



Technology Landscape For Mauritius

NRFE draft Working Paper 13/11

1.0 Introduction

A technology index is a measurement that denotes the technological readiness of a country. It is a composite index created with the following indicators namely: R&D, the creativity of its scientific community, personal computer and internet penetration rate. The benefit of this index is that it does not only focus on hard technology development but also on soft technology development aspects that are responsible for emerging technological development in a country. Hence, such an index is more appropriate for Mauritius.

2.0 Technology definition

Technology is mere extensions of human capacity. It is a term that encircles itself under three aspects namely: science, policy and, economics. In this context, the global technology index 2011 was built from three principal categories of technology namely: innovation capability, technology transfer and diffusion of new ICT.

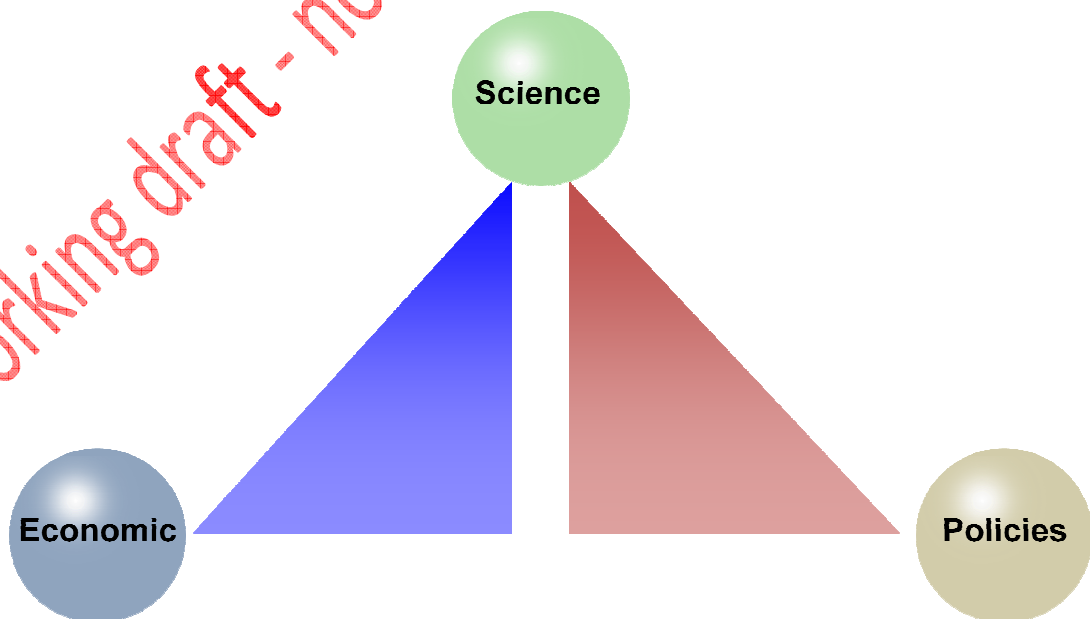


Figure 1: Technology triangle

3.0 Technology indicator measurement

Since, Mauritius is a non-core innovator or a non-core economies country therefore the main index required for calculating technology are: innovation index, technology transfer index and ICT index (J. W. MCARTHUR & J.D. SACHS, 2000).

Technically, the Technology Index calculation may be given as:

