to it. 3D Lab takes learning to newer dimensions and makes it more exciting and fascinating, while the learners are equipped with better understanding of complex concepts that are tough to visualize even by standard animations.</p> <p>A 3D Lab in itself is a novel concept for schools, it makes learning so much vivid and fascinating and gives roots to the students’ imaginations. No longer do the students have to grapple with visualizing complicated concepts and processes. It recognises the need to build anticipation for this virtual world of learning. The feeling of awe and fascination that comes when one sees the 3D demonstration, should come across strongly in the communication to render it that wow factor. 3D brings with it the experience of not just seeing live examples, but enables students to be a part of it making the</p> | Digital learning resource | Annual License Fee |
| 4 | Smartclass Tabs | A revolutionary learning tool for learners, an empowering teaching and communication device for teachers, a device to stay in touch with child’s academic progress for parents, A futuristic, scholastic management | Self learning tool | Onetime fee per tab and content Licensing |

| S.No | Name of the Product/ Solution | Details | Category | Cost (INR) |
|------|-------------------------------|--|---------------------------|---|
| | | <p>means for the school administration. The Smartclass Tab is a paradigm changing concept, changing the way learning is absorbed, disseminated and managed. Parents can now access the student's progress and interact with teachers online. They can view report card via web or mobile and get attendance report via sms. It is a personalized learning tool</p> <p>CTS App – a vast repository of K12 digital content, instruction and assessment materials mapped to the curriculum CBSE, ICSE, and State boards curriculum. Some of the 12 elements that we have in CTS app are Animations, Diagram maker, MCQ, Web links, Note Taker and lot more.</p> <p>Educomp Online</p> <ul style="list-style-type: none"> ▪ For making important school announcements and sending messages to teacher/parents. ▪ Teachers can create MCQ tests online and share it with entire class/section <p>Safe browsing:</p> <ul style="list-style-type: none"> ▪ It ensures that the student's learning discovery remains confined to a safe and secure zone. It blocks access to any objectionable content as Gambling, Pornography etc. | | per annum. |
| 5 | Edureach | Edurite executes projects on a turnkey basis, involving setting up and running computer education programmes in schools. These educational programmes involve comprehensive education infrastructure implementation, teacher training and content development projects | Digital learning resource | There is no fixed cost, varies from project to project. |
| 6 | Edugnite | Skill based academic benchmarking and | Assessme | Licensed |

| S.No | Name of the Product/ Solution | Details | Category | Cost (INR) |
|------|-------------------------------|---|-------------------------------|---|
| | | <p>diagnostic assessment tests.</p> <p>It is an academic system that helps to gauge student's strength & learning gaps and provides effective feedback to address the same. Insight is a paper based test conducted for class 3 to class 10th in 3 core subjects Maths, Science & English.</p> | nt tool | per test |
| 7 | Mindspark | <ul style="list-style-type: none"> ▪ Is a computer based unique, adaptive, self-learning solution for schools that integrates school curriculum <ul style="list-style-type: none"> ○ Unique - One of the features of the Mindspark programme is its focus on understanding and analytical thinking, not just knowledge of facts, or drill in procedures. This is one of the key factors that really distinguish the Mindspark programme from any other learning programme. It has a built-in adaptive logic that allows a student to move at her own pace. ○ is also unique in that students can work on it in school, but can also do it as homework assigned by the school. A student can login from anywhere for up to 90 minutes a day ○ Adaptive - dynamically adapts to a student's level of understanding in a particular concept, and allows the student to move at her own pace ○ Self-learning - Is a learning system that allows the student to construct her own learning – at a pace she is comfortable with. ▪ Is an interactive system, where the student is not learning passively by listening to someone, or viewing | Assessment/self learning tool | <p>Licensed per student per year license fee + Service Tax</p> <p>(does not include premises, computers, electricity, internet, coordinator, etc)</p> |

| S.No | Name of the Product/ Solution | Details | Category | Cost (INR) |
|------|-------------------------------|--|----------|------------|
| | | <p>ready-made solutions, but learning interactively by answering questions of progressively increasing complexity levels.</p> <ul style="list-style-type: none"> ▪ Ensures that each student progresses on the basis of true understanding, not on rote-based learning ▪ Integrates seamlessly with your school's Math curriculum ▪ Provides Instantaneous feedback and explanations targeted at specific misconceptions ▪ Identifies when a student needs extra help to understand a concept and addresses this problem with a variety of utilities– examples, animated displays, interactive multimedia and more | | |

