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Integrating ICT in School Education: A Case of Pratham Info Tech Foundation, India

In the scorching and sultry heat of a Mumbai summer Prem Yadav, the Director of Pratham Info Tech Foundation (referred to as the Foundation), Mumbai, India and his team were busy teaching basic computer skills to students attending a school for children raised in poor households. These children were stumbling at every stage. Classrooms were very small and congested. Electricity supply was erratic. Software products were available only in English and were not compatible with the hardware. Schools and teachers were unenthusiastic if not wary of the additional burden put on them. This was the situation in spite of the fact that for four years since 1998, Prem and his team had tried everything to integrate Information and Communication Technology (ICT) in 54 Municipal Corporation schools, (schools run by the civic body that governs the city) started mainly for unprivileged children. The team enjoyed moderate success, but the overall impact was small.

Uses of ICT in education were perceived to be an add-on support, rather than an effective toolbox to bring consistency and equality in providing quality education and empowerment to underprivileged children. Information technology had led to decisive and sweeping changes in other fields like healthcare, e-governance, logistics, and manufacturing. Yet so far ICT had very limited success in the field of education especially at pre-primary and secondary school levels (i.e., from standard 1st to 8th). On the one hand, India was emerging as a knowledge based economy by exporting IT and IT based services to the world, and, on the other hand, most of the population belonging to the low income group did not have any access to learn basic knowledge and skills related to IT. Prem was convinced that this digital gap needed to be closed as early as possible; otherwise India would risk leaving a large section of the population far behind. He knew that it was not the technology per se, but the implementation of the technology at the grass roots level that was more important. The specific challenges that Prem faced were as follows:

- How should the organization strive to integrate ICT in the state board school curriculum?
- Which type of schools should be selected for intervention?
- Which type of hardware and other infrastructure would be required?
- Should the Foundation buy readily available software and e-content or develop products suitable for its requirements?
- Who would instruct the children? What should be the method of instruction?
- How should the programme be scaled up in order to have a bigger impact and make it financially viable?

Prem knew that the answers to these questions would have an impact not only on the achievement of the social goals set by the Foundation, but also on its survival and growth**.** In fact, these decisions would strongly influence both the structure and the business model adopted by the organization.

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Education in India

The structure of the education sector in India had been complex since gaining its independence in 1947. Various stakeholders such as the central government, state governments, municipal corporations, municipal councils, local level governing bodies like district and village administration units as well as the private sector (such as educational trusts and societies) played an important role in its development. Basic framework and policies were designed by the central and state governments and local partners were given operational authority. The central and state governments also provided the grants to run the education programmes at the public schools. Most of these grants were routed through Zilla Parishad, a district level legislative body. Public schools received these grants through Zilla Parishad under the budget allocated for education. The monitoring authority to oversee the day to day functioning of the local schools was vested with the Gram Panchayats (village level administrative bodies) through the School Management Committee (SMCs) comprising members from the local community.

In urban areas, municipal corporations or various education trusts were responsible for running public schools that were mainly supported with government grants. The school education was also available in various regional languages such as Marathi, Hindi, and Gujarati. Most of these schools were providing education in regional languages and were known as vernacular medium schools. Enrollment in private schools was also increasing at a very fast rate. It had been observed that with rising per capita income, parents wanted to shift their children from public to private sector schools for better quality of education. This better quality was also identified with schools providing education in English. As a result, government aided vernacular medium schools such as Marathi and Gujarati medium schools were being run mainly for underprivileged children whose parents could not afford to send their children to other private or semi-grant schools.

Most of the state board schools followed the "10 + 2 + 3" pattern of education wherein schools generally had responsibility for 12 years of study. It included 5 years of primary education (up to 5^{th} class), 3 years of upper primary or (6^{th} to 8^{th} classes) and 2 years of high school. This was generally followed by 3 or 4 years of undergraduate university courses. The National Council of Educational Research and Training (NCERT), the apex body for curriculum development, provided technical support to schools and oversight of the enforcement of educational policies. The broader picture of the educational status of India for the year 2011-12 is given in Exhibit 1. It shows that there were around 1.42 million primary schools and more than 0.22 million secondary and higher secondary schools in India catering to more than 250 million students. It indicates that public schools funded as well as managed by government still played a very significant role at elementary, secondary and higher secondary educational (11^{th} and 12^{th} standards) levels. The government share was around 76 percent at primary education level and 44 percent at secondary and higher secondary level.

