

DEVELOPMENT OF ICT STRATEGIC PLAN FOR SMART SCHOOL IN IRAN
(CASE STUDY: MINISTRY OF EDUCATION IN IRAN)

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Dedicated to my mother and my father whose love, encouragement and values will
always guide and inspire me

And

To my beloved wife and daughters,

And to the hope that they will encouraged to drive for the best throughout their lifetimes

To my friends who encouraged me

And to all my lecturers and my friends who guided me and helped me to finish during
my study

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Abstract

The purpose of this project is on development of ICT Strategic Plan for Iran Secondary education (Specially High School) in order to define a roadmap for establishing a standard infrastructure and platform for using ICT in teaching and learning at this level of education. In Iran, currently we are running 4th five year national development plan. The qualitative goals of government of Iran in this plan have included developing e-enabled national services such as e-commerce, e-learning, e-health, and e-government. Based on my finding in Malaysian Smart School Pilot project and its success, Iran will benefit from customizing and applying practices of Malaysia in development of both smart schools and the ICT Strategic Plan for smart schools. The reason is Smart School Pilot project and its successor, the four waves roadmap for converting all schools to smart schools in Malaysia were executed and successfully have been performed. In Iran, Smart schools efforts recently have been started by selecting around 100 schools in main cities of states. This activity is based on the results of four sample schools that had equipped earlier. By visiting these initiatives and studying latest practices of Malaysia, the author realized that for succeeding and speeding up smart school development in Iran, an integrated ICT plan should be provided. This plan will coordinate Ministry of Education and other stakeholders such as schools administrators, ICT staffs and local participants to follow a standard, effective and efficient path for implementing smart schools.

ABSTRAK

Tujuan dari projek ini adalah pada pengembangan ICT Strategis Rencana Iran untuk pendidikan sekunder (Specially School) untuk menetapkan peta jalan untuk membangun infrastruktur dan platform standar untuk menggunakan ICT dalam pengajaran dan pembelajaran di tingkat pendidikan ini. Di Iran, saat ini kita sedang berjalan 4. Lima tahun rencana pembangunan nasional. Kualitatif tujuan pemerintah Iran dalam rencana ini termasuk pengembangan e-nasional diaktifkan layanan seperti e-commerce, e-learning, e-health, dan e-pemerintah. Berdasarkan temuan kami di Malaysia Smart Sekolah Pilot proyek dan keberhasilan, kita perlu menyesuaikan saat ini proyek pengembangan ICT dalam Rencana Strategis untuk memenuhi persyaratan dari kedua pendidikan di Iran. Hal ini karena Smart Sekolah Pilot proyek ini ditentukan berdasarkan beberapa rencana strategis yang ada pada pendidikan di Malaysia. Lain yang penting adalah untuk mengembangkan sebuah Rencana Strategis ICT untuk bisnis kita perlu panduan. Oleh karena itu kami ditinjau Mampu Pedoman ICT Rencana Strategis dari Malaysia dan panduan dari Iran bernama Kerangka Nasional Informasi Arsitektur. Salam untuk kami kami yang disesuaikan kebutuhan mereka untuk mengembangkan ICT untuk Rencana strategis pendidikan menengah di Iran.

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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
CRFP	Concept Request for Proposal
ICT	Information and Communication Technology
MSC	Multimedia Super Corridor
NICTA	National ICT Agency
NGN	Next Generation Network
SSP	Smart School Policy
SSMS	Smart School Management System
TAKFA	The Information and Communication Technology Application Program in Iran
TSS	Telecom Smart School corporation

CHAPTER 1

PROJECT OVERVIEW

1.1. Introduction

Information and communicatory Technology (ICT) is an increasingly powerful tool for participating in global markets; promoting political accountability, improving the delivery of basic services and enhancing local development opportunities.