| S.No | Name of the Product/ Solution | Details | Category | Cost (INR) |
|------|--|--|---------------------------|--------------------|
| 8 | Student Progress tracking System (SPTS) | <ul style="list-style-type: none"> ▪ Has a comprehensive database of students, teacher and schools. ▪ Language capabilities ▪ Schools can update assessment and other progress data regularly if they have access, else send it periodically to centralised office for automatic update. ▪ Authority based access to different users – policy planners, educational planners, teachers, principals (Eg. Principal has full access but can only do his school) ▪ Provision to record non-academic progress also (Eg. Sports, talent etc) Schools can choose to keep some data private. ▪ Ability to handle change of class of student at the end of the year. ▪ Advanced searching capabilities (searching for data based on complex criteria) ▪ Ability to add modules (Eg. For teachers professional development) ▪ Advanced statistical module. ▪ Each student tracked uniquely even if he shifts school etc. <p>Student learning analysis module – includes provision to view learning at question and skill level.</p> | Digital learning resource | Annual License Fee |
| 9 | ICT/CAL services at Govt Schools in BOOT/BOT /BOO Model | Provision of computing hardware, Software, Content (Setting up of Computer Labs) at School and maintenance for 3/5 year period under BOOT/BOT model along with provision of education services like computer teacher, Teacher Training, Computer Courseware etc. | Digital learning resource | Not available |

| S.No | Name of the Product/ Solution | Details | Category | Cost (INR) |
|------|-------------------------------|--|-----------------------------------|---------------|
| 10 | Multimedia Content | Interactive Multimedia Content. They are generally part of ICT/CAL services. | Self learning tool | Not available |
| 11 | Teacher Training | Various Teacher Training programmes ranging from capacity building to Computer Training. | Assessment tool | Not available |
| 12 | AC3, edMastery | edMastery™ is a web-based item banking, assessment implementation, and reporting solution that delivers customizable tests through a simple and flexible user interface. It is intended for districts and schools looking to build their assessment programme and database Management system from the ground up. As such, it is a perfect alternative formative platform for basic assessment and implementation – and can be used for classroom, formative, summative Assessments | Assessment/self learning tool | Not available |
| 13 | FAIM | CORE's Examination Management System. It is modular Software Package which effectively manages the full range of examinations and qualification processes. | Digital resource/ Assessment tool | Not available |
| 14 | STEMpower | A comprehensive Teaching, Learning and Assessment Solution – for Math, Science and other subjects. | Assessment/self learning tool | Not available |
| 15 | CORE ULC | An affordable Interactive Whiteboard Solution. | Digital learning resource | Not available |
| 16 | CTS | An Integrated Web based Child Tracking Solution which is an information based analytical solution to track and Identify children | Governance tool | Not available |
| 17 | COREOX | COREOX is a distance learning teacher development programme offered by the University of Oxford in collaboration with CORE Education and Technologies in India. | Governance/Self assessment tool | Not available |

| S.No | Name of the Product/ Solution | Details | Category | Cost (INR) |
|------|-------------------------------|---|----------|------------|
| | | COREOX offers a model of learning that is underpinned by dialogue, scaffolding and mediation that encourages teachers to think critically about and reflect upon the outcomes of their actions. | | |

Our coverage in schools and the outcome clearly shows that ICT has been used for effective learning support, instructional teaching, self-learning and assessment services. Most of the schools have their classrooms integrated with Whiteboard, Projector for visual aid learning besides “chalk and talk” methodology. Different schools have collaborated with different agencies / vendors for technology which is cost-effective and durable. The lessons covered in a day, weekly, monthly lesson plan for subjects are also shared with parents, guardians in respective parent portal. Schools at their discretion have customized their student assessment depending on the learning needs of the children. Products like “Mindspark” integrated in Mobile Tablets where students have to take 90 minutes tests are seen. The set of questions for every student is not same to remove ambiguity. In schools like Woodstock Villa, teachers and subject instructors design their own content backed by internet. Content here refers to instructional and assessment material which is circulated to student during and after school hours.

As mentioned above, ICT backed teaching is more used between Class I-X. In terms of subjects being taught, Maths, Social Science, Science, English has digitized and visual content which is used for classroom teaching. But for higher classes, mostly the content is designed by the respective subject instructors.

3. School Administrative Services

The schools visited recognise the importance as important tools, which whenever used, would increase transparency and efficiency for all stake-holders. However, it was found that there was greater flexibility in its application. All the schools visited by the team customised ICT solutions to strengthen them from within, after identification of their requirements and prioritising these. Schools have home-grown ICT solutions, methods which have helped them in streamlining their School Administrative services. The school administration comprises of the range of activities associated with the student, teacher lifecycle system and administrative tasks such as Accounts, Recruitment, Purchase, Logistics, Transport and others. A standard “School Management Software” has been designed, practised and followed in general by all the Schools. They started it by hiring, scaling in-house team of IT professionals who scan the external environment for open software, ERP solutions which could be customised as per the school’s requirement by buying the software, ERP’s license. The IT team then understands their respective school’s requirement for effective designing. Says IT Head – Step by Step School – “The challenge was not buy the software from the open market but to understand internal stake-holders requirement periodically, make changes phase wise and launch it as a pilot project”. The School Management software is managed by an IT administrator and different rights and log-ins are provided to different school departments say: Academics which includes the group of Teachers (Classroom and Extracurricular activities) and Non-Academics which includes Accounts module, Transport and Logistics module, Library Management services, Store Management, Hostel Management and many more. Every department personnel are responsible in uploading data through their respective log-ins. This data is then stored in high-capacity servers for information back-up, future analysis.

