BHUTAN INFORMATION AND COMMUNICATIONS TECHNOLOGY POLICY AND STRATEGIES (BIPS)

July 2004

Royal Government of Bhutan

CONTENTS

1.   FOREWORD

Information and communications technology (ICT) is changing the way the world works, and will continue do so into the future. By its unprecedented power to move and process information, it is impacting on global trading patterns, culture and governance; in fact ICT impacts on every aspect of our society today.

The application of ICT to Bhutan's development needs holds great promise for all sectors. Providing relevant market information can increase the incomes of our farmers. New communications technologies can take phone lines and data into remote valleys. ICT can improve the operations of our government institutions, increasing integrity, accountability and transparency. It can be a means to express our unique national identity and culture through local media and cultural preservation initiatives.

ICT also can play an important role in furthering Bhutan's political evolution. The policy of decentralisation can be enhanced through improved access to information and services in remote regions. Democratisation will be aided by increasing citizen access to information and participation in the political process.

Recognising the cross-cutting nature of ICT, I am pleased that this BIPS Report has been a truly whole-of-Government effort. The process was launched when the ICT White Paper was approved by the Council of Cabinet Ministers, and has involved stakeholders from right across the spectrum of Ministries and autonomous agencies. I am gratified that this co-operative spirit is also reflected in the wide range of agencies who will be involved in implementation of the BIPS activities.

The impact of ICT, however, reaches well beyond Government. Private sector development has been identified as a key priority for Bhutan. ICT can increase productivity and create high-value private sector jobs. The important insights and priorities of the private sector have been fully incorporated through representation on a number of the Committees, mostly important the Enterprise Committee. Today's school children can be tomorrow's ICT professionals.

I commend this Report to you, congratulate all involved in its preparation, and wish every success to all parties in its implementation.

[signature]

Lyonpo Jigme Thinley
Prime Minister

2. MINISTER'S MESSAGE

Balanced sustainable development is the corner stone of Bhutan's policy. Information and communications technology (ICT) is now recognised as one of the most important tools to achieve our development objectives.

ICT can assist in involving isolated communities in our national development, and by improving services to remote communities we can help stem rural-urban migration.

On another level, providing information and knowledge to citizens through ICT can enable individuals to make better choices about their lives, and hence enhance Gross National Happiness on an individual and societal level.

In order to harness ICTs for the benefit of Bhutan, we need a co-ordinated and concerted national effort, both to apply current technologies to our development challenges, and to prepare ourselves for future opportunities that ICT will present. The formation of the new Ministry for Information and Communications in July 2003 presented the opportunity to forge this strategy.

Bhutan's participation in international fora such as the World Summit for the Information Society and engagement with our donor partners helped clarify our thinking. After an intensive round of discussions and workshops, this BIPS Report represents a Bhutanese approach to the challenges of ICT, but drawing on global experience. We look forward to the assistance of our development partners in helping us implement these strategies.

The challenge of ICT can sometimes seem over-whelming, especially in developing countries like Bhutan. That is why BIPS outlines straightforward activities that, taken as a whole, will significantly boost Bhutan's ability to capture the benefits of ICT.

BIPS recognises that ICT affects all sectors. While the Ministry of Information and Communications is the lead agency, implementation will need to occur in every Ministry, business and school. Most of the activities in BIPS will be implemented by a combination of agencies, in a whole-of-government effort to ensure that ICTs are applied appropriately to the circumstances of each sector.

I wish to thank all the Chairs, Committee members and workshop participants who contributed to the preparation of this Report, and look forward to the ongoing co-operation of all sectors of Bhutan's Government and society to help implement the strategies.

[signature]

Lyonpo Leki Dorji
Minister for Information and Communications

3.   EXECUTIVE SUMMARY

> *With people at the centre of development, Bhutan will harness the benefits of ICT, both as an enabler and as an industry, to realise the Millennium Development Goals and towards enhancing Gross National Happiness.*
>
> From the ICT White Paper, October 2003

The BIPS process involved stakeholders from Government, semi-government and the private sector. Five Committees were formed along the lines of the Digital Opportunity Initiative (www.opt-init.org), covering Policy, Infrastructure, Human Capacity, Content and Applications, and Enterprise. With inputs from open consultative workshops and previous ICT studies, the Committees formulated strategies and activities designed to progress Bhutan's ICT development.

Bhutan is a landlocked, mountainous kingdom with a small and scattered population. It has a rich cultural heritage rooted in Mahayana Buddhism, and a compact and competent Government. ICT is a relatively recent phenomenon in Bhutan.

Three overall policy objectives underpin the initiatives in the BIPS Report:
1. to use ICT for Good Governance;
2. to create a Bhutanese Info-culture; and
3. to create a "High-Tech Habitat".

The initiatives are aggregated under five strategic and logical headings.

Policy.   Policy activities focus on making governance more efficient, transparent and inclusive, introducing a modern legal and regulatory framework, strengthening the relevant policy and regulatory bodies, and investigating ways to fund ICT and reduce the costs of ICT services.

Infrastructure.   The infrastructure activities focus on implementing the liberalized and competitive infrastructure market, and increasing co-ordination between infrastructure providers, and ensuring that there is affordable, fast, secure, sustainable and appropriate ICT infrastructure throughout Bhutan.

Human Capacity.   Human capacity activities are aimed at ensuring appropriate ICT awareness and skills from basic computer literacy to the high level technical skills to boost the ICT industry. Activities outlined in this area aim to improve the quality and coverage of training institutions, including through developing a Centre of Excellence to boost the quality and accredit ICT training institutes in Bhutan. A national ICT awareness campaign is another important element.

Content and Applications.   To enable Bhutan to fully harness the benefits of ICT for its development, the activities include establishing the framework for e-business, using ICT to preserve our cultural heritage, enhancing quality and accessibility of health and education, broadening our national media and web presence and supporting good governance.

Enterprise.   Planned activities will boost the competency of the local ICT private sector, and provide business opportunities through outsourcing RGoB ICT work. Access to finance will be addressed, as well as a strategy to target export of ICT services and boost the application of ICT in non-ICT businesses.

The Report identifies a number of risks to successful implementation of the BIPS strategies and activities. National commitment will be crucial, as well as financial support from our donor partners. Ensuring appropriate human capacity to implement and manage the activities will also be important.

Implementation will be spread across various Government Ministries, agencies and the private sector. The newly-established ICT Units in each Ministry will be utilized to monitor progress, with bi-annual progress reports to the Council of Cabinet Ministers.

POLICY

Strategy P1. By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.

P1.1	Establish policies on information-sharing between agencies	DIT	2005
P1.2	Establish policies on ICT security	DIT	2005
P1.3	Establish policies on use of free and open source software	DIT	2005
P1.4	Email recognised as official Government correspondence	RCSC	2007
P1.5	Introduce 'e-Gazette' as official RGoB publication of record	DIT	2007
P1.6	Establish ICT Units in each Ministry and major autonomous agency	RCSC/ all	2005
P1.7	Establish ICT Units in each Dzongkhag	RCSC/ dzgkhg	2007
P1.8	Each Ministry, autonomous body and agency to provide 75% of all possible public services deliverable through ICT	All	2010
P1.9	Streamline and automate business and ICT licensing processes	MTI	2006
P1.10	Establish system for online citizen polling on Government policies and issues	DIT	2005
P1.11	Publish senior RGoB officials' email addresses	All	2006
P1.12	Publish all public Government reports online	All	2006

Strategy P2. By 2007, introduce a 'light-touch' and modern regulatory environment.

P2.1	Finalise ICM Act and introduce to National Assembly	MoIC	2005
P2.2	Legislate for access to and dissemination of information	MoIC	2006
P2.3	Enforce intellectual property legislation	MTI	2007
P2.4	Introduce a liberalised and competitive telecommunications regime	MoIC	2007
P2.5	Encourage FDI in ICT industry and infrastructure	MoIC	2007

Strategy P3. By 2006, strengthen the existing policy and regulatory bodies to cope with ICT policy and regulatory environment.

P3.1	Strengthen the existing regulatory bodies	RCSC	2005

Strategy P4. By 2005, investigate ways to fund and reduce the cost of ICT services throughout Bhutan

P4.1	Develop a plan for a National ICT Infrastructure Fund (NICTIF), taking into account the Universal Service Fund	MoIC	2005
P4.2	Explore ways of reducing cost of ICT hardware, software and services: - 'walled garden' of Bhutanese web content; - demand aggregation initiatives.	DIT	2005

INFRASTRUCTURE

Strategy IN1. By 2007, Bhutan will have established a liberalised and competitive ICT infrastructure market

IN1.1	License new operators and service providers	BCA	2006
IN1.2	Establish incentives for new ICT players to establish ICT businesses	MoIC	2006
IN1.3	Promote FDI in ICT infrastructure development	MoIC	2007
IN1.4	Establish a co-ordination body to increase co-ordination amongst infrastructure providers	BCA	2005

Strategy IN2. By 2010, ensure an affordable, fast, secure, sustainable and appropriate ICT infrastructure throughout Bhutan

IN2.1	Deploy backbone infrastructure across Bhutan	BT	2007
IN2.2	Develop a plan for a countrywide connectivity to ICT infrastructure, including schools, Geog centres and villages	MoIC	2005
IN2.3	Establish Government-wide intranet connecting all agencies in Thimphu	MoIC	2006
IN2.4	Extend Government-wide intranet to all Dzongkhags headquarters	MoIC	2008
IN2.5	Extend Government-wide intranet to all Geogs	MoIC	2010
IN2.6	Establish multipurpose telecentres in every Geog	DIT	2010
IN2.7	Establish at least 10 telephone connections in each Geog	BCA	2007
IN2.8	Introduce and deploy advanced and appropriate technologies	BCA	2006
IN2.9	Explore ways of reducing cost of ICT hardware and software: - Open source software; - Re-cycling computers; - Substitute processors	DIT	2005

HUMAN CAPACITY

Strategy HC1. By 2009, all public and private sector ICT positions will be filled be well-qualified national staff

HC1.1	Draft National ICT HRD plan, incorporating : - RGoB and private sector training needs assessment; - developing ICT occupational profiles for RGoB positions; - ICT career paths for RGoB ICT professionals	DIT/ RCSC	2006
HC1.2	Make available relevant in-country and external training programmes for ongoing education and constant skill upgrading for ICT professionals	RCSC	2007
HC1.3	Ensure recruitment of qualified personnel for RGoB ICT positions	RCSC	2006
HC1.4	Enforce labour market regulation, including Labour Act and MoUs with private sector companies	MoLHR	2006

Strategy HC2. By 2008, establish one ICT "Center of Excellence"

HC2.1	Identify educational partners in Centre of Excellence	MoE	2007
HC2.2	Identify and establish linkages with international institutions	MoE	2007
HC2.3	Carry out research and development in ICT	RUB	2008
HC2.4	Create standardised curriculum for skills required in the job market	MoE	2007

Strategy HC3. By 2006, expand ICT institutes to other regions

HC3.1	Review current policies in relation to businesses generally and ICT training specifically	MTI	2005
HC3.2	Create strategy for Government intervention in regional training if private sector investment is not forthcoming	MoE	2006

Strategy HC4. By 2008, all students who have completed basic level education have acquired basic IT and computer skills

