DFID Internet Costs Study

Appendix E: Country Case Study: Uganda

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Executive Summary

Key Features of the Market in Uganda

The population of Uganda is 22million, with 10 million under 16 years old. Greater Kampala has an adult population (16+) estimate of 1.1 million people.

There are currently 350,000 fixed network telephone lines in Uganda (teledensity rate of 1.6). The number of mobile subscribers overtook the number of fixed lines in June 2000.

While fixed line rental at $6.73 per month is fairly low, the price, including VAT at 17%, of dial-up calls is high at $3.07/hour for local daytime and $8.07/hour for national daytime calls.

Network quality for data tends to be poor (19 kbps – 22 kbps in Kampala, less in rural areas where local loops are long and cable joints are suspect).

There are 13 licensed ISPs, with about 8,500 customer accounts and over 80,000 individual users.

Total Cost of Internet Service to Customers

Total costs of Internet access are high in Uganda. The average user in Kampala pays a total of $82 per month for 10 hours of full Internet access per month. Including VAT, this amounts to $96 per month. Outside Kampala, the high cost of phone calls drives the cost up to $146 including VAT.

Significance of International Bandwidth

For the dial-up Internet customer living in Kampala, who requires full Internet access and spends the average 10 hours per month online, the proportion of their total service cost that can be ascribed to international bandwidth is 18%. This figure comes down to 6% for an urban e-mail only user spending 10 hours per month online. However, for heavy users at 30 hours per month on-line, the figure is as high as 33%.

The prospect of cutting down the use and cost of, and eventually the dependence on, international bandwidth, is of significant importance to Uganda. While there are so many hurdles to overcome, and Internet

subscription prices are so high compared to local income levels, every reduction in cost can be reflected in lower prices, thus stimulating the market significantly.

Significance of Telephone Call Charges

Call prices are high in Uganda, and the lack of a flat Internet access rate places particular burdens on subscribers outside Kampala who are forced to make long-distance calls.

For the dial-up Internet customer living in Kampala, who requires full Internet access and spends the average 10 hours per month online, the proportion of their total service cost that can be ascribed to telephone call charges is 32%. For the rural market, the figure is significantly higher at 55%. UTL (Uganda Telecommunications Ltd – the incumbent national operator) should give a substantial discount to national calls that are made to ISP telephone numbers. A revenue sharing arrangement with UTL and/or MTN (the second national operator) would allow the ISPs to reduce prices significantly and stimulate the Internet market.

Industry Structure and Regulation

A major concern for the existing ISPs is that UTL, and to a lesser extent MTN, will exploit their positions as fixed and mobile network operators to favour their own ISP activity over those of the independent competitors. Given the dominance of inland call charges in ISP costs, this is a significant concern. There is a clear need for monitoring of the situation by the Regulator, and for regulatory intervention to force equal trading by the fixed and mobile network operators with all ISPs, whether owned or not. The regulator may need some transitional support to achieve this.

There are currently 8 International Data Gateway (IDG) licence holders and since an agreement dated 27 July 2000 no further IDG licences will be issued. Other ISPs therefore need to obtain international access via one of the existing IDG licensees. An IDG licence costs $4000 annually.

A Ugandan Internet Exchange

The Ugandan IXP initiative is a contentious issue with established ISPs. For any established ISP the desire to establish revenue share with UTL and/or MTN is a much more important and immediate issue than a local Internet Exchange or lowering international bandwidth cost. However, we expect that both the volume of Internet traffic and the proportion of which is of national origin and destination will grow, so that for a new entrant ISP, a local Internet Exchange will increasingly be a desirable feature.

Contents

1 Introduction

The cost of Internet connectivity in Uganda is driven by many factors, of which international bandwidth prices, the focus of this study, is one. Key questions for this study were:

- How important are international bandwidth prices in the cost of Internet services in Uganda?
- How do they relate to other factors that affect the price and accessibility of Internet access?

This report provides a broad overview of the Ugandan Internet market and includes an interview with the leading ISP in the country, with these questions in mind.

There are many factors driving the Ugandan Internet market. There have also been several significant developments over the past 12 months, which are summarised here.

2 Telecoms Status

2.1 Telecoms Market

The population estimate for Uganda is 22million, with 10 million under 16 years old. The capital city is Kampala. Greater Kampala has an adult population (16+) estimate of 1.1 million people.

Telephone lines are in short supply in Uganda. There are currently 350,000 fixed network telephone lines in Uganda (teledensity rate of 1.6).

While fixed line rental at $6.73 per month is fairly low, the price, including VAT at 17%, of dial-up calls is high at $3.07/hour for local daytime and $8.07/hour for national daytime calls.

Achievable modem speeds are not inviting for Internet surfing (19-22Kbps in Kampala with luck, less in rural areas where local loops are long and cable joints are suspect).

The number of mobile subscribers overtook the number of fixed lines in June 2000.

2.2 Telecoms Sector Structure and Ownership

Uganda now has two fixed network telecommunications operators:

- Uganda Telecom Limited (UTL) – the National Operator (NO)
- MTN – the second national operator (SNO).

UTL was privatised[1] in June 2000.

