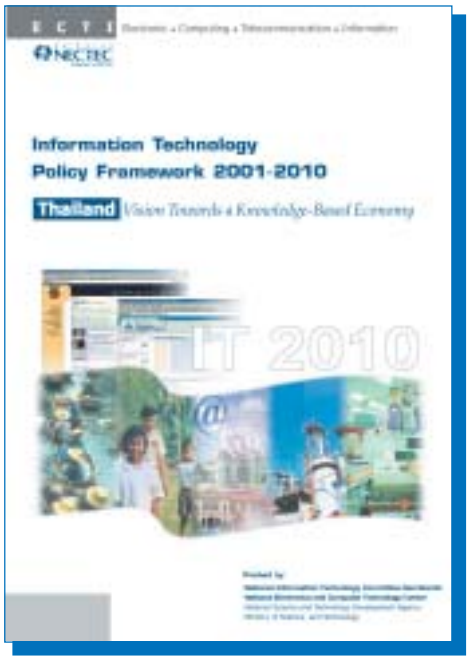
Information Technology Policy Framework 2001-2010

Thailand Vision Towards a Knowledge-Based Economy



Information Technology Policy Framework 2001-2010
Thailand Vision Towards a Knowledge-Based Economy

By the National Information Technology Committee Secretariat

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Foreword

In 1996, Thailand introduced its first information technology policy, known as IT 2000. During the 5-year period under IT 2000, the National Information Technology Committee ("**NITC**") promoted and drove national IT development. The focus was on building various foundations with respect to information infrastructure, human resource development and good governance.

The global economic and social changes have moved towards knowledge-based economy/society ("**KBE/KBS**"). This trend reflects the increasing importance of information technology, as technology plays a crucial role in producing, accessing, storing and disseminating "knowledge," the key production factor under KBE/KBS. Thailand faces questions on how to apply technology in order to increase the knowledge of its citizens, promote distribution of knowledge and apply this knowledge for the benefit of the economic and social sectors in response to those changes.

The NITC recognizes the changing social and economic contexts and the importance of having an IT policy that responds to internal, as well as external, changes. Thus, the second phase of the National IT Policy has been formulated for a period covering ten years (2001-2010). Due attention is given to the role of IT as a national economic and social enabler. Information Technology is to be applied in targeted development sectors, with due attention paid to maintaining a social and economic balance.

IT 2010 has been prepared by the National Electronics and Computer Technology Center ("**NECTEC**"), as the NITC Secretariat, in collaboration with the Policy Innovation Center, King Mongkut's Institute of Technology, Thonburi. IT 2010 has received valuable consideration and comments from various seminars held in Bangkok and the provinces. In a meeting held on October 3, 2001, the NITC approved IT 2010 and appointed NECTEC, the National Science and Technology Development Agency, in conjunction with the National Economic and Social Development Board, to map out the 5-year strategic IT master plan in accordance with the 9th National Economic and Social Development Plan.

On March 19, 2002, the Cabinet passed a resolution approving IT 2010 (2001-2010), to provide guidance in determining the direction of the country's IT development, whereby the public sector, state enterprises, the private sector and relevant agencies are to apply such as framework for the preparation of their IT-related strategies.

The NITC Secretariat and NECTEC would like to express our sincere thanks to all parties participating in the drafting and for providing their valuable comments/advice for this IT Policy. Thanks are also due to King Mongkut's Institute of Technology, Thonburi, for their joint research and the drafting of the IT 2010.

We hope that IT 2010 will serve as a guideline for national IT development in the first decade of the 21st century and play a leading role in developing the economy and raising standards of living in Thailand, leading us towards KBE/KBS.

Dr. Thaweesak Koanantakool
Director
National Electronics and Computer Technology Center
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Challenges of Globalization

Over the past decade, information and communications technology, as well as other cutting-edge technologies, including bio- and genetic engineering technologies, have created a broad range of economic and social activities. Many developed countries successfully maintained economic growth through the utilization of these knowledge-based activities. At the same time, the shortage in skilled labor resulted in a policy of importing the necessary knowledge worker in order to compensate and meet market demand. Many countries have implemented policies to attract their brain drain back for national development.

The beginning of the 21st century witnessed a sharp adjustment in the investment base among business and industry. Excess investment and the convenience of modern communications systems have contributed to a high level of economic volatility. The importance of building a Knowledge-Based Society has become apparent amidst increasing globalization, thereby raising living standards. In addition, innovation has been promoted, enhancing international competitiveness. As a result, many countries have prepared to take a leap in the process of development.

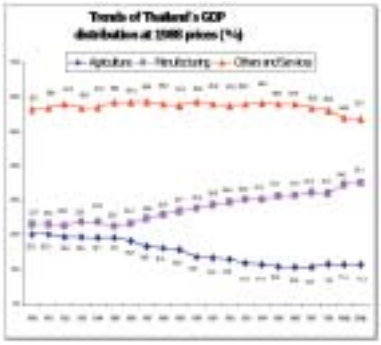
Thailand IT Market

The readiness of several countries to take this step resulted in the development of a new economy. More than ever before, factors of production have largely shifted from labor and capital to “information” and “knowledge.” Several characteristics of the new economy include:

- High level of productivity;
- High level of volatility;
- New innovations in the structure of organizations and businesses;
- Close and rapid interaction among civil society, including the

public sector, private sector and private organizations; and

- Information and knowledge playing a key role in wealth and employment creation.



Despite the continued growth of the new economy, agriculture and industry remain the key production sectors in the economies of developing countries like Thailand. Apart from preparing for the new economy, development guidelines must aim at enhancing the competitiveness of the agricultural and industrial sectors through information technology. In other words, information technology must support both the old and the new economies, with the goal of developing a knowledge-based economy that can completely foster holistic development.

Therefore, the economy under a Knowledge-Based Society rests largely on a system of producing, distributing and utilizing "information and knowledge," where knowledge and technology play a crucial role in driving productivity and economic prosperity. In this respect, greater investment would pour into research and development, education and training, administrative reform, thereby supporting the new economy.

The influence of Information Technology on development is apparent. For example, computer technology has increased the efficiency of production, administration and the quality of education. Telecommunications technology and the Internet have created economic values and activities. Information Technology also serves as a key component in upgrading living standards and creating employment opportunities. IT potential, which includes high processing speeds and greater computing capacity of microchips, the rapid and continued expansion of the Internet worldwide, together with other economic and social values resulting from information technology, have forced countries around the world to try to make more expansive use of IT, so as to enhance economic competitiveness and raise living standards.

At the same time, globalization and the knowledge-based economy have created disparity among the information haves and have nots, along with the knowledge haves and have nots, a result of knowledge communication channels and knowledge creation. This is both a domestic and international digital divide.

National Information Technology development, including the possession of, the use of and the production of IT, is imperative to the overall national development. In this age, where information and knowledge

have no boundaries worldwide, and information infrastructure and industry develop at an accelerated pace, Thailand must rapidly enhance its use of IT in many sectors. With regard to economy factors, the government has the duty of solving economic problems, raising international competitiveness of the private sector and creating employment opportunities. With regard to society, the government has the mission to upgrading standards of living, bridging the digital divide, creating educational opportunities and increasing the skills of knowledge workers among its citizens.

Clearly, increasing globalization means that the world relies on information technology as a tool for tackling problems, and a platform to make the most of any opportunities which are presented.

Knowledge-Based Society

Knowledge-Based Society incorporate both economic and social development. Economic development can be broadly defined as "an economy in which knowledge is produced, distributed and utilized as a key mechanism in the creation of social prosperity, economic wealth and employment for the people in a thorough manner."

The focus of a knowledge-based economy is not only on the "new economy," but also on increasing the effectiveness of the current economy, or the "old economy," in general, such as the application of knowledge in order to increase agricultural productivity or to develop the tourism industry. Knowledge serves as a tool for strategic adjustment in both the old and the new economies.

A knowledge-based economy not only promotes production, distribution and the use of written or codified knowledge, but also includes knowledge gained from experience or tacit knowledge, enabling the transfer and use of such knowledge. This emphasizes the importance of both types of knowledge. For instance, centralized knowledge is as important as local wisdom. In the end, the Thai knowledge-based economy will be filled with modern workers, or knowledge workers. New methods are to be employed for intellectual creation; for example, a strategy to encourage technicians to combine internal knowledge acquired from their experience with new knowledge, whereby the combination of the two benefits each other, business and industry beyond anticipation.

When compared with other production factors, including labor, capital, energy and raw materials, knowledge can be characterized as public goods. Upon discovery and announcement to the public, a number of consumers of knowledge need not bear excess expense or economic waste. Therefore, knowledge is a crucial factor for production in the creation of international competitiveness and the development of living standards which, in turn, benefit society and the economy.

For any society to excel as a knowledge-based society or economy, that society must possess a culture of learning with a broad use of intellectual resources. This is where the public sector comes into play, particularly with regard to furthering education, in order to create a culture of learning. It is apparent that a society open to learning enjoys explicit economic development when compared to those societies that are closed.

Societies that can foster a knowledge-based economy have a tendency to produce, distribute and utilize ideas and creativity in the development of competitiveness; i.e. an innovative society. Many countries promote innovation through investment in three primary areas- information and communication technology, human resources, and science and technology.

Public policy that successfully leads to a knowledge-based society hinges largely on a knowledge workers. Those knowledge workers will continue to grow through the promotion of creative thinking, training in science and technology, and the competition involved in the development of innovation.