The rapid development of (ICT) affects the development of technology implementation in every aspect of life, from business, entrainment, socials and education especially. The benefit of ICT's role in education had been realized since 1990's, along with the declining price of personal computer, the widespread of internet access, the increasing of IT application in the documentation functions, and the availability of animation software development.

Iran has a long and rich history and civilization. This country at the current time has a large network of private, public and state affiliated universities offering degrees in higher education. State-run universities of Iran are under the direct supervision of Iran, s Ministry of Science, Research and Technology (for non-medical universities) and Ministry of Health and Medical Education (for medical schools). Studies of Iran history show that people of this country most of the time involved in war, attack and revolution. But due to the rich heritage of knowledge among the society they were always looking to improve their knowledge.

At pre-higher level, ministry of Education has divided the structure of the education system into five cycles, namely pre-school, primary, middle (or guidance), secondary and post-secondary. Three outstanding characteristics of the Iranian education system must be mentioned at this point. First, elementary education is mandatory under the Iranian constitution. Secondly, due to increasing number of applicants, admission to postsecondary institutions is through a nation-wide entrance examination and thus only the most talented students can enter universities. Finally, in general, education (in primary, secondary and post-secondary levels) is free of charge though private schools and universities authorized by law are allowed to charge tuition fees.

Iran intends to transform its educational system, in line with and in support of the nation's drive to fulfill Vision 2025. This Vision calls for sustained, productivity-driven growth, which will be achievable only with a technologically literate, critically thinking work force prepared to participate fully in the global economy of the 21st century. At the same time, developing the potential of individuals in a holistic and integrated manner so as to produce individuals who are intellectually, spiritually, emotionally, and physically balanced and harmonious. The catalyst for this massive transformation will be technology supported Smart Schools while fostering the development of a work force prepared to meet the challenges of the new century.

Transforming the educational system will entail changing the culture and practices of Iran's primary and secondary school, moving away from memory-based learning designed for the average student to an education that stimulates thinking, creativity and caring in all students, caters to individual abilities and learning styles, and is based on more equitable access. It will require students to exercise greater responsibility for their own education, while seeking more active participation by parents and the wider community.

For instance, in the 4th 5-Year National Develop Plan (2005-2009) of Iran, IT has a major role. The main goals of this plan have included[1]:

- Increasing Internet users till 35% of population;
- Increasing telephone subscribers till 50%;
 - Increasing mobile subscribers till 40%.

The value of ICT projects in this plan of Iran has consisted of 19 billion dollars for communication development and 5 billion dollars for IT infrastructure. The government's policy in telecommunication sector has comprised[1]:

- Migration from monopoly to competition in telecom industry;
- Telecom de-regulation;
- Migration from traditional telecom to Next Generation Network (NGN);
- Promotion foreign investment.

The quantitative goals in this plan have contained 40 million telephone lines, 30 million mobile lines, and 20 million Internet access account. The qualitative goals of

government of Iran have included developing e-enabled national services such as e-commerce, e-learning, e-health, and e-government.

1.2 Statement of the problem

Currently, with a population of 68 million and a growth rate of 1.08 percent [2], and domestic production as measured by GDP of \$115 billion, Iran is the second most populous country with the second-largest economy in the Middle East. The country has the distinction of being the second-largest OPEC oil producer, and has the world's second-largest reserves of gas. The literacy rate is more than 79 percent and education is compulsory through high school. There are currently approximately 18 million students in the school, and about 1.7 million in the universities[3]. Moreover, over than 2.3 million staffs are working in the governmental organizations, such as ministries, universities and other state institutions 4. According to the World Bank Report, Iran has placed emphasis on human development and social protection with good progress to-date. For example, from the early 1970s to 2001 primary school enrollment rates increased from 60 to 90 percent and the portion of the population living under the poverty line decreased significantly from 47 percent in 1978 to 16 percent in 1999.