State of Education in India

The status of education in India painted an intriguing picture. On the one hand India was rapidly becoming known for its world class educational institutions. The educational institutions such as Indian Institute of Technology (IIT) and Indian Institute of Management (IIM) were internationally renowned for their educational standards. These institutes helped India to take a knowledge and information driven growth path after the 1990s. The highly professional and competent intellectual labour force serving as a core competitive advantage was a point of pride for India. At the same time, the overall status of education, especially the education offered to masses, was in a critical condition. The *Report to the People on Education* 2011-12 (2012) published by the Ministry of Human Resource Development stated that national literacy level had increased from 64.8% in 2005 to 74% in 2011. The world average literacy

rate in 2010 was 84.1 % [1]. The level of female literacy was as low as 65%. The report also stated that high drop-out rates from schools at primary and elementary levels were an area of concern. The drop-out rates in 2009-10 were 29 % at primary level and 42% at elementary level (DISE Report: 2009-10).

Quality of education has also been another area of concern. The *Annual Status of Education Report* (ASER, 2013) prepared by Pratham showed that no marked improvement in learning abilities had been seen over the years. Fifty percent of the children from the class II could not read simple everyday words in their regional languages. Only 26% from the class III and 52% from the class V children could do simple subtraction problems. The report also showed the dismal condition of infrastructural facilities available at schools. It stated that still 26% of the schools were without drinking water provisions. Nearly 37% of the schools did not have toilets and nearly 60% of the schools did not have libraries.

The picture related to penetration of ICT in education was also grim. The proportion of schools having computers had marginally increased from 16.5% in 2009-10 to 20.5% in 2011-12. Out of these schools, around 87% had computers that were functional. This made for a very curious picture of the Indian educational system. On one hand, India had emerged as a global leader in the knowledge based economy with successful diversion of the economy towards IT and IT related sectors—made possible by the high proportion of graduates in this field. At the same time, with apparently ample support from the government, the ICT in education had not penetrated deeply in the system. It remained a privilege of a very few segments of the society belonging to the rich and urban class.

Sarva Shiksha Abhiyan and Right to Education

Sarva Shiksha Abhiyan (SSA), meaning "Education for all movement" was a central government launched programme intended to achieve universalization of elementary education in India[2]. It facilitated the implementation of "The Right to Education Act" (RTE) on 1st April, 2010 which established the right of children between ages 6 to 14 years to free and compulsory education. Under Article 21-A of the Indian Constitution, every child's right to a full time elementary education in a formal school which satisfied certain essential norms and standards was recognized. The act also provided some quality norms for the school and made schools and teachers accountable to parents and the larger community. SSA along with RTE had given thrust to the development of the education sector through a multi-pronged strategy such as opening of new schools, strengthening school infrastructure, capacity building of teachers, development of teaching-learning materials and provision of academic support structures at the local and regional levels. It also sought to bridge the digital divide through the implementation of ICT at the school level.

Global Outlook on ICT in Education

Information and Communication Technology (ICT) refers to all technology used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems and network based control and monitoring functions. It is an umbrella term used to depict any kind of communication application encompassing integration of a variety of technologies such as telecommunications, radio, and computer networks using common transmission lines. ICT in education is defined as use of all devices, tools, content, resources, forums, and services for realizing the educational goals. (Exhibit 2).

[1] http://www.uis.unesco.org/literacy/Documents/fs20-literacy-day-2012-en-v3.pdf

[2] www.ssa.nic.in accessed on 8th October,2014

All across the globe, many countries had been eager to adopt ICT in education—regardless of whether they were developed or developing nations or if their growth was IT led or not. ICT in education was used to bring innovations in education, to enhance the quality of teaching and learning in the classrooms, to increase efficiency in education management and to extend boundaries of the schools. For instance, all the Organisation for Economic Co-operation and Development (OECD) countries had sought to install networks in all of their schools, to connect them with internet and to ensure that this technology would help in improving the quality of education and make it more joyful and engaging (Venezky: 2002). Major international educational institutions, such as MIT and Harvard, were using ICT to introduce online courses that were helping them to tap global students with minimal resources. Online educational programmes like Coursera and Khan Academy had become immensely popular amongst students across different countries.

Global data showed that there was a very high level of disparity in access to education between high and low income countries. Average length of schooling in high income countries was ten years, whereas in developing countries it was 4.6 years. Nearly 16.9 percent of children of primary school age from developing countries did not attend school and the majority of these were girls (ICT & MDGS: World Bank, 2003). It was feared that if developing countries did not catch-up with developed countries in providing access to education, the income and wealth gap would widen. Millennium Development Goals (MDGs) also had set "Universal access to primary education to each and every child by the year 2015" as one of the major objectives. The World Bank considered ICT in education as one of the most important tools to achieve it (ICT & MDGS: World Bank, 2003). The World Bank understood that ICT could not undermine or replace the need for political stability or physical infrastructure. Yet it could be used effectively as a part of an overall development strategy, especially to increase the effectiveness of teaching and learning and to bring out synergies between government agencies, business groups and local communities. More specifically ICT could help in providing education through distance learning to those who did not have access due to distance/remoteness, social barriers or physical barriers (disabilities). It would enable knowledge networking across society, help teachers in effective dissemination, broaden access to quality educational materials and help in managing educational administration more effectively.