Student and Teacher lifecycle has also been integrated in the School Management software by all the schools. For example, from the time prospective students who want to take admission in a school till the time of their school completion, student records are maintained with a unique admission roll number. Same is the case of Teacher lifecycle where from the time Teachers fill Online application form for current school openings to their in-service training assessment to retirement, all data is maintained and stored. As mentioned above, Accounts module is for maintaining, checking financial health of the school in terms of Accounts receivable and payable, Transport module is for effective Vehicle tracking to ensure Child safety and security, Library Management systems is for proper record maintenance of books being issues, returned, Store management software is for stock maintenance,

raising of computerized Purchase Orders for effective invoicing, bill payments and others

Among the various services for which schools are making use of ICT, student enrolment, attendance, their academic progress, payment of fee, salary transfer and teacher recruitment were found to be the most common activities related to school management for which schools are using ICT. Some other activities cited by the schools are – preparation and sharing of transport roster, library management, vehicle tracking and procurement.

Table: Tools used for school management

| School Name | Name of the School Management System |
|------------------------------|--|
| The Millennium School, Noida | Freeware sourced from open market, customized as per requirement |
| Step by Step School, Noida | StepSys (Home grown ERP solution) |
| Woodstock Villa, Mussoorie | ERP developed by In-house team of IT professionals |
| Vasant Valley, New Delhi | Freeware sourced from open market, customized as per requirement |
| Delhi Public School, Sonapat | School Management software, DPS Sonapat |

Table: List of various ICT products used by private schools for school administration

| S.No | Name of the Product/Solution | Details (functions, ease of usage, | Category | Cost (INR) |
|------|--|--|------------------------------|--|
| 1 | Student Progress tracking System (SPTS) | <ul style="list-style-type: none"> ▪ Has a comprehensive database of students, teacher and schools. ▪ Language capabilities ▪ Schools can update assessment and other progress data regularly if they have access, else send it periodically to centralised office for automatic update. ▪ Authority based access to different users – policy planners, educational planners, teachers, principals (Eg. Principal has full access but can only do his school) ▪ Provision to record non-academic progress also (Eg. Sports, talent etc) Schools can choose to keep some data private. ▪ Ability to handle change of class of student at the end of the year. ▪ Advanced searching capabilities (searching for data based on complex criteria) ▪ Ability to add modules (Eg. For teachers professional development) ▪ Advanced statistical module. ▪ Each student tracked uniquely even if he shifts school etc. <p>Student learning analysis module – includes provision to view learning at question and skill level.</p> | Governance / Assessment tool | Annual License Fee (cost would come down in the subsequent years) |
| 2 | Fedena | <p>Fedena is free and open source school management software which has more features than a student information system. Fedena efficiently manages students, teachers, employees, courses and all the systems in an institution.</p> <p>Fedena is a web 2.0 application. Fedena can be installed in a web server or Local Lan server. Fedena's architecture doesn't support it to be installed as a standalone application. Suggested OS is Ubuntu 11.04 / CentOS 6 with minimum 2GB RAM 40 GB hard disk and a new generation</p> | Digital learning Resource | Free & Open source |

| S.No | Name of the Product/Solution | Details (functions, ease of usage, | Category | Cost (INR) |
|------|------------------------------|--|-----------------------------|--------------------|
| | | processor. This has to be scaled based on the usage statistics. Windows based OS is not suggested for installing Fedena. | | |
| 3 | Fedena Pro | Fedena provides user-friendly dashboards with login access to all the teachers, non-teaching staff, students, parents and management body of your institution. The various modules available in Fedena takes care of all the processes in your institution, right from admission of new students to generating transfer certificate, when the student completes the studies. | Governance Tool | Annual License Fee |
| 4 | Core CMS | End to End School/Campus management solution. It is a web based software package for the comprehensive Information Management and Decision Support System, including Administrative, Academic, Resource, Financial Management, Student Information, Student Tracking and Teacher Monitoring. | Governance /Assessment tool | Not available |

4. Governance of School Education

School Governance is an important factor for effective, transparent and smooth functioning of schools. Most importantly, it helps the School management to ensure better operational and financial health of the school. As the current sample sizes of the school are individually operated in nature, the school governance is more about how the school management functions. Some components of the School governance include Conducting examinations, Teacher recruitment are already ICT integrated. For example, schools are mostly affiliated to Central Board of Secondary Education (CBSE) which requires students to give exams in “pen-paper” mode. However, schools do conduct internal assessments such as Class tests, surprise tests, Live projects Online through the help of tools like “Mind Spark”. Teachers also create their own Online quizzes through the use of freeware available on the internet.