In order to drive society and the private sector to create knowledge-based innovation, the government must employ a mechanism to help society and the private sector cushion the "risks" that often arise in the process of innovation development. Naturally, the ability to absorb risk is limited in the private sector, particularly those risks that occur in attempts to develop scientific and technological procedures. The public sector may introduce supporting mechanisms; e.g. legal mechanisms, along with financial and tax measures. The public sector also has the mission of enhancing the market environment and conditions that faci-litate business and industrial undertakings, prescribing conditions for fair competition, and extending consumer protections.

The digital divide comprises of an infrastructure divide, a literacy divide, a management divide and a cultural divide. Knowledge-based society not only refers to technological knowledge, but also to the ability to manage knowledge with regard to social development and culture.

To create economic and social values, society must invest in information and communications technology in order to promote education among all sectors of society through convenient and affordable

"access" to information infrastructure and equipment. Users of this infrastructure have more opportunities to create innovation, and therefore achieve greater intellectual creativity, than those without such access. It is usually those knowledge workers within the education sector and labor market who possess the greatest intellect and expertise in science and technology.

A knowledge-based society possesses qualifications that facilitate social and economic openness. New ideas are to be applied through information and communications technology for the benefit of the economy, along with the implementation of macro and micro economic policy and the promotion of education, which includes life-long education, in a swift and effective manner.

Thailand in the First Decade of the 21st Century

Overall, apart from driving innovation in society through the application of knowledge, many societies have recognized the long-term value of basic-knowledge creation, including basic research and development, as compared to applied research and development. Given limited national budget, each society must find suitable methods that yield the greatest benefit, and then continuously assess the results.

Thus far, the public sector has exerted its role in information technology at many levels with varying results. Public policy is one key factor, along with the market mechanism, that the private sector, private organizations and communities have developed in parallel.

Since its introduction in 1995, Phase one of the Information Technology Policy, or IT 2000, has laid a foundation for national development at a time when Thailand was not familiar with many technologies and applications. The three key pillars, covering information infrastructure, development of IT personnel and public sector reform through information technology, have yet to be completed, though social awareness has apparently picked up steam. Past projects fulfilled their goals of piloting future expansion through learning from their experience and mapping out plans for the future.

Thailand, in this first decade of the 21st century, has a variety of public policies involving IT development based on policies announced by the government to the parliament. Procedures in public administration have, in many aspects, been determined by the need for ministries, departments, and divisions to achieve their set targets. Particularly urgent missions include the solving of economic, social and political problems. Development guidelines, which are directly or indirectly related to information technology, can be summarized below:

- "Internet Tambon" to provide infrastructure to communities in all regions,
- "One Tambon One Product," where IT and electronic commerce will enhance efficiency in the management of global information

and markets, particularly with regard to the growth of Thailand's "E-Commerce Cooperatives,"

- "National health insurance scheme, or the 30-baht charge for all diseases," which requires an information management system,
- "Development of education technology and information networks" in order to enhance and distribute educational opportunities to both urban and rural Thais,
- "Internet for Education," which is a government program, providing Thais with an opportunity to access information as a part of human resource development,
- "E-tourism" as one factor in the creation of value-added and marketing efficiency for the promotion of tourism as the main revenue-generating industry of the country,
- "Promotion of e-commerce" to provide entrepreneurs with an opportunity to enter world markets through the introduction of measures and legislation necessary for e-commerce,
- "Promotion of IT in the manufacturing sectors," particularly the agricultural sector,
- "Promotion of IT in order to enhance the capabilities of SMEs,"
- "Promote IT applications" in public-sector reform,
- "Promote the development of science and technology" in the areas of research and development.

Nevertheless, Thailand's Information Technology development over the past decade, since the establishment of the National Information Technology Committee in 1992, has faced a variety of chronic social obstacles, including:

- Problems regarding the country's leader. Most national leaders around the world step in to supervise information technology policies regarded as a primary paths to the future development. These include policies relating to, and coordinating with, several agencies. With regard to Thailand's past, supervisory tasks were assigned to deputy executives. As a result, public and private agencies were unable to coordinate due to the constant changing of the executives and their lack of understanding.

- Problems regarding corruption.

- Problems with national education. The creation of the workforce has been focused on working from memory rather than on an ability to adjust one's own thinking to a highly dynamic world.

- A lack of coordination, the focus on individualism, and the shortcomings of Team Thailand. The country has stumbled and lost opportunities on the international stage.

Moreover, there are many challenges awaiting Thailand in the process of developing information technology for its economy and society,

- The application of IT as a tool in the creation of readiness and strength for administrative decentralization or, in other words, to strengthen local administrative organizations.

- To meet educational needs of Thai youths. Following the drafting of the Constitution and the National Education Act (1999), along with the stipulation of 9-year compulsory education and 12-years of free education, the demand for education took a sharp leap.

- Lessons from the economic crisis clearly point out that the country needs to undertake significant industrial restructuring in order to maintain its international competitiveness with regard to IT device manufacturing industries and the application of information technology to other industries.

- In addition, Thailand has both an agricultural and an industrial society. The information-based society and knowledge-based society can directly and indirectly benefit the other two societies. In the future, Thai society will become stronger than those of many other countries, as the three areas coexist and benefit from one another.

- The gap between those who have information and those who do not in Thai society has affected income distribution, employment opportunities and the quality of the overall population.

- Social and moral impacts.

Thailand in the first decade of the 21st century possesses both strengths and weaknesses in the midst of opportunities and threats, particularly as a result of the IT revolution.

The Thai economy possesses strengths in many industries, including tourism, agriculture and handicrafts, along with a uniqueness and geographical location suitable to its serving as a regional center for transportation and communications, while adjacent to Cambodia, Laos, Myanmar, and Vietnam (CLMV). Moreover, Thai culture has been passed on for decades.

However, the Thai economy also has many weaknesses, including a skilled workforce, deficiencies in the education system, outdated industries due to failures in creating value-added services, inadequate investment in research and development for new economic innovations, as well as lack of cooperation and coordination among the public and private sectors.

The country's opportunities depend upon leadership at all levels, in particular the top executives of the country and large organizations. Thailand needs to rapidly reap the benefits of information technology, as recognized and practiced in countries around the world. The opportunity to take a leap in social and economic development, utilizing information technology as a tool, is just around the corner.

The threats that Thailand faces come in a variety of forms. The apparent external threats are the result of international agreements that, in one aspect, increase awareness. At the same time, the speed and level of development could create problems in terms of Thailand's readiness for globalization, in addition to the prolonged, chronic social problems discussed earlier.

Moreover, the regulations and criteria from international agreements and cooperations, where Thailand is a party or member, become the key conditions in the process of Thailand's IT development. Examples include the Information Technology Agreement (ITA), telecommunications liberalization, and the e-Commerce Free Trade Zone under the World Trade Organization (WTO); e-ASEAN under ASEAN; and the Mutual Recognition Agreement (MRA) under APEC.

Analysis of the achievements of IT 2000 have provided valuable insights, including the promotion of thorough IT applications in the industrial sector, the encouragement of foreign investment in domestic IT industries, the promotion of research and development, the development of IT personnel through informal education, the establishment of sector development plans, and the establishment of an organization to promote the IT program.

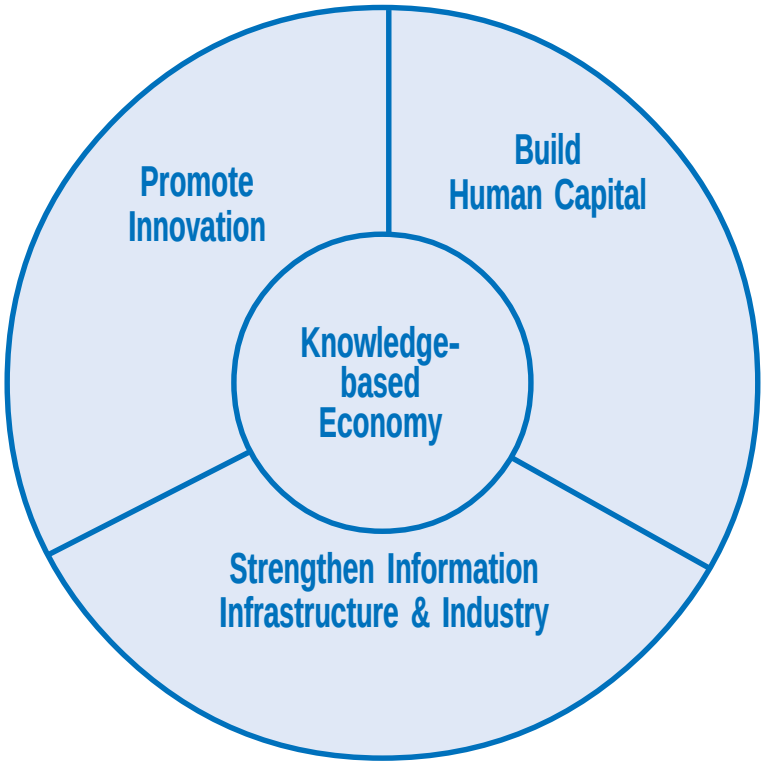
Information Technology Policy

Thailand's Vision towards a Knowledge-Based Society

Information Technology Policy, Thailand's Vision towords a Knowledge-Based Society, for the 10-year period from 2001 to 2010, is aimed at sustainable economic strength, international competitiveness and increased living standards with a minimal income distribution gap. IT 2010 has the following three key components:

- Building knowledge-based human capital.
- Promoting innovation in economic and social systems.
- Strengthening information infrastructure and industry.