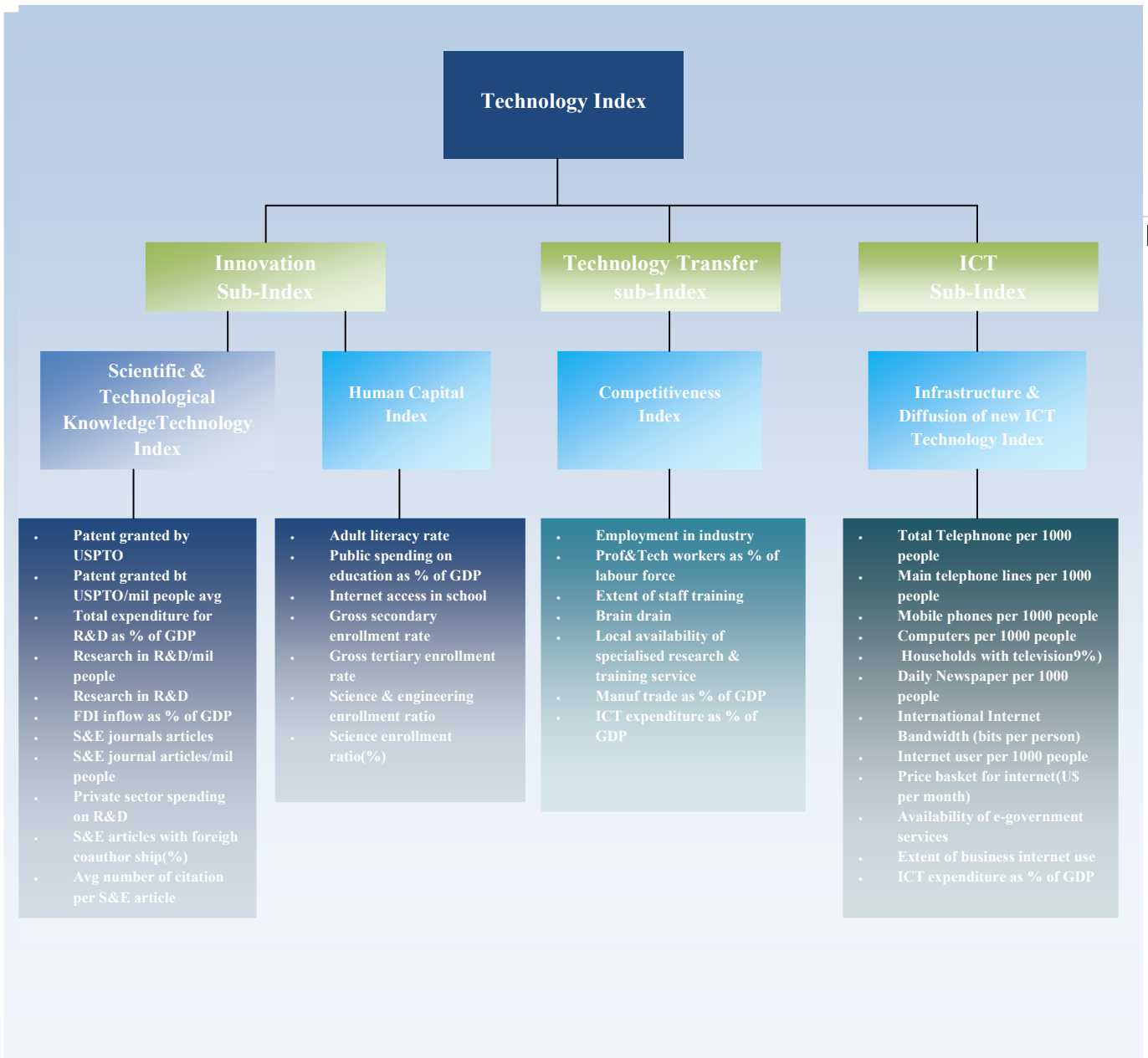
Core innovators TI = $1/2$ Innovation-index + $1/2$ ICT-index.

Non-core innovators TI = $1/8$ Innovation-index+ $3/8$ technology transfer- index+ $1/2$ ICT-index. (Each index is composed of several variables)

Based on the information retrieved from "The technological capabilities of nations: State of art of synthetic indicator by D.Archibugi, M. Denni & A. Filippetti, 2009", the three sub-indices have been further subdivided to generate four technology indices namely: Scientific & technological knowledge technology index, human capital index, competitiveness index and, infrastructure and diffusion of new ICT technology index.

In order to measure the above mentioned indices, technology indicators were retrieved from the World Bank. This is best illustrated in figure 1.

Somehow, in this study data from the World Economic Forum was also used to project technological changes between Mauritius and Switzerland. The main idea behind this attempt was to analyze the growth potential indices that reflect a critical element of the growth process of a national economic system.



