

Eye Witness Account: The Role of IT and Data Management in Expansion and Change at a Remote Research Unit in Kenya

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Tom Oluoch - KEMRI/Wellcome Trust,
Kilifi, Kenya

Background

- KEMRI/Wellcome Trust
 - Collaborative Malaria Research Project between Kenyan scientists and counterparts from Oxford University etc since 1989.
 - Kilifi is 60km north of Mombasa, one of poorest districts in Kenya, high malaria prevalence and infant mortality rate.
 - Unit holds large clinical, laboratory, demographic databases
 - ICT has affected the way research is done at the Unit.

Previously ...

- Data Management

- Data recorded on paper q'naires and double entered
- Standalone Databases for Clinical, Lab, Census data
- Access only through Data Managers

- Connectivity

- Dial-up Access via terrestrial lines through an analogue exchange. Data rate $\sim 9,600$ bps (approx. 10% achieved).
- Unreliable, costly, low quality

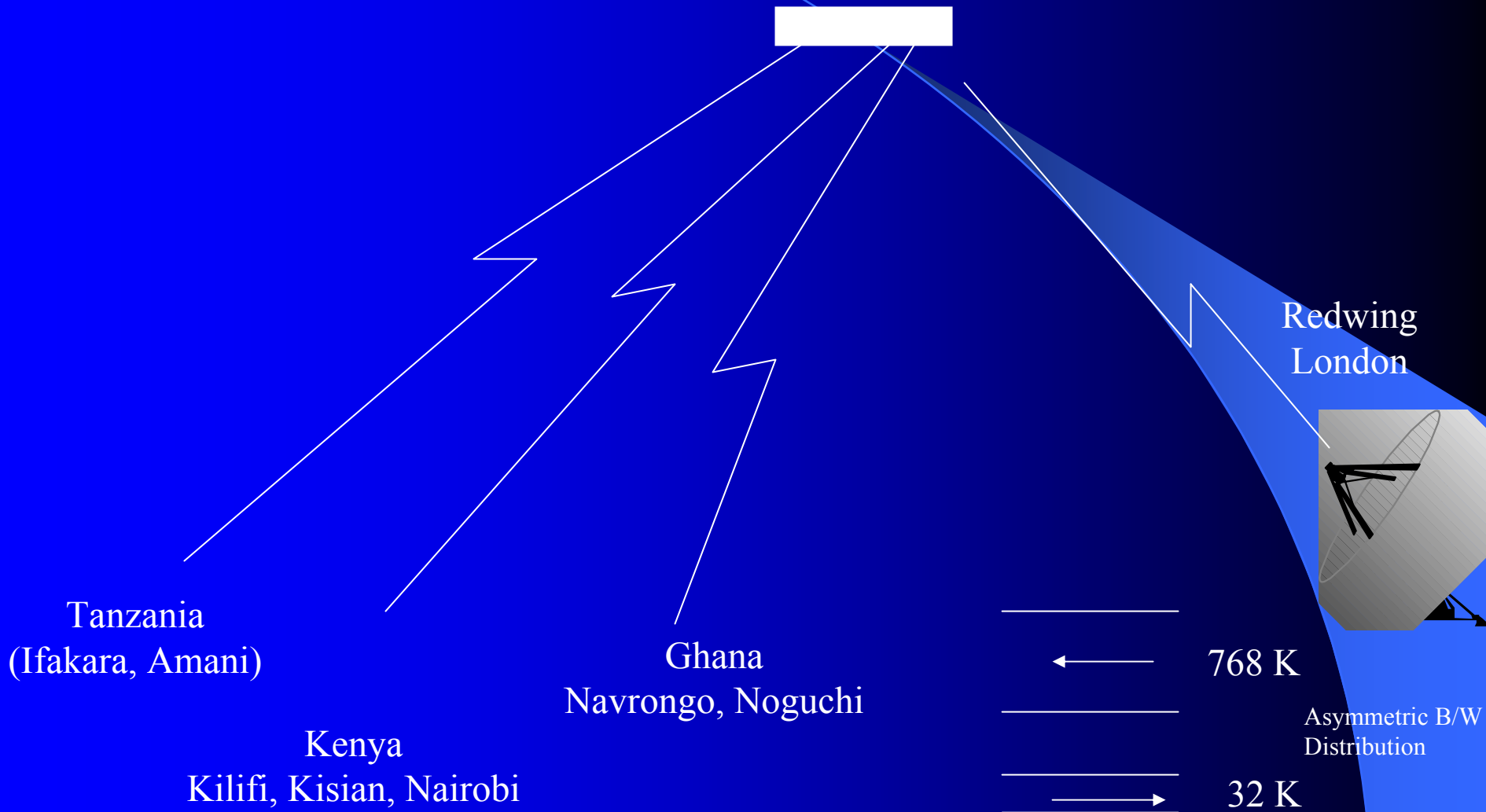
Previously ...