Examples of Successes and Failures in ICT in Education

There were plenty of examples of how and why ICT in education had not worked. In many cases obsolete or nearly obsolete hardware was dumped in the schools, hoping some miracle would emerge on its own. In a few cases, this policy was implemented with assistance of the third party vendors who were eager to sell their software and training modules without giving due respect to local needs and requirements. Availability of relevant user-friendly e-content, tuned with each school's syllabus and developed in regional languages, was almost non-existent everywhere. Implementation of ICT required fixed costs in terms of installation of hardware as well as variable costs in terms of servicing, maintenance and updating. Typically fixed costs are around 10 to 25% of the total cost. But many ICT programmes tended to ignore variable costs, thus threatening program sustainability. There was no system to monitor and evaluate the impact of any programme, which became a hindrance for replicating the same elsewhere. This, along with teacher's apathy or lack of interest in taking on additional burdens, had only aggravated the nature of the problems in implementing ICT. The World Bank noticed that ICT related projects in developing countries were often focused more on technology than on using ICT to meet broader educational objectives. This narrow focus on providing "ICT literacy" resulted in the lack of integration of ICT in the overall national curriculum and education system.

Nevertheless, there have been a few success stories. Accredited Social Health Activists (ASHA) 2005, India; Jordan Education Initiative, Jordan; Gyandoot and Hole-in-the-Wall experiment, India; Multipurpose Community Telecentres for Community Development, Sri Lanka, were examples (see

Exhibit 3). These examples showed that use of innovative and appropriate technology, policy support, involvement of local communities (especially local youth) and identification and involvement of key stakeholders were the crucial success factors for the implementation of ICT at the grassroots level.

The Beginning of Implementation of ICT in Education in India

The idea of using ICT in school education had been introduced in India as early as 1984 when a project called Computer Literacy & Studies (CLASS) was launched by the *National Council of Educational Research & Training, India* (NCERT) along with the *Dept of Electronics* (DoE) and the *Ministry of Human Resource Development* (MHRD). Nearly 42 resource centres were established and 2502 schools were provided with micro-computers to disseminate the knowledge and technical skills. This pilot programme was re-launched in 1993 as "CLASS 2000" at a much higher scale. It covered around 10,000 schools for the Computer Literacy Programme, 1000 schools for the Computer Assisted Learning (CAL) programme and 100 schools for the Computer Based Programme. All the programmes had limited success due to ambiguity in policies and inconsistencies in their implementation.

Not deterred by these inadequacies, the New National policy on ICT in School Education, 2012 aimed to devise, catalyze, support and sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system. It stated that the central government in collaboration with state governments would implement ICT programmes at the school level. Rs. 5 million ($81,000) budgetary provisions were made for implementation of ICT at each district level. The policy supported all states and union territories to establish computer labs in all government and government aided secondary and higher secondary schools by provision of Rs. 2.5 million ($40,500) per year, as well as Rs. 0.25 million ($4,100) per year at the district level. It also aimed to setup 150 smart schools in each state that would act as "Technology Demonstrators" and lead other neighbouring schools in propagating IT skills. The policy also supported the development of e-content mainly through Central and State Institutes of Educational Technologies, and capacity building of teachers. NCERT had also developed a national policy on ICT in school education that provided some guiding principles on what competencies should be developed and at what level with the help of ICT (NCERT: 2013). Yet success had been elusive.

Many reasons had been cited for the limited success of ICT penetration in India. The policy on paper states that ICT can be an effective tool to provide learner centered education which enables students to work with their own pace, experiment, and evaluate their own work. At the same time, most of the technologies used remained supply-driven and equipment-centric, and not teacher and student driven (NCERT:position paper: 2006). Secondly, SSA was a central government sponsored programme where state governments or local level governments did not have enough autonomy to make decisions related to use of resources. ICT in education required contextual e-content that was based on state curriculums and developed in vernacular languages. Lack of proper decentralization for decision making and resource allocation resulted in a lack of sustainability of ICT in the long run (Das, 2012). The other reasons cited were lack of funds required for maintenance, repairs and upgrades; low level of involvement of other stakeholders such as the local community, schools and parents of the children; and delays in getting payments sanctioned.