As a result of heavy investment in the telecommunication system since 1995, the number of telephone lines, cellular phone, and radio and television stations has grown. Many villages have been brought into the net; the number of main lines in the urban systems has approximately doubled; and thousands of mobile cellular subscribers are being served. It is estimated that the number of telephone lines and mobile phones respectively from 13.2 million and 3.4 million in the current year would reach to 20 million and 5 million lines in the next year. There has been a considerable increase in

number of Internet users in the recent years. The rapid development in ICT and the recent trend of globalization and their influences in different social and economic systems are motivating issues for the Iranian government to cope comprehensively with such technological issues. Thus, Iran's National ICT Agenda (INICTA) was initiated by the government. The aim of INICTA, or Extension of Application of Information and Communication Technologies in Iran, is to develop and maintain an advanced technological environment in order to support and enhance the education, research, and learning, service, and administrative activities all over the country. At the beginning of 1998, national ICT development study began by the formation of the Supreme Council of ICT (SCICT) under the president's own leadership. At the beginning of 2002, the parliament allocated a national and centralized budget for INICTA. Currently, the plan has more than 40 major projects and 110 subprojects that cover all major aspects of the ICT applications in the country.

Since, ministries and other state organization are allowed to spend 2% of their total budget in ICT projects, it is expected that growing ICT related projects will be implemented in the near future. The INICTA seeks similar purposes as we can also see in the several international ICT programs initiated for developing countries, such as United Nations Information and Communication Technologies Task Force, UNESCO Asia and Pacific Regional Bureau for Education[4], World Bank initiative and World Summit on Information Society[5] which were planned to promote the confidence and technological competence of The budget for the NICTA is allocated by the parliament at the beginning of every fiscal year. Many studies have emphasized that the use of ICT has a considerable effect on teaching and learning processes such as less directive and more student-centered teaching, increased interest in teaching, increased planning and collaboration with colleagues and greater participation in school. The results of a number of empirical researches on achievements related to the use of ICT in education are well highlighted in the related literatures[5]. Thus, it is natural that in the Iran's national ICT plan a significant emphasize has been drawn to support and enhance the educational processes in schools, universities and governmental organizations, known as Development of Human Resources and Education Program (highlighted before by asterisks).

The Ministry of Education has several key educational plans to develop ICT applications in primary, secondary and high schools. In this case, the ministry is the most important organization which has the majority of the ICT educational projects in the Iran's national ICT plan. So far, 6,500 schools have computer sites (33%) and by 2006 all of the rest will as well. Moreover about 1200 (10%) schools have been connected to the Internet. About 70,000 teachers (8%) have participated in ICT related workshops and courses. The Growth Network (www.roshd.ir) is the Ministry's plan for establishing ICT facilities in schools. Guidelines for the Growth Network include research and development, putting hardware and Internet connectivity in place, developing educational materials and providing training for people in the educational sectors.

The Information and Communication Technology Application program (TAKFA) in Iran is the most important policy initiative for Iran. Its mission is to foster the development of a knowledge-based economy by achieving the following objectives (some objectives mentioned):

- Creating infrastructure (network, law and security) for Iran's information and communications development.
- Promoting the development of ICT skills at both individual and institutional levels.
- A plan for electronic government (system, virtual network, law and security).
- A plan for promoting ICT application in education and expanding digital skills in Iran's manpower.
- A plan for expanding ICT in higher education.
- A plan for expanding ICT in health, treatment and medical education.
- Developing ICT in schools.
- Creating digital libraries.
- The application of ICT in schools and workforce development (at primary and secondary schools as well as vocational training institutes).

Given that most world governments are addressing the issues of globalization and how to harness the capacities of the ICT revolution to achieve world competitiveness,

what makes the Malaysian and Iran government's efforts different from others? In spite of the above progress in the country, Iran is facing many problems in implementing ICT plans. These problems are rooted from its socio-economic structures. This study is trying to find out these problems and develop a comprehensive ICT strategy plan for smart school in secondary education as a practical plan for implementing ICT for smart school at high school.