HC4.1	Ensure infrastructure is in place in all MHS and HS schools	MoE	2006
HC4.2	Ensure teachers are ICT literate through recruitment and training	MoE	2008
HC4.3	Develop standardised 'basic ICT literacy' curriculum for use in schools and other training centres	MoE	2007
HC4.4	Explore use and adoption of open source software for use in schools	DIT	2006

Strategy HC5. By 2006, majority of Bhutanese will be aware of the benefits of ICT

HC5.1	Broadcast ICT-related programming through existing media	BBS	2006
HC5.2	Incorporate ICT skills into community learning centres and NFE program	MoE	2006
HC5.3	Conduct a national ICT awareness-raising campaign	DIT	2005

CONTENT AND APPLICATIONS

Strategy CA1. By 2007, Bhutan will have the enabling framework to promote e-business

CA1.1	Establish an affordable local digital signature Certifying Authority	MoIC	2006
CA1.2	Create a mechanism for the resolution of e-business disputes, to build faith in Bhutanese e-business	MTI	2007
CA1.3	Ensure payment methods exist to support online transactions, including: - Facilities to transfer funds within Bhutan; - Facilities to allow Bhutanese customers to purchase online (eg Visa cards); - Facilities to allow Bhutanese merchants to sell online (eg PayPal)	RMA	2006 2006 2007

Strategy CA2. By 2008, Bhutan will use ICTs to preserve and promote its cultural heritage and boost the creation of local content

CA2.1	Develop and incorporate UNICODE-based Dzongkha computing into at least one operating platform	DIT	2006
CA2.2	Develop digital archive of significant Bhutanese and religious texts	MoHCA	2008
CA2.3	Develop digital archive of significant Bhutanese cultural content in sound and picture formats	MoHCA	2008
CA2.4	Avail online content to promote Bhutanese cultural heritage in support of tourism industry	MoHCA	2008
CA2.5	Encourage the creation of Bhutanese web content	DIT	ongoing

8

Strategy CA3. By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of education

CA3.1	Establish policy for the recognition of online degrees	RCSC	2006
CA3.2	Establish e-learning nodes in all tele- kiosks and telecentres	MoE	2010
CA3.3	Share educational resources throughout Bhutan - Establish digital library of educational resources - Establish system for distance education	MoE	2010

Strategy CA4. By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of health services

CA4.1	Establish links with neighbouring countries and international agencies to track Emerging Health Threats	MoH	2008
CA4.2	Establish real time telemedicine from BHUs to districts to Referral Hospitals	MoH	2010
CA4.3	Establish Integrated Health Management System	MoH	2010

Strategy CA5. By 2008, all Bhutanese citizens will have real-time access to Bhutanese media

CA5.1	Extend FM radio coverage to all Dzongkhags	BBS	2005
CA5.2	Kuensel printed on same day in all Dzongkhags	Kuensel	2006
CA5.3	Extend real-time BBS TV coverage to all Dzongkhags	BBS	2008

Strategy CA6. By 2008, Bhutan will develop content and applications to support good governance

CA6.1	Establish data interoperability standards	DIT	2005
CA6.2	Support the implementation of a national GIS system	MoA	2006
CA6.3	Identify common usage applications	DIT	2005
CA6.4	Establish computerised ID system for citizens	MoHCA	2004
CA6.5	Establish computerised ID system for companies	MTI	2006
CA6.6	Re-develop and re-launch integrated RGoB web portal	DIT	2005
CA6.7	Establish online presence for all Ministries, autonomous bodies and agencies, including all publicly available documents	All	2006
CA6.8	Publish online information relevant to the public including:	All	
	- Acts, rules and regulations	All	2005
	- Plans, goals, targets and progress	All	2007
	- Contracts, procurements and tenders	All	2008
CA6.9	Launch Citizen-Citizen portal	DIT	2010
CA6.10	Establish automated system for dealing with citizen complaints and inquiries	DIT	2010

ENTERPRISE
Strategy E1. By 2006, increase the competency of the local ICT industry

E1.1	ICT association strengthened to represent industry and increase competence	Private	2005
E1.2	Establish vendor certification guidelines to certify and improve the skills of local ICT companies	DIT	2005
E1.3	Establish professional forums to exchange knowledge between ICT professionals	Private	2004
E1.4	Explore demand aggregation to reduce the price of common goods and services (eg business leased line Internet access, installment finance for ICT equipment)	Private	2005

Strategy E2. By 2007, ensure outsourcing of all appropriate RGOB ICT work

E2.1	Conduct a baseline survey of current ICT outsourcing practice	DIT	2005
E2.2	Ensure awareness and capacity to conduct outsourcing by conducting business fairs and workshops on ICT outsourcing for industry and RGoB	DIT	2005
E2.3	Review current tendering and procurement procedures and establish e-procurement system	RCSC	2005

Strategy E3. By 2005, improve the access to financial mechanisms for ICT businesses

E3.1	Promote foreign direct investment with high skills transfer components	Private	2005
E3.2	Investigate need for ICT business fund to support start-up enterprises	MTI	2005
E3.3	Review existing tax environment for ICT businesses	MTI	2005
E3.4	Encourage the creation of private capital markets for investment in ICT businesses	MTI	2006

Strategy E4. Target export of ICT services by 2010

E4.1	Establish pilot small-scale call centre to investigate viability	MTI	2007
E4.2	Establish pilot small-scale data warehouse for RGoB data to investigate viability	MTI	2006
E4.3	Investigate demand for ICT incubation services	MTI	2005
E4.4	Establish ICT business cluster with access to shared infrastructure and services	MTI	2006

Strategy E5. Promote the appropriate use and application of ICT in non-ICT businesses

E5.1	Establish a sustainable national e-commerce portal	MTI/ DIT	2007
E5.2	Strengthen postal services to facilitate e-services and e-commerce	Post	2007
E5.3	Strengthen the film and music industries by improving the quality of its products through the use of ICT	Private	2007
E5.4	Demonstrate and promote the use of ICT to improve efficiency in non-ICT businesses	Private	2007

4.   INTRODUCTION

a.   BHUTAN'S DEVELOPMENT APPROACH

Since the start of planned development in 1961, Bhutan has followed its own unique development path. Inspired by His Majesty the King's vision of enhancing 'Gross National Happiness', Bhutan has always placed people at the centre of its development efforts.

A series of Five Year Plans has provided the framework for continuous development over the last forty years, and has yielded significant results.

"Bhutan 2020" established the goal "to ensure future independence, sovereignty and security of our nation-state," guided by six main principles: "identity, unity and harmony, stability, self-reliance, sustainability and flexibility".

Bhutan has also adopted the Millennium Development Goals as national development targets to aim for by 2015.

b.   WHY ICT?

The phenomenon of globalisation is underpinned by innovation, information and enterprise.   It is largely supported and driven by the development and use of ICT. Without ICT, it is increasingly difficult to take advantage of the opportunities and as well as minimize the threats of globalisation. There is a real and growing fear of being caught on the wrong side of a global digital divide, disconnected from global markets, knowledge and ideas, or alternatively of being swamped by waves of global culture undermining one's own identity.

ICT has the potential to assist Bhutan overcome its geographic challenges. The traditional geographic barriers that confront Bhutan - a dispersed population divided internally by high mountain passes, being landlocked - can be lessened by the smart application of ICT. Additionally ICT can be used to create business, jobs, tap international markets, preserve and promote cultural heritage and support good governance. In its entirety, ICT can help create a knowledge-based society.

c.   BIPS PROCESS

The new Ministry of Information and Communications was created in July 2003. The Minister for Information and Communications immediately initiated a national ICT policy process, calling for an 'ICT White Paper' to be drafted.

This White Paper was approved by Cabinet in October 2003, and became "the basis for an inclusive and consultative process for formulating a new strategic framework for ICT in Bhutan".

Subsequently five committees were formed, one for each of the five strategic components identified by the White Paper. The Committees worked intensively over a period of three months during which they held individual meetings and as well as interacted with other committees through a number of inter committee meetings.

The Committees drew on a wealth of materials, from the Ninth Five Year Plan, previous ICT plans prepared by international consultants, local e-Readiness studies, and WSIS documents and materials (see Appendix e).

The process was open and participative. All documents and minutes of meetings were posted online at a BIPS website. Open Consultative Workshops were held whereby the inputs from citizens, members of the donor community and other interested parties were gathered. These have contributed significantly to the final shape of BIPS.

The Council of Cabinet Ministers approved this BIPS Report on 22 June 2004.

5.   SITUATION ANALYSIS

Bhutan is a small, isolated and landlocked Kingdom in the eastern Himalayas. It rises from the plains in the south to the main range of the Himalayas in the north at an altitude of over 7000m. The population of around 700,000 lives mainly in the valleys, with sparse population in the mountainous north. The terrain makes travel between the population centres difficult and time-consuming.

Bhutan embarked on a rapid process of modernisation with the first Five Year Plan in 1961. Currently most Bhutanese are engaged in agriculture, or employed in the civil service. The Government has recognised the need to boost the private sector as a key source of employment for its youth.

Bhutan is a Buddhist Kingdom, with a rich and unique cultural heritage. Under the leadership of His Majesty King Jigme Singye Wangchuk, Bhutan has pursued a unique development philosophy of 'Gross National Happiness'.

It has a small, compact and competent government. Bhutan is politically stable. Of late it has embarked on a process of decentralisation and democratisation. Educated Bhutanese possess near-native standard of English.

POLICY

Bhutan is putting in place a regulatory environment to encourage the use and development of ICT. A Telecommunications Act was passed in 1999, a Copyright Act in 2000, and a Draft Information, Communications and Media Act is ready for presentation to the National Assembly. Bhutan is building its institutional capacity to regulate and support ICT activity through DIM, DIT and BCA, and the establishment of ICT Units in Ministries to assist them harness the potential of ICT.

Bhutan has the opportunity to harness the potential of ICT through a greater and more co-ordinated national effort. ICT can improve the internal efficiency of Government as well as the provision of information and services to citizens. ICT can enhance efforts in a number of established national priorities, such as de-centralization, private sector development and good governance. ICT can also make governance and policy-making more inclusive and transparent, by providing citizens with access to key public information and the mechanisms to participate in public debate and policy formulation.

There are vast collections of relevant public documentation within Ministries which could be digitized and provided online. There is a consensus across Government that legislation, rules and regulations and *chathrims* should be made available online. Recognising email as official correspondence will boost the internal efficiency of Ministries and inter-Ministry communications. The newly established ICT Units provide a strategic framework to enhance intra-ministerial as well as inter-ministerial (and thereby national) coordination and application of ICT.

ICT equipment is already exempted from import duty and ICT companies have been accorded a tax holiday.

INFRASTRUCTURE

Bhutan faces geo-demographic constraints for the roll-out of ICT infrastructure, including harsh terrain and small scattered populations. ICT vies with other development priorities for funds; Bhutan's limited resources have meant that the roll-out of ICT equipment in schools and businesses is not far advanced. The small size of the country means that there is limited ability to build a critical mass of telecommunications engineers and other ICT professionals to adopt and implement infrastructure; Bhutan continues to rely substantially on outside technical assistance. Teledensity is currently estimated at 4.3% nationally, with a large disparity between urban (15%) and rural areas (1%). Urban teledensity has been boosted by the enthusiastic take-up of cellular mobile phones since the network was launched in some urban areas in November 2003.