Pratham Info Tech Foundation

Pratham Info Tech Foundation was established as an affiliated organization of the parent organization "Pratham Foundation", the largest Non-Governmental Organization (NGO) working to provide quality education to the underprivileged children of India[3]. It was set up in 1994 as a Public Charitable Trust in

[3] www.pratham.org accessed on 12th august, 2014.

joint collaboration with the Municipal Corporation of Greater Mumbai (MCGM), UNICEF and several prominent citizens such as Dr. Madhav Chavan, Co-founder and CEO-President of Pratham, Farida Lambay, Co-founder and other prominent business people. Its board of directors consisted of eminent personalities from various fields, such as education, development, media, and civil services, who brought lots of experience and expertise to the Foundation. Its mission statement has been "Every child in school and learning well" (see Exhibit 4). Pratham firmly believed in working with the government to bring about large scale change and worked in close collaboration with the municipal corporations in several cities such as Mumbai and Delhi. In almost 20 years after its foundation, Pratham had become a pan-Indian movement having presence in 19 states and had already reached millions of children through its variety of programmes such as Read India, Urban Learning Centres, remedial classes for underperforming children, and outreach programmes, such as the Council for Vulnerable Children. As a non-governmental organization, the Foundation was mainly funded by national and international donor organizations, private corporate organizations and individual donors.

Prem Yadav – Founder and Director

Mr Prem Chand Yadav, a former Pratham employee and Director of both "Sanchar Info Tech Pvt Ltd" and the Pratham InfoTech Foundation, came from a very humble background. His early sufferings as a victim of polio and economic hardships had made him a stronger person. "I am a strong believer that a handicap – whether physical or economic is mostly in the mind," he would say. He took the initiative in his own slum community to work on adult literacy and later became part of a larger movement for literacy in Mumbai under the National Literacy Mission. Since then, Prem had been very actively and passionately involved in all the activities of Pratham under the mentorship of Dr. Madhav Chavan, Co-founder and CEO – President of Pratham. Prem received several awards for his contribution in the development field, including a "Civic Leadership Award" from the city of St. Louis.

The Journey So Far

Prem began his journey in the city of Mumbai, the capital city of Maharashtra state. Maharashtra was considered to be one of the most progressive states in India in terms of per capita GDP, level of industrialization and availability of infrastructure, etc. Mumbai was one of the major financial and trade centres in India. Exhibit 5 gives the details of the educational status of Mumbai city for the year 2011-12. Although the educational status of Mumbai was better in comparison with the rest of India, there were still many pockets within the city where poor people resided. There were in all 2,238 schools in Mumbai alone, providing education to more than 1.5 million students at the elementary level. Government granted and managed schools accounted for 52% of the total schools at the elementary level. Most of these schools were in vernacular languages, mainly providing education to poor children. In fact, Mumbai had more than 15 million people who resided in slum areas.

In 1998, Prem was working as an account officer at the Pratham Foundation when opportunity knocked on his door. ICICI Bank, one of the leading private banks in India, wanted to give away 120 used computers. They asked if Pratham would be able to put them to better use in the field of education. At the time, Prem was the only person from Pratham to have some basic qualifications in computers. Thus the responsibility fell into his hands. He understood only one thing at that time: these computers would be a good resource for furthering the cause of education.

Prem started his new journey with great enthusiasm. Pratham Foundation was running a "Balsakhi" programme (meaning friend of a child) that offered remedial classes in MGMC schools in Mumbai for the students who were weak in their studies. He decided to use these donated computers in this programme. The programme was run in vernacular medium schools between the periods of 1994-98 where Computer Aided Learning (CAL) was used to supplement regular class teaching (see Exhibit 6). Nearly 12,000

students of 3rd and 4th classes (average age group of 8 to 9 years) from 54 schools and 12 wards attended the CAL programme. It was moderately successful. Though it was fully sponsored by ICICI Bank for one year, there were a lot of other challenges—such as lack of space, electricity and need for approvals—that were encountered in the beginning. These four years of experience gave Prem insights that helped him to set up a new foundation. Pratham Info Tech Foundation was established in the year 2000 as a separate entity but affiliated to the Pratham Foundation. Its mission statement was "boost digital literacy" (Exhibit 7). The mission and vision statements of both the foundations show that though these two were separate entities, there were strong synergies between the two organizations.

The Foundation grew slowly and steadily. The management made an effort to groom the leadership team and by 2009 there were eight team members closely working on the CAL project. The team conducted a number of experiments with the curriculums, pedagogies, and syllabi related to ICT at school levels. It developed partnerships with many corporate houses, government bodies as well as with public and private schools. The foundation also collaborated with a few private schools where it funded the CAL project by charging tuition fees. This helped the foundation in building a revenue model. By the end of the year 2009-10, the foundation's total receipts were Rs. 22.43 million ($0.36 million) out of which nearly 28% came in the form of donations and 72% were received in the form of tuition fees. Slowly, the Foundation started expanding to other regions such as Gujarat, Delhi and Haryana. These additional years of experimentation gave confidence to the team, preparing it to launch the programme on a larger scale and setting up a series of crucial decisions.

