Foresight Activities and Strategic Policies of Thailand

Chatri Sripaipan, Kasina Limsamarnphun, Chatwarun Ongkasing, Mayuree Vathanakuljarus, Chongchit Charoensingkorn, and Witaya Jeradechakul[*]

1. Background

Thailand has been hosting the APEC Center for Technology Foresight (APEC CTF) for the past 5 years, but it has not yet launched a comprehensive national foresight exercise. However, several major foresight exercises in Thailand have been conducted and most of them have some links to APEC CTF and the National Science and Technology Development Agency (NSTDA) – its host. This paper aims to show the evolution of Thai foresight projects including lessons learned and the way forward.

Even before seeking support for a regional foresight center at the first APEC Minister's Conference on Regional Science and Technology Cooperation in Beijing in October 1995, NSTDA commissioned Chiang Mai University for a study on "Future Key Technologies for Thailand". After the launching of the APEC CTF in February 1998, an informal grouping called the Thai Foresight Unit was formed with the aims of involving beyond NSTDA onto other organizations and extending beyond technology into the more social aspects of foresight. The initial enthusiasm led to the project on "Foresighting Thai Agriculture" to re-position agriculture after the economic crisis of 1997. The Director of the Public Warehouse Organization who participated in the scenario workshop was impressed and invited NSTDA to conduct a scenario planning exercise for his organization in 1999. Another major project by ministerial order on "Science and Technology in the Year 2020" was conducted in 1999-2000. In 2000, an active participant from the "Technology for Learning and Culture in the APEC Region" undertook the foresight project on "IT for Education" with the underlying intention of promoting foresight in the process of drafting the Master Plan for ICT in Education. The "IT for SMEs" project was an idea of the Ministry of Industry. In 2002, we were approached to develop a 5-year strategic plan for the Technology Promotion Association (Thailand-Japan) by the same person who invited us to review the Master Plan for the National Metrology Institute of Thailand using scenario planning in 2000.

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[*] The authors are in consecutive order at above 1. Vice-President of the National Science and Technology Development Agency (NSTDA) 2. Assistant Policy Researcher 3. Policy Researcher 4. Assistant Policy Researcher 5. Administrator 6. Executive Director. 2-6 are staff at the APEC CTF, NSTDA – Bangkok, Thailand http://www.nstda.or.th/apectf

2. Evolution of National Policy Process in Thailand

Thailand has been under five-year national development plans since the early 1960s. It currently operates the 9th National Economic and Social Development Plan (2002-2006). This section outlines several changes in the national policy planning process, especially in science and technology. Firstly, the development of science and technology has shifted from emphasizing the academic excellence of universities and research institutes to meeting the demand of the economic and social sectors. Secondly, the formulation of national plans has become more participatory. Traditionally, plans were drafted by the secretariat of a committee comprised mainly of bureaucrats and a few representatives from the private sector. Starting from the 8th Plan, the Office of the National Economic and Social Development Board invited a wider spectrum of people to share their opinions and expertise in the planning process. In the preparation of the 9th Plan, this model expanded: hundreds of workshops were organized covering all the provinces and involving more than 30,000 people from all walks of life. 'Participation' has become a buzzword and partly intended to provide legitimacy to every major planning activity of the state, such as the new Constitution, and new Health Act.

Thirdly, investment in science and technology is becoming more focussed. Though Thailand identified biotechnology, materials, and electronics as priority areas since 1985, the government now demands more economic justification and more tangible output. The Competitiveness Development Committee chaired by the Prime Minister would like to concentrate on developing the 5 niches that Thailand should have the greatest potential, namely, food, automobile, tropical fashion, graphic design, and tourism. Each of these niches provides ample opportunities for contributions from science and technology. Lastly, the government is implementing the 'performance-based budgeting' where the head of each department will have to sign a 'public service agreement' with his/her superior. The purpose is to increase the efficiency of expenditure and to make sure that what is promised is in fact delivered. It will certainly have a very strong impact on getting policies implemented.

These changes undoubtedly open up the demand for some guidance into the uncertain future and hence the demand for foresight.