The use of ICT in School Governance was palpable in the case of Millennium Schools. The Millennium schools are a group of more than 16 schools spread in Tier 2 and Tier 3 cities such as Agra, Amritsar, Bathinda, Gurgaon, Indore, Karnal, Kurukshetra, Lucknow, Meerut, Mohali and Noida mostly in the Northern India cluster. The Principal of Millennium School, Noida is also the Director (Central Administrator) for the 16 schools. She makes use of ICT to monitor the schools and does not have to visit the schools very often. All the schools have designated MIS administrators who enter school data (teacher, student attendance, new enrollments, curriculum progress, class time-table, non-instructional hours of a teacher, student grades subject wise and many more) everyday in Educomp’s MIS reporting solution. Then, customised standard reports are generated across the chain of schools and shared with the Director every day at a stipulated time.

5. ICT Architecture in Private Schools

In the initial years of introduction of ICT, the schools started by setting up of computer labs and gradually developed an IT architecture which is suited to the requirements of the school. Some indicative features of this architecture are outlined below :

Table: ICT Architecture in different private schools

| S. No | Name of the School | ICT Architecture (Hardware, Software, AMCs, Annual Budget, CAPEX) | |
|-------|------------------------------|--|--|
| 1 | The Millennium School, Noida | Smartboards, Projectors, CPUs, UPSs, Desktop, Cannoi, Mythware, Laptops, Computer labs, other computer peripherals, IT staff cost, Internet, Wi-Fi connectivity, 2 servers and upgradation | <ul style="list-style-type: none"> ▪ Laptops ▪ Cannoi with Mythware ▪ The school runs on turnkey basis by Educomp, AMCs, replacements absorbed by Educomp |
| 2 | Step by Step School, Noida | Sony Tablets, Computer labs, Teacher laptops, other peripherals, Software licences (School ERP – Stepsis, Mindspark), IT administration, Internet, Wi-Fi connectivity, 3 servers and upgradation | <ul style="list-style-type: none"> ▪ 64 Sony Tablets ▪ Laptops |
| 3 | Woodstock Villa, Mussoorie | Smartboards, Computer labs, School Management software, Peripherals, Dedicated broadband lines from Bombay Gateway (submarine), Wi-max, Wi-Fi connectivity, 2 servers and AMCs | <ul style="list-style-type: none"> ▪ 64 laptops ▪ 32 desktops in computer labs ▪ IT infrastructure introduced 15 years back |
| 4 | Vasant Valley School, Delhi | Customized School ERP solution, Kyans, Smartboards, Cameras, Video recorder, Computer labs, Broadband and Wi-Fi connectivity, 3 servers, peripherals, AMCs | |
| 5 | Delhi Public School, Sonapat | DPS School Management Software, eBeam, Projectors, Computer labs, Tabs, Broadband and Wi-Fi connectivity, 4 servers, AMCs and peripherals | <ul style="list-style-type: none"> ▪ 60 projectors ▪ 60 Whiteboards ▪ 60 eBeams |

As one may see from the above mentioned table, the average budget of schools vary from 50 lakhs to 1 crore. This includes recurring costs and keeping pace with the rapid pace of technological advancements. It was also observed that although there is heavy reliance on the existing products offered by the service providers, some schools are encouraging their teachers to develop their own content making use of the available technology.

6. Prerequisites for ICT enablement

There are a number of perceived benefits for the schools. It makes their work more systematic, leads to better time management, facilitates better communication with the parents, brings in greater transparency and helps them make less use of paper. The available products are being used in government schools also, but to a limited extent. For example :

1. Educomp has designed a Edureach programme specially for state government schools. Currently, it is being used by 11,000 government schools
2. Education Initiatives – Mindspark is being used by about 20 government and government aided schools in India. The product has been translated into Gujarati to remove the language barrier. Their other product SPTS is being used by 400 schools across Bhutan to track progress of all students.
3. Foradian – About 20,000 schools in India are making use of their products. The most commonly used product is Fedena, Most notable project Sampoorna in Kerala is making use of their products.
4. CORE - Over 9000 Schools are using the product and services (except edMastery) developed by CORE. edMastery is being used by all CBSE Schools (more than 12500) as part of a single project. The most commonly used products are ICT/CAL Services, Teacher Training, CTS, Multimedia Content.