- Information Access (Library)
 - Subscription to paper based journals
 - Medline searches on CD-ROM
 - Circulation of photocopies of papers
 - Physical visit to library
 - Physically meet to discuss papers

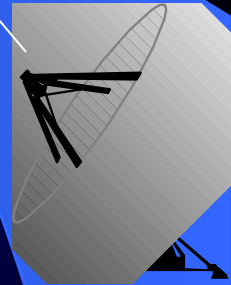
ICT Infrastructure at the Unit

- Massive Expansion of PC installations
 - 25 standalone in 1998 to 102 networked in 2002.
 - 3 servers – 2 configured as file, mail, print and web proxy servers and the other as a dedicated database server.
 - Expansion based on demand as a result of increased research activity and need for fast information exchange.
- Connectivity
 - VSAT link courtesy of the NLM – July 1999
 - Data rate: 32Kbps outbound, 768Kbps shared (BE ~ 512K)

MIMCOM NETWORK



Redwing
London



768 K

Asymmetric B/W
Distribution



32 K

Satellite Dish at Kilifi



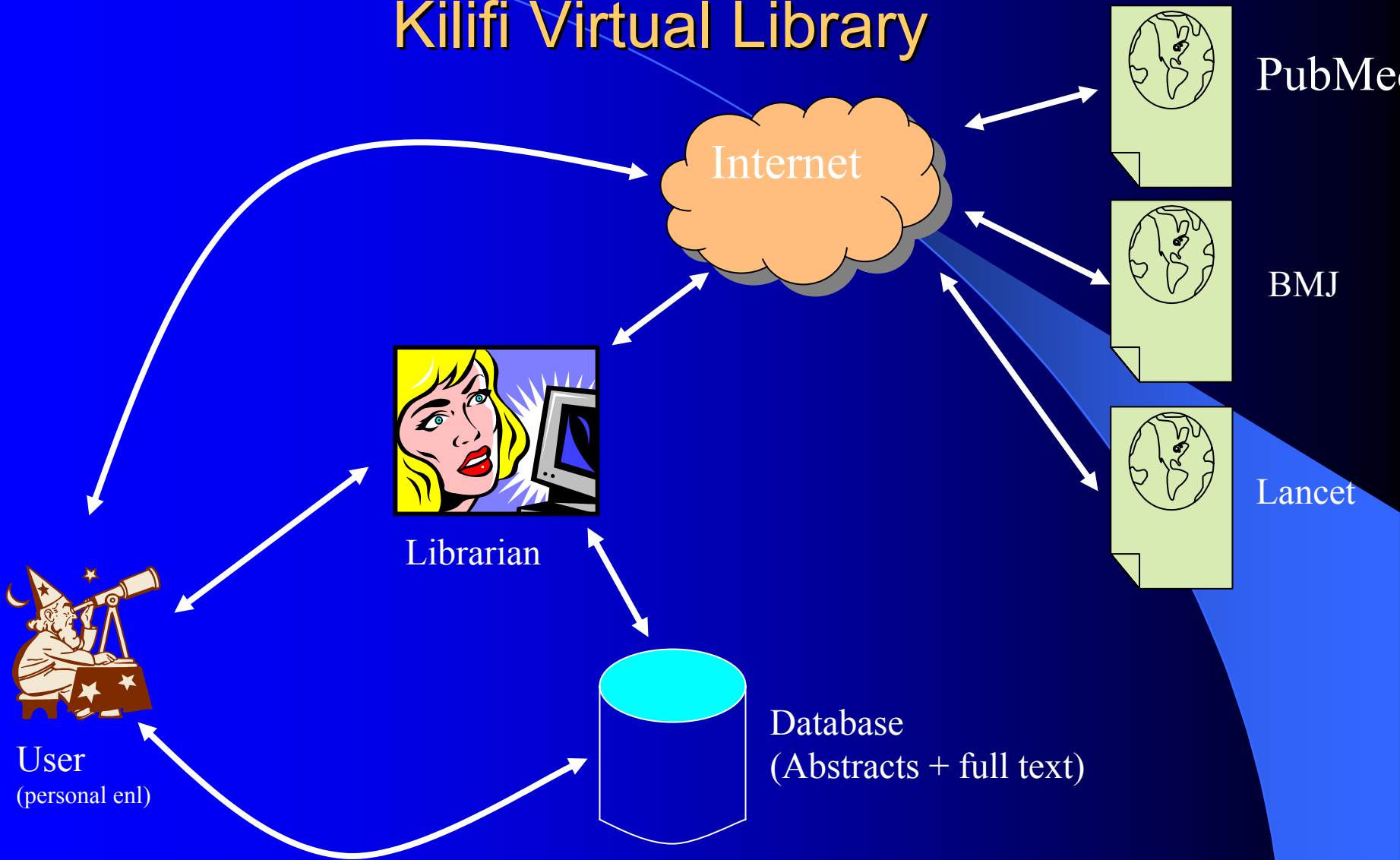
Adding Value to Infrastructure

- Kilifi Virtual Library
- Online Admission System
- Centralised Data Access
- Laboratory Data Capture System

Kilifi Virtual Library

- In-house centralised system, developed to give researchers easy access to online resources.
 - Librarian updates content
 - Abstracts stored as part of an indexed searchable database
 - Researchers use EndNote to search virtual library
 - Populated using entries from PubMed to standardise entry of references
 - e-TOC groups exchange TOCs from latest journals
 - Journal Web Database (JWD) gives journal info to users

Kilifi Virtual Library



Kilifi Virtual Library

FileMaker Pro - [Kvl]

File Scripts Help

Kilifi Virtual Library showing 1254 / 1254 refs

[show subset](#)

unit	name	year	journal	title
	Chalasanani N	1995	Chest	Clinical utility of blood cultures in adult patients with community- acquired pneumonia without defined underlying
	Gessner B	1995	Pediatr Infect Dis J	Risk factors for invasive disease caused by Streptococcus pneumoniae among Alaska native children younger
	Henrichsen	1995	Journal of Clinical	Six newly recognized types of Streptococcus pneumoniae
	Zalacain R	1995	Chest	Influence of three factors on the diagnostic effectiveness of transthoracic needle aspiration in pneumonia
	Falquera M	1996	Chest	Detection of Mycoplasma pneumoniae by polymerase chain reaction in lung aspirates from patients with
	Lautenschlaa I	1996	J Clin Microbiol	Immunodetection of Pneumocystis carinii in bronchoalveolar lavage specimens compared with methenamine
	Mirzanejad Y	1996	Chest	Pneumococcal bacteremia in two tertiary care hospitals in Winnipeg, Canada. Pneumococcal Bacteremia Study
	Ortovist A	1996	Chest	Oral empiric treatment of community-acquired pneumonia. A multicenter, double-blind, randomized study
	Shaheen S	1996	Bmi	Cell mediated immunity after measles in Guinea-Bissau: historical cohort study