The Crucial Elements of the Decisions

• How should the organization strive to integrate ICT in state board school curriculums?

Under the existing education policy, ICT was mainly introduced as a separate subject for 9th and 10th classes in the state board syllabus wherein the students would learn basic computer skills mainly with the help of illustrated textbooks. In many schools, the students did not even get the chance to see a computer, let alone experiment with it. ICT was also perceived as a peripheral tool, whose main purpose was to assist teachers and schools in managing administration. Pratham Info Tech had to make a decision either to narrow its focus and assist schools in covering the given syllabus or to take a bigger role in integrating ICT into the core curriculums so as to make a larger impact. On the one hand, the first option was easier; the syllabus and the textbooks were already prepared and Pratham could take on the challenge of effective implementation through provision of practical training. On the other hand, Prem firmly believed that ICT had a major role to play both in bridging the digital divide between the rich and the poor and in improving the quality of mass education. Integrating ICT into core subjects like mathematics, science, and history would require gaining expertise and building competencies at different levels and in different subjects. This would involve greater costs and would require restructuring in the organization.

• Which types of schools should be selected for the intervention?

Private schools had better resources and parents were more likely to support the programme by willingly paying the fees for the computer programmes. In fact, Prem's team had been approached by a few private schools to implement the CAL programme. The response had been positive and parents had willingly paid fees for the same. Unfortunately, most of the public schools run for unprivileged children were not only inadequately equipped with the necessary infrastructure, they were also unable to bear the minimum cost of running the programme. Neither the public schools nor the parents were keen on launching this project. Without school support it would be very difficult to get a free slot in the student's timetable for conducting computer classes. The type of schools selected would have further impact on other decisions to be made by the foundation. It would also determine the following: what kind of software would have to be used—English software (readily available in the market) or vernacular (harder to come by); the type of

manpower required (instructors *plus* developer in case of training for vernacular language software); as well as its sources of revenues (could the programme be charged or not).

• Which type of hardware and other infrastructure would be required?

Based on his experience in the field, Prem understood that even schools from metropolitan cities like Mumbai were typically grossly ill-equipped in terms of necessary infrastructure. Schools did not have adequate space, chairs or even tables to conduct computer classes. Electricity supply was erratic. Most of the second hand computers that the team used were not compatible with the available software in the market. The schools did not have any additional revenue for maintenance and repairs of the donated computers. Upgrading systems was out of the question. Building the mechanism for repairs, maintenance, upgrades and development of e-content would require additional resources in terms of manpower and infrastructure. Using the existing infrastructure would reduce the cost but would also limit the capabilities of the organization.

• Should the Foundation buy readily available software and e-content or develop materials suitable for its own requirements?

As previously noted, there was a dearth of suitable software and e-content in the regional/vernacular languages on the market. Prem knew that the system would work efficiently if and only if there was proper e-content that was student-centric and met the requirements of teachers to cover the syllabuses for their classes. ICT was best used in an experiential learning method (i.e., through trial and error). In many places, however, it was actually taught in a rote learning method supported by textbooks. Prem wanted to avoid this as far as possible. To do so, e-content needed to be developed based on playful activities that would engage children actively and would also help them understand basic concepts. The Foundation did not possess the expertise necessary to develop e-content for school curriculums. To develop this capability would require employing a team of IT programmers, designers and educationists. This would not only lead to additional costs but would also require additional school time for the children.

• Who would instruct the students? What should be the methodology of instruction?

There were two options for instruction. If the foundation decided to train the already employed school teachers to conduct Computer Assisted Learning (CAL) programmes in the schools, it would not have to bear the cost of their salaries. As these teachers would already be aware of the socio-economic background of the students, the programme would be easily adopted at the ground level. If the Foundation recruited new instructors, it would have to bear the additional expenses of their salaries. The Foundation would then have to select appropriate candidates who would not only have an adequate educational background but also the ability to adapt to the socio-economic context of the children. It would also have to link their services to the schools where the programmes would be conducted. The schools would have to be willing to take the additional responsibility of providing necessary facilities to conduct the classes and monitor the progress of these external instructors. At the same time, the advantage of recruiting new instructors would be to have more control over the programmes as the Foundation would have full freedom of selection, recruitment, training, and assessing the work of the instructors. This would not only help in effective implementation of the programmes but would also help in effective monitoring and evaluation.

