

Focus Area 9 : Information Communication Technology and Knowledge Services

Introduction

Sri Lanka has invested a vast amount of resources for free education since 1945. Only a very few countries in the world provide free education for its citizens from the primary school to the university. Main product of this investment is a large pool of educated youths at different levels of educational attainments which provide ideal raw material for knowledge-led development. One of the ways of utilizing this valuable resource towards economic gain is to deploy them towards opportunities available in the recently emerged two fast growing sectors of the world: Information Communication Technology and Knowledge Services. Most of the graduates passing out from our universities with Mathematic, Physics, IT, Statistics, and Biology background are ideal candidates to grab opportunities available in these sectors. Students who have reached the Diploma level or even those who have been successful in GCE Advanced Level who could not gain admission to the universities may also be trained for specific employment opportunities in these sectors.

Of the multitude of areas that come under the ICT sector, one that has already well-established in Sri Lanka is the Information Technology (software industry) and Business Processes Out-sourcing (IT/BPO). Many leading information technology research advisory companies have rated Sri Lanka as a promising outsourcing destination for the IT/BPO sector. According to the last budget speech Sri Lanka has earned \$0.6 billion from the IT/BPO sector. It is expected that IT/BPO sector will become a major foreign exchange earner in the country with the potential of creating 150,000 employment opportunities by 2020. Further, Sri Lanka's IT/BPO industry has set its vision to achieve US\$ 5 billion in export by 2022 while generating 200,000 jobs and creating 1,000 start-ups in this process. Even though Sri Lankan universities are producing qualified graduates who can take up opportunities in this sector, the supply rate is no match to the projected demand for next 5 years. Many universities, having understood this situation are striving hard to expand their IT/Computer science education. Another important factor is that

the BPO sector could bridge the urban-rural divide as companies do not need to be based in Colombo thus paving the way forward for rural masses to get engaged from within their native environment.

Branding Sri Lanka as a fast emerging South Asian Knowledge Services Hub for selected niche areas, making critical infrastructure such as electricity cost competitive, providing attractive tax concessions, encouraging the development of infrastructure such as IT parks that will promote software companies are some of the progressive steps that may be needed to ensure the rapid development of the sector. There are several other important ICT areas such as Datafication, Big data analysis, and Financial Portfolio analysis that deserve our special attention. Sri Lankan companies may take advantage of this trend either undertaking outsourced jobs or entering into joint ventures with the well-established organizations. Bioinformatics, Mathematical Solutions to Real World Problems, Geophysical Data Processing, Architectural CAD Drafting and Designing (CAD), On-line-Legal Services, On-line-Tutoring are some of the knowledge services that we are competent to provide and make a rapid and continuous progress.

There are several new trends that are emerging in the ICT sector. Cloud computing, the Internet of things, Smart systems and 3D printing are some of them. It is often speculated that there is a strong possibility of revolutionizing the industries in the future as a result of these new trends. Cloud computing has the capability of spreading rapidly through the developing economies, with the potentially profound impacts on business costs. It may also provide opportunities for ground breaking innovations. Similarly enormous opportunities are opening up in the other areas mentioned above. It is therefore necessary to prepare future generation of Sri Lanka to make the best use of these emerging opportunities and educational institutions must take appropriate steps in capacity building in this direction.

Sub Areas, Issues and Relevant Interventions

Table 1: Sub Areas and Justifications

Thrust Areas	Sub Areas	Justifications
Information Communication Technology (ICT)	1) Information Technology(Software Industry) & Business Processes out-sourcing	IT//BPO sector is one of the rapid developing business/industries in Sri Lanka. With proper incentives and encouragement this sector can be expanded to ensure income increase in several folds while ensuring very high level of direct and indirect employment creation.
	2) Datafication (Using data as a critical resource and determinant of performance of business and government activity.)	Datafication which involves data storage and analysis in business and in government activity can be used to enhance performance level and gain competitiveness.
	3) Big data analysis (collection and analysis of very large and complex data sets that are difficult to process using traditional data processing applications. The challenges include capture, curation, storage, search, sharing, transfer, analysis and visualization.)	Big data has a great commercial value and many companies large and small increasingly depend on the analytical power of big data to take important decisions. Many governments also maintain extensive databases on citizens, business and organizations for national identity systems, education, health, social security etc. to identify priorities and take appropriate decisions. Very often this type work is outsourced providing opportunities Sri Lankan companies or joint ventures.
	4) Emerging Trends in ICT (Cloud Computing, The Internet of Things and Smart Systems, 3D Printing)	Sri Lankans should be competent in these emerging trends in ICT so that she can exploit ensuing opportunities.
Knowledge Services	5) Portfolio Analysis	Most business concerns throughout the world carry out portfolio analysis when taking important business decisions creating enormous opportunities for organizations providing such services and for those who are having the right qualifications. Required trained manpower is available in Sri Lanka.