	Tamburrini E	1996	J Clin Microbiol	Detection of Pneumocystis carinii DNA in blood by PCR is not of value for diagnosis of P. carinii pneumonia
	H	1997	Report	Antimicrobial and support therapy for bacterial meningitis in children.
	Finch D	1997	Chest	The utility of a single sputum specimen in the diagnosis of tuberculosis. Comparison between HIV-infected and
	Nauer C	1997	Infect Immun	Plasmodium falciparum- and merozoite surface protein 1-specific antibody isotype balance in immune
	Ceneviva G	1998	Pediatrics	Hemodynamic support in fluid-refractory pediatric septic shock
	Concepcion N	1998	Clinical and	Evaluation of previously assigned antibody concentrations in pneumococcal polysaccharide reference serum
	Crook J	1998	Clinical and	Immunoreactivity of five monoclonal antibodies against the 37- kilodalton common cell wall protein (PsaA) of
	French N	1998	AIDS	Pneumococcal vaccination in HIV-1-infected adults in Uganda: humoral response and two vaccine failures
	Helweg-Larse J	1998	J Clin Microbiol	Diagnostic use of PCR for detection of Pneumocystis carinii in oral wash samples
	Ishida T	1998	Chest	Etiology of community-acquired pneumonia in hospitalized patients: a 3- year prospective study in Japan [see
	Levine M	1998	Pediatr Infect Dis J	Epidemiology of invasive pneumococcal infections in infants and young children in Metropolitan Santiago, Chile,
	Rolland K	1998	Microbiol	Shigella and enteroinvasive Escherichia coli strains are derived from distinct ancestral strains of E. coli
	Torres J	1998	Chest	Streptococcus pneumoniae bacteremia in a community hospital
	Totapally B	1998	Chest	Pneumococcal bacteremia in childhood: a 6-year experience in a community hospital
	Bernstein J	1999	Chest	Treatment of community-acquired pneumonia-IDSA guidelines. Infectious Diseases Society of America
	Bhutta Z	1999	Pediatrics	Zinc supplementation in malnourished children with persistent diarrhea in Pakistan
	Bulow S	1999	Pediatrics	Prednisolone treatment of respiratory syncytial virus infection: a randomized controlled trial of 147 infants
	Cambell G	1999	Chest	Commentary on the 1993 American Thoracic Society guidelines for the treatment of community-acquired
	Doriao-Zetsem J	1999	J Clin Microbiol	Comparison of PCR, culture, and serological tests for diagnosis of Mycoplasma pneumoniae respiratory tract
	Feldman C	1999	Chest	Bacteremic pneumococcal pneumonia in HIV-seropositive and HIV- seronegative adults
	Garlv M	1999	Int J Epidemiol	Early two-dose measles vaccination schedule in Guinea-Bissau: good protection and coverage in infancy
	Goodman C	1999	Health Policy Plan	The evidence base on the cost-effectiveness of malaria control measures in Africa
	Cerulick M	1999	Pediatrics	Corrosive tests for urinary tract infection in children: a meta-analysis