Although in recent years some efforts have been done for developing smart schools in Iran, there is not a defined and an efficient way for establishing ICT environment for smart schools. Based on my interviews in different levels of organizations, namely, ministry of education, education offices of states and cities and finally in several pilot high schools that have planned to become smart school, it realized that there are many concern on development of smart schools. For instance, these schools need to have electronic contents for courses, special networks and internet lines and also they should have computers, printers and other equipments to become a real smart schools. In fact, it realized that an ICT strategy plan is required for executives to coordinate all programs and activities in developing smart schools. This ICT plan also will help all participants to define their activities and roles in spread of ICT platforms for smart schools.

The following are proposed strategies to improve and develop the use of ICT in smart schools:

- Develop a national ICT strategic plan that is appropriate for primary, secondary and high schools, as well as vocational training centers.
- Train specialist teachers to develop ICT teaching in smart schools.
- Train ICT specialists in the Education Department.
- Introduce smart school principals to the use of ICT.

- Hold training seminars to introduce families to the use of ICT in teaching.
- Activate parent-teacher associations to support the use of ICT in teaching.

1.2. Significance of the study

In Iran the Ministry of Education is committed to utilizing the following multi-prong strategies to ensure that the objectives of ICT in education are achieved:

- The preparation of sufficient and up-to-date tested ICT infrastructure and equipment to all educational institutions.
- The roll-out of ICT curriculum and assessment and the emphasis of integration of ICT in teaching and learning.
- The upgrading of ICT knowledge and skills in students and teachers
- Increased use of ICT in educational management.
- The upgrading of the maintenance and management of ICT equipment in all educational institutions.

Also The Ministry of Education sees ICT as a tool to revolutionize learning, to produce richer curricula, enhanced pedagogies, more effective organizational structures in schools, stronger links between schools and society and the empowerment of learners. The concept of ICT in education, as seen by the Ministry of Education, includes three main policies for ICT in education such as ICT for all students, meaning that ICT is used as an enabler to reduce the digital gap between the schools, The role and function of ICT

in education as a teaching and learning tool, as part of a subject, and as a subject in its own right, using ICT to increase productivity, efficiency and effectiveness of the management system. Smart Schools are not only characterized by the introduction of technology but also by their ability to deliver education in a better way. Multimedia technologies will create the enabling infrastructure for new teaching-learning and management processes, the connectivity to the external constituencies, and the educational network to link all Smart Schools.

Based on Forth Five Year Development Plan of Iran, the following are several proposed strategies for improvement and development of using ICT in the country[1]. Develop detail of national strategies and plans for attraction and transformation ICT in the country:

- Train specialist principles to develop IT teaching;
- Introduce principals to the use of IT and help them develop a supporting society school culture;
- Develop a vision for education of using IT based on lifelong learning;

There are many issues to be considered. The government should invest in the infrastructure development, by providing the necessary resources and training to the population. Despite the obstacles, internet is expanding in Iran. The government in its Forth Five Year Development Plan should show its support by allocating resources to this growing sector.

1.3. Objectives

The objectives of this project are as follows:

- To analyze Malaysian Smart School Practice for reuse in Iran.
- To study current ICT environment in Education in Iran.
- To develop ICT Strategic Plan for smart schools in Iran

1.4. Scope of the project

Due to time and financial constraints the scope of the project will focus on the following areas only:

- This study will only will base on ICT practices of smart school in Malaysia
- The project is limited to current secondary school and ICT environment in Education of Iran
- This project will develop ICT Strategic Plan for smart school in Iran.