TECH adapted from info.worldbank.org

Figure 1: Structure of technology index

RESULTS

Chart 1: Technological system for Mauritius

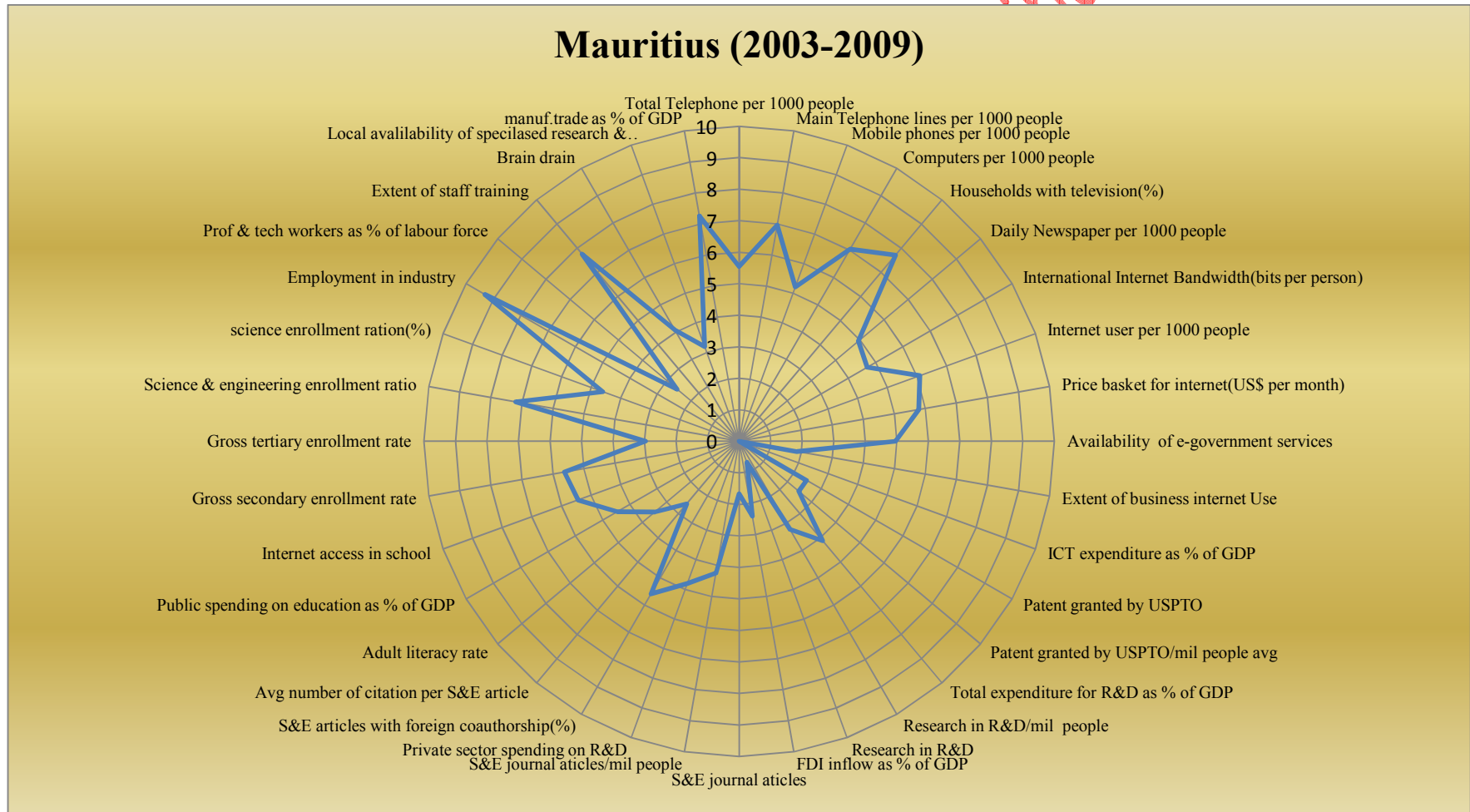
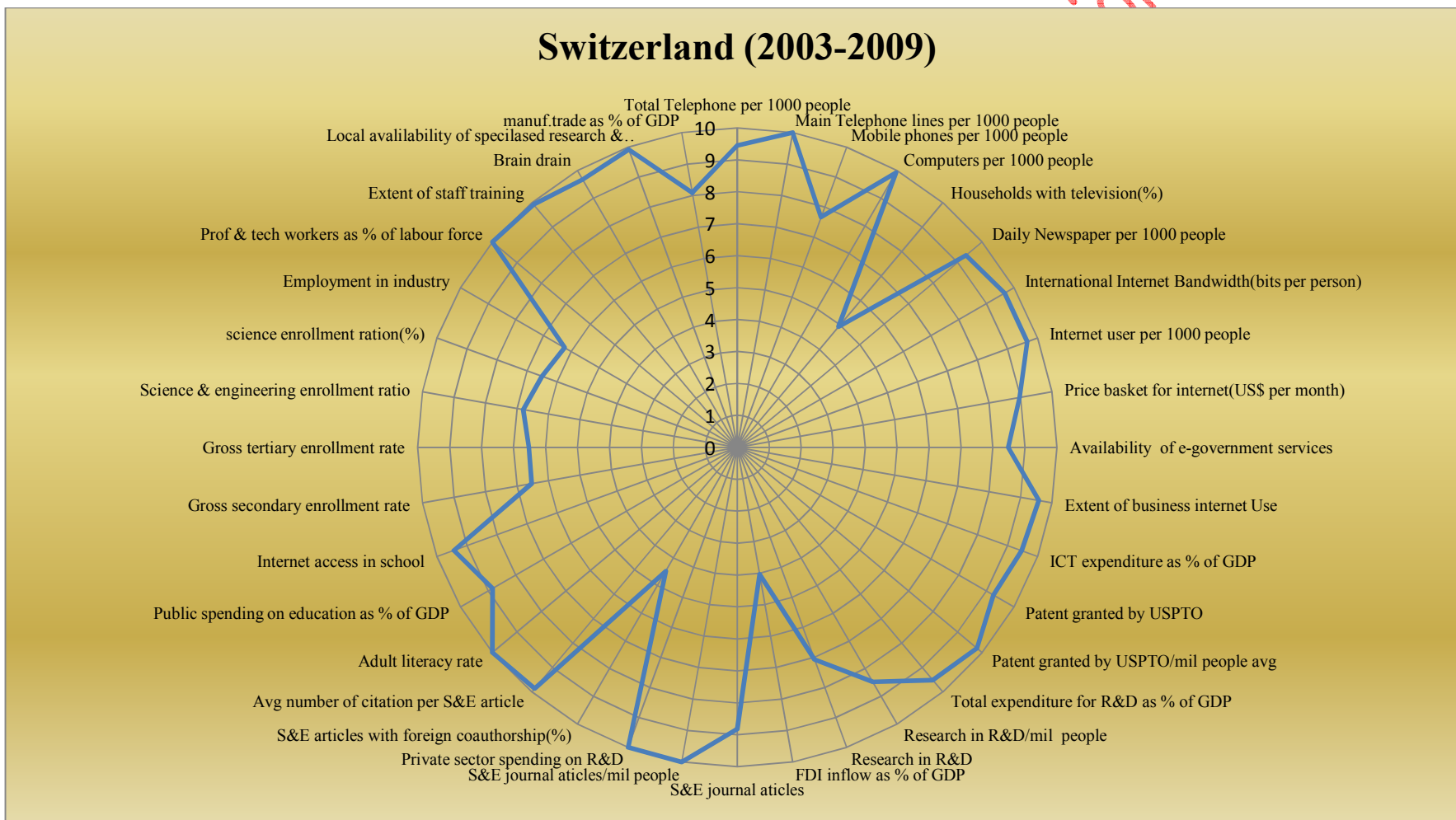