There are some pre-requisites for enabling the usage of ICT in schools. Some of these have been discussed below:

6.1. Infrastructure Requirements

In the words of an ICT Manager of Woodstock School, Jeff Rollins, “ICT is a very expensive proposition and cannot be created overnight”. It took their school almost 15 years to set up an infrastructure for ICT. It is still evolving since there is constant up gradation taking place. There are minimum infrastructure requirements for different products. The bare minimum, of course is availability of electricity and internet connectivity. Beyond that there are some adaptations that can be made. As an example, as shared by Educational Initiatives

1. For Mindspark in schools
 - a. In case of Wireless LAN Zone – Infrastructure requirements are setting up of Internet/ Wi-fi facilities and Mobile Tablets

- b. In case of Wired LAN – The requirement is setting up of a computer lab with computers @ 1 for every 15 children
2. For SPTS
 - a. Setup of a Computer facility, Data Resource Person
3. ICT/CAL services require secure room/space to set up computer hardware in. Software products would require servers to be placed either at client site or in a hosted environment, Computers, Internet/LAN are basic requirements for functioning of any Software solution. These services have maintenance, and running expenses (teacher salary, consumables , etc.) for project period generally ranging from 3 to 5 years. Software products also have running expenses with relation to maintenance, customization, enhancements, hosting, etc.

6.2. Human Resource Requirements

In addition to the IT experts there are a number of other human resource requirements for effective and efficient usage of ICT. Some of these are:

1. Subject matter experts which can enable methodological conversion of subject matter into technological platform.
2. Copywriters
3. Trainers
4. Content development professionals – Programmers, animators, illustrators etc
5. Infrastructure deployment and maintenance professional
6. Personnel for Operations

There are other human resource requirements to undertake the following functions :

1. Research
2. Field Data Collection
3. Data Entry
4. Content Development and updation
5. Capacity Development or Training
6. Testing
7. Report Generation and analysis
8. System Development

Schools invest considerable time and resources in undertaking capacity development of the teachers. Technology can be overwhelming if one is not familiar with the

same. While knowledge of IT is mandatory for the new teachers who are recruited, there are regular programmes for their capacity enhancement.

6.3. Feedback from Teachers & School Administrators on ICT Implemented in Schools

Teachers and administrators were asked about their perception of the use of ICT in their respective schools – whether they found it useful and what was the ease of implementation. Their responses have been categorised below:

1. Millennium School, Noida

The chain of schools spread in Delhi/NCR is an educational venture of Educomp. Since, Educomp is a ICT service provider, it has been able to leverage ICT technology to all its Millennium schools at nominal cost. Our finding from the ICT administrator reveals that Educomp does the process of “hand-holding” at the time of inception of school, transition of ICT (hardware/software) in the school, capacity building (teacher training) to all school staff in NIWDs (Non-instructional working days which covers summer and winter breaks), AMCs (Annual Maintenance Contracts) by the service provider to all schools and Educomp IT SPOC for each school branch to address all IT issues periodically. The recruitment of teachers is done by a joint panel of Millennium-Educomp with qualifying criteria for teachers, staff to be “computer-literate”. An average teacher’s experience with the school is over 5 years, are well versed with Smart-boards, Projectors, MIS manual reporting, preparing online material, assignments. Each teacher is provided with an official laptop to ensure all student curriculum and related areas are uploaded on the website through their official id and password. The teachers, staff do not face any problem/issues in teaching/non-teaching activities which are now ICT integrated. Besides, as mentioned, Educomp does pre-training needs assessment, shortlists teachers with different training needs, draws, shares calendar with the school and trains teachers in NIWDs. Teachers are given formal IT on-boarding training/refresher courses on timely basis to familiarise them with the operation, teaching methodology and maintenance of Smart-boards/Projectors/Sensors. By keeping a continuous process and check list, Educomp ensures that teachers, staff are well versed with ICT. Teachers find maneuvering of ICT an easy task. Says ICT administrator “Initially, the introduction of ICT was a nightmare to us but with a lot of support from school management, Educomp, we are now trained on various learning, teaching, assessment tools of ICT without which now life seems impossible”

2. Step-by-Step school, Noida

The school is a new set-up but has a clear line of vision “To make learning enjoyable for students and give a WOW experience to stake-holders”. The school is a part of the modern age list of schools which clearly focuses on using ICT/IT in day-to-day administrative, learning and overall governance of the school. Says ICT head “Our school authorities were very clear on introduction of ICT, they did not want to blindly procure the technology from the market but wanted the in-house IT team to experiment and come-up with a “home-grown” educational solution which could be scaled up in years with minimal license/procurement cost”. That is how the school designed and came up with “StepSys” – a customized ERP solution to meet the school activities. As of now, their entire school management (administrative, overall governance which includes audits, internal controls) and learning activities is integrated with ICT. The school staff including teachers, teaching and non-teaching staff are chosen with pre-defined criteria of being “computer-literate”. Moreover, hand-holding, teacher training is provided to all staff to sensitize them with ICT over a period of time. The teachers are at ease (observed during our interaction) using technology to do a host of teaching activities such as creating surprise tests, sharing immediately in class through Wi-Fi, sharing presentations, subject-aided material over email, using “Mind-spark” through tablets. Teachers are allowed to bring their personal laptops which are then configured with StepSys and added configurations so that teachers can upload important, share, evaluate assignments/exams which makes their teaching experience overall enjoyable and easy.