• How should the programmes be scaled-up in order to have a bigger impact and make it financially viable?

Most social organizations depend upon grants and donations in the early period. There has been, however, pressure to find their own sources to cover (at least) recurring costs for the long run. There were

various options open to the Foundation. One was to become financially viable by charging some minimal fee for the training from the students. Prem knew that many students coming from poor families would not be able to afford it and would therefore fall outside the orbit of the programme--thereby diluting its social mission. The second option was to collaborate with corporate houses that would fund the programme under the banner of "Corporate Social Responsibility"—a corporate mantra in recent years. A third option was to partner with other social organizations/NGOs and run the programme under their umbrella. The challenge in the last two options was identifying the right kind of partners, ones that were willing to share the Foundation's vision. This would involve determining both the role and scope of the interventions as well as ensuring autonomy to each partner while continuing to achieve the social mission.

Summary

Prem and his team were looking at a big dream: bridging the digital gap in India in the long run. He knew that the decisions he made would be the key to achieving it. They would not only affect the social mission of the Foundation, but its growth and sustainability. Balancing both growth and sustainability without diluting the social mission was the tricky part.

These decisions would have particular impact on the business model of the Foundation. According to Osterwalder's Business Model Generation, nine components of an organization that are interlinked with each other decide the fate of that organization (Osterwalder & Pigneur, 2010). These components were customer segment, value proposition, channels, revenue streams, key resources, key activities, key partners and cost structure. As noted in Exhibit 8, this model specifies the innovative strategies that an organization can use to create value for its customers and to remain competitive in the future. The decisions Prem had identified would drive these components and would influence the structure and growth of the organization. For instance, the choice of schools (consumer segment), choice of hardware, e-content and software as well as instructors (key resources) would have impacts on cost structure as well as revenue structure. The choice of collaborations (key partners) would significantly affect the revenue stream and thus the long term sustainability.

It is very rightly said that "Every student needs a grandparent to link them to the past and a PC to link them into the future." But "How" was the big question.

Exhibit 1: Educational Status in India for the Year 2011-12

Sr. No	Indicator	Categories	Number	Percentage of Total
1	Population (in millions)	Male	623.12	51.5%
		Female	587.45	48.5%
		Total	121.05	100.0%
2	Literacy rate	Male	504.10	80.9%
		Female	379.49	64.6%
		Total	883.59	73.0%
3	Enrollment (in millions)	Primary (1 to 4th class)	137.09	54.1%
		Elementary (5 to 8th class)	61.95	24.4%
		Secondary (9 & 10th class)	34.64	13.7%
		Higher secondary (11th & 12th class)	19.92	7.8%
		Total	253.61	100.0%
4	Primary schools	Government aided & managed	1078904	76.4%
		Private (aided)	73433	05.2%
		Private (unaided)	259841	18.4%
		Total	1412178	
5	Secondary & Higher secondary schools	Government aided & managed	99578	43.5%
		Private (aided)	40518	17.7%
		Private (unaided)	88818	38.8%
		Total	228914	100.0%

Source: Elementary Education in India, Progress towards UEE, 2013, National University of Educational Planning & Administration, Department of School Education & Literacy, Ministry of HRD, Government of India.

Exhibit 2: What is ICT in Education?

Information and Communication Technologies are defined as all devices, tools, content, resources, forums, and services either digital or those that can be converted into or delivered through digital forms. These are deployed for realizing the goals of teaching, learning and enhancing of learning capacities, as well as for management of the educational system. These do not only include hardware devices connected to computers, and software applications, but also interactive digital content, internet and other satellite communication devices, radio and television services, web based content repositories, interactive forums, learning management systems, and management information systems. These will also include processes for digitization, deployment and management of content, development and deployment of platforms and processes for capacity development, and creation of forums for interaction and exchange.

Source: National Policy on information and Communication Technology (ICT) in School Education: revised in March 2012.

Exhibit 3: A Sample of Success Stories of ICT in Education

1. American Speech-Language-Hearing Association (ASHA) – 2005

Objectives:

To educate illiterate adults in remote villages and to train rural youth in computer applications to improve their employability

Country and state: India, Himachal Pradesh

Innovative uses of ICT:

- To build community learning centres using information technology
- To foster community awareness by making information available to them

Implementing organization and Partners:

Science Awareness Trust (SAT), Himachal Pradesh in collaboration with State Government of Himachal Pradesh

Year of launch: 2002

Scale of operation:

Trained more than 15,000 adults in 3 years since inception

Key lessons learned:

- Community involvement has been necessary for successful implementation.
- IT technologies must be adopted in local languages to tackle local needs.
- The Community Learning Centres must focus on local developmental issues to create and sustain community interest in the new initiatives.