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100 Browse

Kilifi Virtual Library

FileMaker Pro - [Kvl]

File Scripts Help



Kilifi Virtual Library

record 10 of a display of 1254

Authors	Unit publication	Keywords
Tamburrini, E.	no	AIDS-Related Opportunistic Infections/diagnosis/microbiology
Mencarini, P.	Journal J Clin Microbiol	Base Sequence
Visconti, E.		DNA Primers/genetics
Zolfo, M.	Year 1996	DNA, Fungal/*blood/*genetics
De Luca, A.	Volume 34	False Negative Reactions
Siracusano, A.	Number	Human
Ortona, E.	Pages 1586-8	Leukocytes, Mononuclear/microbiology

Title
Detection of Pneumocystis carinii DNA in blood by PCR is not of value for diagnosis of P. carinii pneumonia

Abstract
A nested PCR which amplified a portion of the mitochondrial large-subunit rRNA gene of Pneumocystis carinii was used to detect P. carinii DNA in blood from patients with P. carinii pneumonia. P. carinii DNA was not detected in serum and was detected at low levels of blood cells.

NLM citation  

100 Browse

Kilifi Virtual Library (JWD)

Wellcome Trust / KEMRI-Centre for Geographic Medicine Research - Coast

Kilifi Library: JOURNAL WEB DATABASE

To visit a journal's website, click on the name of the journal. The table indicates whether we have an active subscription to the paper edition and the facilities and access restrictions to the electronic edition. Online access implies that we are able to download full text articles, usually as PDF. If you would like to receive regular e-mails with tables of contents, click the toc cell for the appropriate journals. The last column indicates the Wellcome Trust abbreviated citation scale for the journal.

Website	Paper	Web facilities	Since	Access	Online	e-TOC	WT scale
Acta Tropica	N	full text / pdf	1-Mar-98	-	Y	toc	1
Afr J Health Sci	Y	none	-	-	N	n/a	n/a
Afr J Nursing Midwifery	Y	none	-	-	N	n/a	n/a
AIDS	Y	full text / pdf	1-Jan-97	free to subscribers	Y	n/a	3
Am J Clin Nutr	N	full text / pdf	1-Jan-98	free 12 months old	N	toc	3

Online Admission System

- Data entered in real time at point of admission
 - Data entered by FW and MOs
 - Data almost readily available once committed to the DB
 - Single data entry

Online Admission System

FileMaker Pro - [admissions]