IT 2010: National Information Technology Policy



Goals of IT 2010

1. The goal for the next ten years under the IT Policy focuses on enhancing capacity for the use of technology for national development. UNDP's technology achievement index is applied as criteria. The United Nations has classified countries into four categories, by their capacity to develop the country through technology, as follows:

- Leaders are primarily powerful, developed countries having technological innovation of their own and having achieved technological creation, distribution and sound technological skills.
- Potential Leaders are those countries advancing and developing their leadership potential. Most investment is on the development of the skills of the workforce and on the broad distribution of existing technologies. There is not a lot of recent innovation. The labor skills of most countries in this group are similar to those of the leaders.
- Dynamic Adopters are those countries actively adopting new technology. In spite of cutting-edge technology, older technology is distributed slowly and incompletely.
- Marginalized countries comprised of those countries that require substantial distribution of technology and development in skilled labor. Most of their citizens have not enjoyed the benefits of the older technology.

In 2001, Thailand was ranked 40th among the 72 countries listed and was among the top of the third group (Dynamic Adopters).

By the year 2010 , IT development towards a Knowledge-Based Society will have placed Thailand among the top of the second group (Potential Leaders).

In 2010, IT development towards a Knowledge-Based Society will put Thailand among the top of the second group (Potential Leaders).

2. The second goal of IT 2010 is to develop a knowledge workers. Statistics compiled under the International Labour Organization's (ILO) criteria, which classifies knowledge workers by occupation as people who utilize knowledge or specialized knowledge as a primary function of their work, reveals that knowledge workers represent 30% of total

workforce in most developed countries, while standing at 10-20% of the total workforce in Latin American, Asia and most developing countries.

In 2001, knowledge-based workers represented 12% of the total workforce in Thailand. The second goal of IT 2010 is to increase knowledge workers to 30% of the total workforce, or equivalent to the average of the knowledge workers of OECD in 2001.

In 2010, 30% of the total workforce is knowledge workers.

3. The third goal is determined from the volume of economic activity under the knowledge-based industries or knowledge-intensive industries. OECD has classified knowledge-based industries to cover high technology industries, medium to high technology industries, services to the community, society and individuals, financial and business services and communication services. All knowledge-based industries can be calculated as a ratio of GDP through the domestic account and the national input-output table.

Using the above criteria, OECD discovered that knowledge-based industries of most developed countries comprised of over 40% of their GDP in 2001.

The third goal of IT 2010 is to bring knowledge-based industries to 50% of GDP, or the current average of OECD.

Nevertheless, the three goals are comparative macro indexes. Factors may be adjusted in detail to the unique development conditions and the needs of Thailand, based on goals and actual development processes so that they correspond to the overall national economic and social development trends.

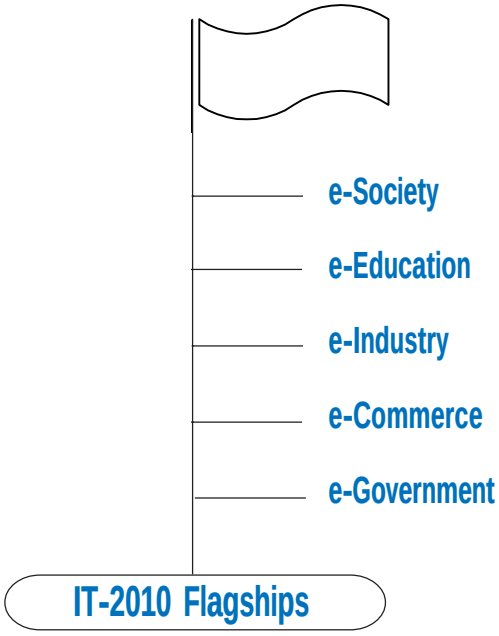
In 2010, the knowledge-based industries will increase to 50% of GDP.

From Policy to Strategy

Under Thailand's Vision towards a Knowledge-Based Society, with economic prosperity and social stability, the target of development partnerships through IT applications has become clearer. Meanwhile, development strategies can be classified into five flagships, as follows:

1. e-Government,
2. e-Commerce,
3. e-Industry,
4. e-Education, and
5. e-Society.

All of the above are well connected and synthesized, and hence benefit the country in many respects. They reduce repetitive investment, create markets for the private sector, and help to connect Thai knowledge-based resources. The development base corresponds to the key factors of a knowledge-based society and economy-building human capital, promoting innovation, and strengthening information infrastructure and industry.



e-Government

Goals: Information Technology development in the public sector, including central, regional and local administration, has two primary goals:

- Back office development, which includes record keeping, inventory, human resource management, finance and accounting, and budgetary works: to utilize integrated information technology by 2004.
- Front office development: to provide 70% of services through electronic means by 2005 and 100% of services by 2010.

This serves as part of a movement towards good governance.

Development strategies:

1. Establishment of plans and budgets
   - Prepare an IT master plan for the public sector, along with operational plans at ministerial and departmental levels.
   - Continuously monitor the implementation of the plan.
   - Continuously evaluate the implementation of the plan.
   - Increase the ratio of funding for IT development in the public sector.
2. Establish an organization reform
   - Issue regulations or cabinet resolutions for the establishment of a central organization, whose duties are to map out a plan for the development and promotion of IT applications in the public sector.
   - Clarify the roles and missions of organizations that support IT in the public sector.
3. Development of the public sector workforce
   - Introduce four classifications for the public sector workforce with a view to acquiring appropriate IT knowledge and skills:

     1) Top executives,

     2) Primary and intermediate executives,

3) Operations officers, and

4) IT operation officers in agencies.

- Raise the standard of IT qualifications for government officials.
- Revise regulations governing specific qualifications for government officials at all levels.

4. Improvement of public administration
   - Establish a central standard for back office software application.
   - Assign the responsibility for the development of IT applications to those agencies in charge of the five key back office tasks, comprising of record keeping, inventory, human resource management, finance and accounting, and budgetary works.
5. Improvement of public services
   - Develop and apply IT in order to enhance the efficiency of services to the general public, including convenience, speed, coverage and quality.
   - Establish a central information network for the public sector, where all agencies are able to share information and the levels of access to each category of information are appropriately determined.
   - Promote cooperation among the public sector, government agencies and private agencies that extend services to the general public.

e-Commerce

Goals:

To enhance the competitiveness of Thai entrepreneurs, using e-commerce as a tool for business ventures. E-commerce is to focus on export, trade and services, and domestic consumption, with due attention paid to national interests.

Development strategies:

1. Implementation of a proactive foreign policy
    - Announce e-Commerce as a national trade strategy.
    - Promote the formulation of an e-commerce policy for each sector.
    - Create a mechanism for the formulation for international negotiations through the establishment of Team Thailand, which comprises of individuals with diverse skill sets, in order to mutually determine a clear position for Thailand.
2. Increasing awareness in order to boost e-commerce activities
    - Promote the dissemination of e-commerce knowledge and information to all sectors of society.
    - Develop electronic public service delivery and an e-Procurement system in order to promote e-commerce among businesses performing transactions with the public sector.
3. Expediting the legislation necessary to enhance confidence in the electronic system.
    - Expedite the consideration and enactment of the Electronic Transaction Act and related laws.
    - Accelerate the consideration of regulations governing information infrastructure, pursuant to Section 78 of the Constitution 1997.
    - Accelerate the drafting of data protection law and revise consumer protection laws in support of e-commerce.
4. Development of payment and security systems
    - Develop guidelines for systems on payments and money transfers through electronic media in order to support e-commerce.
    - Establish a flexible and effective central agency for the maintenance of the security and safety of e-commerce systems.
    - Implement security and safety measures in the public-sector database, along with an emergency unit in each core agency.

5. Creation of a database and data management system
    - Establish a database and a data network in order to serve businesses, industry and consumers.
    - Establish a Business Monitoring Center, whose duty is to monitor trade movements in key trading countries.
6. Promotion of SMEs
    - Cooperate with the private sector in various areas for the development of a portal site, to be utilized as a centralized source of information in any specific field connected to other related sites.
    - Consider the export criteria and procedures for the development of a paperless trading system in accordance with international agreements.
    - Introduce measures on the incubation of new businesses and the promotion of venture capital.
7. Development of human resources
    - Promote and allocate resources for the systematic and continuous development of human resources for e-commerce.
    - Develop and have widely available, e-commerce curriculum programs in higher education.
    - Provide e-commerce training for community-based entrepreneurs through the existing network of local institutions.
8. Development of a supportive infrastructure and its components
    - Promote widespread application of the internet and eliminate the telecommunications monopoly in order to support the expansion of e-commerce.
    - Develop IT industries, particularly software industry and projects on a national-scale, in order to drive e-commerce development.
    - Support research and development by focusing on the creation of standards, innovation and prototypes.

e-Industry

Goals:

To promote and develop information technology applications and production in the private sector, before 2010, for implementation in stages. The aim is to develop knowledge-based industries.

Development strategies:

1. Creation of a Thailand Exchange.
   - Establish a trade transaction center, facilitating the supply chain, using the internet in the form of a B2B Exchange, as an on-line marketplace for the exchange of industrial products, as well as linking producers with consumers both at home and abroad.
2. Support of industrial development through the application of IT
   - Establish an advisory agency for industries and factories wishing to develop and utilize IT to increase their competitiveness.
   - Support the development of Smart Factories.
3. Establishment of a Marketing Intelligence Center
   - Provide information on the supply and demand of goods and services in order to match and link producers, consumers, information on regulations, import and export trends, and overseas markets.
4. Promotion of the development of the Thai IT industry in the areas of software, telecommunication, information and electronics
   - Reduce the levels of importation of computers, telecommunication and software equipment.
   - Expand IT research and development activities, so as to raise the competitiveness of the Thai IT industry.
5. Development of IT literate personnel within the industrial sector
   - The industrial sector is to cooperate with educational institutions in the implementation of training programs for the development of IT education and skills for workers.