Source: ICT in Non formal Education, Information & Communication Technology for Education in India and South Asia. (2010). PriceWaterHouseCoopers. Retrieved from http://www.infodev.org/infodev-files/resource/InfodevDocuments_937.pdf

2. The Jordan Education Initiative

Objectives:

- To improve school education through effective use of ICT
- To help building capacities of local IT and ICT industries
- To improve delivery of education to Jordan's citizens through Public Private partnerships

Country and states: Jordan, entire country

Innovative uses of ICT:

- Development of e-content for school curricula in local languages that is also relevant for local requirements
- Capacity building of teachers through training
- Enabling schools to adopt ICT by making infrastructure available

Implementing organizations and partners:

The programme was implemented by the government of Jordan with financial support provided by the World Economic Forum and international and national donor organizations, including private companies with 30 active partners.

Year of launch: 2003

Scale of operation:

It covered more than 100 pilot schools, 2,300 teachers and 50,000 students in the first phase. It is likely to get expanded across all public schools and in other developing countries as well.

Key lessons learned:

- Government plays a crucial role in bringing transparent, competent and reform oriented policies required for successful implementation of ICT in education.
- Building effective public and private partnerships is crucially important. The private organizations provide the technology and skill sets required for the programme. The public organizations are required to create sound policies, create infrastructure, scale-up the programme and implement it at the ground level.
- Restructuring of existing education models to integrate ICT has been essential for success.
- The existing ICT sector, though it may be small in size needs to be facilitated for creation of e-content.

Source: The Jordan education Initiative: a multi-stakeholder Partnership Model to Support Education Reforms, Policy Research Working Paper – 6079, The World Bank, Human Development Network, Education Team, June 2012.

3. Gyandoot: A Community Owned, Self-sustainable and Low Cost Rural Intranet Project

Objectives:

- To provide government services available at the district level through e-governance
- To ensure equal access of emerging technologies to deprived and marginalized sector in the economy
- To enhance the participation of marginalized sector in community affairs with the use of ICT

Country and states: India, Madhya Pradesh

Innovative use of ICT:

- Development of intranet based Government to Citizen (G2C) service delivery portals
- Provision of access to information such as agricultural market prices and government policies and procedures with the use of ICT
- Capacity building of local youth in managing and running these portals/ kiosks at village levels

Implementing organizations and partners:

Gyandoot Samiti formed at village level in collaboration with state government and local district level governments.

Year of launch: 2000

Scale of operation:

It covered 20 villages in Dhar district, Madhya Pradesh at the pilot stage and strived to provide as many as twenty-two services such as provision of birth and death certificates, land records, income certificates, and grievance redressal applications.

Key lessons learned:

- The programme has helped in improving the delivery of government services and also in reducing the corruption level as well as the harassment level involved in receiving these services.
- ICT though this programme has helped in providing easy access to district administration.
- Creation of reliable infrastructure and server connectivity to nodal level organization such as district level organization in this case is crucially important for the successful implementation of ICT.
- Building awareness and involving local participation is important for successful implementation of ICT.

Source: http://gyandoot.nic.in/gyandoot/intranet.html

4. The Hole-in-the-Wall Experiment Demystifying Computers

Objectives:

- To teach computers to slum children with Minimal Invasive Technique
- To initiate the self-learning process of the unprivileged children
- To improve the computer literacy as well as learning abilities of slum children

Country and states: India, Uttar Pradesh and other states

Innovative uses of ICT:

- Introduction of unsupervised and minimally invasive computer education to slum children through installation of computers in public places where they will be easily available and accessible to children without anybody to guide them or to instruct them

Implementing organizations and partners:

National Institute of Information Technology (NIIT) supported by International Finance Corporation (IFC)

Year of launch: 2000

Scale of operation:

It started in New Delhi in 2000 and spread across 300 stations covering more than 300 thousand children.

Key lessons learned:

- Suitable computer facilities and entertaining e-content encourages children to take the path of self-learning.
- ICT helps children in choosing their own learning paths which are different for different children.
- Peer/ mutual learning and joyful learning plays a crucial role in successful implementation of ICT.
- ICT implementation helps in improving learning abilities and also in preparing children for choosing their own independent opinions.

Source: http://www.hole-in-the-wall.com/Beginnings.html

5. Multipurpose Community Telecentres for Community Development

Objectives:

- To improve access to information to the poor and marginalized sector through creation of Community Learning Centres (CLCs)
- To empower them with information and reduce their isolation
- To build entrepreneurial capabilities of rural population by encouraging them to use ICT in marketing and selling their products

Country and states: Sri Lanka

Innovative use of ICT:

- Use of ICT for community empowerment through non-formal education
- To create an entrepreneurial eco-system with the help of ICT by providing access to information, guidance, training and support

Implementing organizations and partners:

Sarvodaya Shramadana Movement (NGO) in partnership with Ministry of Education, Sri Lanka, village banks and district level administration

Year of launch: 2000

Scale of operation:

It covered about 18 villages in the pilot phase.