3. Foresight Projects

Section 1 showed the diversity and evolution of foresight projects in Thailand. To explain them in a more orderly fashion, the activities have been categorized into three levels of foresight as follows:

> National Level
> Sectoral Level
> Organizational Level

The two projects which could be categorized as national level are "Future Key

Technologies for Thailand" and "Science and Technology in the Year 2020". The Public Warehouse Organization, the National Metrology Institute of Thailand, and the Technological Promotion Association (Thai-Japan) were foresight projects at the organizational level. The rest were sectoral projects. The details of each level are described below.

3.1 National Level

While concentrating on the development of science and technology at national level, it is unavoidable to bring in socio-economic factors. The two projects described below also show the shift from first generation of technology forecasting to third generation foresight that integrates social needs[1].

Table 3.1: Summary of National Science and Technology Projects

Title	Future Key Technologies for Thailand	Science and Technology in the Year 2020
Project Year	1995	1999-2000
Objective	Identify the direction of Thailand's science and technology development and its relation to socio-economic-cultural priorities	Set a long-term vision and strategies for science and technology in Thailand
Main Players	NSTDA, Chiang Mai University	Minister of MOSTE, MOSTE, NSTDA
Methodology	2-round Delphi survey	Consultation
Participants	400 scientists and engineers	1,400 people from all social sectors
Time Frame	1996-2010 in 3 five-year periods	2000-2020
Outputs/ Outcomes	Future key technologies as in Table A1 in the Appendix	◆A synthesis report and 13 papers of S&T demands and strategies ◆Inputs into the 9th National Economic and Social Development Plan (2002-2006)

In the Delphi survey of '**Future Key Technologies for Thailand**", respondents were asked "what are the important technologies?", "when will these technologies most likely be realized", and "possible constraints to their development?" based on five main criteria of relevancy of the technology to the country's development. Eleven to thirteen technologies for each five-year period were identified (see Appendix). It was noted that 'a number of identified technologies are similar to those expected to be of importance for developed countries. The further into the future…'[2] the more similar

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[1] Luke Georghiou *Third Generation Foresight – Integrating the Socio-economic Dimension* Proceedings of the International Conference on Technology Foresight – The Approach to and Potential for New Technology Foresight March 2001 NISTEP, Japan, available at http://www.nistep.go.jp/index-e.html

[2] Yongyuth Yuthavong and Chatri Sripaipan, "Technology Foresight as a Tool for Strategic Science and

technologies were predicted. After the completion of the study, the principle investigator gave several talks at various seminars. However, the results of this study did not influence the national policy and the policy of NSTDA.

The project '**Science and Technology in the Year 2020**" or S&T2020 project tried to create awareness on the importance of science and technology and to link science and technology to the social and economic development of the country. The pre-foresight stage kicked off with the First Congress on Science and Technology for Development that was attended by 1,200 participants from all sectors of society. After listening to lectures from national figures, participants were encouraged to air their views in brainstorming groups of 20. The message was that science and technology are matters of concern to all people and ought to be developed for the benefits of the people. Views of the participants became inputs into the terms of reference for 13 commissioned papers. The first set of papers was on the status and future directions of 7 sectors, while the second set were on 6 main strategies of science and technology to respond to the demand of the 7 sectors. Research teams of the 13 papers met over three weekends to brainstorm and interact. The two sets were interconnected as in Table A2 with the sectors in the column and the strategies in the row. Examples of important issues are in the boxes. (See Appendix)

The drafts of the 13 papers were presented to the Second Congress on Science and Technology for Development which was attended by 1,400 people. Opinions on the 13 papers were sought from small discussion groups of 10. The final reports in 3 volumes were published in December 2000. The conduct of the project coincided with the drafting of the 9th National Economic and Social Development Plan and project outcomes were taken up and incorporated into the Plan, especially the part concerning science and technology. The fact that key personnel responsible for drawing up the plan from the National Economic and Social Development Board had participated fully in the S&T 2020 project undoubtedly contributed to its successful impact.

3.2 Sectoral Level

The APEC CTF has encouraged the development of sectoral foresight projects in Thailand, and was able to provide some seed funding since its core budget comes from the Thai government. The APEC CTF's intention was to provide some demonstrations of successful foresight projects and initiate the development of Thai foresight skills, while at the same time, producing some useful foresight outcomes for the various sectors addressed.