3. Woodstock Villa, Mussoorie

The school is part of the heritage schools in Mussoorie. As the school is a blend of the Indian and American school education system, most of the teachers are equipped with computer knowledge. The school’s teaching methodology is a blend of usage of Smartboards, Projectors and “Chalk and Talk” methodology. Teachers with their cumulative experiences are well versed with using Smartboards, designing teaching content over the web, storing, sharing it in the “School Knowledge Repository” and sharing learning-aided material with students over Wi-Fi. Teachers don’t face any problem or issues of using technology and if need arises, it is properly addressed by IT staff. Says ICT Director “The school is a mix of International and NRI students from different parts of the world, diverse backgrounds, their countries, backgrounds have empowered them with using ICT from a very early age, there is no way the Teachers at Woodstock can be behind them. It is the constant endeavour of the school management and teachers to be uptodate”.

4. Vasant Valley, New Delhi and DPS, Sonapat

The findings in Vasant Valley School, New Delhi and Delhi Public School, Sonapat were no different from what has been mentioned above in other schools. In the case of Vasant Valley, the Head of Department – IT who teaches as well as drives “IT awareness” drive in the school amongst all the staff believes that till the time the student/school teaching staff is not empowered with technology, they will not be able to play, learn the tools. She cited relevant examples of how experienced, vintage teachers transformed themselves to be open about learning, harnessing the true potential of the technology. During summer breaks, IT department head takes refresher courses on the latest tools such as freeware, software, ERPs for all teachers. She also equips the teaching staff with computers in the lab, gives live projects, tests to increase skills in the workshop. Besides, she engages herself in post-training feedback to make the training programmes relevant for the teachers. As of now, all the school teachers have made interactive/non-interactive subjects as “Interactive” through effective usage of ICT.

7. Challenges of Introducing ICT in Schools

Service providers face a number of challenges in offering and operationalising different products in schools. Some of these identified by the respondents are as follows:

1. Absence of basic infrastructural facilities like Electricity, Internet connectivity etc
2. Affordability
3. For any country where multiple languages are spoken – language becomes a challenge.
4. Exposure of the relevant officials to the use of technology in education is relatively low resulting to low acceptance of the concept of using technology in education to improve the quality of teaching and learning in the classroom.
5. Absence of qualified and trained support personnel. Teachers require a very high level of training and hand holding for using the systems effectively in the classrooms.
6. In addition to the technical challenges, there are managerial challenges related to ERP Implementation.
7. Resistance and disinterest of local populace to make use of newer technologies had been a major area of concern. Regular and inclusive training and mentoring was carried out to overcome this challenge.

During our primary study which included interaction with key stake holders of the school management such as Principal, School Administrator, ICT Manager, it was

found largely that ICT has been used widely, right from covering School Administrative services to small components of School governance. Key stake holders such as Parents, Guardians and School staff have been given access through individual user ids and passwords to respective portals.

Please refer to the below links available at various schools:-

Step-by-Step School, Noida

1. Parent Portal - <https://stepsys.org/parentportal/app/login.cfm>
2. StepSys - <http://stepsys.org/stepsysnew/login.cfm>
3. Student, My Desk - <https://stepsys.org/vle/index.cfm>

Woodstock Villa, Mussoorie

1. Student User Log in -
<https://www.woodstockschool.in/userlogin.cfm?pp=608&userrequest=false&keyrequest=YES>
2. Parent's page - <http://www.woodstockschool.in/page.cfm?p=602#.UZHJvR1TCE4>
3. Community login -
<https://www.woodstockschool.in/userlogin.cfm?pp=603&userrequest=false&keyrequest=YES>
4. Alumni Connect -
<http://www.woodstockschool.in/page.cfm?p=384#.UZHkfb1TCE4>

Vasant Valley, New Delhi

1. Lesson Plans - <http://www.vasantvalley.org/lessonplan2009/login.php>
2. For more links, please visit -
<http://www.vasantvalley.org/vasantvalley/default.shtml>

Delhi Public School, Sonapat

1. DPS, Sonapat – Information Technology -
<http://www.dps.in/informationtechnology.asp>
2. Login arena - <http://dps.in/login.asp>

8. Conclusions Relevant to School Education MMP

In conclusion it maybe said that key factors to be kept in mind if ICT is to be used for school management and providing learning support to students and teachers in government and aided schools across the country in a cost effective way are:

1. Availability of Basic Infrastructure and adequate power supply
2. Using of Distance learning mode for regular and refresher trainings.
3. Use of low cost Interactive Whiteboard solution
4. Regular Refreshment of course curricula in line with Global Trend
5. Practical aspect of ICT needs to be taken care of and its use in solving day to day problems should be encouraged.
6. Usage of already available free content on Internet can be promoted.
7. Effective mechanism for measuring teachers training needs and performance.