6. Promotion of the manufacturing industry base on research and development
    - Coordinate research and development information for IT applications in the industrial sector.
    - Create measures that encourage entrepreneurs to create and develop new industrial products.
7. Support of information technology applications in the development of SMEs
    - Create IT programs and promote awareness of the use of IT for SMEs.
    - Create an IT consultancy system for SMEs.
8. Support of information technology applications for the development of the agricultural and agro-industrial sectors
    - Create an information network for the agricultural sector, connecting important agricultural information.
    - Arrange such information so that farmers and related persons have access to, and benefit from, the IT network in the agricultural sector.

e-Education

Goals:

To develop and prepare the country's human resources at all levels in support of the development of a Knowledge-Based Society.

Development strategies:

1. Development of a mechanism for the management of information technology policy and the administration of effective education.
    - Create an administration system and the shared application of educational resources in order to reduce duplicate investment, and use educational resources efficiently and for the maximum benefit of students.
    - Enhance the capabilities of organizations and agencies involved in the development of education technology, whose duties are to promote and support student-

centered learning.

- Combine forces with, and build a system for, the management of the IT network for education, operating under a single policy, but offering diversity in implementation practice.

2. Development of an equitable information infrastructure for education
   - Expedite the development and provision of equitable telecommunication infrastructure service.
   - Develop an effective IT network for education at a reasonable price.
   - Support and encourage the participation of an industrial sector in the investment in educational technology and provision of education technology services.
3. Support and promotion of human resource development at all levels
   - Develop and train personnel and education-related human resources at all levels, so as to increase their IT knowledge and skills.
   - Accelerate the production of graduates and develop advanced IT labor in order to support the rising demand.
   - Expedite the production and training of IT technicians, who serve schools and institutions.
   - Develop programs for training and life-long learning for knowledge workers.
4. Rapid development and supply of high quality and appropriate knowledge and content
   - Combine the forces of all parties for the production and supply of educational content.
   - Develop and improve educational curriculums that support students in the use of IT in order to increase their knowledge, where students are the center of the learning process.
   - Support and enhance the capabilities of educational institutions in preparing curriculums with local content.

- Promote and support research and development which focuses on the development of knowledge, learning processes, and achievements through knowledge.

5. Bridging the gap to the access to information and knowledge
   - Build a system for effective administration of information and knowledge.
   - Accelerate the development of educational media suitable for students, allowing students to benefit from educational content for quality education, in all forms.
   - The government must place greater importance on the development of information content and human resources than on the investment in technology.

e-Society

Goals:

To bridge the digital divide in society in the information age, while promoting a better quality of life and a Knowledge-Based Society.

Development strategies:

1. Development of an equitable information infrastructure
   - Expedite telecommunications reform, allowing for free and fair competition.
   - Allocate radio frequencies in view of public interest.
   - Proceed, as per Section 78 of the Constitution, with respect to an equitable information infrastructure.
   - Support the participation of the private sector in the investment in information infrastructure

2 Development of human resources to nurture IT knowledge and skills
   - Develop and train the general public with regard to IT knowledge and skills.
   - Create social awareness and the recognition of opportunities and threats to the society in the information age.
   - Support the creation of educational programs and

life-long learning services.

3. Increase the capacity of educational institutions in the promotion of learning in the community and society.
    - Encourage agencies to produce and disseminate data, information, and knowledge to the public in such a form that people are able to access and benefit from.
    - Create capacity for public organizations, educational institutions, and non-government organizations in the promotion of learning in the community and society.
4. Creation of digital opportunities and bridging the digital divide
    - Support the appropriate applications of IT as a tool for the distribution of content to the general public.
    - Establish information and learning centers that citizens are able access and benefit from.
    - Promote R&D to bridge the digital divide.
5. Development of IT systems in support of the creation of learning communities
    - Support the creation, transfer and utilization of knowledge in the community.
    - Build a community network in which experience and knowledge are exchanged to strengthen the community.
    - Develop an information system that supports a Thai knowledge-based network for the systematic development of local knowledge and wisdom.
6. Improvement in the quality of life
    - Utilize IT in order to disseminate the concept of a sufficiency economy.
    - Support e-Community Commerce in order to strengthen local economies and support the "One Tambon One Product" policy.
    - Develop database systems for decision-making and planning on quality agriculture. Provide information on the improvement of production quality and reduction in production costs, along with information on product processing and marketing.

- Develop IT systems in order to ensure quality, equal and thorough coverage, providing information on basic public health and ensuring the health and well-being of the people.

7. Creation of a caring society
   - Promote the application of IT among rural communities, the disabled and the underprivileged.
   - Promote the creation of networks among a variety of social groups for the exchange of perceptions and the creation of mutual understanding.
   - Combine forces to fight the inappropriate use of IT, such as the illegal and immoral use of media and technology.
   - Strengthen family institution in order to develop quality youth.

The key factor supporting and promoting the effective implementation of the above five flagships is supporting industries. There is a need to enhance the capabilities and strengths of the domestic IT industry, which is ready to meet demand for various IT products and services. The four key policies and strategies for the development of the IT industry are listed below:

1st Policy: Support and improve IT production, so as to have the ability to produce parts and components for domestic distribution at a lower cost than imported parts.

2nd Policy: Develop a Thai software industry to an international standard, creating confidence in Thai software products and services.

3rd Policy: Develop and improve the telecommunications infrastructure, meeting public policy on the creation of equitable and universal access to IT, by promoting the use of locally produced products.

4th Policy: The government, educational institutions and industrial sector must jointly develop IT programs, along with training programs, in an attempt to produce IT graduates and professionals, while increasing the knowledge and skills of IT personnel.

Linking Sector Development and Moving towards a Knowledge-Based Society

IT development guidelines for the five primary sectors are to serve as components driving synergy, covering both social and economic development. Aside from the support from information infrastructure and industry, synergy is to be made possible through the linking and interaction of the many missions, including:

- The joint utilization of resources in order to reduce duplicate investment;
- The creation of demand and response mechanisms in order to supply common missions. These missions will reduce the need for imports, while boosting economic activity and employment;
- Physical and information networking, which will eventually lead to a network of cooperation;
- Cooperation among public agencies and the public and private sectors;
- Standards resulting from technical and information links and connections;
- Confidence in the economic sector supported by appropriate legislation;
- Effective decentralization of administrative authority

The above contingent links, along with other subsequent links, are to lead to a more caring social network in the form of civil society.

These missions are to be a major driving force in the expansion and development of the Thai information industry, including the software industry, telecommunications service, information services, trade and the electronics industry. Moreover, competition will be fueled in those businesses working in fields relating to information infrastructure. As a result, the general public will enjoy greater access to information with regard to both its physical presence and its cost. Nevertheless, investment in infrastructure must maintain a balance between the desired development targets and national budgetary constraints,

Investment in infrastructure must maintain a balance between the desired development targets and limitations in the national constraints, with systematic administration, planning and monitoring to ensure the worthiness of investment.

utilizing the appropriate procedures and volume. Systematic administration, planning and monitoring are necessary to ensure the worthiness and efficiency of investment.

The IT development guidelines for each sector must support the goal of a Knowledge-Based Society. Sector tasks can be integrated utilizing the three goals of the Knowledge-Based Society, with the following three components:

Human resources covers the skill development of government officials (e-Government), the development of personnel and students in the educational system (e-Education), the promotion of life-long learning (e-Society) and the development of a knowledge workers (e-Commerce, e-Industry).

Promotion of innovation covers the changes in public administration and services through public reform (e-Government), the innovation capacity of Thai youth (e-Education), the spread of local wisdom (e-Society), and the research and development and technology transfer in the economic sector (e-Commerce, e-Industry).

Information infrastructure and industry covers information network development and the administrative systems of the public sector (e-Government), the development of an educational network and market (e-Education), the development of a local and rural information network (e-Society), the development of e-commerce and a downstream software industry (e-Commerce) and the development of a supply chain and electronic industry (e-Industry).

A Knowledge-Based Society is a target clearly linked with the strategies on IT applications for sector development. Not only for advanced information and telecommunications industries, the strategies provide a long-term impact on strengthening the society on the basis of quality human resources and social innovation, while fostering sustainable intelligence and creativity.

Keys to Success

To successfully achieve the above-listed missions, many key development conditions are necessary. Past social experiences point to limitations in IT development, which make it difficult to put policy and operational plans into practice. Therefore, the second phase of the IT Policy prescribes the following development conditions:

Information, content and knowledge must receive priority over, or at least not less than, investment in infrastructure and equipment.