The Dutch mobile company MSI bought an 80% share in both the biggest ISP, Infocom and Celtel (the mobile operator that's been in the country the longest time) last year.

The regulator has placed a moratorium on new VSAT licences after protests from MTN and UTL who are taking the position that the extensive use of VSAT by the ISPs infringes on their licences. They emphasise that the ISPs' customers might be making unregulated use of Internet telephony.

[1] Detecon, a Deutsche Telekom subsidiary, acquired 51% in a deal completed in June 2000

3 Internet Status

3.1 Internet Market Overview

There were between 8,000 and 8,500 ISP customers in April 2001. With the Ugandan population at 22 million, this represents a population penetration of 0.04%. Multiple users per subscription are the norm, and the current estimate is that there are more than 80,000 individual Internet users (0.36% of the population). Kampala is the only Internet point of presence (POP) in Uganda.

There are currently 13 licensed Internet Service Providers (ISPs) although not all are active. The Uganda Communications Commission (UCC) currently places no restriction on the number of ISPs; neither does it place any universal service obligations on those that exist. An ISP licence costs $2,000 annually with a $340 application fee.

The first ISP to be established was InfoMail, followed by Starlight Communications (Uganda) Limited (STARCOM), then Bushnet. In November 1998, AfricaOnline began operating. During 1999, Starcom and Infomail merged to form Infocom (Uganda) Limited. The second largest ISP is AfricaOnline, which bought out Swift Global (Uganda) Ltd. last year. Both Bushnet & Wilken are seen as “serious” ISPs delivering specialised services to the corporate/power user. Together they hold an important segment of the market, with relatively few heavy users.

There are currently 8 International Data Gateway (IDG) license holders and since an agreement dated 27 July 2000 no further IDG licenses will be issued. Other ISPs therefore need to obtain international access via one of the existing IDG licensees. An IDG licence costs $4000 annually.

There are nineteen licensed Internet cafés (a café licence costs $500 annually and there is a $85 application fee). There are more Internet cafés operating without a license 38 on the last count, but they come and go.

Uganda: Internet Connection Prices, April 2001		
(All rates ex. VAT, which is 17%)	**Kampala**	**National**
UTL: Telephone Dial-up price per hour, Standard Rate (6am-8pm)	$2.62	$6.90
UTL: Telephone Dial-up price per hour, Economy (8pm-6am)	$1.55	$5.13
UTL: Telephone Dial-up price per hour, Weekend (Sat. 2pm-Mon.6am)	$0.87	$2.93
MTN mobile to fixed call price per hour		$8.26
Celtel mobile to fixed call price per hour		$8.26
Mango (UTL) mobile to fixed call price per hour		$7.58
Infocom: Dial-up Account, full Internet access per month		$50
Email only per month (was $30 until March '01)		$15
Wireless dedicated access with multiple users per month (no call charges)		$250
AfricaOnline: Dial-up Account, full e-mail and Internet access price per month		$50
AfricaOnline: Dial-up Account, e-mail only, price per month		$30
AfricaOnline: Dial-up Account, e-mail all day & Internet access after 7pm, price per month		$40
Cyber Cafés in Kampala: price per hour	$3.45	

Table 1: Uganda: Internet Connection Prices, April 2001

3.2 The Players

3.2.1 National Operator – Uganda Telecommunications Limited (UTL) (http://www.utl.co.ug/)[2]

Privatisation of UTL reached a conclusion in June 2000 when a consortium led by the German telco, Detecon (a subsidiary of Deutsche Telecom) won a 51% stake in the company. It is plagued with staff & billing problems, but launched its cellular mobile service in January 2001. In February 2001 UTL launched their Cellular pre-paid service under the brand name "Mango" with pre-paid airtime priced below the competition's. This is the third player in the Ugandan cellular market and will compete with both MTN (Uganda) and Celtel - a fourth licence will not be granted until at least 2003. In April 2001, UTL announced its intention to become an Internet Service Provider.

[2] All web site addresses were visited during May 2001

3.2.2 Second National Operator – MTN Uganda (http://www.mtn.co.ug)

In April 1998, the South African cellular mobile company MTN (owned by Multichoice International Holdings) was awarded the Second National Operator (SNO) Licence. MTN is installing a fibre-optic network around Kampala and is offering primary rate (2,048 kbps) and basic rate (144 kbps) ISDN lines, and other business services for corporate clients.

The SNO licence stipulates shared exclusivity rights on VoIP operation in Uganda.

MTN provides GSM cellular service and launched SMS messaging in January 2001 and this has proved very popular. The SMS website is one of the highest traffic sites in the country, together with Yahoo and Hotmail.

3.2.3 Mobile – Celtel Ltd (http://www.celtel.co.ug/)

MSI Cellular acquired a further part of Celtel in June 2000, increasing MSI Cellular's shareholding in Celtel to some 80%. MSI also owns Infocom.