1.5. Summary

Vision 2025 of Iran emphasized that the country had to embrace the knowledge economy in order to become globally competitive. Creating an information Communication Technology (hereafter ICT) literate society was a central platform in achieving that transformation. Smart Schools can be part of 2025 strategy which not only characterized by the introduction of technology but also by their ability to deliver education in a better way. The Government can plan so that all schools to be converted into Smart Schools by the year 2025. There has been a long way for Iran to achieve its strategic planned goal. This study presents the main plans and experience of Malaysia in order to gain a standard level of infrastructure for smart school in secondary level. The objectives of the Information and Communication Technology Application program (TAKFA), the most important policy initiative for Iran, in secondary education level are:

- A plan for promoting ICT application in education and expanding digital skills in Iran's manpower.
- Developing ICT in schools.
- Creating digital libraries.
- The application of ICT in schools and workforce development (at primary and secondary schools as well as vocational training institutes).

In spite of the some progresses in ICT and some defined plans in Iran, this country is facing lack of developing ICT plans in lower levels such as high school level and also many issues in implementing ICT plans. These problems are rooted from its socio-economic structures. This study is attempting to find out these problems and their solution and analyze them at secondary level of education and developing an ICT strategy plan for development of smart schools.

REFERENCES

1. Asemi, A., Information Technology and National Development in Iran, in 2006 International Conference on Hybrid Information Technology (ICHIT'06). 2006.
2. Iran's population and average annual growth. 2008 [cited 2008; Available from: <http://www.sci.or.ir/>].
3. Iran's educational statistics. . 2008 [cited 2008; Available from: <http://www.sci.or.ir/>].
4. UNESCO Asia and Pacific Regional Bureau for Education. . 2007 [cited 2008; Available from: <http://www.unescobkk.org/education/>].
5. Technology in the Schools: It Does Make a Difference. . 2006 [cited 2008; Available from: http://www.education-world.com/a_admin/admin122.shtml/].
6. The Malaysian Smart School Implementation Plan. 1997, Kuala Lumpur, Government of Malaysia,.
7. The Malaysian smart school ,An MSC flagship Application ,A Conceptual Blueprint 1997, Government of Malaysia
8. EL-Halawany, H. and E. Ibraheem, Malaysian Smart Schools: A Fruitful Case Study for Analysis to Synopsise Lessons Applicable to the Egyptian Context. International Journal of Education and Development using ICT 2008. 4(2).
9. Duta, J. Approaches. 1999 [cited; Available from: www.ppk.kpm.my/smartschool/curriculum.html].
10. Kirschner, P. and N. Davis, Pedagogic benchmarks for information and communications technology in teacher education. . Technology, Pedagogy and Education, 2003. 12(1): p. 125-147.

11. Halim, A.H.A., et al., The taxonomical analysis of science education software in Malaysian Smart Schools. . Malaysian Online Journal of Instructional Technology (MOJIT), 2005. 2(2): p. 106-113.
12. Sharif, A.M. and K.M. San, The Invention curriculum: A Malaysian Experience. , M.o. Education., Editor. 2001: Kuala Lumpur:Malaysia.
13. Perkins, D. Smart Schools. 2003 [cited; Available from: <http://www.pz.harvard.edu/Research/SmartSch.htm>.
14. Telekom Smart School Passes Ownership of Smart School Pilot Project to Ministry of Education. 31 March 2003 [cited March 2004]; Available from: <http://tss.tmsasia.com>
15. Statistics of Education: Survey of Information and Communications Technology in Schools 2001. 2001, National Statistics Bulletin Department for Education and Skills, Issue No. 09/01.
16. Measuring the Preparedness of Nations for the Networked World. 2002 [cited; Available from: <http://www.cid.harvard.edu/cr/pdf/gittr2002-ch02.pdf>.
17. The 1996 National Survey on Computer Education - Philippines 1996 [cited; Available from: <http://www.ncrel.org/engage/framework/efp/align/efpalisu.htm>.
18. Isernhagen, J.C., A Major Catalyst for Increasing Learning University of Nebraska-LincolnTechnology,Horizons in Education Journal Online 1999.
19. The Impact of Networked ICT on Literacy Learning in English, 5 – 16. [cited; Available from: http://eppi.ioe.ac.uk/EPPEWEB/home.aspx?page=/reel/review_group.../review_one_abstract.ht
20. Frost and Sullivan, Benchmarking of the Smart School Integrated Solution. 2005, Multimedia Development Corporation, Malaysia.
21. Standards, Policies and Guidelines - Malaysian Public Sector ICT Strategic Plan Guide, M.A.M.M.P.U. (MAMPU), Editor. 2003.
22. THE SMART SCHOOL ROADMAP 2005-2020: AN EDUCATIONAL ODYSSEY, S.S.P. Team, Editor. 2005, Government of Malaysai: Putrajaya, Kualaumpur.
23. Ariff, I. and G.C. Chuan, Multimedia Super Corridor. 2000.