1. Information, contents and knowledge must receive priority over, or at least not less than, investment in basic infrastructure, tools and equipment. All future development projects must guarantee cost-effectiveness of investment in hardware. Specifically, investment in information and content must be substantial. Moreover, research, development and innovation must be promoted in order to strengthen Thai competitiveness. A policy of promoting the establishment of knowledge centers at all levels of society, from local administrative organizations, schools, communities, government agencies, to SMEs, should be implemented.
2. Human resources must be continuously developed at all levels of education: formal, informal and voluntary education systems. The capacity of the existing national labor force must be increased through training in order to ensure sustainable development. The focus is to be placed on knowledge workers.
3. The digital divide must be bridged through the creation of digital opportunities. Nevertheless, the focus is not only on the lack of infrastructure and equipment (infrastructure divide), but also on unequal literacy (literacy devide), the differences in culture (cultural divide) and the lack of management expertise (management divide).
4. There must be a clear and permanent mechanism for creating "leadership" to be an integral part of the National ICT Development Policy, and incorporated into principles and procedures for policy implementation. The country's top executive must give such leadership and guidance. Other crucial elements include an effective management structure and good governance, details of which follow:

- The Prime Minister shall act as the Chairman of the National Information Technology Committee (NITC) himself. The NITC shall be equipped with a policy support unit, or the "IT Policy" Office, responsible for information management and technical papers, which is to facilitate continuance of policy implementation as well as examining and assessing the policy. Committee Secretary or the manager of the IT Policy Office shall submit a progress report on the status of national information technology to the Chairman, on a monthly basis. The IT Policy Office shall be an independent entity, and shall not operate under the umbrella of any state agency, or comply with cumbersome official regulations due to the rapidity of change of technology and foreign policy. It is deemed expedient that the IT Policy Office must recruit the highest quality and caliber of personnel to run the office.
- The IT Operations Support Office, which has the primary duties and functions to provide support, as required by the implementation of policies that shall cover both provisions of technology and project supervision/management, function as a consultant office to the NITC, support research and development programs, project management and carry out assignments, and support state agencies regarding e-Government development programs. Nevertheless, the office should allow private sector and industrial sector paricipation in most operations, by establishing a fair, transparent, and efficient outsourcing system.
- Both the IT Policy Office and the IT Operations Support Office must closely coordinate in implementing the policies set by the NITC. When duties and responsibilities of both offices grow beyond a critical level, or under critical pressure to act more dynamically, the next appropriate step would be the establishment of the Ministry of Information and Communications Technogy. The establishment of the said organization is to be executed within the timeframe of this policy.

- Ministries, departments, and divisions shall render their participation in the capacity of the authority responsible for certain parts of the development projects that are related to their own organization and services, which the NITC has made into policy, or has reached a resolution for implementation. In this case, a master plan should be developed and the Budget Bureau should allocate a sufficient budget for implementation. If this operational stage cannot be undertaken due to limitations or inadequacies, i.e., lack of personnel and/or expertise, then the allotted budget can be used for hiring the private sector to carry out the work in order to create jobs and increase employment within the economy, whereby the contractors shall be dependent on the IT Operations Support Office as the project consultant, or the said budget can be used to request the office to undertake the assignments as deemed suitable and appropriate.

5. The NITC is entrusted the duties and responsibilities as provisioned in Section 78 of the Constitution of the Kingdom of Thailand 1997. This section defines the state's obligation to facilitate Thai society with the means of efficient, indiscriminate and equal accessibility and usage of the IT infrastructure. The policies and operations of NITC should be linked with the policies and operations of the National Telecommunications Commission, the National Broadcasting Commission, which are tasked with duties/responsibilities provisioned in Section 40 of the Constitution: to regulate and manage radio frequencies to gain the highest possible benefits for the general public. Due attention is also given to make the most of IT convergence.

Executive Summaries

Development Strategies for Each Sector

Executive Summary
e-Government

Electronic government (e-Government) refers to the application of electronic means in public administration and services with the goal of building a Knowledge-Based Society, creating good governance and enhancing competitiveness, leading to a higher quality of life for Thai society.

Vision

To build a Knowledge-Based Society through the application of electronic means in the administration and services of the public sector before the year 2010 in order to create good governance and enhance national competitiveness, leading to a higher quality of life for Thai society.

e-Government Policy

1. Promote the application of electronic media in the front office in order to increase alternatives for the people to access and utilize public services, and there by increasing convenience and efficiency.
2. Improve the back office operation through the applications of electronic media order to enhance the efficiency and effectiveness of public administration.

Targets

IT development in the public sector, with respect to centralized and decentralized administrations, has the following two principle targets:

- Back office, which includes record keeping, inventory, human resource management, finance and accounting, and budgetary works: is to completely utilize IT by 2004.

- Front office: is to provide 70% of their services through electronic means systems by 2005 and 100% of their services by 2010.

Development Strategies

The five primary e-Government strategies cover the areas of planning, budgets, organization, personnel, and operation systems, as follows:

1st Strategy: Establishment of Plans and budgets comprise of measures on the preparation of a master plan for IT development in the public sector, along with operational plans, measures for monitoring the implementation of the plan in accordance with the plan evaluation and measures for increasing the ratio of funding for IT development.

2nd Strategy: Establish an organization reform covers the issuance of regulations on the establishment of a centralized organizations overseeing IT applications in the public sector and clarifying its roles and missions.

3rd Strategy: Development of the public sector workforce includes measures on developing the four groups of personnel in the public workforce - - top executives, primary and intermediate executives, operations officers, and IT operations officers in agencies - - in order to acquire the appropriate IT knowledge and skills, along with measures for raising the standards of IT qualifications of government officials.

4th Strategy: Improvement of public administration includes measures for establishing central standards for IT application in the public sector and measures for assigning responsibility for the development of IT to those agencies in charge of the five key back office tasks, comprising of record keeping, inventory, human resource management, finance and accounting, and budgetary works.

5th Strategy: Improvement of public services covers measures for the development and application of IT for the enhanced efficiency of services to the general public, with regard to convenience, speed, coverage and quality, along with measures for the establishment of a central information network for the public sector, and measures for the promotion of cooperation among the government agencies and private sector that provides services to the general public.

Executive Summary
e-Industry

e-Industry refers to the "strengthening of the manufacturing sector through the use of information technology as an essential tool in the creation of competitiveness of the manufacturing sector, thereby leading to sustainable economic growth."

The status of IT applications in the Thai industrial sector comprises of IT applications in the back office, the production process, and logistics and marketing. The study found that, at present, IT applications in the manufacturing industry are concentrated in the back office.

Vision

To strengthen the Thai industrial sector in support of a Knowledge-Based Society via the development and linking of IT networks in production and management by 2010.

e-Industry Policy

1. Promote the use of knowledge as a production base in the Thai industrial sector;
2. Promote the use of industrial and marketing information on industrial products as guidelines for decisions on the production of industrial products;
3. Promote production links between large-scale and small-scale entrepreneurs, both centrally and regionally;
4. Bridge the gap in accessibility to information among Thai entrepreneurs.

Target:

To promote and develop IT applications in the private sector in order to create knowledge-based industries by 2010.

Development Strategies:

1st Strategy: Creation of a Thailand Exchange, an online transaction center for the exchange of Thai industrial products, utilizing the internet in the form of a B2B Exchange.

2nd Strategy: Support of industrial development through the application of IT applications. Provide consultation to industries and factories wishing to enhance their IT applications. Prescribe the standards of Smart Factories.

3rd Strategy: Establishment of a Marketing Intelligence Center to provide information on the supply and demand of goods, linking that supply and demand with information on regulations, import/export trends and overseas markets.

4th Strategy: Promote manufacturing industries using research and development as a base for effective coordination of knowledge regarding the use of IT in the industrial sector.

5th Strategy: Support IT applications for the development of SMEs.

6th Strategy: Support IT applications in the development of the agricultural and agro-industrial sectors.

7th Strategy: Develop the IT skills of human resources in the industrial sector.

8th Strategy: Eliminate legal obstacles and create regulations that facilitate investment and development of IT in the industrial sector.

9th Strategy: Develop the information infrastructure for e-readiness.

Executive Summary
e-Commerce

e-Commerce is a key mechanism in the development of national competitiveness in local and global trade in the age of borderless trade, as of 2000, and in the movement towards a knowledge-based economy. In this regard, e-commerce refers to "the process in which businesses undertake trade and services through all types of electronic media, either in the form of business to consumer (B2C), business to business (B2B) or business to government (B2G)" transactions.

Vision

To enhance the competitiveness of Thai entrepreneurs through the use of e-commerce as a key tool in business process and transaction, particularly with regard to export, trade and services, and local consumption, with the greatest attention placed on national interest.

e-Commerce Policy

1. Focus on the development of e-commerce and prescribe such development as a prime moving strategy for national economic development, while announcing e-commerce as a key national trade strategy, integrated with the 9th and 10th National Economic and Social Development Plans. Formulate e-commerce plans for each sector in support of export, trade and services, and local consumption.

2. Fuel the growth of e-commerce in the country. The government has a duty to support and implement measures in the facilitation of e-commerce activities among the private sector, entrepreneurs and consumers, particularly with regard to building a mechanism to ensure trust and confidence.

3. Support Thai entrepreneurs in the application of e-commerce in order to enhance competitiveness in the global trade scene, particularly among SMEs.

4. Public regulations, rules and criteria that impede the development of e-commerce are to be eliminated and revised, as the government has a duty to ensure fair competition, while providing protection to consumers.

5. Accelerate public sector reform in the use of electronic media and IT for effective administration and utilization for public services, create an e-commerce market for the private sector, and support and facilitate B2G, B2B and B2C activities.

6. The public sector, in conjunction with the private sector, is to prepare a database, study policy and provide guidelines for e-commerce development at an international standards in order to maintain national interest in all negotiations and trade agreements.

Target

To promote the broader application of e-commerce in the business sector in order to boost exports, develop trade and services, and increase local consumption.

Development Strategies

1st Strategy: Proactive foreign strategy. Announce e-commerce as a national trade strategy, formulating an e-commerce policy for each sector. Enhance cooperation with other countries. Create and provide e-commerce knowledge and understanding. Build mechanisms for the preparation of international negotiations and discussions through the establishment of Team Thailand. Study the trends and effects of tax collection on e-commerce related income.