Thrust Areas	Sub Areas	Justifications
	6) Bioinformatics (Development and implementation of tools to access and manage information, analysis and interpretation of data including nucleotide and amino acid sequences, protein domains and protein structures and development of algorithms and statistics to assess relationships in large data sets)	Sri Lanka possesses trained graduates and postgraduates in molecular biology, computer science, statistics etc. who can be trained to address these tasks successfully through the development of core competence in Bioinformatics by integrating required knowledge and skills of these disciplines. These algorithms could be useful for computer aided drug design and for testing genetic pre-disposition for certain disorders.
	7) Mathematical Solutions to Real world Problems	Many real world problems including those in engineering, software development, designing, traffic flow monitoring very often involve providing solutions to relevant mathematical problems. Sri Lankans who are highly competent in mathematics and statistics can be gainfully employed if the proper business environment is created.
	8) Geophysical Data Processing Processing	In upstream oil industry geophysical data processing which basically involves gravity, gravity gradiometry, magnetic and most importantly seismic processing play a crucial role. Suitably qualified Sri Lankan youths can be trained for these purposes.
	7) Architectural CAD Drafting and Designing (CAD)	Maneuverability of architectural plans and other designs (archiving, retrieving and improving accessibility) can be tremendously enhanced by converting them into Auto CAD drawings. There is a very high demand for Architectural CAD drafting and designing and technically competent Sri Lankans can be trained for this purpose.
	8) On-line-Legal Services	Obtaining on line legal services from real or virtual lawyers is becoming more and more popular today. A well balanced combination legal and computer personnel can gainfully exploit this trend.
	9) On-line-Tutoring	Throughout the world there is a very high demand for on-line tutoring at school level to postgraduate level. Some of these opportunities have already being grabbed by some of our neighbors. Educated Sri Lanka can exploit this opportunity if proper infra-structure facilities are provided.

Table 2: Issues/Problems, R&D Needs and Relevant Interventions

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
1) IT & BPO	I) Lack of skilled labour force in relation to anticipated future development plans II) Lack encouragement from the state (Tax concessions, making critical infra-structure cost effective, Establishment of IT parks etc.)	i) Capacity Building ii) Formulation of policies leading to required results	Capacity building Identify the gap between industry needs and skill level of graduates who completed the degree courses. Bridge the gap by introducing subjects catering for industry needs.
			Policy Studies Develop a policy document to encourage the IT/BPO sector
2) Datafication	I) Lack of relevant Policies II) Lack of knowledge of datafication and its applications	i) Policy Formulation ii) Popularization iii) Capacity Building	Policy Studies Develop policies for Datafication
			Popularization Implement strategies to popularize Datafication and its applications among the community
			Capacity Building Arrange training program on Datafication and its application
3) Big Data Analysis	I) Lack of encouragement to venture into new areas.	i) Policy Formulation	Policy Studies Develop policies for Big Data Analysis
4) Emerging Trends in ICT	I) Lack of knowledge of emerging trends in ICT	i) Popularization, Capacity Building and Policy Studies	Popularization Find the ways and means to popular emerging trends in ICT among the community

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
			Capacity Building Create awareness about Emerging Trends in ICT
5) Portfolio Analysis	I) Lack of sufficient encouragement to expand the industry	i) Policy Formulation	Policy Studies Formulate a policy to encourage and expand the Portfolio Analysis
6) Bioinformatics	I) Lack of sufficient encouragement to expand the industry	i) Policy Formulation ii) Popularization iii) Capacity Building	Policy Studies Formulate a policy to encourage and expand the Bioinformatics Popularization Implement strategies to create awareness on Bioinformatics Capacity Building Conduct training programs on Bioinformatics
7) Mathematical Solutions	I) Lack of sufficient encouragement to expand the industry	i) Policy Formulation ii) Popularization iii) Capacity Building	Policy Studies Formulate a policy to encourage and expand the Mathematical Solutions Popularization Implement strategies to create awareness on Mathematical Solutions Capacity Building Conduct training programs on Mathematical Solutions

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
8) Geophysical Data Processing	I) Lack of sufficient encouragement to commence and expand the industry	i) Policy Formulation ii) Popularization iii) Capacity Building	Policy Studies Formulate a policy to encourage Geophysical Data Processing
			Popularization Implement strategies to create awareness on Geophysical Data Processing
			Capacity Building Conduct training programs on Geophysical Data Processing
9) Architectural CAD Designing	I) Lack of sufficient encouragement to commence and expand the industry	i) Policy Formulation ii) Popularization iii) Capacity Building	Policy Studies Formulate a policy to encourage Architectural CAD Designing
			Popularization Implement strategies to create awareness on Architectural CAD Designing
			Capacity Building Conduct training programs on Architectural CAD Designing
10) On-line-Legal Services	I) Lack of sufficient encouragement to commence and expand the industry	i) Policy Formulation ii) Popularization iii) Capacity Building	Policy Studies Formulate a policy to encourage On-line-Legal Services

Sub Areas	Issues/Problems	Research and Development Needs	Relevant Interventions
			<p>Popularization Implement strategies to create awareness on On-line-Legal Services</p> <p>Capacity Building Conduct training programs on On-line-Legal Services On-line-Legal Services</p>
<p>11) On-line-Tutoring</p>	<p>I) Lack of sufficient encouragement II) Lack necessary technical support</p>	<p>i) Policy Formulation ii) Popularization iii) Capacity Building</p>	<p>Policy Studies Formulate a policy to encourage On- line- Tutoring</p> <p>Popularization Implement strategies to create awareness on On-line-Tutoring</p> <p>Capacity Building Conduct training programs on On-line- Tutoring</p>

***Table 3: Interventions and Key Performance Indicators**

Sub Areas and Issues/Problems	Interventions/Activities									
	Policy Studies	Pure and Applied Research	Innovation	Information and Communication Technologies	Nanotechnology	Biotechnology	Indigenous Knowledge & Intellectual Property Rights(IPR)	Testing, Standardization & Accreditation	Capacity Building	Popularization
1) Datafication,										
i) Lack of relevant detailed Policy	Policy Formulation	Feasibility Studies							Capacity Building	Improve the awareness
Time Frame(TF)	2 years	2 years							3 years	3 years
KPIs	Completed Policy Doc.	Completed Report							No. Persons Trained	No. Pop. Programmes Docs.
Lead Institute (LI) Lack of Knowledge of Datafication	ICTA	NSF							HEIs/NSF	ICTA/NSF/HEIs

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