However, Bhutan has made progress in centrally planned roll-outs of key backbone infrastructure. As a relatively late entrant, Bhutan has been able to capitalise on mature technologies. Bhutan Telecom has installed an east-west 34Mbps microwave radio backbone, which connects with a 34Mbps optical fiber link from Thimphu to the Indian border at Phuentsholing. International connectivity is also provided via satellite earth station in Thimphu, which connects voice traffic to London, Tokyo and Singapore. All Dzongkhag headquarters are connected, either via the microwave backbone or 8Mbps radio links.

In addition to this backbone network, cable TV networks operate in 19 of 20 Dzongkhags. The Rural Telecom Project plans at least 10 telephone connections in each of the 201 Geogs by 2007. There is an efficient and trusted national postal network. BBS radio provides coverage to most of the population.

Bhutan is committed to establishing a liberalised and competitive ICT infrastructure market to improve services and lower costs. The use of national power grid as an ICT carrier, greater co-ordination between infrastructure providers and including integrated utility ducts in newly planned and upcoming towns offer further opportunities to improve infrastructure scenario.

HUMAN CAPACITY

Bhutan does not have adequate ICT and knowledge-workers. It is estimated that there are less than 400 ICT professionals in Bhutan. This is partly due to the small size of the population, but also can be ascribed to the ability of the training institutions. The civil service, which is the largest and most sought-after employer, has no job profiles or career paths for ICT professionals, resulting in their skills not being fully utilised. There is also a mismatch between

the skills demanded by the job market and the ICT training available. Many school leavers are taking basic ICT training courses but then find no willing employer.

There are two main tertiary institutions providing ICT training: RIM and Sherubtse College. RIM provides diploma courses in ICT, and Sherubtse College provides Bachelor courses in Computer Applications, Information Technology, and Science (Computers) through its affiliation with Delhi University, as well as a Post Graduate Certificate in Teaching Information Systems. Some vocational training institutes such as Vocational Training Institute in Rangjung, Department of Human Resources, and Bhutan Vocational Qualification Authority are developing curriculum for basic computer hardware maintenance, TV/VCR repair, and regulatory and monitoring ICT training programmes. There are also 18 private institutes providing basic ICT courses in fields including network administration, web developing, graphics and desktop publishing. There are no training institutes providing courses in more advanced vocational ICT skills such as telecommunications, mass communications and media studies, communication management and information management systems.

Future opportunities include building awareness of the potential of ICT, expanding access to ICT training, and boosting the overall quality and relevance of training courses. There is currently limited infrastructure or ICT curriculum development for ICT in schools. However, the MoE has formulated an Education ICT Master Plan to roll-out ICT infrastructure to schools and implement ICT curricula.

Combined with a young population eager to learn, and renewed RGoB focus on ICT and private sector development, there is great potential to boost the nation's ICT human capacity.

CONTENT AND APPLICATIONS

Bhutan is just beginning to tap the potential of ICTs by developing and using relevant content and applications. Some Ministries have web pages, but content tends to be static and not updated regularly. While there has been some progress in the development of some systems, limited co-ordination means that similar systems are being re-created. Data compatibility for future systems integration is another issue. Some of the better websites are run by private tour operators. E-services and a-business are hindered by the lack of online payment systems, appropriate legal frameworks, infrastructure and private sector initiative.

All Ministries use email for informal correspondence, and basic data management and monitoring tools are in use. Some central agencies are using ICT to communicate with and gather data from regional offices.

Future opportunities abound. E-commerce whereby Bhutanese products can be sold globally is a significant one. Preservation of cultural heritage and enhancing national identity are other opportunities. The provision of health and education services can also be substantially improved.

ENTERPRISE

The ICT private sector is young and small. The size of the domestic ICT market is very limited. There are about 16 ICT vendors, mostly dealing with hardware supply and maintenance. ICT business is heavily centered around hardware with very limited development and provision of software products and services. Limited access to capital has also limited the expansion of ICT businesses, and poor enforcement of intellectual property rights has not helped the development of high-value software enterprises.

There is, therefore, substantial opportunity for the private sector to upgrade its skills and business management, improve its reputation amongst RGoB customers, and take advantage of RGoB outsourcing policy and increasing ICT investments. It may be able to harness the skills of foreign workers within the national labour policy to deliver better service and transfer skills to national staff. There is also great potential to grow the market for ICT goods and services into the private sector, by demonstrating the efficiency gains that can be made. Further, Bhutan is keen to explore the viability of establishing business process outsourcing pilots for call centres and data warehousing, which offer great future potential as export industries.

6. VISION

> *With people at the centre of development, Bhutan will harness the benefits of ICT, both as an enabler and as an industry, to realise the Millennium Development Goals and towards enhancing Gross National Happiness.*
>
> From the ICT White Paper, October 2003

ICT can create a knowledge-based society. Empowered by knowledge, Government, the private sector, communities and individuals can make better informed choices about how best to pursue their individual and collective happiness.

7. POLICY OBJECTIVES AND GUIDING PRINCIPLES

National policies in Bhutan are informed by **Bhutan's Vision 2020** and the principles of **Gross National Happiness (GNH)**. Bhutan has also adopted the Millennium Development Goals as an important aspiration.

POLICY OBJECTIVES
Three broad policy objectives underpin the BIPS strategies.

1. **To Use ICT for Good Governance;**
2. **To Create a Bhutanese Info-culture; and**
3. **To Create a "High-Tech Habitat"**

ICT Vision

ICT for Good Governance

Creating a Bhutanese Info-Culture

Establishing a High-Tech Habitat

POLICY OBJECTIVES

POLICY

INFRASTRUCTURE

HUMAN CAPACITY

CONTENT AND APPLICATIONS

ENTERPRISE
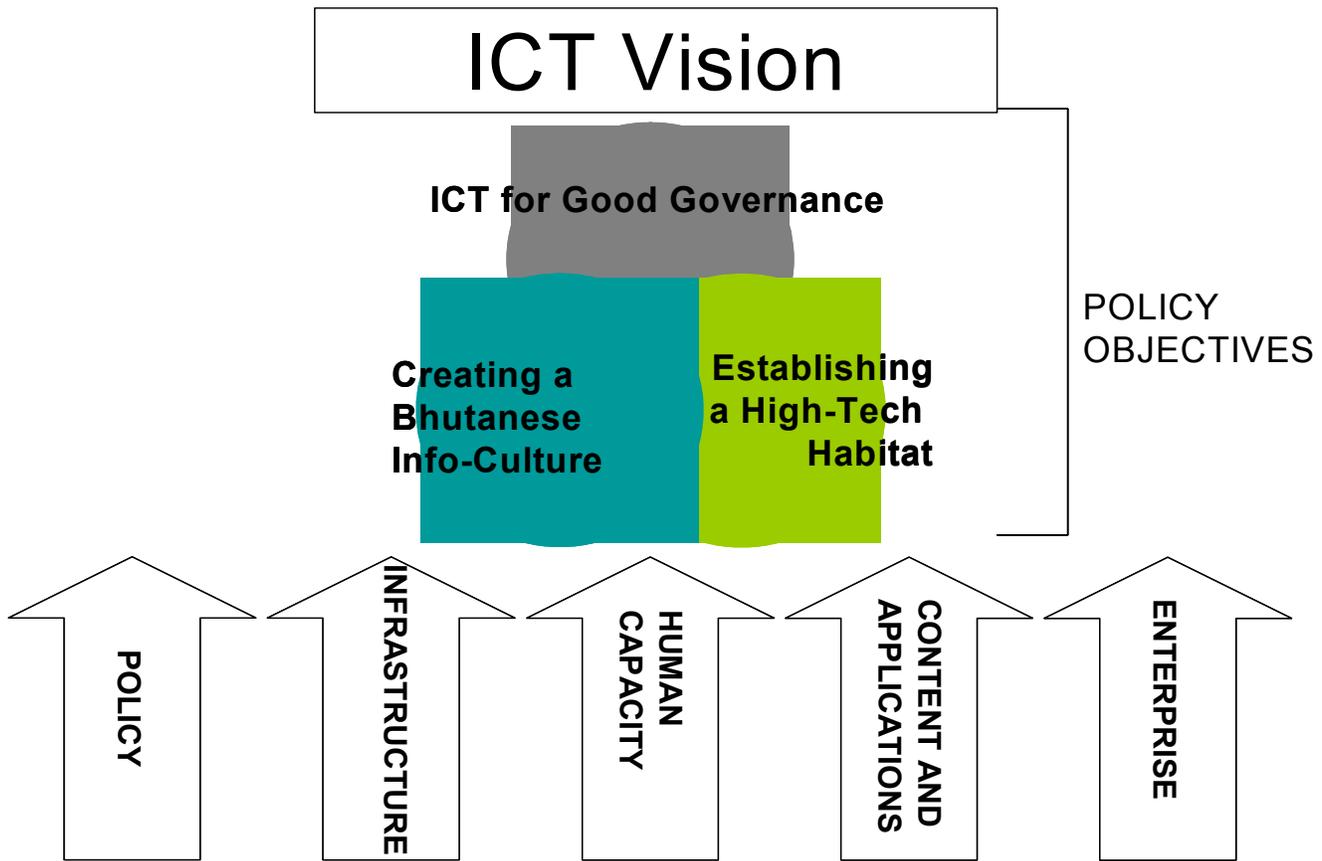
1. To Use ICT for Good Governance

Good governance is characterised by efficiency, transparency and accountability. As Bhutan seeks to create de-centralised and democratic governance, ICTs can help in boosting the internal efficiency of Government and improving the ability of citizens to access key information and services. Good governance is responsive to the needs of its citizens; ICTs can help to create interactions between citizens and Government where citizens can identify their needs.

2. To Create a Bhutanese Info-culture

As Bhutan continues its rapid modernisation, Government decision-makers, citizens and businesses will increasingly demand access to information to assist them in making better decisions. Creating a culture of open and free sharing of information will not only boost efficiency in all sectors of the economy, but will also increase the accountability of Government and allow an enterprising culture to develop in the private sector. It will also be necessary to promote the skills which allow people to disseminate and access information.

3. To Create a "High-Tech Habitat"

Government can aim to create the enabling environment for ICTs to be applied and developed. From global experience, the important factors include skilled workers, a culture of enterprise, access to capital, access to local and global markets, and research and development. This environment will allow Government and businesses in all sectors to apply ICT to improve their efficiency and operations, and for the ICT sector itself to grow, resulting in productivity gains and the creation of high-value jobs. Government can assist in creating this environment; the private sector will capitalise on it.

GUIDING PRINCIPLES

The pursuit of the above objectives will be guided by three guiding principles which reflect the reality of ICT globally:

i)   **Strong Government Leadership** is perceived as one of the key principles required to ensure success in implementing the ICT policy of Bhutan. The Government must be the key driver of ICT policy and provide the leadership and necessary resources to back up programmes whose developments will impact every sector and sphere of life.

ii)   **Convergence** of ICT technologies and markets requires an integrated approach for regulation and coordinated development within the ICT sector. The Bhutan ICT Policy will promote convergence as one of its core principles. This shall be reflected in the institutional set up of the Acts and bodies set up to regulate, plan and monitor ICT development as well as in ICT-related plans and programmes.

iii)   **Public-Private partnership** will be a key instrument by which ICT sector will be promoted. This is a tested model in other countries and Bhutan will use this to promote sustainability of ICT programmes as well as promote private sector growth. The government will ensure an enabling environment for the private sector to leverage their businesses to realize the common goal of productivity and high-value employment.