2nd Strategy: Strategy for the creation of awareness, including measures for the promotion of e-commerce knowledge and understanding in the business sector, with a focus on SME entrepreneurs. Develop projects to increase the interest of entrepreneurs and the public as a whole. Promote these campaigns through all levels of educational institutions in order to increase the knowledge and understanding of e-commerce. Formulate regulations governing the e-procurement system of the public sector. Abolish any regulations impeding e-commerce. Provide public services through electronic media, facilitating the general public in becoming familiar with e-commerce.

3rd Strategy: Legislative strategy. Accelerate the process of the draft Electronic Transaction Act, as well as computer crime and electronic funds transfer laws in order to increase confidence among entrepreneurs and consumers. Expedite the process of laws governing information infrastructure, pursuant to Section 78 of the Constitution 1997. Implement measures for the benefit of community trade such as the e-commerce cooperatives project. Accelerate the protection of intellectual property. Review and revise regulations governing consumer protection in e-commerce systems in order to increase consumer confidence.

4th Strategy: Strategies on payment and security. Study and review the current system of electronic funds transfers. Establish a central agency to spearhead the maintenance of the country's e-commerce security and safety, providing advice, coordination and set safety and security systems in the public sector with respect to databases, trade, finance and information essential to e-commerce security. Establish an emergency response team. Promote and support the establishment of a system ensuring the safety of information and electronic transactions in the private sector.

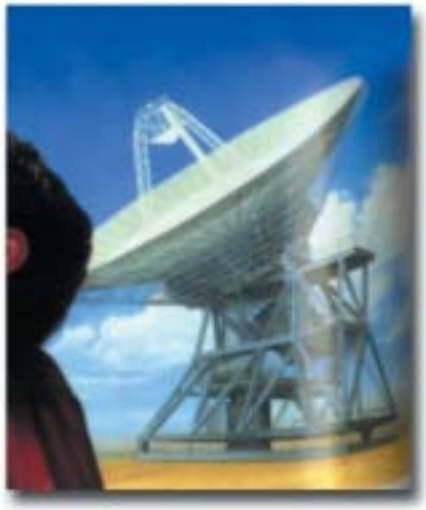
5th Strategy: Database and data management strategies include measures on the establishment of database and a data network to facilitate planning and services for businesses, industries and consumers. Establish an office for the supervision, investigation, monitoring and distribution of information on the country's e-commerce status. Establish a Business Monitoring Center for key trade-partner countries

6th Strategy: Strategies to support SMEs through the development of portal sites covering various fields, in cooperation with the private sector such as a tourism portal or some other virtual markets. The public sector must consider export criteria and procedures for the development of "paperless trading," as per international agreements. Promote the incubation of new business and venture capital.

7th Strategy: Strategies for human resource development. Continuously and systematically promote and allocate resources necessary for the development of e-commerce related personnel. Set targets for the development of human resources in a variety of fields, for the education sector and for skill development in the current market workforce. Broadly implement e-commerce courses in higher education. Organize universities, in conjunction with agencies or business organizations in

the private sector that have local knowledge and expertise, to act as advisors for the localities or SMEs in the form of e-commerce resource center satellite offices. Promote e-commerce training for local entrepreneurs through the existing network of local institutions, such as local cooperatives or locally connected networks, e.g. utilizing the Internet Tambon as the center of knowledge and training for technology and primary business. Formulate measures for effective human resource development, such as financial and tax incentive measures. Establish an institution for the development of e-commerce personnel, in order to ensure the continuous development of human resource capabilities.

8th Strategy: Strategy on infrastructure development. Drive the implementation of the National Information Infrastructure Act, pursuant to Section 78 of the Constitution of the Kingdom of Thailand 1997. Promote widespread internet applications for the growth of e-commerce. Eliminate the telecommunication monopoly. Encourage internet service providers to provide quality, safe and affordable services, while assuring wider consumer protections. Promote the development of the IT industry, particularly the software industry, in order to meet the demands of the entrepreneurs. Establish a certification authority. Promote cross certification/cross recognition. Support research and development by focusing on the creation of standards, innovations and prototypes or pilot projects. Enhance technical standards and systems necessary for e-commerce development, as well as payment standards and cryptography technology. Promote the standards of key products, goods and services in the country.



Executive Summary
e-Education

In a Knowledge-Based Society, production, accumulation, transfer, integration and utilization of knowledge are keys to the enhancement of competitiveness and in building a strong, high-quality society. As people are the most valuable resource, education is a crucial mechanism in human resource development. Information technology development plays an important role in the support of education reform, in compliance with the National Education Act 1999, supporting student-centered learning, life-long learning, education for the masses, as well as supporting the development of potential in Thai children, particularly those in rural, distant regions, in order to achieve quality education and learning.

e-Education covers the development and application of the information and knowledge supporting student-centered learning, the development of quality and moral human resources, and the reduction in the disparity on the access to educational services. e-Education supports the development of a Knowledge-Based Society, with particular attention paid to effective administration, the reduction of duplicate investment, the production of quality educational content, the use of technology to enhance educational diversity, and the focus on the educational efficiency of students.

Vision

All Thai people have access to, and are able to benefit from, IT for life-long learning, professional development, a better quality of life and environment, with thorough, equal, quality and effective services, thus leading to a Knowledge-Based Society.

e-Education Policy

1. Value-Added Policy: Implement the policy through existing IT resources so that the educational investment is utilized to the utmost effectiveness and efficiency through the creation of an effective administrative system and the development of qualified personnel.

2. Equity Policy: Rapidly create opportunities for the access to information and knowledge, while creating equality in the utilization of the information infrastructure.
3. Quantum Jump Policy: Support the use of IT for advancements in development.

Targets

1. By 2010, all schools will be connected to the network and such network will be thoroughly, equally, and effectively utilized in education.
2. By 2006, not less than 10% of education and instruction, at all levels, will utilize computers and IT in support of such education and teaching, reaching 30% by 2010.
3. To produce an adequate, high-level workforce, meeting the demands of the industrial sector. This includes the production of full-time scientists, engineers, and researchers in fields necessary for the development of computers, software programs, telecommunications technology and information technology, in accordance with national demand. Development of upstream technology and industrial innovation, along with the production of graduates in related fields, is also considered a necessity.
4. To create educational innovations, facilitating quality educational integration, in accordance with demands in the industrial sector. This includes the development of courses on computer technology and information technology, supporting development, applications and the transfer of technology to the industrial sector.
5. By 2010, 50% of the Thai workforce is to receive training in order to enhance knowledge and skills concerning the information network.

Development Strategies

1st Strategy: Policy and management. Create a system for the joint administration and utilization of educational resources and reduce duplicate investment, with a focus on the educational achievements of students. Policy administration is to be unified, though diversified in practice. Strengthen organizational and institutional administration,

particularly with regard to institutional changes and relationships among organizations involved in e-Education, which include the National Information Technology Committee, the Ministry of Education, the National Telecommunications Commission and the National Broadcasting Commission.

2nd Strategy: Develop an information infrastructure for education. Accelerate the development and the provision of a thorough and equal information infrastructure service. Expedite telecommunications reform in order to enable free and fair competition, with due attention paid to public interest. Implement the National Information Infrastructure Act. Formulate a master plan for the development and utilization of an information infrastructure. Create standards for a system allowing related agencies to exchange information correctly and effectively. Formulate measures for the creation of value added services from educational resources (infrastructure, hardware and software), which have been invested in, but have not yet been utilized or fully utilized. Introduce a policy encouraging the participation of the Thai industrial sector in the investment in IT for education and reducing the need for imports.

3rd Strategy: Human resource development. Develop and train educational personnel with regard to IT knowledge and skills, to apply technology for effective education. Adjust the paradigm shift of education to student-centered learning. With regard to targets on the development of students, those targets should focus on creating technology literacy, information literacy, logic, pride in a unique culture and the acceptance of cultural diversity. Support the production of high-level IT personnel and technicians in order to meet market demand. Support the training and development of knowledge workers.

4th Strategy: Develop educational content and knowledge creation. Support the owners of content and/or knowledge, along with those people with the potential to create information and knowledge, in the rapid and effective creation and distribution of knowledge to the public as a whole. Promote and support research and development. Rapidly provide and develop educational resources, educational media, and an electronic library. Support the creation of the software industry and the production of educational multimedia. Create new software entrepreneurs and educational service providers.

5th Strategy: Create equal access and utilization of educational content for learning. Focus on the creation of a system to effectively manage educational resources, thus allowing students to access and utilize information, content and knowledge for student-centered learning. Prioritize investment, beginning from the supply and development of educational content produced centrally or locally. Develop a workforce and educational personnel, in parallel with the appropriate investment in equipment and technology, in accordance with the readiness of the institutions and students. Support the creation of educational innovation, which bridges the gap on the access to education, such as the creation of educational industries, educational service providers and virtual universities.

6th Strategy: Create a learning network. Create a learning network in a variety of fields, including social sciences, human sciences, liberal arts, particularly ScienceNet, in order to enhance the capabilities of teachers, schools and students in science and technology, particularly those in the rural and distant regions. Promote the exchange of academic experiences. Broaden the domestic and international perception of sciences. Provide advice on the integrated development of the study and teaching of science, along with the development of local courses in connection with professional development, and quality of life and the environment. Support educational institutions in their transition to knowledge institutions supporting the community, industry and the society in moving towards a Knowledge-Based Society.

Executive Summary
e-Society

In progressing towards the new economy, Thai society has both the opportunity to leapfrog the development through the utilization of advanced technology, and the threats from the digital divide. This divide, on an international scale, has greatly reduced competitiveness in trade and the divide within the society has led to unequal income distribution and social problems. Without a successful remedy, both divides will lead to greater disparity and to the deterioration of human resource development, tarnishing the long-term development potential of the Thai society.