"**Foresighting Thai Agriculture**" was a project of the Thai Foresight Unit, a unit of volunteers mainly drawn from NSTDA staff who were interested in foresight and the topic. The project started with 33 experts from universities, industries, government and NGOs who were interviewed to define the issues and to gather information. The results were fed into a Technical Committee which drafted a Delphi questionnaire.

Technology Planning and Policy Development", ASEAN Fifth Science and Technology Week, Hanoi, 1998

Table 3.2: Summary of Sectoral Projects

	Foresighting Thai Agriculture	**IT for Education**	**IT for SMEs**
Project year	1998-1999	2001-2002	2001-2002
Objectives	To plan the development of science and technology in Thai agriculture	To examine the applications of IT for learning in the dimensions of equity, quality, and efficiency	To promote the role of IT among SMEs focusing on three areas of the industry: automobiles, electronics, and food
Main Players	Thai Foresight Unit, NSTDA	King Mongkut's University of Technology	Department of Industrial Promotion
Time Frame	10 years	10 years	5 year
Key Questions	What will Thailand's agriculture be like in the next 10 years?	In 10 years from now, how can the community develop methods of learning under the influence for IT?	What the views of SMEs on ◆ Government IT policy ◆ Application of IT in SMEs ◆ Future of own business ◆ Future of SMEs
Participants & Methods	◆33 experts interviewed ◆Delphi questionnaire to 1070 experts with 19.4% success rate ◆36 participants in scenario workshop	◆ 22 participants in scenario workshop ◆ 31 participants in a consultation workshop to re-examine strategies from the first workshop ◆ Case study of IT in a village ◆ Discussion of a youth research network	◆Policy Delphi questionnaire to 2,000 SMEs with 9.9% success rate ◆5 seminars organized in four regions and Bangkok
Outputs	Obtain national agenda from scenario workshop: ◆Good governance for agriculture ◆Research & development to create new technologies based on local knowledge ◆Develop database and disseminate information throughout the country ◆Enhancing the capacity of farmers and grass root organizations.	Important aspects from the studies: ◆Communities will access information and knowledge easily and enhance capabilities in life-long learning. ◆Communities will learn how to integrate and balance the global knowledge with local wisdom. ◆Good governance and management mechanisms were key factors in shaping their future.	Needs of SMEs ◆ Special courses of IT training from existing institutions ◆ Low cost software package for SME's business ◆ Fast cost analysis ◆ Laws for E-commerce ◆ Model of supply chain management ◆ Speed of introducing new products into the market ◆ Financing of IT from government banks

The questionnaire which used a traditional approach of predicting the year of realization, had 71 topics covering water supply management, agricultural technology, future market, productivity, trends of research and development, management technology, and policy. Surprisingly, the long Delphi questionnaire without any follow up had a rather respectable response rate. Many respondents called up to clarify the topics. The results of the interviews and the Delphi survey were used as inputs to a scenario workshop. The title of one of the scenarios 'Kitchen of the World' was repeated in the project S&T 2020 and has now become a catchword of the present government. The project caught the attention of Mr. Boonchu Rojanasatien, the Senior Advisor on Economics to the Prime Minister, who had a special interests in agricultural development issues. Mr. Boonchu called a meeting for the team to present the results and invited about 30 heads of department and leaders from the private sector. The meeting gave valuable feedback which was used to improve the report. For example, the meeting concluded that one of the Delphi topics which suggested that '30% of agricultural land be irrigated to have water all year round' was impractical because most agricultural lands were rain-fed and they were scattered all over the whole country.

The project '**IT for Education"** took place during the drafting period of the Master Plan for Information and Communication Technology (ICT) in Education which was the responsibility of the Office of the National Education Commission (ONEC). When starting the project, the research team unsuccessfully tried to convince ONEC to integrate foresight into the development of the Master Plan. While the timing of the project was inconvenient for ONEC, the difficulty may also have arisen from their unfamiliarity with foresight as a process and possible concern about their ability to control its outcomes. However, though failing to convince ONEC to use foresight in the master plan, the project successfully engaged some key persons of ONEC into the project, shaping issues and selecting participants. In planning the first workshop, the issue of digital divide was clearly in the mind of the organizers. The proposed key question was "in 10 year from now how can the community develop methods of learning under the influence of IT?" The composition of the participants was spiced up by the inclusion of community leaders who gave accounts of a successful story of IT in a village and students who were articulate without being aggressive. The second workshop had the theme of "the Development of IT for Learning from the Roots: in the dimensions of equity, quality, and efficiency". It was to review and further develop the strategies from the first workshop in the hope of making some of them into action plans. The research team then visited the village and held a discussion forum for the youth research network. Having participated in the foresight process, some ONEC executives were convinced of the merit of the foresight technique and the research team was asked to conduct a scenario workshop for executives from 30 schools who would then write proposals to compete for support from ONEC in developing their IT capability.