8.   STRATEGIES AND ACTIVITIES

These strategies and activities form the crux of BIPS. They are categorised under the five strategic components identified by the Digital Opportunity Initiative : Policy, Infrastructure, Contents and Application, Human Capacity and Enterprise.

Implementing agency – lead agency in bold text

Indicative cost in US dollars. 'Agency' means that the activity can be funded from the internal resources of the implementing agency.

Table P1. By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10	11	12
P1.1	Establish policies on information-sharing between agencies	MoIC (**DIT**), all agencies	Agency									

Time frame, indicating action period and target date. For this activity, action will commence in 2004; the target date for completion is 2005.

a. POLICY

> *Creating a legislative and regulatory framework, which is adaptable, comprehensive, transparent, inclusive and forward-looking, and building effective institutional capacity to implement it.*
>
> From ICT White Paper

Bhutan recognises that to become a truly 'knowledge-based society' requires policy approaches that encourage transparency, access to information and accountability. ICT tools are uniquely suited to these ends.

While creating a 'Bhutanese Info-Culture' might be some way off, it is important to start taking steps in that direction if the full benefits of ICT are to be reaped. Again, Government is well-placed to set the example. The following sets of strategies and activities will help Bhutan progress towards its overall ICT policy objectives.

Strategy P1.   By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.

In Bhutan, Government has a special role in the economy and society. While in the medium term RGoB recognises the private sector as the driver of economic and employment growth, it is natural in the short-term that RGoB should take a strong lead in the application of ICT. In this way, RGoB will not only create private sector market opportunities through outsourcing, it will also act as a lead user and demonstrator of the benefits of ICT to all other sectors. The efficiency gains from better application of ICT to government processes will have benefits for citizens in terms of improved Government services and access to information.

In Bhutan's mountainous terrain, citizens frequently travel days to access public services. ICT can be used to take these services closer to where they live.

Good governance is founded on active citizen participation. ICTs can allow citizens more opportunities to participate in governance, through access to government procedures, by communicating directly with public servants and elected representatives, as well as communicating with each other to discuss issues relevant to them.

Table P1. By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
P1.1	Establish policies on information-sharing between agencies	MoIC (**DIT**), all agencies	Agency	░	█					
P1.2	Establish policies on ICT security	MoIC (**DIT**), all agencies	Agency	░	░					
P1.3	Establish policies on use of free and open source software	MoIC (**DIT**), all agencies	Agency	░	█					
P1.4	Email recognised as official Government correspondence	**RCSC**, MoIC (DIT)	Agency			░	█			
P1.5	Introduce 'e-Gazette' as official RGoB publication of record	MoIC (**DIT**), all agencies	Agency			░	█			
P1.6	Establish ICT Units in each Ministry and major autonomous agency	RCSC & all agencies	Agency	░	█					
P1.7	Establish ICT Units in each Dzongkhag	RCSC/ Dzngkhgs	Agency		░	█				

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
P1.8	Each Ministry, autonomous body and agency to provide 75% of all possible public services deliverable through ICT	**All agencies**, MoIC (DIT)	Agency							▓
P1.9	Streamline and automate business and ICT licensing processes	**MTI**	Agency			▓				
P1.10	Establish system for online citizen polling on Government policies and issues	MoIC (**DIT**), MoHCA	>50		▓					
P1.11	Publish senior RGoB officials' email addresses	**All agencies**, MoIC (DIT)	Agency			▓				
P1.12	Publish all public Government reports online	**All agencies**, MoIC (DIT)	Agency			▓				

Related strategies and activities :

  IN1.3   Promote FDI in ICT infrastructure development
  IN2.2   Develop a plan for a countrywide connectivity to ICT infrastructure
  IN2.6   Establish multipurpose telecentres in every Geog
  HC1.1   Draft National ICT HRD plan
  HC1.3   Ensure recruitment of qualified personnel for RGoB ICT positions
  HC4   By 2008, all students who have completed basic level education have acquired basic IT and computer skills
  CA1.1   Establish an affordable local digital signature Certifying Authority
  CA1.3   Ensure payment methods exist to support online transactions, including facilities to transfer funds within Bhutan;
  CA3   By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of education
  CA4   By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of health services
  CA5   By 2008, all Bhutanese citizens will have real-time access to Bhutanese media
  E2.2   Ensure awareness and capacity to conduct outsourcing by conducting business fairs and workshops on ICT outsourcing for industry and RGoB

Strategy P2. By 2007, introduce a 'light-touch' and modern regulatory environment.

The world of technology changes rapidly. New technology trends can make it difficult for policy-makers and legislators to keep pace. It is important to establish regulatory frameworks that are adaptable and technology-neutral. Global experience in developing countries has demonstrated the benefits of deregulation and competition on improving infrastructure. The Draft Information, Communications and Media Act 2004 has been prepared with these key principles in mind. However, there are other short-term activities that can assist in creating a regulatory environment in which ICT can thrive. Pushing forward with access to public information as a right will also help shift Bhutan towards being a knowledge-based society. Protection and enforcement of intellectual property right will constitute a key part of this regulatory environment.

Table P2. By 2007, introduce a 'light-touch' and modern regulatory environment.

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
P2.1	Finalise ICM Act and introduce to National Assembly	**MoIC**	-		▓					
P2.2	Legislate for access to and dissemination of information	**MoIC**, MoHCA	>50			▓				
P2.3	Enforce intellectual property legislation	**MTI**	Agency				▓			
P2.4	Introduce a liberalised and competitive telecommunications regime	**MoIC**					▓			
P2.5	Encourage FDI in ICT industry and infrastructure	**MoIC**					▓			

Related strategies and activities :
> IN1.1 License new operators and service providers
> IN2.2 Develop a plan for a countrywide connectivity to ICT infrastructure
> IN1.3 Promote FDI in ICT infrastructure development
> HC3.1 Review current policies in relation to businesses generally and ICT training specifically
> CA1.1 Establish an affordable local digital signature Certifying Authority
> CA1.2 Create a mechanism for the resolution of e-business disputes
> E3.2 Investigate need for ICT business fund to support start-up enterprises
> E3.3 Review existing tax environment for ICT businesses

Strategy P3. By 2006, strengthen the existing policy and regulatory bodies to cope with ICT policy and regulatory environment.

In order to deal with the increasing complexities of ICT policy and regulatory challenges, it will be important to strengthen the capacity of existing regulatory bodies. The introduction of the new ICT and media legislation in 2005 will introduce a range of new regulatory responsibilities, such as setting interconnection fees and administering a Universal Service Fund.

Table P3. By 2006, strengthen the existing policy and regulatory bodies to cope with ICT policy and regulatory environment.

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
P3.1	Strengthen the existing regulatory bodies	**RCSC**, BCA MoIC	100							

Related strategies and activities :
> IN1.1 License new operators and service providers
> IN1.3 Promote FDI in ICT infrastructure development
> IN2.2 Develop a plan for a countrywide connectivity to ICT infrastructure
> HC3.1 Review current policies in relation to businesses generally and ICT training specifically
> E3.2 Investigate need for ICT business fund to support start-up enterprises
> E3.3 Review existing tax environment for ICT businesses

Strategy P4. By 2005, investigate ways to fund and reduce the cost of ICT services throughout Bhutan

Bhutan will ensure that the benefits of ICT reach right across the country. Universal access will be a major aim and government measures will promote the universality of networks and services. In places where infrastructure investment will be uneconomical, RGoB will undertake a variety of activities to ensure that these areas are not left on the wrong side of the information divide.

Table P4. By 2005, investigate ways to fund and reduce the cost of ICT infrastructure throughout Bhutan

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
P4.1	Develop a plan for a National ICT Infrastructure Fund (NICTIF), taking into account the Universal Service Fund	**MoIC**, BCA	Agency							
P4.2	Explore ways of reducing cost of ICT hardware, software and services: - 'walled garden' of Bhutanese web content; - demand aggregation initiatives.	MoIC (**DIT**)	100							

20

Related strategies and activities :
> IN 2.9   Explore ways of reducing cost of ICT hardware and software
> HC3.   By 2006, expand ICT institutes to other regions
> HC4.1   Ensure infrastructure is in place in all MHS and HS schools
> HC4.4   Explore use and adoption of open source software for use in schools

b.   INFRASTRUCTURE

Deploying a reliable, sustainable, appropriate and affordable ICT infrastructure to achieve universal access and global connectivity through liberalisation and co-ordination between infrastructure providers.

From ICT White Paper

ICT infrastructure is a critical enabling element for all ICT related activities. Without appropriate infrastructure, it will be difficult for enterprises to tap into global markets, for Government to operate more effectively and for schools to get access to new learning tools. Infrastructure should be appropriate and wide-spread, to ensure that no segment of the community, especially those in isolated areas, is left on the wrong side of the information divide.

Strategy IN1. By 2007, Bhutan will have established a liberalised and competitive ICT infrastructure market

A liberalized and competitive ICT infrastructure market can deliver many benefits to citizens, including improved services and lower prices. This strategy aims to support the policy of liberalization by creating an open ICT market that is internationally competitive and conducive for investment, employment and expansion.

Table IN1. By 2007, RGoB will have established the framework for a liberalised and competitive ICT infrastructure market

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
IN1.1	License new operators and service providers	**BCA,** MoIC	100							
IN1.2	Establish incentives for new ICT players to establish ICT businesses	**MoIC**, MoF, BCA	250							
IN1.3	Promote FDI in ICT infrastructure development	**MoIC**, MoF	100							
IN1.4	Establish a co-ordination body to increase co-ordination amongst infrastructure providers	**BCA**, MoIC (DIT), BT, DoP	Agency							

Related strategies and activities :
> P1.   By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.
> P2.1   Finalise ICM Act and introduce to National Assembly
> CA1.1   Establish an affordable local digital signature Certifying Authority
> E3.1   Promote foreign direct investment with high skills transfer components
> E3.2   Investigate need for ICT business fund to support start-up enterprises
> E3.3   Review existing tax environment for ICT businesses
> E3.4   Encourage the creation of private capital markets for investment in ICT businesses

Strategy IN2. By 2010, ensure an affordable, fast, secure, sustainable and appropriate ICT infrastructure throughout Bhutan

This strategy aims to build a countrywide ICT infrastructure providing access to network facilities and services. The infrastructure to be created should be appropriate, affordable, fast and secure. It should be 'future-proof' to the extent possible: that is, using the most up to date open standards that are compatible with foreseeable future technologies. It should be able to carry voice, data and other multi-media services. The infrastructure roll-out should support and keep pace with the implementation of all other activities.

The government, supported by external funding partners, will be the promoter and catalyst of ICT infrastructure building, and be responsible for ensuring that the policy and regulatory environment encourages private sector investment in infrastructure. Extra emphasis has to be made to put in place advanced and appropriate technologies.