Vision:

All Thai people have equitable access to information technology, and that they are able to use their intelligence and abilities in order to accumulate and apply that knowledge. This development includes life-long learning and professional development, the increase in the quality of life and the environment, and the creation of a caring, Knowledge-Based Society.

e-Society Policy:

1. Create equal opportunity with respect to access to information and learning, with the government implementing holistic policies in support of such equal opportunity. The government policies are to cover the development of an equitable infrastructure, development of quality services at reasonable rates, and development of content and information suitable to the local communities. The policies are to support the readiness of communities, along with participation in planning and decision-making.

2. Information technology is to be developed in order to support social and environmental development. IT is to be used in support of life-long learning, professional development, and an increase in the quality of life and the environment for the community and society. Central and local educational institution, public and private organizations, and international agencies are

to provide assistance and act as advisors in the development, application and continuation of content and knowledge. In addition, these agencies are to provide advice on the enhancement of the capabilities of communities with regard to the utilization of information technology.

3. Information technology is to be developed in support of the foundation of a Knowledge-Based Society, focusing on the creation, development and continued application of Thai knowledge and intelligence. Thai knowledge and intelligence is to be integrated with modern knowledge so that Thai society is able to keep up with the constant changes of globalization. A strong and sustainable social development base is to be created using the principle of a sufficiency economy, in compliance with the 9th National Economic and Social Development Plan.

Targets:

1. By 2010, all Thai people have the opportunity to equitable access and utilization of information technology, while receiving effective services at affordable price, leading to professional development, an increased quality of life and improvements in the environment. Appropriate media and content are to be developed in response to local demand. In this regard, local content is to account for no less than 10% of total content developed in the country.

2. To compile, process, and establish a wisdom network of senior thinkers, local philosophers, and local wisdom in order to create an international knowledge pool for the wisdom of mankind. Thai concepts and knowledge are to be continually researched and integrated with modern academic knowledge in order to create intellectual innovations.

3. By 2010, no less than 50% of Thai villages are to be learning communities, where knowledge is continuously developed and strong economies are formed. This includes providing all children and youths in villages with quality education, implementing a strong public health system, eliminating problems concerning crime and debt obligations, and taking care of senior citizens in a manner suitable to their status.

Development Strategies:

1st Strategy: Develop an equitable national information infrastructure. Accelerate telecommunications reform in order to create free, fair, and transparent competition. Allocate radio frequencies in view of the public interest. Monitor and proceed, as per provisions under the National Information Infrastructure Act.

2nd Strategy: Human resource development. Develop and train the public in the basic knowledge and skills of IT applications for professional development, as well as an increased quality of life and improved environment. Support life-long learning strategies.

3rd Strategy: Increase the capacity of educational institutes in the promotion and support of education in the community and society. Encourage those agencies that produce and own information and knowledge-based resources to produce and distribute those resources to the public. Support the creation of an information-friendly society, where the public is able to thoroughly and equally view, search, and utilize basic information and knowledge. Enhance cooperation among educational institutions and the community in the creation, continued application, transfer and integration of knowledge suitable for the balanced development of the community and society.

4th Strategy: Create digital opportunities and bridge the digital divide. Create capacity with respect to effective administration. Utilize IT in conjunction with other accessible technologies, emphasizing information and knowledge over modern technology. Support the establishment of a community information and data center, for which all people have equal access. Rapidly support and promote public and private agencies, along with non-government development organizations, in producing and providing information and knowledge-based services that are appropriate for, and in accordance with, the demands of the community and society. Support and promote research and development to bridge the digital divide in Thai society.

5th Strategy: Create learning communities. Utilize IT in promoting the creation of learning processes in the community and society. Create top-down knowledge (or the application of modern knowledge in compliance with local ways of life) and bottom-up knowledge (the transfer of intelligence and ethical ways of life to society as a whole). Build community networks, where experiences are exchanged, and thoughts are gathered, in order to develop suitable, strong and self-sufficient

communities. Support the creation of networks for education and the exchange of experiences among communities. Create a network of Thai intelligence, comprising of senior philosophers and distinguished persons in society, in order to support the creation of Thai knowledge, culture and intelligence. This is to create an internationally recognized knowledge base to serve as a development alternative. The aim is for the world to recognize the value of mankind and support the co-existence of man and nature.

6th Strategy: Enhance the quality of life and create a caring society. Support IT development that assists in the compassion and caring of social groups in the country. Develop information technology and websites for the disabled, rural societies, homeless children, the underprivileged, and community and cultural groups, such as the hill-tribe communities. Distribute information and create understanding in society at large. Exchange opinions and visions on the world and ways of life in order to create understanding and caring in society. Promote the participation of people in all groups to seek measures and guidelines in the control and creation of social immunities. Strengthen family institutions in order to protect youths from inappropriate forms of media, IT applications that violate the rights of others, and immoral actions.

The successful administration of the above requires unity in policy and diversity in practice, with a focus on the participation of local communities. There must also be vision and leadership at national and local levels, creating an effective administrative system with the appropriate application and integration of technologies, the establishment of a working group for the constant monitor in achievements, and a focus on moving towards a Knowledge-Based Society.

Executive Summary
IT Industry

The IT industry in this section includes:

1. The Hardware Industry

The progress of information technology has affected all aspects of national development throughout the world, creating an increased demand for IT tools and equipment. In an attempt to excel as an industrial country, Thailand, which is rooted in its agricultural society, has faced substantial obstacles with regard to IT product development for domestic consumption and exports, resulting in a high trade deficit.

Between 1996-2000, The Ministry of Industry established target products, and industrial development strategies, for the development of the competitiveness of the Thai electronics industry. Targeted electronics industries and products include wafer fabrication, IC design, optic fibers, telecommunications switches, and software.

2. The Software Industry

Consumption of application software in 2000 was valued at THB 4.5 billion, while packaged software consumption was valued at THB 3.9 billion, with the prospect of growth at 33.3% per annum. The software produced in over 500 small-scale production houses was purchased primarily for specific operations, such as accounting, personnel administration and inventory control. Larger software systems are primarily imported, with the import value accounting for over 70% of total software consumption. Nevertheless, software consumption has shown an impressive upward trend, which includes the software consumption of general users, software applications for products and production processes, and software applications for public administration and services, and is likely to be a huge market in the next 5 years.

3. Telecommunications Services Industry

The telecommunications industry is one production sector that has played an increasingly important role in the economic growth of

Thailand, though the industry currently accounts for a mere 3% of GDP. However, basic telephone services, value-added services such as e-commerce, satellite data communication, internet and e-mail, are business that have enjoyed a high rate of growth and sharp advancement in line with the age of borderless communications.

Vision

To strengthen the IT industry through the support of research and development, the creation of a marketing database, the thorough distribution of telecommunications infrastructure to the community, and the creation of value in the utilization of locally-produced equipment. The goal is to develop the Thai IT industry in line with international standards and support progress towards a knowledge-based economy and society.

Target

To upgrade the Thai IT industry to international standards in order to compete in the world market.

Development Policies and Strategies

1st Policy: Support and develop the capabilities of the producers of IT products in the manufacture of parts and assembly equipment for local distribution at lower costs than for imports.

1st Strategy: Research and development, including measures in support of research for the upgrade of production technology to international standards. Support R&D in building production expertise. Provide producers with knowledge and expertise in the creation of value-added components and services for products, increasing the ability of the producers to compete in the market.

2nd Strategy: Create value added for the products, comprising of measures that create confidence in the producers by enforcing laws on the protection of intellectual property. Create unique, quality products through the promotion of Thai hardware in the world market.

3rd Strategy: Promote investment through the exemption or reduction of import duties on raw materials for the production of electronic equipment for local distribution.

4th Strategy: Roles of the public sector. Introduce measures, such as marketing support, with the government conducting marketing intelligence, to assist in the decision making of entrepreneurs. The relevant ministries are to coordinate and cooperate in the promotion of the computer hardware industry. Implement policies for the promotion of local SMEs such as tax deductions for research and development expenses. Set regulations for technology transfer. Strengthen the IT industry to be among the leaders in the region.

2nd Policy: Upgrade the Thai software industry so that it is competitive on the international stage, increasing confidence in the Thai software industry.

1st Strategy: Set standards by developing measurements, through the implementation of tests by the central standards agency, The improvements in the competency levels for the software development industry are to continue until software development reaches level 2 or above under the Capability Maturity Model (CMM). Technology transfer is to be encouraged through the issuance of business visas and appropriate investment periods for foreign investment and works in Thailand. A benchmark center for software development is to be established as a public agency.

2nd Strategy: Public relations and confidence are to be promoted, including measures to encourage a consortium of Thai software companies to undertake overseas software development works in the form of a consortium of national software groups. The aim is to enhance negotiating power and allow small-scale entrepreneurs to undertake large projects, thereby increasing the knowledge of software entrepreneurs. In this regard, the government agency is to provide financial support and act as a facilitator for entrepreneurs working in software businesses, as well as boost marketing promotion activities both at home and abroad. One such measure is an income tax exemption for software entrepreneurs in their first 5 years of business operation. The creation and development of multimedia software, such as games, educational media, and cartoons, is to be promoted, as Thais are known for their artistic skill and intricate workmanship. In order to increase confidence in Thai software products and manufacturers, laws governing the protection of intellectual property are to be strictly enforced, with severe punishment for those in violation of such intellectual property regulations.