The '**IT for SMEs"** project was initiated at the time that the country was desperate for economic recovery - late 1999. It was believed that effective SMEs would produce dramatic improvement in business and create significant national income growth. However, most of Thai SMEs have not used IT to their advantage. Therefore, it would be useful for the Department of Industrial Promotion (DIP), Ministry of Industry and NSTDA to know the status of IT in SMEs, their needs for government assistance, and

their business vision in order to plan the best activities for their development. The key foresight technique used was a two-round Delphi survey. The questionnaire had two parts: the first part was a simple questionnaire which surveyed the status of IT usage in order to classify the companies into sophisticated and elementary users of IT. The second part was a policy Delphi survey where companies were asked to rank the importance, the feasibility, and the obstacles of the topics. It was designed to find out how SMEs viewed government IT policy, how SMEs were using IT, what was important in their own business in 5 years, and what might SMEs become in 5 years. Since IT was progressing at a very rapid rate, the time frame was five years which was seen to cover more than 3 business cycles. It was also decided that the survey would only cover SMEs in 3 priority areas of food, automobiles and electronics. The survey was supported by 4 seminars in 4 provinces to explain the purpose of the exercise to participants. The fifth seminar in Bangkok was to present survey results to get feedback and recommendations. The study triggered ideas for future projects at the DIP. As part of the "Revitalization Thai Businesses" project, DIP supported 50 SMEs in developing services and improving efficiency using IT in cooperation with the National Institute of Development Administration (NIDA). Another project on "Developing New IT Entrepreneurs" involved the selection of 3-5 software companies to develop software for SMEs.

3.3 Organizational Level

We have worked with 3 organizations to apply foresight to their strategic repositioning. We do not know if there are any other organizations using foresight, especially in the private sector. Three organizations are the Public Warehouse Organization (PWO), the National Metrology Institute of Thailand (NMIT) and the Technology Promotion Association (Thailand-Japan) (TPA). PWO is a state enterprise, NMIT is an autonomous public agency, and TPA is a not-for-profit private organization.

The Public Warehouse Organization (PWO) was established in 1955 as a state enterprise under the Ministry of Commerce. For more than 40 years, PWO was better known to the public for its intervention in the market of agricultural and consumer products to stabilize the price by government policy and directives. Its regular activities in the business of warehousing, port facilities and import and export were less well known. Facing the uncertainties of privatization, the organization considered that it was time to develop a long-term strategic plan and foresight was selected as the tool.

The project started with a survey of employee opinions to get feedback on internal problems and to build up awareness. Then a scenario workshop was conducted where top executives developed scenarios, strategies and preliminary action plans. The executives conceded that price subsidies were on the way out and agreed that their main business was warehousing. Subsequent activities consisted of 2 seminar sessions to communicate with middle level managers and further clarify the result of the scenario workshop. A recent follow up with an executive confirmed that the foresight exercise had been useful and some of the strategies were implemented.

Table 3.3 Summary of Organizational Projects

	Public Warehouse Organization	**National Metrology Institute of Thailand**	**Technology Promotion Association (Thailand-Japan)**
Project Year	1999	2000	2002
Rationale & Objective	Facing the threat of privatization, PWO looked for an alternative way to set its future directions.	Having worked under various limitations, NMIT initiated a foresight exercise to engage key staff to review its master plan and to develop effective strategies.	30th anniversary was approaching, While being proud of its past contribution to Thai industry, the organization was aware of changing environments. Foresight was used to develop their strategic 5-year plan.
Key Question	What is the scenario for PWO in 10 years?	What should the goals of the organization be?	What should be the next stage of development?
Time frame	10 years	10 years	10 years
Methodology	Scenario planning	Scenario planning	Scenario planning, SWOT, Balanced Score Card
Participants	32 top executives and department heads	Executives and core staff	35-50 board members, executives, clients.
Outputs	5-year action plan	Draft vision and core strategies.	5-year strategic and 1-3 year action plans.