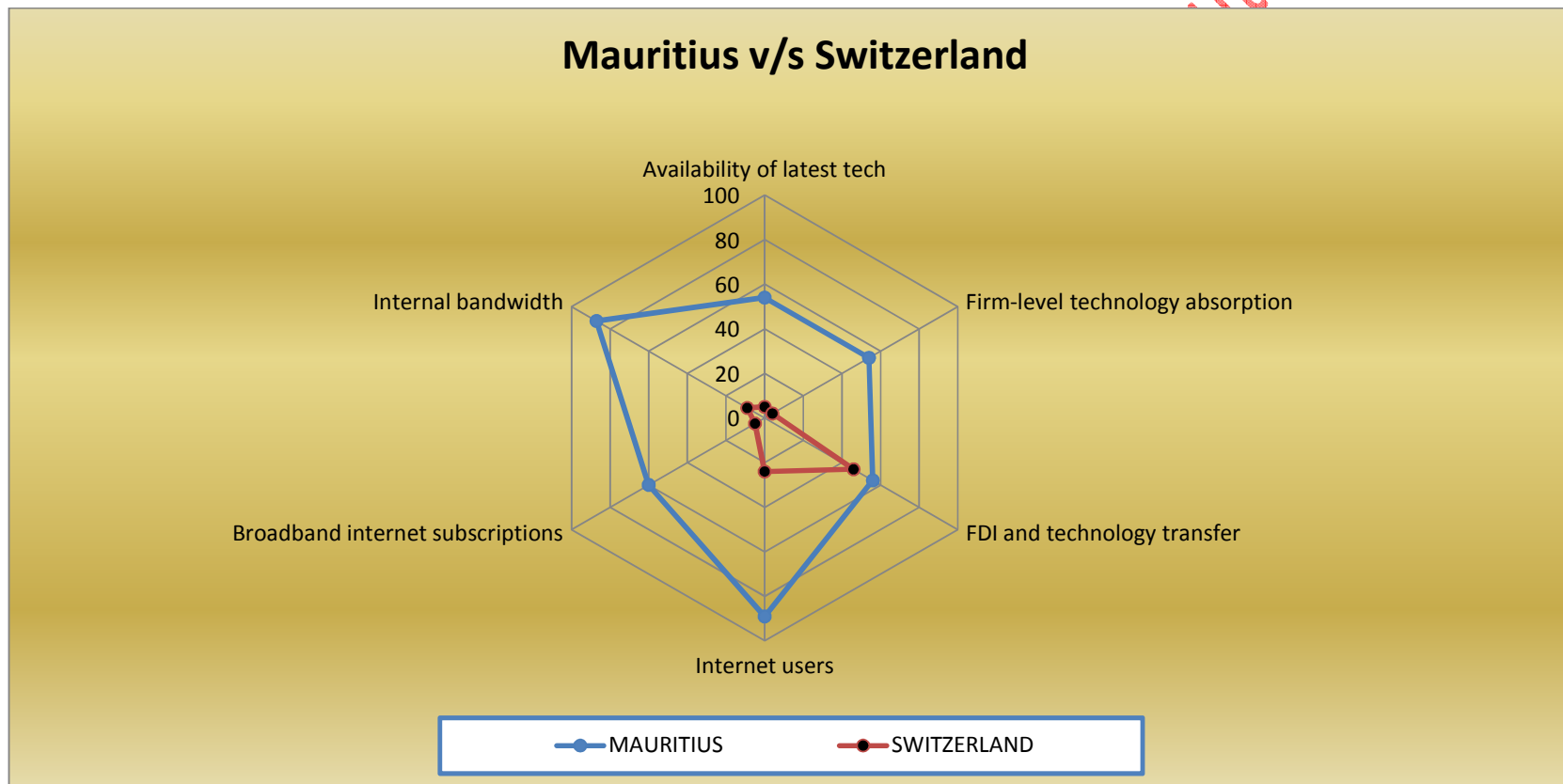
Chart 1: Technological system for Switzerland