24. Puteh, M. and A.M. Vicziany, How smart Are Malaysia's smart Schools? , in 4th Global Congress on Engineering Education 2004, Thailand, 5 - 9 July, 2004 Monash Asia Institute: Monash University ,Melbourne, Australia.
25. Partners and Affiliates. 2004, Telekom Smart School (TSS) Corporation.
26. Smart School Pilot Project Information, M.o.E. Malaysia, Editor. 2004, Ministry of Education Malaysia Kuala Lumpur.
27. Concept RFP For smart school Teaching- Learning Materials 1997 Government of Malaysia.
28. K.S, L. If Malaysia's smart school concept does not require computers, then it should not be one of the MSC flagship applications, Speech. 1999 [cited March 2004]; Available from: <http://www.malaysia.net/dap/sg1824.htm>.
29. Schools Online Curriculum Content Initiative - Phase Two Plan 2002-2006. 2002, Learning Federation.
30. TSS Update 2003 31 March 2003 [cited March 2004]; Available from: <http://tss.tmsasia.com>
31. Frequently Asked Questions. 2003 31 March 2003 [cited March 2004]; Available from: <http://tss.tmsasia.com>
32. A Smart School in Action , MSC Success Stories. 2002 [cited; Available from: www.mdc.com.my/today/html/2003-sstory_04.asp?story=381169.
33. Lewis, C., Putting IT in its Place (in the Classroom) in Marika Vicziany (ed.) 2004, Cultures and Technologies in Asia, Monash Asia Institute, Melbourne.
34. Ngah, A. and M. Masood, Development of ICT Instructional Materials Based on Needs Identified by Malaysia Secondary School Teachers, in informing science and IT Education Joint. 2006.
35. Mohamed, M., Multimedia Super Corridor. 1998, Subang Jaya, Pelanduk Publications (M) Sdn Bhd: Kuala Lumpur.
36. Iran - Education system. 2005, International Association of Universities (IAU), updated from IBE Website.
36. SALEHI-ISFAHANI, J. and D. EGEL, Youth Exclusion in Iran: The State of Education, Employment and Family Formation. 2007, WOLFENSOHN CENTER FOR DEVELOPMENT, MIDDLE EAST YOUTH INITIATIVE WORKING PAPER.

37. Sadeghneghad, T., Iran, ICT Use In Education ,UNESCO Meta-survey on the Use of Technologies in Education. 2005.
38. Kousha, K., Iran's National ICT Education Plan: an Overview of the Possibilities, Problems and the Programs, in 70th IFLA General Conference and Council. 2004: Buenos Aires, Argentina.
39. Strategic Plan for Smart School. 2005, Ministry of Education, Iran: Tehran.
40. Jahangard, N., The Goals of Educations in the Information Era. . TAKFA Magazine, 2003. 1(5-6).
41. School net: Community of the Iranian School. 2007 [cited 2008; Available from: <http://www.schoolnet.ir>.
42. Educational Co-operation in Asia and the Pacific. 2007, National Institute for Educational Policy Research (NIER): Tokyo, Japan.