The National Metrology Institute of Thailand was established recently in 1997. Since it was established immediately after the economic crisis, NMIT had encountered a number of difficulties including limited funding, human resource shortages, and unsettled directions. Therefore, a foresight project was initiated to engage key staff to review its master plan and to clarify its goals. A workshop was held in January 2000, and before this there was a brainstorming session to gather the opinions of the staff that were not attending the workshop. They were able to produce a long list of problems about the executives, the work system, the policy, human resource and communications, but when asked what one could do about those problems, the answer was "not much" reflecting the low morale of the workers. In the scenario workshop, "what should the goals of the organization be?" was the key question. Executives and core staff had a good sharing of opinions through discussions during the workshop. At the end, they arrived at a draft vision and a set of core strategies. The vision and core strategies were to be further refined and shared with everyone in NMIT. In May 2002, NMIT held another workshop to revise the strategies and activities in view of the new performance-based budgeting (PBB) system. In August 2002, NSTDA organized another brain-storming session to consolidate the strategies from 17 to 3 on human resource development, management system, and national metrology system.

The Technology Promotion Association (Thailand-Japan) has the main aim of transferring technology to Thai industry, from training courses in technology, business management and languages; calibration; to publications; and starting to embark on the new business of consultancy. The association has enjoyed technical and financial support from Japanese donors. While considering its history a success story, the association, which was approaching its 30th anniversary in 2003, deemed it appropriate to rethink its vision and strategy seriously.

In developing the organization's 5-year strategic plan, foresight was deployed to look 10 years ahead. Scenario writing was used at a very early stage as a means to review and assess changing environments around the organization. The workshop participants included the chairman of the board and its members, the director and managers and some department heads, and a few major clients. Some pre-foresight steps were prepared in advance including interviews with stakeholders, a compilation of SWOT tables (strengths, weaknesses, opportunities and threats) and a series of lectures on strategic planning, development of not-for-profit organizations, and industry trends. Scenario writing was a gradual process and it was interesting to see how some ideas were dropped while others retained priority. For example, the 'uncertainty' and threat of dwindling financial support from Japan changed into an 'almost certainty' that must be accommodated, when it was finally resolved that TPA must be financially self-sufficient. It also became clear that TPA would lose more than gain by seeking to become a profit-seeking agency. After the scenario development, another tool, the Balanced Scorecard, was used to move the process from vision to core strategy identification and to ensure the coherence and balance of sub-strategies towards the goal. At the project's conclusion, TPA's new vision was to be the national leader in accumulating, creating, and disseminating knowledge and technology in order to enhance the competitiveness of Thai industry using the key strategy of product excellence and proactive networking.

4. Discussion

It is true that planning, as described in Section 2, is becoming more participatory. Every major project of the state invites more people into the planning process. However, there is a question not just of wide participation but also deep participation and the latter appears to be of less concern. The latter might be defined as the sufficiency of breadth and depth of the discussion and that requires more thinking about a better structure to manage judgments and to facilitate creative confrontation and conclusion. Participation is only one element of planning. Another element is about what basic information and previous analyses are gathered as inputs into the participatory planning. Here the thinking paradigm of what are important to be inputs and how to manage those inputs has not seen much development. Many 'master plans' have a long time frame of up to 20 years, yet they tend to be mere extrapolations from the present. Foresight's good track record of managing participation and process benefits in many other countries is still not well recognised in Thailand, and its principle

concepts of 'plausible and possible futures' and assessing uncertainties seem too new and hence difficult for planners to adopt.

All our examples demonstrate the importance of ownership. At the national level, the "S&T 2020" with the full backing of the Minister of Science, Technology and Environment clearly has more impact than the one initiated by NSTDA alone. At the sectoral level, the "IT for SMEs" project though less successful in engaging participants, with the ownership of DIP did lead to subsequent projects. Compared to the projects at national and sectoral levels, the projects with foresight at the organizational level had the clearest ownership and hence the best chance to make the changes identified as necessary through the foresight project. In all these examples, the projects were initiated and actively supported by their top executives, but TPA actively involved the Chair and members of the Board as well.