Table IN2. By 2010, ensure an affordable, fast, secure, sustainable and appropriate ICT infrastructure throughout Bhutan

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
IN2.1	Deploy backbone infrastructure across Bhutan	**BT,** MoIC	15,000	░	░	░	■			
IN2.2	Develop a plan for a countrywide connectivity to ICT infrastructure, including schools, Geog centres and villages	**MoIC**	Agency	░	■					
IN2.3	Establish Government-wide intranet connecting all agencies in Thimphu	**MoIC**	2,000		░	■				
IN2.4	Extend Government-wide intranet to all Dzongkhags headquarters	**MoIC**	1,000				░	■		
IN2.5	Extend Government-wide intranet to all Geogs	**MoIC**, MoHCA	1,000						░	■
IN2.6	Establish multipurpose telecentres in every Geog	MoIC (**DIT**), BT	250			░	░	░	░	■
IN2.7	Establish at least 10 telephone connections in each Geog	**BCA,** BT	20,000	░	░	■				
IN2.8	Introduce and deploy advanced and appropriate technologies	**BCA**, BT, MoIC (DIT)	150	░	░	■				
IN2.9	Explore ways of reducing cost of ICT hardware and software: - Open source software; - Re-cycling computers; - Substitute processors	MoIC (**DIT**)	100	░	■					

Related strategies and activities :
P1.   By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.
P4.2   Explore ways of reducing cost of ICT hardware, software and services
HC3.   By 2006, expand ICT institutes to other regions
HC4.1   Ensure infrastructure is in place in all MHS and HS schools

c. *HUMAN CAPACITY*

Ensuring institutions and curricula to provide ICT skills at all levels, from technical, professional and entrepreneurial skills for industry and government to basic ICT literacy for all.

From ICT White Paper

Without activities designed to boost the ICT human capacity of Bhutan, very few of the strategies and activities listed in this report can be achieved. Further, ICT skills training should also target ICT beginners, to ensure that they are capable of using ICT to improve their lives.

It is also crucial to generate a critical mass of knowledge workers to allow ICT industry to take-off and for the benefits to be fully realized. This will have an overall impact on the use and application of ICT in the country. Heavy emphasis must be placed on strengthening the existing human resource capacity for the private sector and to ensure a steady supply of ICT professionals, managers and entrepreneurs.

Strategy HC1. By 2009, all public and private sector ICT positions will be filled be well-qualified national staff

RGoB has recently introduced ICT Units in each Ministry to assist in the implementation of ICT systems, equipment and training. However, there remains no clear career path for ICT professionals within the civil service. HRD in the ICT sector poses a big dilemma. In-country training is inadequate while sending people outside is expensive. There is also a need to better match the training and the job market requirements.

This strategy aims to overcome some of these barriers. It will result in the production of critical mass of national ICT professionals. This will facilitate future growth of ICT businesses and attract more young people into ICT professional.

Table HC1. By 2009, all public and private sector ICT positions will be filled be well-qualified national staff

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
HC1.1	Draft National ICT HRD plan to create a critical mass of ICT workers, incorporating : - RGoB and private sector training needs assessment; - developing ICT occupational profiles for RGoB positions; - ICT career paths for RGoB ICT professionals.	**DIT**, RCSC	75							
HC1.2	Make available relevant in-country and external training programmes for ongoing education and constant skill upgrading for ICT professionals	**RCSC**, private sector	100							
HC1.3	Ensure recruitment of qualified personnel for RGoB ICT positions	**RCSC**	Agency							
HC1.4	Enforce labour market regulation, including Labour Act and MoUs with private sector companies	**MoLHR**	Agency							

23

Related strategies and activities :

> P1.   *By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.*
> E1.1   *ICT association strengthened to represent industry and increase competence*
> E1.3   *Establish professional forums to exchange knowledge between ICT professionals*
> E3.1   *Promote foreign direct investment with high skills transfer components*
> E4   *Target export of ICT services by 2010*

Strategy HC2. By 2008, establish one ICT "Center of Excellence"

The Centre of Excellence will be the national leader and co-ordinator for ICT education and research and development. It will be charged with boosting the quality and consistency of ICT education in all institutes across the country. This will be achieved by linking the Centre of Excellence to global ICT educational institutions, as well as by entrusting it with the role of certifying and standardizing ICT curricula within Bhutan.

Table HC2. By 2008, establish one ICT "Center of Excellence"

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
HC2.1	Identify educational partners in Centre of Excellence	**MoE**, MoIC (DIT)	NA				▓			
HC2.2	Identify and establish linkages with international institutions	**MoE**, MoIC (DIT)	50				▓			
HC2.3	Carry out research and development in ICT	**RUB,** DIT	50							▓
HC2.4	Create standardised curriculum for skills required in the job market	**MoE**, MoIC (DIT), MoLHR	50			▓				

Related strategies and activities :

> CA2.5   *Encourage the creation of Bhutanese web content*
> CA3.1   *Establish policy for the recognition of online degrees*
> CA3.2   *Establish e-learning nodes in all tele-kiosks and telecentres*
> CA3.3   *Share educational resources throughout Bhutan*

Strategy HC3. By 2006, expand ICT institutes to other regions

Not surprisingly, ICT training institutions in Bhutan tend to cluster in the larger towns, where markets are better developed. However, to achieve the national priority of broad and equitable access to ICTs, there must also be broad access to ICT skills.

This strategy aims to ensure that access to ICT training extends to all regions of Bhutan. This will be achieved through private sector involvement, government interventions and as well as public private partnership.

Table HC3. By 2006, expand ICT institutes to other regions

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
HC3.1	Review current policies in relation to businesses generally and ICT training specifically	**MTI**, MoIC (DIT)	Agency		▓					
HC3.2	Create strategy for Government intervention in regional training if private sector investment is not forthcoming	**MoE**, MoLHR, MoIC (DIT)	Agency			▓				

24

Related strategies and activities :

>   P4.1   Develop a plan for a National ICT Infrastructure Fund (NICTIF)
>   IN2.2   Develop a plan for a countrywide connectivity to ICT infrastructure
>   IN2.6   Establish multipurpose telecentres in every geog
>   HC1.1   Draft National ICT HRD plan
>   CA2.5   Encourage the creation of Bhutanese web content
>   CA3.1   Establish policy for the recognition of online degrees
>   CA3.2   Establish e-learning nodes in all tele- kiosks and telecentres
>   CA3.3   Share educational resources throughout Bhutan
>   E3.2   Investigate need for ICT business fund to support start-up enterprises
>   E3.3   Review existing tax environment for ICT businesses
>   E3.4   Encourage the creation of private capital markets for investment in ICT businesses

Strategy HC4. By 2008, all students who have completed basic level education have acquired basic IT and computer skills

ICT education in schools will ensure that our youth are ready for the workplaces of the future. Providing access to computer equipment and training in schools will also increase the future pool of ICT professionals. In order to achieve this target, infrastructure must be in place, and teachers must have the knowledge, tools and curriculum to deliver ICT skills to their students.

Open source software offers a potential cost-effective tool to assist in achieving this strategy.

Table HC4. By 2008, all students who have completed basic level education have acquired basic IT and computer skills

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
HC4.1	Ensure infrastructure is in place in all MHS and HS schools	**MoE**, MoIC	2,000			▓				
HC4.2	Ensure teachers are ICT literate through recruitment and training	**MoE**	Agency					▓		
HC4.3	Develop standardised 'basic ICT literacy' curriculum for use in schools and other training centres	**MoE,** MoIC	100				▓			
HC4.4	Explore use and adoption of open source software for use in schools	MoIC (**DIT**), MoE	Agency			▓				

Related strategies and activities :

>   P1.   By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.
>   P4.2   Explore ways of reducing cost of ICT hardware, software and services
>   IN2.2   Develop a plan for a countrywide connectivity to ICT infrastructure
>   CA2.1   Develop and incorporate Dzongkha computing into at least one operating platform
>   CA2.5   Encourage the creation of Bhutanese web content
>   CA3.3   Share educational resources throughout Bhutan

Strategy HC5. By 2006, majority of Bhutanese will be aware of the benefits of ICT

General awareness of the benefits of ICT is low. This will negatively impact the development of ICT. If Bhutan is to become a knowledge-based society, at the very least, people from all walks of life will need to be aware of the benefits of ICT.

Table HC5. By 2006, majority of Bhutanese will be aware of the benefits of ICT

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
HC5.1	Broadcast ICT-related programming through existing media	**BBS**, MoIC (DIT)	25							
HC5.2	Incorporate ICT skills into community learning centres and NFE program	**MoE**, MoIC (DIT)	50							
HC5.3	Conduct a national ICT awareness-raising campaign	MoIC (**DIT**), all agencies	50							

Related strategies and activities :

    P1.   *By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.*
    IN2.2   *Develop a plan for a countrywide connectivity to ICT infrastructure*
    IN2.6   *Establish multipurpose telecentres in every geog*
    CA2.1 *Develop and incorporate Dzongkha computing into at least one operating platform*
    CA4.3 *Develop applications to enhance the delivery of health services*
    E2.2   *Ensure awareness and capacity to conduct outsourcing by conducting business fairs and workshops on ICT outsourcing for industry and RGoB*

d.   CONTENT AND APPLICATIONS

> *Promoting widespread creation of content and applications that are accessible, relevant, appropriate and useful, in particular, the development of applications for public services.*
>
> From ICT White Paper

Content and applications are what will truly unleash the power of ICT. It is vital to both develop relevant content and applications and to put in place the underlying framework to support them. Bhutan's rich and diverse indigenous cultural content can be appropriately captured and used.

Strategy CA1. By 2007, Bhutan will have the enabling framework to promote e-business

E-business has great potential to help Bhutan enter global markets despite its geographic isolation, but there are a number of fundamental requirements for e-business to take-off. E-business cannot proceed without payment methods, mechanisms to enhance trust, and the postal systems to deliver goods.

This strategy will facilitate online transactions.

Table CA1. By 2007, Bhutan will have the enabling framework to promote e-business

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
CA1.1	Establish an affordable local digital signature Certifying Authority	**MoIC**	75							
CA1.2	Create a mechanism for the resolution of e-business disputes, to build faith in Bhutanese e-business	**MTI**, MoIC	50							
CA1.3	Ensure payment methods exist to support online transactions, including:	**RMA**, banks, MoIC	Agency							
	- Facilities to transfer funds within Bhutan;	**RMA**, banks, MoIC, Post	Agency							
	- Facilities to allow Bhutanese customers to purchase online (eg Visa cards);	**RMA**, banks, MoIC	Agency							
	- Facilities to allow Bhutanese merchants to sell online (eg PayPal)	**RMA**, banks, MoIC	Agency							

Related strategies and activities :

  P1.   *By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.*
  P2.   *By 2007, Introduce a 'light-touch' and modern regulatory environment.*
  IN1.2 *Establish incentives for new ICT players to establish ICT businesses*
  E1.1 *ICT association strengthened to represent industry and increase competence*
  E5.1 *Establish a sustainable national e-commerce portal*

Strategy CA2. By 2008, Bhutan will use ICTs to preserve and promote its cultural heritage and boost the creation of local content

Bhutan has long recognised the importance of its cultural heritage, both in its own right and as a mark of its sovereignty and nation status. ICTs provide a number of tools to enhance the preservation and conservation of this heritage, as well as new ways of sharing this rich culture with the rest of the world.