File Scripts Help

admissions register clinical prescribe inpatients studies results home

Displaying a total of 2 patients

Serial no.	names	age	sex	temp	pulse	O ₂ sat	date	time	FW	MO/CO	± ?
54207	Priscilar Yawa	8 y 4 m	f	38.6	135	97	27 Sep	12:52	BKB		46
54165	Kelvin Luvaga	2 y 6 m	m	37.6	172	100	22 Sep	23:03	NKS	MMB	1

new pt FW MO drugs delete archive missing results reports E Labels

100 Browse

Success Stories

- Increase in amount of scientific data downloaded (weekly statistics – sawmill logs).
- Faster, reliable exchange of data, incl. e-groups.
- Fewer data entry clerks, info available almost immediately, near paper-less environment.
- Data Dictionaries and Metadata can be shared electronically, making it easy to understand datasets.
- Data can be accessed from nearly any computer at the unit.

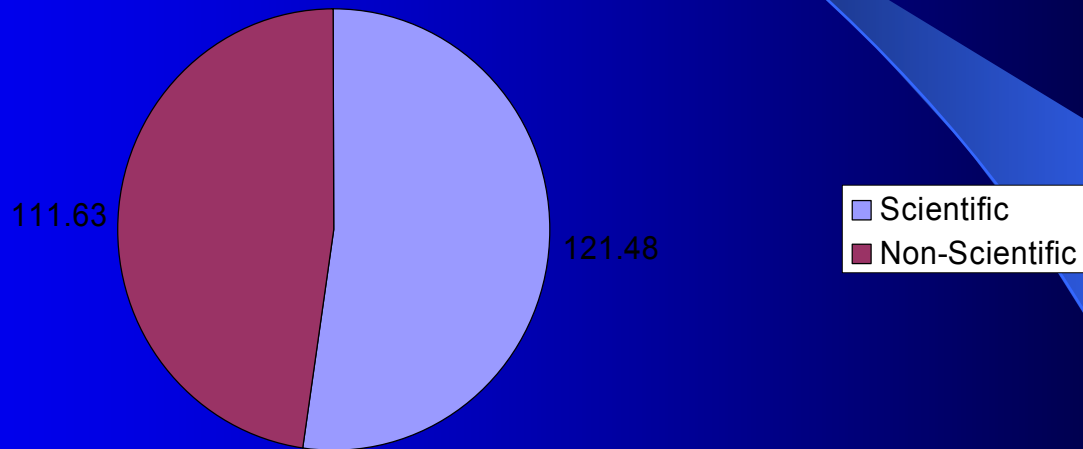
Problems

- Resistance to change
- Maintenance (down time, unavailable parts, power supply)
- Weaknesses of single data entry (not yet evaluated)
- Inappropriate use of systems (sawmill logs)

Bandwidth Utilisation Data

	Page or Directory	Bandwidth (MB)
1	http://download.adobe.com/pub/	38.71
2	http://www.statsoft.com/download/	23.61
3	http://lw9fd.law9.hotmail.msn.com/cgi-bin/	17.27
4	http://www.statsoft.com:443	15.90
5	ftp://ftp.hawaii.edu/outgoing2/	15.45
6	http://bannerserver.gator.com/bannerserver/	15.13
7	http://nationaudio.com/News/	13.77
8	http://lw12fd.law12.hotmail.msn.com/cgi-bin/	10.36
9	http://warp1.aling.net/KISS100-IN/	09.88
10	http://sea2fd.sea2.hotmail.msn.com/cgi-bin/	09.61
11	http://www3.jasc.com/pub/	08.79
12	http://www.ncbi.nlm.gov/entrez/	08.56
13	http://us.greet1.yimg.com/img.greetings.yahoo.com/	08.56
14	http://a1408.g.akamai.net/5/	06.32
15	http://www.journals.uchicago.edu/JID/	06.02
16	http://login.yahoo.com/config/	05.89
17	http://us.a1.yimg.com/us.yimg.com/	05.41
18	http://lw10fd.law10.hotmail.msn.com/cgi-bin/	04.97
19	http://www.rotary.org/newsandinfo	04.46
20	http://arconline.esri.com/arconline/	04.44
	Total	233.11

Bandwidth Utilisation



Source: Sawmill Data for week 23/09 – 27/09

Conclusions and Future Works

- ICT has changed the way things are done
 - The way data is collected and processed
 - The way data is accessed
- Access to more online resources
- Comprehensive study to assess the true impact:
 - Papers published etc
 - Data quality using single entry
 - Reluctance by some scientists to adopt.