Key lessons learned:

- Use of ICT helps in improving learning skills required for entrepreneurial ventures.
- ICT has helped in encouraging youth to participate more in community affairs.
- Effective networks created with the use of ICT have helped entrepreneurs to market their products in a better way.
- ICT has helped in improving employability of rural youth.

Source: Information and Communication Technology (ICT) for Community Empowerment through Non-formal Education: experiences from LaoPDR, sri Lanka, Thailand & Uzbekistan, UNESCO, 2005.

Exhibit 4: Mission and Vision of Prathem Foundation

Mission statement: Every Child in school and learning well.

The organization believes that education is a fundamental right of every child and no child should be deprived of this basic right simply because he/she does not have access to it due to lack of resources.

Vision of the organization:

• Generating a societal mission to achieve the broad goal of universal pre-school and primary school education

• Creating an impact on a large scale to bring about perceptible changes

• Creating a low-cost model of education to ensure sustainability and replicability of the interventions.

Source: www.pratham.org/about-us/faq accessed on 21st September, 2015

Exhibit 5: Educational Status of Mumbai Metropolitan Region – 2011-12

Sr. No	Indicator	Categories	Number	Percentage of total
1	Population (in millions)	Male	6.73	54.0
		Female	5.74	46
		Total	12.47	100.0
2	Literacy	Male	6.28	93.32
		Female	4.97	86.70
		Total	11.25	90.28
3	Enrollment	Primary (1- 5^{th} class) (in millions)	0.90	61.6
		Elementary (6- 8^{th} class) (in millions)	0.56	38.4
		Total	1.47	100.0
3	Primary schools	Government aided & managed	1163	52.0
		Private (aided)	447	20.0
		Private (unaided)	628	28.0
		Total	2238	100.0
4	Secondary & Higher secondary schools	Government aided & managed	157	9.8
		Private (aided)	816	51.2
		Private (unaided)	622	39.0
		Total	1595	100.0

Source: Status of Elementary Education in Maharashtra State and Municipal Corporation Profiles, District Information System for Education (DISE), 2011-12, Government of Maharashtra

Exhibit 6: What is the Computer Aided Learning Programme?

A Computer Aided Learning Program (CAL) involves integrating school curriculums with the help of ICT. The preliminary stage of a CAL programme involves careful selection of partner schools, recruitment/training of teachers, community mobilization, curriculum finalization, development of teaching-learning aids and baseline testing. Classes are kept small to ensure individual attention and optimal learning. The hardware used is of a high quality and the software is developed in local languages designed around school curriculums. To make certain that desired goals and outcomes are being achieved, evaluation and monitoring are done at regular intervals.

Exhibit 7: Mission and Vision Statements of Pratham InfoTech Foundation

Mission statement:

Aim to boost digital literacy, bridge digital divide, facilitate the adoption of information technologies in education, and equip at risk youths with skills, tools and capabilities that new global economy demands.

Vision statement:

All people- regardless of social background, income level, geographic isolation, skill gap and educational qualifications, reap the social and economic benefits that information technologies promise to all in the new world in which information and technology touch every aspect of our life.

Approach:

In pursuit of the vision, the following principles guide our operations and outreach,

- Programs, products and services that stress the use of IT to address socio-economic problems of the disadvantaged and underserved population.
- Holistic program development, value-addition to stakeholders and sustainability of efforts are key determinants of success.
- A low cost, scalable and quality driven operational model that relies on recruiting smart, talented youth from the underserved communities we serve.
- Emphasis on capacity building, skill development, social integration and inclusive growth.

Source:www.pif.org.in/AboutUs/VisionMissionApproach.aspx accessed on 21st September,15

Exhibit 8: Business Model Generation

The book *Business Model Generation* written by Alexander Osterwalder and Yves Pigneur is a practical handbook that is useful for entrepreneurs or business leaders who want to reinvent or re-design strategies for their organizations based on new realities of changing technologies and competitive scenarios. The authors discuss nine building blocks that are essential elements of any organization. They are customer segment, value proposition, channels, revenue streams, key resources, key activities, key partners and cost structure. These nine building blocks are interlinked to each other in such a way that they create certain patterns which govern the business model of the organization. The Business Model Canvas helps entrepreneurs and change leaders to experiment in changing these nine building blocks to bring out innovations and change the value propositions in order to remain competitive in the long run.

Source: Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*, Wiley Publication.

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