9. Appendix A – List of Respondents

| Organisation | Respondent |
|-------------------------|---------------------|
| Educomp | Ms. Tuhin Mehrotra |
| Educational Initiatives | Mr. Venkatesh Reddy |
| Foradian | Mr. Unni Koroth |
| CoreEdu | Ms. Dipti Kadam |
| Millennium School | Ms. Prantika |
| Step-by-Step School | Mr. Keshar Mehra |
| Woodstock Villa | Mr. Jeff Rollins |
| Vasant Valley School | Ms. Sonya Bahri |
| Delhi Public School | Mr. Pramod |

10. Appendix B – Brief write up of the schools visited

1. The Millennium School, Noida – The school is a part of the Educomp school initiatives programme and as mentioned, the school has been able to make apt use of technology from the parent company. All classes from I-X are equipped with Smart-boards, CPUs, UPS, Wi-Fi access points projectors to aid blackboard learning with audio/visual learning. Typically, teachers start lessons and simultaneously navigate through Educomp’s available digitized content over the internet and explain the concept. They also navigate the students on the internet for live projects, concept explanation. Students from Class 3 onwards are provided with Class Mate Personal Computers (CMPC) called as Canoi. It’s a light-weight small laptop which has a Celeron processor backed by software called Mythware which connects, supports Educomp’s digitized content. Students use Canoi to do Live Individual, Group projects, Class work, Online tests, Examinations and Homework. Teaching & Learning in an interactive style is the jumping-off point of Mythware Classroom Management Software. Serving as a management platform for multimedia interactive teaching in computer classrooms, this classroom management software enables the instructor to control and manage the class effectively, supervise students’ activities, maintain order in class, and the students to learn, communicate and collaborate with each other and across groups.
2. Step-by-Step School, Greater Noida – In this school, teachers take an active part in developing the content. They design their own eContent, Presentations to use it for teaching for students of all classes. The school does not believe in providing individual laptops to students as it would only equip students with technology when they are not ready for. They have a unique concept of Tablet Cart. They have altogether 2 tablet carts. The carts have been designed by the IT team. In a single cart, 32 tablets manufactured by Sony are kept. It is designed in such a way that all the tablets can be charged simultaneously. Apart from that it has a router in it; which helps to connect with the internet. Upon request of the class teacher to the IT department the cart moves to the classroom and distribute the tablets to each student. A log book is being maintained for this purpose. The tabs are used in Mathematics class for the students to use “Mind-Spark” – an Educational Initiatives programme. “Mind-Spark” is a Online resource learning tool for 90 minutes that helps students solve



live Mathematical problems and projects. Besides this, teachers provide class-work which is then uploaded respectively on student and parent portal and also sent through emails to parents for after school hours access.

3. Woodstock Villa, Mussoorie – The school is one of the oldest residential schools built in Mussoorie. The school is a traditional mix of ICT technology and American school education system. Classrooms are equipped with Smartboards and projectors but it totally depends on the subject teachers requirement whether they want to use Smartboards or not. The school follows the curriculum from affiliated boards and teachers adopt their own way of teaching students. Teachers carry laptops to the school through which they create their own content, presentations, word documents subject wise and store it in the “Knowledge Resource Bank”. Smartboards are used more frequently in Primary classes to make learning and understanding more interactive for younger children.
4. Vasant Valley School, New Delhi – All classes in the school are equipped with Smartboards like other schools. The tools of the software are being used for different subjects. Apart from this, projects in different subjects are allotted to students which require them to use ICT. While working on the projects along with the subject content, students also learn computer and software skills. For example if students are given an assignment in science to make a website on natural resources, Then along with learning about the natural resources for the science project, they also learn the skill of web designing. Thus is a way, this approach facilitates dual learning. The school has purchased Kyans – an IL&FS educational initiative. Kyan is a portable mobile computer combined with a projector which is used in different classes depending on the requirement. Teachers have digitized material used for effective learning methodologies.
5. Delhi Public School, Sonapat – This school is part of the flagship chain of schools under Delhi Public School Society. DPS society promotes the usage of Educomp products. However, it is not a mandate for all the schools to be on the same ICT platform. The school currently has 60 classes and all of them are equipped with an ICT product: eBeam manufactured and sourced from the company: Luidia Ltd. The eBeam is a combination of sensor (internal memory and processing speed), projector, stylus, speakers and UPS which converts the whiteboard into smartboard which could be operated by stylus. The smartboards are used by respective subject teachers to show pictures, videos, navigate students on the internet for live demonstration of concepts / live projects. “eBeam helps teachers with experiential learning which is of greater advantage to teachers” Says IT teacher, DPS Sonapat. DPS Sonapat has also intake of students of

Thailand, Korea and Japan. The students face problem with English as a medium of instruction. The school has taken the initiative of converting CBSE curriculum of respective classes into their vernacular, install them in individual Tabs and given to students to enhance and promote after school hours learning. This has helped them in attempting class assignments, case studies, projects and other class activities.