In this context, it is important to build Dzongkha language support in major computing platforms.

Table CA2. By 2008, Bhutan will use ICTs to preserve and promote its cultural heritage and boost the creation of local content

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
CA2.1	Develop and incorporate UNICODE-based Dzongkha computing into at least one operating platform	MoIC (**DIT**), DDA, Sherubtse	150	░	░	█				
CA2.2	Develop digital archive of significant Bhutanese and religious texts	**MoHCA**, MoIC (DIT)	150	░	░	░	░	█		
CA2.3	Develop digital archive of significant Bhutanese cultural content in sound and picture formats	**MoHCA**, MoIC (DIT)	200	░	░	░	░	█		
CA2.4	Avail online content to promote Bhutanese cultural heritage in support of tourism industry	**MoHCA**, MoIC (DIT), MTI (DoT)	50	░	░	░	░	█		
CA2.5	Encourage the creation of Bhutanese web content	MoIC (**DIT**), Druknet	25	░	░	░	░	░	░	░

Related strategies and activities :

  P1.   *By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.*
  IN2.2 *Develop a plan for a countrywide connectivity to ICT infrastructure*
  HC4.3 *Develop standardised 'basic ICT literacy' curriculum*
  HC5.1 *Broadcast ICT-related programming through existing media*
  E5.3 *Strengthen the film and music industries by improving the quality of its products through the use of ICT*

Strategy CA3. By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of education

ICT brings great potential for enhancing the quality and accessibility of education. Multi-media materials can enrich the learning experience; ICT infrastructure can be used to share and disseminate learning resources.

The following activities are aimed at facilitating online education. Recognising online degrees will increase access to education as well as prove cost effective, particularly in post-tertiary studies, given the current high cost of sending students outside to pursue further studies.

Table CA3. By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of education

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
CA3.1	Establish policy for the recognition of online degrees	**RCSC**, MoE	Agency			■				
CA3.2	Establish e-learning nodes in all tele- kiosks and telecentres	**MoE**, MoIC	75							■
CA3.3	Share educational resources throughout Bhutan - Establish digital library of educational resources - Establish system for distance education	**MoE**	200							

Related strategies and activities :

P1.	By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.
P4.2	Explore ways of reducing cost of ICT hardware, software and services
IN2.2	Develop a plan for a countrywide connectivity to ICT infrastructure
HC1.1	Draft National ICT HRD plan
HC3.	By 2006, expand ICT institutes to other regions
HC4.	By 2008, all students who have completed basic level education have acquired basic IT and computer skills
HC5.	By 2006, majority of Bhutanese will be aware of the benefits of ICT

Strategy CA4. By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of health services

ICT is a proven tool for delivery of health services. It is particularly relevant in a situation where there is a lack of adequate specialists and beneficiaries are far removed. ICT has clear potential to assist in the delivery and accessibility to health services. ICT can assist in bringing relevant information to health professionals, and linking Bhutan's health providers with each other and with international experts.

The Ministry of Health is already well advanced in developing health-related ICT applications, and this work is set to continue. When combined with the plans to link hospitals with appropriate infrastructure, the quality and accessibility of health services to all Bhutanese can be expected to be boosted by the application of ICT.

Table CA4. By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of health services

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
CA4.1	Establish links with neighbouring countries and international agencies to track Emerging Health Threats	**MoH**	50					■		
CA4.2	Establish real time telemedicine from BHUs to districts to Referral Hospitals	**MoH**	6,500							■
CA4.3	Establish Integrated Health Management System	**MoH**, MoIC	1,000							■

Related strategies and activities :

> P1.   By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.
> IN2.2   Develop a plan for a countrywide connectivity to ICT infrastructure
> IN2.3   Establish Government-wide intranet connecting all agencies in Thimphu
> IN2.4   Extend Government-wide intranet to all Dzongkhags headquarters
> IN2.5   Extend Government-wide intranet to all Geogs
> E5.4   Demonstrate and promote the use of ICT to improve efficiency in non-ICT businesses

Strategy CA5. By 2008, all Bhutanese citizens will have real-time access to Bhutanese media

In light of the pervasive accessibility of global media, it is important to strengthen as well as to improve local media in terms of coverage, real-time access and quality.

The 9FYP emphasises the importance of expanding BBS TV programming hours and geographic coverage of the FM radio network. The recent Media Impact Study outlined the benefits Bhutanese are gaining from access to local media, and their enthusiasm for expanding the coverage.

This strategy and activities are aimed at expanding the current coverage of Bhutanese radio, TV and print media to all parts of the country, to allow all Bhutanese to balance their exposure to foreign media with local media content that is relevant and timely.

Table CA5. By 2008, all Bhutanese citizens will have real-time access to Bhutanese media

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
CA5.1	Extend FM radio coverage to all Dzongkhags	**BBS**, MoIC	50	░	▓					
CA5.2	Kuensel printed on same day in all Dzongkhags	**Kuensel**, MoIC	Agency	░	░	▓				
CA5.3	Extend real-time BBS TV coverage to all Dzongkhags	**BBS**, MoIC	50	░	░	░	░	▓		

Related strategies and activities :

> IN2.2   Develop a plan for a countrywide connectivity to ICT infrastructure
> HC5.1   Broadcast ICT-related programming through existing media
> HC5.3   Conduct a national ICT awareness-raising campaign

Strategy CA6. By 2008, Bhutan will develop content and applications to support good governance

There can be no better tool than ICT to realise the objectives of good governance. Appropriate content and applications take the centre stage. Different sectors need to work together both to share information and as well as to develop shared applications. It will be crucial to follow common data standards.

Table CA6. By 2008, Bhutan will develop content and applications to support good governance

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
CA6.1	Establish data interoperability standards	MoIC (**DIT**)	Agency	░	█					
CA6.2	Support the implementation of a national GIS system	**MoA**, MoIC (DIT)	Agency	░	░	█				
CA6.3	Identify common usage applications	MoIC (**DIT**), all agencies	Agency	░	█					
CA6.4	Establish computerised ID system for citizens	**MoHCA**	>1,000	█						
CA6.5	Establish computerised ID system for companies	**MTI**, , BCCI, MoIC (DIT)	>1,000	░	░	█				
CA6.6	Re-develop and re-launch integrated RGoB web portal	MoIC (**DIT**)	>10		█					
CA6.7	Establish online presence for all Ministries, autonomous bodies and agencies, including all publicly available documents	**All agencies**, MoIC (DIT)	Agency		░	█				
CA6.8	Publish online information relevant to the public including :	**All agencies**, MoIC (DIT)	Agency							
	- Acts, rules and regulations			░	█					
	- Plans, goals, targets and progress				░	░	█			
	- Contracts, procurements and tenders				░	░	░	█		
CA6.9	Launch Citizen-Citizen portal	MoIC (**DIT**)	>100	░	░	░	░	░	░	█
CA6.10	Establish automated system for dealing with citizen complaints and inquiries	MoIC (**DIT**), All agencies	150	░	░	░	░	░	░	█

Related strategies and activities :

> *P1.*   *By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive.*
> *IN2.2*   *Develop a plan for a countrywide connectivity to ICT infrastructure*
> *IN2.3*   *Establish Government-wide intranet connecting all agencies in Thimphu*
> *IN2.4*   *Extend Government-wide intranet to all Dzongkhags headquarters*
> *IN2.5*   *Extend Government-wide intranet to all Geogs*

e.   ENTERPRISE

Creating an enabling business environment that helps to generate employment, attracts local and foreign investments, enhances access to local and global markets, improves business processes, stimulates domestic demand and fosters research and development.

From ICT White Paper

Globally, the private sector has been at the forefront of the ICT revolution, both in producing ICT goods and services, and harnessing ICTs to improve their business operations.

In Bhutan, the private sector is in a relatively infant stage. Factors such as a small local market far removed from external markets, limited infrastructure and ICT skills have combined to limit growth potential.

For Bhutan to capture the potential of ICT, it is vital that local enterprises, both in the ICT sector and more broadly, are well placed. To achieve this, a number of strategies will be important, including some strategies discussed in the Human Capacity and Infrastructure sections above.

Detailed below are a series of strategies focussing on the local private sector to prepare it to fully harness the potential of ICT.

Strategy E1. By 2006, increase the competency of the local ICT industry

Bhutan plans to join the WTO in 2007, which may open local markets to competition from foreign enterprises. In order to be able to meet this competition, local private sector companies, especially ICT businesses, will need to bring their operations and products up to world-standard.

Detailed below are activities to help strengthen the capacity of the local ICT industry in light of these future challenges.

In many countries, a strong industry association has proved a catalyst for improving competency and networking amongst ICT firms. Some activities that industry associations can undertake include 'demand aggregation' activities. By adding together the demand of many members for services such as leased line access or an installment payment system for ICT goods, an association can negotiate for lower prices for these services for their members.

Table E1. By 2006, increase the competency of the local ICT industry

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
E1.1	ICT association strengthened to represent industry and increase competence	**Private Sector**, MoIC (DIT)	50							
E1.2	Establish vendor certification guidelines to certify and improve the skills of local ICT companies	**MoIC (DIT)**, Private Sector	<50							
E1.3	Establish professional forums to exchange knowledge between ICT professionals	**Private Sector**, MoIC (DIT)	-							
E1.4	Explore demand aggregation to reduce the price of common goods and services (eg business leased line Internet access, installment finance for ICT equipment)	**Private Sector**	-							

Related strategies and activities :
> *IN1.2   Establish incentives for new ICT players to establish ICT businesses*
> *IN1.3   Promote FDI in ICT infrastructure development*
> *IN2.1   Deploy backbone infrastructure across Bhutan*
> *HC1.1   Draft National ICT HRD plan*
> *HC3.1   Review current policies in relation to businesses generally and ICT training specifically*
> *CA3.   By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of education*

Strategy E2. By 2007, ensure outsourcing of all appropriate RGOB ICT work

The 9FYP states that 'ICT support, maintenance and software development will be increasingly outsourced to the private sector.'

In Bhutan, RGoB represents by far the largest market for suppliers of ICT goods and services. Therefore, in order to create opportunities for the private sector, it is vital that RGoB follows the prescription of the 9FYP in relation to outsourcing.

The activities below will gather information on the outsourcing market, and address some of the main constraints identified by the private sector.

Table E2. By 2007, ensure outsourcing of all appropriate RGOB ICT work

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
E2.1	Conduct a baseline survey of current ICT outsourcing practice	MoIC (**DIT**)	<10	░	█					
E2.2	Ensure awareness and capacity to conduct outsourcing by conducting business fairs and workshops on ICT outsourcing for industry and RGoB	MoIC (**DIT**), RCSC, Private Sector	<50	░						
E2.3	Review current tendering and procurement procedures and establish e-procurement system	**RCSC**, MoIC (DIT)	<10	░	█					

Related strategies and activities :

> P1.   *By 2007, RGoB will use ICT to make governance more efficient, transparent and inclusive*
> IN2.1   *Develop a plan for a countrywide ICT infrastructure*
> CA2.2   *Develop digital archive of significant Bhutanese and religious texts*
> CA2.3   *Develop digital archive of significant Bhutanese cultural content in sound and picture formats*
> CA2.4   *Avail online content to promote Bhutanese cultural heritage in support of tourism industry*
> CA2.5   *Encourage the creation of Bhutanese web content*

Strategy E3. By 2005, improve the access to financial mechanisms for ICT businesses

Globally, the key to successful growth of ICT businesses is access to capital. In developing countries poorly functioning capital markets make access to funds difficult.