Source: info.worldbank.org

4.0 Mauritius Fare

Comparing ranks between Mauritius [GTI ranking of 43] and Switzerland [GTI ranking of 7]



Source: www.nationmaster.com

4.1 Results for Mauritius, United state & Switzerland

Mauritius ranks 43rd out of 139 countries. While Switzerland ranks 7th with a score of 6.24 respectively. The table below summarises the principal indicator used for the GTI.

Table 1.0: Most recent technological index for Mauritius & Switzerland (2003-2009)
source: info.worldbank.org

Variable	United state		Switzerland		Mauritius	
	actual	normalised	actual	normalised	actual	normalised
Infrastructure & Diffusion of New ICT						
Total Telephone per 1000 people	1.390.00	7.33	1.740.00	9.45	1.030.00	5.55
Main Telephone lines per 1000 people	540	9.31	650	10	290	6.97
Mobile phones per 1000 people	850	5.96	1.090.00	7.67	740	5.21
Computers per 1000 people	810	9.72	920	9.93	180	7.04
Households with television(%)	95	7.29	86	4.93	96	7.71
Daily Newspaper per 1000 people	194	8.18	429	9.35	77	4.94
International Internet Bandwidth(bits per person)	11.277.00	8.69	29.417.00	9.66	226	4.69
Internet user per 1000 people	740	9.45	760	9.66	270	6.1
Price basket for internet(US\$ per month)	14.95	6.21	7.9	8.97	16.43	5.79
Availability of e-government services	5.79	9.44	5.38	8.48	3.83	4.96
Extent of business internet Use	5.5	9.15	5.6	9.58	3	1.86
ICT expenditure as % of GDP	7	8.67	8	9.47	n/a	n/a
Scientific & Technological Knowledge						
Patent granted by USPTO	94.252.40	10	1.322.40	9.25	0.00	2.47
Patent granted by USPTO/mil people avg	318.06	10	177.82	9.79	0	2.47
Total expenditure for R&D as % of GDP	2.61	9.31	2.93	9.51	0.38	4.12
Research in R&D/mil people	4.651.32	9.19	3.436.12	8.48	184.29	3.23
Research in R&D	1.394.682.34	10	25.400.00	7.07	231	0.71

FDI inflow as % of GDP	0.81	0.78	2.73	4.04	1.62	2.41
S&E journal articles	205.475.42	10	8.762.20	8.82	15.43	1.67
S&E journal articles/mil people	694.42	9.1	1.178.17	10	12.41	4.24
Private sector spending on R&D	5.8	9.92	6	10	3	4.8
S&E articles with foreign coauthorship(%)	26.6	0.49	59.32	4.48	67.86	5.59
Avg number of citation per S&E article	3.35	10	3.2	9.86	0.99	2.59
Human Capital Index						
Adult literacy rate	100	10	100	10	87.41	3.49
Public spending on education as % of GDP	6	8.84	6	8.84	4	4.46
Internet access in school	5.9	9.28	6	9.44	3.5	5.44
Gross secondary enrollment rate	93.89	6.67	92.69	6.53	87.81	5.63
Gross tertiary enrollment rate	81.68	9.57	47	6.52	13.96	2.97
Science & engineering enrollment ratio	15.56	2	24.1	6.8	24.27	7.2
science enrollment ration(%)	8.89	4.7	10.72	6.5	8.86	4.6
Competitiveness Index						
Employment in industry	21	4.79	23	6.24	32	9.32
Prof & tech workers as % of labour force	20.69	5.33	39.3	10	12.61	2.57
Extent of staff training	5.5	9.68	5.8	9.92	4.6	7.76
Brain drain	6.1	10	5.3	9.68	3	4.08
Local availability of specialised research & training service	6.1	10	6	9.92	3.6	3.2
manuf.trade as % of GDP	16.79	1.15	68.05	8.09	55.31	7.25

5.0 Results of relevance to the Ministry of Information & Telecommunication Technology

According to GTI 2011, Mauritius was ranked 73rd in Information & Communication technology with a global score of 2.33. Mauritius is also poised to become a cyber island that will serve as info -communications hub in the region. In this respect, four composite indexes were identified for Mauritius, namely:

- 1) ICT goods import; decreased from 13.15% to 4.18% for the year 2005 to 2009

- 2) ICT goods export; increased from 2.28% to 3.67%
- 3) Mobile cellular subscription; the highest commodity in demand with 52.83 subscriptions per 100 people in 2005 to 85.21 subscriptions in 2009.
- 4) ICT service export; increased from 2.28% to 3.67% for the year 2005 to 2009