11. Appendix C - Questionnaire for Schools

Dear Sir/Madam,

Ernst & Young is undertaking a study to understand how schools are making use of ICT for school management and governance. This study has been commissioned by the National Institute for Smart Governance which is preparing a roadmap for the Ministry of HRD to introduce ICT in public schools in a mission mode.

As part of the study we are collating information from progressive schools such as yours to learn from their experience. We solicit your support to fill up this questionnaire for us to understand how ICT can be used in schools for better school management and extending learning support services to students and teachers. Your views on the application of ICT, the ease of implementation and the impact on end stakeholders will add a lot of value to the study. We request you to spare a few minutes out of your busy schedule to fill up the questionnaire.

We would welcome any other information you think would be useful for the study but has not been sought in this questionnaire.

General information

Name _____ of _____ the _____ school:

Name _____ of _____ the _____ contact _____ person:

Designation:

Email _____ ID:

–

| | |
|---|--|
| <p>How many students are currently studying in the school?</p> | |
| <p>What is the total staff strength?</p> <p>Teachers</p> | |
| <hr/> <p>Department of School Education & Literacy, MHRD, GoI NISG</p> | |

| | |
|---|--|
| Administrative Staff | |
| Support Staff | |
| What is the average number of students in a class? | |
| What is the computer-to-student ratio? | |

Is the school making use of ICT for classroom transaction? Yes/No. Please provide details (for which classes, what subjects, individual/group usage etc.)

Is the school making use of ICT to provide services other than classroom transaction?

If yes, please tick against the following options, whichever applicable.

School management

1. Student enrollment
2. Student attendance
3. Tracking Student academic progress
4. Fee payment
5. Teacher recruitment
6. Teacher attendance
7. Capacity need assessment for teachers
8. In-service training for teachers
9. Salary transfer
10. Any other (Please provide details)

Management information system

Do you maintain data related to any of the above mentioned school management services?

Is the MIS so maintained used for monitoring or designing schemes?

Please explain the process followed in terms of human resource engaged to prepare/maintain the MIS; check points to maintain consistency, access to the MIS etc.)

How is the MIS being used for decision making? Please give examples.

Learning support

1. Self learning tools for students/teachers
2. E-content/instructional resources
3. Portal for learning resources
4. Standard assessment services for students
5. Standard assessment services for teachers
6. Digitized format for library content
7. Any other (Please provide details)

Could you please provide details of products being used to provide the above mentioned services?

| Product | Details |
|---------|---------|
| | |
| | |
| | |
| | |

How and from where did the school source these products?

What is the infrastructure requirement for implementation of ICT to provide learning support and school management services?

How cost effective is it to make use of these products? What measures has the school taken to make these cost effective?

In your opinion, has there been any impact in the functioning of school after making use of ICT for school services? Please give examples.

Has the use of ICT helped in improving involvement of the stakeholders – Board Members, Parents, Students and Teachers – for better decision making and improving school performance?

In your opinion has there been an improvement in value delivered to the end stakeholders - (Board Members, Parents, Students and Teachers)? Please substantiate by giving examples.

12. Appendix D – Questionnaire for Service Providers

Dear Sir/Madam,

Ernst & Young is undertaking a study to understand how schools are making use of ICT for school management and governance. This study has been commissioned by the National Institute for Smart Governance which is preparing a roadmap for the Ministry of HRD to introduce ICT in public schools in a mission mode.

As part of the study we are collating information from professional organisations such as yours, to understand the range of products available, ease of using these and your experience of their usage in schools. We solicit your support to fill up this questionnaire for us to understand how ICT can be used in schools for better school management and extending learning support services to students and teachers. Your views on the application of ICT, the ease of implementation and the impact on end stakeholders will add a lot of value to the study. We request you to spare a few minutes out of your busy schedule to fill up the questionnaire.

We would welcome any other information you think would be useful for the study but has not been sought in this questionnaire.

Could you list the Products/Solutions you have for schools?

| | | |
|--|--|--|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

How many schools in India are making use of these products?

Which of the above mentioned products are more commonly used by the schools?

Have any of these products used by any of the State Governments for State run or Aided Schools ?

Are there any minimum infrastructure requirements for using these products ? Could you please specify.

What are the other recurring expenses associated with the usage of these products? Please give details.

Have these products been used in any other countries? Please specify.

What are the challenges you have faced in the usage of these products in countries facing similar challenges as ours in terms of reaching out to remote areas; lack of adequate infrastructure or human resource? What measures were taken by you to overcome these challenges?

What are the human resource requirements to carry out different functions related to the use of ICT such as content development, capacity development, research etc.

From your experience what are some of the key factors to be kept in mind if ICT is to be used for school management and providing learning support to students and teachers in government and aided schools across the country in a cost effective way?

Please share any other information which you think would be useful for us to consider such as which of the products developed by your company would be relevant for usage in the government or aided schools, any policy changes required, any procedural changes you would like to suggest etc.