ICT businesses need access to different financial mechanisms at different stages of their growth. Early stage, highly innovative companies often need public support for their R&D activities, which are often too high-risk for private sector investors. At later stages of growth, 'angel' and mezzanine investors mostly support growth in well-developed capital markets. Further up the development curve, private capital markets function by way of take-overs and public offerings.

The benefits of some of these activities are not limited to ICT firms. FDI policies, availability of expansion capital and a review of the business tax environment will have benefits for businesses within and outside the ICT sector.

FDI can bring not only capital investments to local ICT companies, but through appropriate partnering also bring in expertise resulting in the transfer of high-end technical skills to local companies.

In order to make investment in ICT businesses financially attractive, the market for ICT goods and services must develop through outsourcing and otherwise.

Bhutan has been progressive in removing sales tax on some types of ICT equipment. A re-examination of the tax environment as it effects ICT businesses, including depreciation, sales tax exemptions, and possible incentives for investment in ICT businesses, is now timely.

Table E3. By 2005, improve the access to financial mechanisms for ICT businesses

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
E3.1	Promote foreign direct investment with high skills transfer components	**Private Sector**, MTI, MoIC (DIT)	NA	▒	█					
E3.2	Investigate need for ICT business fund to support start-up enterprises	**MTI**, Private Sector, MoIC (DIT)	<10	▒	█					
E3.3	Review existing tax environment for ICT businesses	**MTI**, Private Sector, MoF, MoIC (DIT)	NA	▒	█					
E3.4	Encourage the creation of private capital markets for investment in ICT businesses	**MTI**, Private Sector, MoF, MoIC (DIT)	NA	▒	▒	█				

Related strategies and activities :
> P1.9   *Streamline and automate business and ICT licensing processes*
> P4.1   *Develop a plan for a National ICT Infrastructure Fund*
> IN1.2   *Establish incentives for new ICT players to establish ICT businesses*
> IN1.3   *Promote FDI in ICT infrastructure development*
> IN2.1   *Deploy backbone infrastructure across Bhutan*
> HC3.1   *Review current policies in relation to businesses generally and ICT training specifically*

Strategy E4. Target export of ICT services by 2010

The global information infrastructure provides opportunities for Bhutan to overcome the barriers of its geography which have historically hampered its ability to trade. ICT enables business process outsourcing, such as call centres and software development, which can provide great economic benefit.

A number of the strategies in BIPS are aim to capture these opportunities. However, it is still necessary to assess the viability of these industries in Bhutan through pilot projects, and identify the 'competitive advantage' that Bhutan possesses to succeed in highly competitive global markets.

Table E4. Target export of ICT services by 2010

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
E4.1	Establish pilot small-scale call centre to investigate viability	**MTI**, Private Sector, MoIC (DIT)	75	▒	▒	▒	█			
E4.2	Establish pilot small-scale data warehouse for RGoB data to	**MTI**, Private Sector, MoIC	100	▒	█	█				

	Activity	Agency	US$	04	05	06	07	08	09	10
	warehouse for RGoB data to investigate viability	(DIT)				░	█	█		
E4.3	Investigate demand for ICT incubation services	**MTI**, Private Sector, MoIC (DIT)	Agency		░	█				
E4.4	Establish ICT business cluster with access to shared infrastructure and services	**MTI**, Private Sector, MoIC (DIT)	250		░	░	█			

Related strategies and activities :
>   P2.3   *Enforce intellectual property legislation*
>   P1.9   *Streamline and automate business and ICT licensing processes*
>   IN2.8   *Introduce and deploy advanced and appropriate technologies*
>   HC1.1   *Draft National ICT HRD plan*
>   HC2.   *By 2008, establish one ICT "Center of Excellence"*
>   HC2.2   *Identify and establish linkages with international institutions*
>   CA1   *By 2007, Bhutan will have the enabling framework to promote e-business*
>   CA2.2   *Develop digital archive of significant Bhutanese and religious texts*
>   CA2.3   *Develop digital archive of significant Bhutanese cultural content in sound and picture formats*

Strategy E5. Promote the appropriate use and application of ICT in non-ICT businesses

It has become increasingly clear that the sustained growth of the global economy through the '90s was due as much, if not more, to the implementation of ICT in non-ICT sectors as to the growth of the ICT sector itself. To fully harness the benefits of ICT in Bhutan, it is important to plan for the appropriate application of ICT in non-ICT businesses as well.

A number of activities towards this end are listed below.

The 9FYP emphasises the opportunity to harness ICTs for e-commerce including by establishing a national e-commerce portal.

The vibrant Bhutanese film and music industry reinforces Bhutanese culture as well as providing many jobs. ICT can be applied for the more efficient production and distribution of these important cultural industries.

Table E5. Promote the appropriate use and application of ICT in non-ICT businesses

	Activity	Agency	US$ (000)	04	05	06	07	08	09	10
E5.1	Establish a sustainable national e-commerce portal	MoIC (**DIT**), Private Sector, MTI	100				█			
E5.2	Strengthen postal services to facilitate e-services and e-commerce	**Post**, MTI, MoIC	Agency				█			
E5.3	Strengthen the film and music industries by improving the quality of its products through the use of ICT	**Private Sector**, MTI, MoF, MoIC (DIT)	100				█			
E5.4	Demonstrate and promote the use of ICT to improve efficiency in non-ICT businesses	**Private Sector**, MTI, MoIC (DIT)	50				█			

Related strategies and activities :
> P4.2   *Explore ways of reducing cost of ICT hardware, software and services:*
> CA1.   *By 2007, Bhutan will have the enabling framework to promote e-business*
> CA3.   *By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of education*
> CA4.   *By 2010, Bhutan will harness ICTs to enhance the quality and accessibility of health services*
> CA6.1   *Establish data interoperability standards*
> CA6.2   *Support the implementation of a national GIS system*

9.   RISK ANALYSIS

There are a number of risks which will have an impact on the overall implementation of the BIPS.

NATIONAL COMMITMENT

ICT is a cross-cutting issue that presents challenges and opportunities to all sectors of Government and the private sector. The BIPS process recognised this by involving committee members from all ministries and the private sector to ensure that all views were taken into account and that the resulting strategy is truly a 'National' effort.

Reflecting the reality of ICT as cross-cutting, most of the activities outlined will be implemented outside MoIC.

This raises the risk that implementation of the BIPS strategies and activities is heavily dependent on the commitment, and in some cases the financial resources, of all sectors. While most of the BIPS activities are relatively low-cost, some of the activities will require an allocation of internal resources.

This risk has been lessened by ensuring broad representation on the BIPS Committees. Further, the approval of BIPS by the Committee of Secretaries and then the CCM was intended to ensure whole-of-government commitment.

Future steps such as involving all sectors in the monitoring and oversight of implementation, as well as continuing to boost awareness of the potential of ICT throughout Bhutan, will also mitigate this risk factor.

DONOR SUPPORT

Bhutan is in the socio-economic category of least developed countries, with limited ability to mobilise internal resources for development activity. Therefore there is a need for strong donor support to ensure that the strategies and activities in BIPS can be carried out.

In line with Bhutan's development approach, the BIPS represents Bhutan's national priorities in the ICT sector. While members of the donor community attended the consultative workshops, they were not involved directly in the committee processes. This was to ensure that the final BIPS report is driven by national needs, not donor priorities.

It is hoped that all partners will support activities which fit their funding priorities and development policies.

HUMAN CAPACITY

In order to implement the BIPS activities successfully, the implementing agencies will need both specific technical and project managerial skills. Currently Bhutan has a fairly small pool of highly skilled ICT technicians apart from a few managers with skills and knowledge in development and project management. The private sector in general lacks sufficient technical and as well as managerial skills to initiate innovative growth in ICT businesses.

An additional human capacity risk is that decision-makers and key actors who are risk-averse may refrain from promoting ICT activities for fear of negative impacts that may result.

In order to mitigate these risks, sufficient technical and project managerial skills training must be undertaken, focussing particularly on private sector identified needs. Project management training could focus initially on the ICT Unit Heads who will be participating in the monitoring and oversight. Technical training needs should be assessed and incorporated into the ICT HRD Plan (see activity HC1.1). Further, an ongoing awareness-raising campaign (see activity HC 5.3) should be careful to target key decision-makers and actors within organisations to try to overcome risk-aversion.

OTHER RESOURCE AND ENVIRONMENTAL ISSUES

There is a variety of other resource and environmental issues that may constitute risk factors to the successful implementation of the BIPS activities.

Currently, urban centres in Bhutan enjoy a reliable and abundant supply of electricity. Future availability can be ensured through good infrastructure security.

Bhutan has historically enjoyed social, labour and political stability. Ongoing efforts to ensure geo-political stability, led by His Majesty the King, will maximize the chances of this continuing into the future.

10. MONITORING AND OVERSIGHT

While implementation of the BIPS strategies and activities will be decentralised across RGoB and the private sector, progress will be monitored by an Inter-Ministerial Working Group. The membership will consist of all ICT Unit Heads from across Government, MoIC PPD Officers, and the Director of DIT. ICT Units will be responsible for monitoring activities for which their agency has lead responsibility.

The Working Group will meet quarterly to review progress for each activity. Every six months, the Working Group will prepare a progress report on BIPS to the Cabinet.

Appropriate software will be used for monitoring purposes, and the Web will be utilised wherever possible to increase transparency and accountability. It may be necessary to conduct training for members of the Working Group to ensure they have the skills and capacity to perform their functions.