3rd Policy: Develop and improve the telecommunications infrastructure in response to government policies addressing the creation of opportunities for equitable access to technology by promoting the use of locally-produced products.

1st Strategy: Standardization. Formulation of rules and regulations governing local and international services of mobile telecommunications systems. Prescribe standards on communications in the open system, high-speed communications, as well as the Asynchronous Transfer Mode (ATM) or Synchronous Digital Hierarchy (SDH) in order to accelerate access to multimedia data. Apply a pricing system that thoroughly responds to demands in order to ensure fairness in telecommunications services. Cooperate with international organizations in the creation of a sound investment environment for the telecommunications industry.

2nd Strategy: Investment, finance and legislation. These proposed measures include the liberalization of telecommunications joint-ventures in order to encourage partnerships with foreign joint-ventures in each industry. These measures are meant to promote infrastructure investment and the establishment of an international network, such as the information superhighway project. Investment support will be granted for those factories manufacturing telecommunications equipment in which consumption is high and changes in technology are slow, such as the production of telephone batteries, signal cables, signal converters, and fiber optic connection equipment. A National Telecommunications Committee is to be established.

3rd Strategy: Human resource creation and promotion consists of measures to promote education over electronic media and provisions for making the internet available at public facilities, such as libraries and community centers. Flexibility is to be allowed in the adjustment of content in IT and communications courses at the diploma level and above. Information technology is to be introduced in local communities in order to bridge regional disparities. An example includes the construction of a broadcasting station in order to expand the scope of wireless telecommunications, along with television signal and AM radio frequency services. Cooperation from private companies will be sought to provide knowledge to the public via the information superhighway and mass communication services.

4th Strategy: Research and development through the active and timely employment of measures in support of a workforce and budget for R&D. In this regard, R&D is aimed at upgrading telecommunications products to meet international standards in order to reduce the need for imports. The public sector is to be promoted and supported in the pursuit of research on communications and telecommunications development, the expenses for which may be applicable for tax reductions. Universities are to be promoted as locations for compiling and distributing information derived from research. Competition is to be promoted in order to fuel innovations in IT.

4th Policy: The government, educational institutions and the industrial sector must jointly develop information technology, along with training courses, to produce IT graduates and professionals, while increasing the skills and knowledge of IT personnel.

1st Strategy: Course development and skill enhancement is to be promoted through the improvement of primary and secondary courses, strengthening skills in mathematics, sciences, arts and English. This is to lay the foundation for IT education, providing commercial training programs and establishing a project for the production of upstream IT personnel.

2nd Strategy: Assist in the coordination of users and producers, with educational institutions working in collaboration with the private sector to provide courses on program development for high school students in the provinces so that they have experience in program development, hence promoting local wisdom. The government is to coordinate knowledge exchange between software producers and agencies employing software in order to enhance operational efficiency.

Glossary

Back Office	Refers to the primary form of administration in the public sector, comprising of record keeping, inventory, human resource management, finance and accounting, and budgetary works.
Business Monitoring Center	Refers to the agency whose duties are to closely monitor e-commerce movements and market information concerning foreign trade partners and compile such information for Thai entrepreneurs. The agency does not necessarily need to be newly established, as we may take advantage of Thai public agencies already established in many countries that are trading partners.
Certification Authority (CA)	Refers to a third party source of certification who serves as an intermediary in the examination and issuance of electronic certificates to those processing electronic transactions. The certificate is used to verify the ownership of information and the accuracy of electronic information.
Chief Information Officer (CIO)	Refers to a high-level IT executive of an organization. In the context of e-Government, it refers to high-level IT executives (Deputy Permanent Secretary and Deputy Director General) in public agencies i.e. ministry, department, division and state enterprises.
Codified knowledge	Refers to knowledge that can be recorded, communicated and distributed.
Convergence	Refers to the convergence of three types of technology and the applications, which are computer technology, communications/telecommunications technology and voice broadcasting technology.
Digital Divide	Refers to social disparity resulting from the divide between the haves and have nots, or the disparities in the ability to access information, news and knowledge through communication and computer networks. Such a gap creates a social and economic impact.
Electronic Service Delivery	Refers to the delivery of services to the general public via electronic media.
e-ASEAN	An ASEAN agreement and cooperation on joint regional development through the utilization of information and communications technology.

Electronic Transaction	Refers to transactions performed using electronic media through either a private or a public network, such as the internet.
e-Marketplace	Refers to a market via electronic media for various products and services on the internet, acting as an intermediary between a buyer and seller.
e-Procurement	Refers to procurement by the public sector through an electronic network to increase the effectiveness of public administration and, at the same time, create transparency in the procurement systems of the public sector.
Front Office	Refers to services of the public sector, such as the preparation of citizen identification cards, driving licenses, passports and birth certificates.
Good Governance	The key principles of good governance are transparency, accountability, participation, efficiency and effectiveness, and integrety and compliance, with the principles covering government officials and officers.
International Labour Organization (ILO)	Refers to the organization under the United Nations promoting labor and human rights.
Information	Refers to data that has been analyzed, news, or content, in the form of letters, numbers, visual or audible or otherwise, that have meaning in communication, under a clear goal and have a target group who will accumulate or apply such for their work or to create knowledge in other areas.
Information Infrastructure	Information infrastructure has a broad scope of application, covering telecommunications networks, information technology, information, human resources, and other factors, which can be utilized in order to create equitable information distribution to people in all areas.
Information Technology	Refers to knowledge in any product or procedure that applies technology in computer software or hardware, communications, compilation and timely information applications in order to enhance effectiveness in production, services, administration and operations, as well as learning, increasing economic and trade advantages, quality of life and the quality of people in society.

Innovation	Refers to innovation, creativity, ideas, and practices that lead to new value and value-added products and services in the economy and in society.
Information Technology Agreement (ITA)	The Information Technology Agreement, for which member countries are bound to in the World Trade Organization, determines the reduction and abolishment of tariffs on electronic products and parts, such as computers, telecommunications equipment, semi-conductors and electronic parts, before January 1, 2000, along with other abolishments, whereby some countries have received special exemptions.
Knowledge Worker	Knowledge workers serve as the core of economic sectors in both the new economy and the old economy.
Knowledge-Based Economy	The knowledge-based economy is an integral part of a Knowledge-Based Society, whereby knowledge production, distribution and use act as the key engines driving social prosperity, economic wealth, and employment for the people.
Knowledge-Based Industry	Knowledge-based industry is not limited to the new economy, which hinges largely on the knowledge base and innovation, but it is also relevant to the old economy, where knowledge, intelligence and continuous learning development are utilized for the continuous development of the industry.
Knowledge-Based Society	Refers to the society of knowledge and learning, or the Knowledge-Based Society, covering not only the knowledge-based economy, but also the advancement of society, education, culture and management, utilizing knowledge as a tool. Knowledge includes knowledge distributed through various forms of media and knowledge embedded in the experiences of an individual or an organization. Such a society often has the characteristic of encouraging personal innovations in society, economic activities, continuous learning and complete utilization of the information infrastructure and telecommunications system.
Market Intelligence	Refers to a market information center that compiles useful information in order to assist producers in the industrial sector in decision-making.
Mutual Recognition Agreement (MRA)	An APEC agreement on the certification of standards for telecommunications equipment testing.

New Economy	Refers to the new economy, with high levels of productivity, high volatility, new innovations in economic structure and business organizations, as well as a close interactions between organizations society - - consisting of the public sector, the private sector and non-government organizations.
Organization of Economic Cooperation and Development (OECD)	The Organization of Economic Cooperation and Development has 30 member countries, as of 2001, representing two-thirds of the world's production volume, covering products and services. The cooperation is aimed at the exchange of information and experiences and the joint development of the economy and society, which is often in the form of an agreement between organizations. Most members are in the North America, Europe and certain countries in Asia.
Portal Site	A portal site is the source of central information on any specific subject, with links to websites containing other related information.
Smart Factory	Refers to the utilization of the application of computer and IT systems in the control of production and management in industrial factories.
Tacit Knowledge	Refers to knowledge or experience embedded in an individual or an organization.
Technology Achievement Index	The Technology Achievement Index allows a national administrator to map out a technology plan. The index measures national achievements on the creation and distribution of technology, as well as the creation of a personnel base. Achievement measurements cover technology development and the application in the country. The achievement index has 4 primary components - - creation of technology, diffusion of recent innovations, diffusion of old innovations and human skills.
Team Thailand	Refers to a working group established under the joint cooperation of the public and private sectors, consisting of persons with diverse skills/capacities, in connection with trade negotiations. Team Thailand plays a crucial role in international negotiations in e-commerce.
Thailand Exchange	Refers to a trade transaction center that facilitates the supply chain using the internet in the form of an on-line marketplace for the exchange industrial products, as well as linking producers with raw material suppliers both at home and abroad via a national on-line network.

United Nations Development Programme (UNDP)	An organization under the United Nations aimed at poverty reduction in many countries through the promotion of education, the exchange of experiences, the creation of alliances, the supply of necessary resources and the establishment of promotional guidelines with global targets.
Virtual University	Virtual University has a broad definition, referring to the development and adaptation of technology for the study and instruction in higher education. Instruction includes distance learning (e.g. satellite and video conferencing), on-line education, whereby internet technology is used for communications and education between the teachers and the students and an Asynchronous Learning Network (ALN). The student may choose to study at any suitable time or place, provided that he/she has the opportunity to interact with his/her peers and teacher, either via internet or face-to-face.
World Trade Organization (WTO)	The World Trade Organization has the duty to co-ordinate agreements under trade negotiations of member countries worldwide with regard to general agreements on trade and duties and general agreements on trade and services.