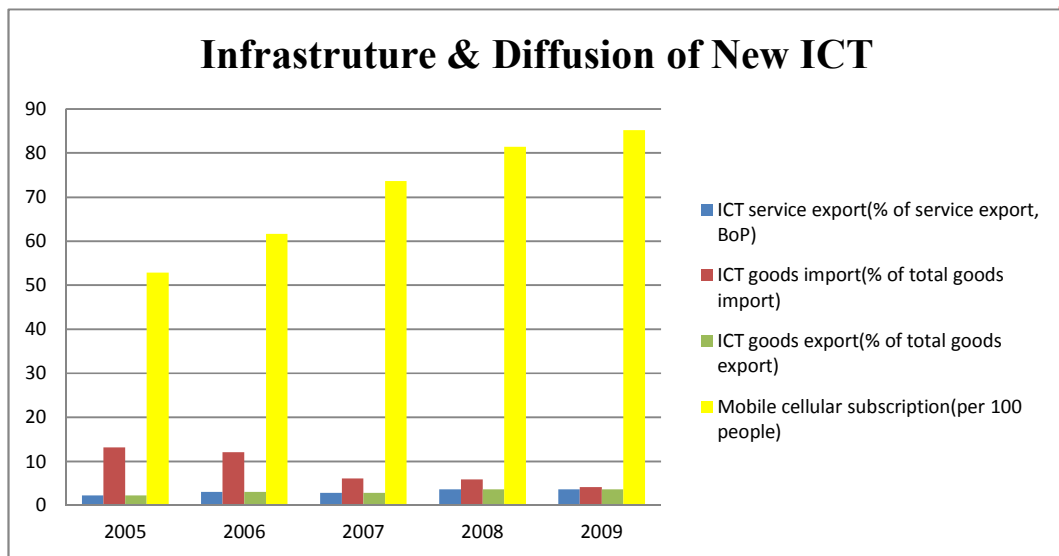


Figure 4: Data for infrastructure & diffusion of New ICT sub-indices for year 2005 to 2009

Similarly, for the competitiveness index the share of high technology export sub-index was analyzed for Mauritius. The high technology export products include: chemicals and allied goods; machinery; electrical and electronic equipment; spare parts of motor vehicles and finally transportation equipment. As shown in figure 5, the share of high technology export record a maximum of 24.11% in year 2006 and a minimum of 1.12% in 2009.

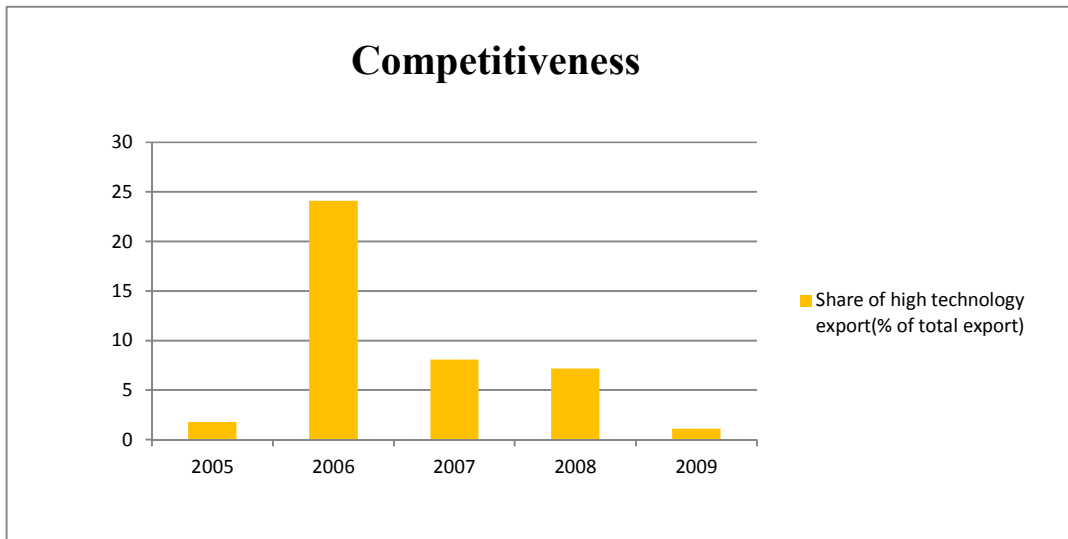


Figure 5: Data for competitiveness sub-index for year 2005 to 2009

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