11. APPENDICES

a. COMMITTEE MEMBERS

Secretariat

Honourable Lyonpo Leki Dorji, Minister for Information and Communications
Honourable Dasho Tashi Phuntsog, Secretary, Ministry of Information and Communications
Bhimlal Sharma, Deputy Director, PPD, MoIC
Tshering Tenzin, Planning Officer, PPD, MoIC
Dorji Wangmo, Assistant Planning Officer, PPD, MoIC
Yeshey, Assistant Planning Officer, PPD, MoIC

Policy Committee

Chair :	Tenzin Chhoeda, Director, DIT, MoIC
Members :	Karma Tshiteem, Deputy Secretary, PPD, Ministry of Finance
	Ugyen Wangdi, Legal Officer, Office of Legal Affairs
	Dorji Norbu, Joint Director, Department of Planning, MoF
	Karma Yonten, Head, Bhutan Electricity Authority
	Chris Faris, UNV ICT for Development Specialist, UNDP
	Penjore, Head of Research, RMA
	Chenchen Dorji, Managing Director, RIIT
	Cheda, Legal Officer, PPD, MoIC
Rapporteurs :	Karma Wangdi, Systems Engineer, DIT, MoIC
	Tandin Wangchuk, Economist, BCA/MoIC

Infrastructure Committee

Chair :	Thinley Dorji, Director, BCA, MoIC
Members :	Dechen Yangdon, Assistant Engineer, Department of Works and Housing
	Sonam Tobgay, System Engineer, Bhutan Broadcasting Service
	Gangaram Sharma, Planning Engineer, Bhutan Telecom
	Kinley Dorji, Association of Private Cable Operators
	Karma Tshering, Assistant Engineer, Department of Energy, MTI
	Karma Singay, Managing Director, Peljorkhang Pvt. Ltd.
Rapporteurs :	Kezang, Deputy Executive Engineer, BCA, MoIC
	Pema Choejey, System Analyst, DIT, MoIC

Human Capacity Committee

Chair :	Pema Wangda, Director, Department of Labour, MoLHR
Members :	Karma Jurmi, IT Co-ordinator, Department of School Education
	Singye Namgay, Joint Director, NFE
	Bharat Subba, Programmer, Druk Information Technology
	Kuenga Jurmi, Head ICT, RIM
	Graeme Foster, UNV Lecturer, Sherubtse College
	Thinlay Wangdi, Director of Planning, Royal University of Bhutan
	Sangay Wangchuk, Deputy Director, DIT, MoIC
	Nim Dem, Director, Dept. of Higher Education, MoE
	Umesh Pradhan, Managing Director, InfoTech Solutions
Rapporteurs :	Tashi Wangmo, Head, PPD, MoLHR
	Tshering Chophel, Communications Officer, DIM, MoIC

Content and Applications Committee

Chair :	Karma, Deputy Managing Director, BNB
Members :	Tshering Jamyang, Monitoring and Evaluation Officer, PPD, MOA
	Tobgye, Information and Communications Officer, MOA
	Singay Namgyal, Planning Officer, PPD, MOE
	Sonam Dhargay, GIS Officer, CSO
	Yangka, Director of Academy, Royal University of Bhutan

	Rinzin Dorji, Deputy Director, Department of Planning, MoF
Rapporteurs :	Jigme Tenzing, System Analyst, DIT, MoIC
	Tenzin Dorji, Assistant Engineer, BCA, MoIC

Enterprise Committee

Chair :	Sonam Tshering, Director, Department of Energy, MTI
Members :	Yeshi Selden, Planning Officer, PPD, MTI
	Karma Tshering, Program Officer, Department of Industry, MTI
	Damber S. Kharka, Senior Lecturer, RIM
	Sourav Howlader, IT Manager, BPC
	Lekey Dorji, Manager, Bhutan Telecom
	Rinzy Dorji, Managing Director, Sigma Cable
	Nirpa Raj Rai, Executive Director, Peljorkhang Pvt. Ltd.
	Jiwan Siwakoti, General Manager, Singye Group of Enterprise
Rapporteurs :	Mayumi Miyata, UNV Systems Analyst, PPD, MoIC
	Passang Dorji, Assistant Manager, BPC

b.   WORKSHOP PARTICIPANTS

Participants in the Consultative Workshop held on 16 April 2004
(not including above-listed Committee members):

Aditya Sharma, MG Techno World, Thimphu
Akira Kawada, AMC, JOCV, Paro
Bishnu Bakta Mishra, Technical Officer, JICA
Chandra Ghallay, Kelwang Enterprise, Thimphu
Chris Whitehouse, UNDP
Dawa Gyeltsen, MoLHR
Dawa Penjor, DIM, MoIC
Deirdre Boyd, Deputy Resident Representative, UNDP
Dechen Chimme, Save the Children Foundation
Dorji Thsering, Department of Survey and Land Records, Thimphu
Dhendup Wangdi, Helvetas
Gaki Tshering, MoH, Thimphu
Gopilal Acharya, Kuensel Corporation, Thimphu
Hem Raj, Sherikhang, Thimphu
Hemlal Subedi, DIT, MoIC
Ichharam, Department of Urban Development and Housing, MoWHS
Jigme Thinley, Youth Development Fund, Thimphu
Karma Tshering, Dept. of Employment, MoLHR
Dasho Megraj Gurung, MD, Bhutan Post
Nidup Dorji, Sherubtse College, Kanglung
Dasho Nima Wangdi, Director, Road Safety and Transport Authority, MoIC
Pema Chewang, Department of Aid and Debt Management, MoF
Phub Dorji, National Provident and Pension Fund, Thimphu
Prakash, Digital Shangrila, Thimphu
Dasho Dr. Sonam Tenzin, MoHCA
Sakaida Hideaki, JOCV, Centre for Bhutan Studies
Sangay Zam, Department of Revenue and Customs, MoF, Thimphu
Sangay Norbu, CEO, Kuenphen Technology, Thimphu
Sangay Tenzing MD, Bhutan Telecom
Sangay Dorjee, Bhutan Vocational Qualification Authority, MoLHR
Sherub Dorji, DIT, MoIC
Sonam Tobgyal, Planning, MoF
Sonam Phuntsho, Deputy Secretary, RCSC
Sonam, RCSC
Sonam Tashi, City Corporation, Thimphu
Sonam Tobgay, Bhutan International

Suemitsu Hiroshi, Coordinator, JOCV
Tandin Wangmo, MoLHR, Thimphu
Takaya Osada, Department of National Property, JICA, Thimphu
Thinley Jyamtsho, Department of Survey and Land Records, Thimphu
Tshering Penjor, J.P Enterprise, Thimphu
Tshering Wangchuk, DIT, MoIC
Teruhito Sakuma, JOCV, Department of Budget and Accounts
Ugen Norbu, Department of Aid and Debt Management, MoF
Wangchuk Gyeltshen, Dhendup Informatics, Thimphu
Yosuki Sehata, JICA, RIM, Thimphu
Zecko, DIT, MoIC

c.   SECRETARIES' PRESENTATION PARTICIPANTS

Participants in the Secretaries' Presentation held on 6 May 2004 to seek cross sector endorsement:

Dasho Sangay Thinley,Secretary, MoA
Pema Thinley, Secretary, MoE
Aum Yanki T Wangchuk, Secretary, MoF
Aum Neten Zangmo, Secretary, MoFA
Sangay Thinley, Secretary, MoH
Dasho Penden Wangchuk, Secretary, MoHCA
Dasho Tashi Phuntsog, Secretary, MoIC
Dasho Karma Dorji, Secretary, MTI
Dasho Sherab Tenzin, Secretary, Cabinet Secretariat

d.   BIPS SCHEDULE

Task Items	December	January	Feburary	March	April	May	June	July
	1 8 15 22 29	5 12 19 26	2 9 16 23	1 8 15 22 29	5 12 19 26	3 10 17 24 31	7 14 21 26	5 12 19 26
100 Orientation								
110 Chairmen Meeting	▬							
120 Create guidance	▬▬							
140 Kick-off Meeting		▬						
200 Drafting								
210 Individual Committee Meetings		▬▬▬▬▬▬▬▬▬▬▬						
220 Inter-committee meeting				▲ 10/03				
230 Consultative Workshop					16/4 ▲			
240 Draft Paper					▬▬			
250 Consolidate and Finalize						▬▬▬		
300 Release								
310 Put up to Committee of Secretaries						▲ 06/05		
320 Put up to CCM							▲	19/07
330 Press Release							22/06	△ (tentative)
Rapporteur meeting	✓	✓			✓		✓	
Chairmen Meeting	✓				✓			

39

e. REFERENCES

Many of the resources listed below are available through the BIPS website : www.dit.gov.bt/bips

Books & Documents:

Accenture, Markle Foundation and UNDP, *Digital Opportunity Report* (2001)

Australian Framework for the Future Steering Committee, *Enabling our Future* (2003)

DIT, *Bhutan ICT Master Plan* (2001)

DIT, Concept paper on Business incubator (unpublished)

DIT, Concept paper on Cyber Park (unpublished)

DIT, *IT Survey* (2001)

GMCT Information and Communication Technologies, *Bhutan E-Readiness Assessment* (2003)

Holtec Consulting Pvt Ltd & MTI, *Feasibility Study on Contact Centre in Bhutan* (2002)

MoE, *Education sector 9TH Plan* (unpublished)

MoE, *Proposed IT in Education Implementation Strategies* (2003)

MoIC, *Draft Bhutan Information, Communications and Media Act* (2004)

Planning Commission RGoB, *Bhutan 2020: A Vision for Peace, Prosperity and Happiness*, 1999

Planning Commission RGoB, *Bhutan National Human Development Report 2000*

Planning Commission, RGoB, *Ninth Five Year Plan* (2002)

PLS Consult, *Bhutan Information Technology Strategy* [BITS] (1999)

Ram Jakhu, *Report on ICT Act* (2003)

RGOB, *Bhutan 2003: People at the centre of Development: Eighth Round Table Meeting, February 2003* (2003)

RGoB, *Enhancing Good Governance: Promoting Efficiency, Transparency and Accountability for Gross National Happiness* (1999)

RGOB, *ICT White Paper* (October 2003)

Siok Sian Pek and MoIC, *Media Impact Study 2003* (2003)

Sonam Kinga, Karma Galay, Phuntsho Rapten and Adam Pain (eds), *Gross National Happiness*, 1999.

UNDP Evaluation Office, *Essentials – Information and Communications Technology for Development*, September 2001

WSIS Declaration and Plan of Action (2003)

Online References:

Asia-Pacific Development Information Program (www.apdip.net)

Digital Opportunity Initiative (www.opt-init.org)

Millennium Development Goal (www.un.org/millenniumgoals/)

United Nations Development Programme : ICT for Development (www.sdnp.undp.org/it4dev)

World Summit for the Information Society (www.itu.int/wsis)

f.   ABBREVIATIONS

BBS	Bhutan Broadcasting Service
BCA	Bhutan Communications Authority
BCCI	Bhutan Chamber of Commerce and Industry
BNB	Bhutan National Bank
BPC	Bhutan Power Corporation
CSO	Central Statistical Organisation
DDA	Dzongkha Development Authority
DIM	Department of Information and Media
DIT	Department of Information Technology
DoP	Department of Planning
FDI	Foreign Direct Investment
GNH	Gross National Happiness
HRD	Human Resource Development
ICT	Information and Communications Technology
ITU	International Telecommunications Union
MDGs	Millennium Development Goals
MoA	Ministry of Agriculture
MoE	Ministry of Education
MoF	Ministry of Finance
MoH	Ministry of Health
MoHCA	Ministry of Home and Cultural Affairs
MoIC	Ministry of Information and Communications
MoLHR	Ministry of Labour and Human Resources
MTI	Ministry of Trade and Industry
PPD	Policy and Planning Division
R&D	Research and Development
RCSC	Royal Civil Service Commission
RGoB	Royal Government of Bhutan
RIM	Royal Institute of Management
RMA	Royal Monetary Authority
RUB	Royal University of Bhutan
UNDP	United Nations Development Programme
WiFi	Wireless Fidelity
WSIS	World Summit on the Information Society
WTO	World Trade Organisation

g.   EXPLANATORY NOTES

[1] The Digital Opportunity Initiative (DOI), a public private partnership of Accenture, the Markle Foundation and the United Nations Development Programme (UNDP), was launched at the G-8 Okinawa Summit in 2000, with the aim of identifying the roles that information and communication technologies (ICT) can play in fostering sustainable economic development and enhancing social equity. See www.opt-init.org.

[2] Bhutan is divided into 20 administrative regions, known as "Dzongkhags", and 201 sub-regional areas known as "Geogs".