All 3 organizations were at the stage of revisiting their corporate vision and positioning but not to ascertain certain business movements or decisions about to be made. For some organizations, it was the first time to allow staff to share opinions about the organizations openly, although TPA already had a more open culture of expression. TPA also went through a traditional SWOT strategic planning but the process could not get them to agree upon corporate directions. Through scenario writing, PWO decided that its main business was warehousing and TPA confirmed its stance to be a not-for–profit organization.

The impact of these projects confirms the belief of many foresight practitioners, that foresight should be a continuous process. In all these projects, the projects most limited in duration and scope had lesser impact. It would be too optimistic to hope for serious structural change to result simply from a 2-day of scenario workshop, but even there (for example, the PWO), the benefits of foresight to the participants as a creative communication tool were evident, and also importantly, it was able to instill an awareness of future possibilities and an encouragement to go beyond current limitations.

The Delphi approach, though less successful in engaging participants in depth and bringing about the process benefits, had the advantage of breadth. The tally of about two hundred returned questionnaires contain a wealth of valuable information, which will continue to be mined for further insights as new questions and concerns arise.

5. The Way Forward

Though foresight is still not widely known or practiced, undoubtedly the demand for foresight is on the rise. NSTDA has been contacted by several organizations and individuals to help them undertake foresight. Some of the demand stems from the limitations of current planning methodologies in solving the problem. There is also a movement to institutionalize the Thai Foresight Unit. With proper budget and personnel, the Thai Foresight Unit can be the focal point in providing assistance to conduct foresight exercises at national, sectoral and organizational levels in Thailand.

Acknowledgement

Appendix

Table A1: Future Key Technologies for Thailand from the Thai Foresight Survey (1996)

1996-2000	2001-2006	2006-2010
◆Material analysis and diagnosis ◆Fermentation ◆Cell and tissue culture ◆Carbohydrate conversions ◆Vaccines and drugs for AIDS ◆Fuel pipe corrosion prevention ◆Material recycling ◆Jewelry technology ◆Telecommunications ◆Geographical information system ◆Computer modeling ◆Energy conservation ◆Magnet and superconducting magnet	◆Gene manipulation ◆Biofertilizer and biopesticides ◆Cancer therapy ◆Drugs from herbs ◆Particle accelerator ◆Surface modification ◆Solar cell ◆Optical communications ◆Machine translation ◆Computer assisted instruction ◆Computer modeling ◆Clean coal technology ◆High-speed train	◆Biosensors ◆Protein engineering ◆Drug design from antibody molecular structure ◆New ceramics ◆Light alloys for vehicle parts ◆Micromechanics ◆Robotics ◆Optical data storage ◆Synchrotron radiation ◆Nanoelectronics ◆Asynchronous transfer mode ◆Fuel cell ◆Electric vehicle ◆Superconducting materials ◆Nuclear energy

Table A2 Relationship between the Demand for S&T and the Strategies of S&T Development

Sectors / Strategies	R&D	Tech. Transfer	Personnel	Infrastructure	S&T Management	S&T information
Agriculture	New breeds for plants, animals and microbes Food innovation	Local R&D and Innovation Center	Technology transfer personnel	Standards IP system	National S&T plan	Commodity prices Agricultural technology
Industry	New materials Improvement of machinery	Metals and polymers Product quality	Engineering education Personnel management	Testing Standards Law	Executive information system	Database of materials & machinery Transaction system
Service	Generic computer program Rehabilitation of natural resources	Learning from vendors, customers, colleagues	Computer personnel Engineers Logistics manager	60 telephones per 100 persons E-commerce	R&D manager Transportation network	Customer database Tourism Transportation
Education Culture Health Welfare	Multimedia Post-genomic medicine	Lessons on educational management from abroad	Network of higher education institutions	All schools can access the Internet Special science school	Education accreditation Career path	For learning and entertainment Lessons in the web site
Environment	Environmental monitoring Clean technology	Learn from abroad Transfer to the people	Researchers with post-graduate degrees	Monitoring points throughout the country Center for environmental technology	Departments of MOSTE	Status of the environment in 76 provinces
Communications	Telecommunication equipment Software	Learning from international organization Learning from vendors	Electronics and computer engineers Telecommunications network	Telephone and Internet network over the whole country Telecommunications act	Just liberalization policy	Movements in other countries Marketing and commerce