3.2.4 ISP – Infocom (Uganda) Ltd (http://www.infocom.co.ug/)

Infocom claims an 80% share of the Ugandan Internet market, although in reality it has about 60% of the customers. Infocom was formed in 1998 as the result of a merger between Starcom and Infomail. In October 2000, Infocom was acquired by the Dutch cellular operator MSI Cellular, which is the parent company for Celtel. The acquisition of Infocom reflects the convergence between mobile telephony and the Internet, which is happening already in Uganda because of the shortage of fixed network access lines. Besides dial-up and ISDN access, Infocom offers wireless access to the Internet, using cellular (GSM) connections and high-speed wireless data network for corporate customers using Breezecom systems.

3.2.5 ISP – AfricaOnline (http://www.africaonline.co.ug/)

AfricaOnline is a multinational ISP, headquartered in Kenya, and active throughout Africa. AfricaOnline acquired Swift in 2000, the second biggest ISP in Uganda, and now hold this position with a claimed 25% of the market (Swift had 2500 users in 1999). They have established e-touch cyber-cafés together with partners in Kampala, Fort Portal, Mbale and Mukono.

3.2.6 ISP – BushNet (Uganda) Ltd (http://www.bushnet.net/)

Bushnet started life as an ISP, but has diversified into providing access services including fixed wireless Internet access and HF Radio to fill the access gap and overcome the restraints posed by a lack of fixed-line

infrastructure. These services generate additional customers for its core ISP service.

3.2.7 ISP – Wilken Afsat (http://www.afsat.com/)

In 1996, the Wilken group established the company Afsat Communications Ltd. to provide private data networks and also Internet access including wireless technologies and service provision.

3.3 Interview with Andy Pond, MD of Infocom (ISP)

Andy Pond gave an in depth interview and answered a range of questions. The summary below aims to reflect his views.

Broad picture of the Internet industry and market in Uganda

Only a very small percentage of the population can afford Internet access. Access is too expensive, the fixed network infrastructure is of very poor quality, and until infrastructure is greatly improved or the technology increases significantly, the numbers will remain extremely small.

The total subscription market is between 8,000 and 8,500 customers today; this figure excludes corporate clients on wireless access for all their employees.

Cyber cafés are a poor business in Uganda – they have to be funded. You can't make money from them unless you supplement Internet access with other services, as Infocom does. The one that was the most likely to succeed has just gone out of business (it was funded from the USA). Infocom have two cafés which make no money, they are just there as a "value-added" service. In total there are between 30 and 40 cyber cafés at the moment.

There are 13 licensed ISPs in Uganda, which is too many for such a small market.

Infocom offer a total solution for clients including hosting and web design. They are using cellular and wireless to reach customers, until the fixed infrastructure catches up.

UTL & MTN have no intention of putting in new or better copper. They are putting in ISDN & fibre optic, which they can charge more for. Wireless access technology is the way forward for Africa. WAP handsets and SMS will

take off - handset prices are as low as $200 now. So Africa will give up on copper technology eventually.[3]

Infocom's market position as an Internet Service Provider

Infocom hold about 80% of the market with only two other major competitors: AfricaOnline, which is Swift (they are struggling because they have to increase subscriptions by 144% by 1 May -- that will be a bandwidth issue as well) and then Bushnet, Wilken, etc. There are no other serious players in the market.[4]

It is expected that UTL will launch within 1 to 3 months. They will dominate the market and leave the rest a small percentage to be shared.

Market prospects following a UTL launch

There are two ways to look at this. Either UTL will destroy the market and be a monopoly, which can be done tomorrow, or they will price access so that ISPs can afford to use their services. The whole crux of DFID's thoughts, USAID's thoughts and the ITU, is that without revenue sharing, rival ISPs will be ruined when a national operator starts up. Both Infocom and UCC know this. UCC made a vague statement in a rural development paper saying that they "want the playing field to be even".

With revenue sharing, Infocom could provide Internet access for $5 or $10 per month, no problem what so ever. It could even be given away free and rely on advertising as in the rest of the world, if Infocom could get 40% of the $150,000[5] it makes for UTL per month. This assumes revenue sharing at the same sort of % that ISPs get in Europe. Then that could be taken straight off the cost to the end user. But UTL is not offering anything. Infocom have approached them and will continue to do so, until their service launch.

Infocom's prices charged to end-users

[3] UTL have a new line installation target of 100,000 by June 2002, which is mandatory.

[4] Infocom's market share is possibly closer to 60%, since Africa Online claim a 25% market share, and Bushnet, Wilken and the others must have about 15%. There's no formal research/measure available to check these claims against. Infocom are the market leaders, no doubt, but not with as much market share as they claim.

[5] Working on the assumption that Infocom's ISP customers all make local phone calls, this estimate means they spend around 57,700 hours online per month. If we estimate the number of Infocom subscriptions at 60% of 8,000-8,500, or approx. 5,000, this equates to an average of 11 hours 30 minutes online per subscription per month. However, if we assume that 80% of the calls are made locally and 20% from national locations, the total online time estimate is 43,400 hours, and this equates to an average of 8 hours 40 minutes online per subscription per month.

$50 per month for full Internet access and $15 per month for email only.[6]

These are so different because e-mail consumes very little expensive bandwidth. E-mail only subscribers are a small proportion of the subscriber base.[7]

Off-peak time packages

These are hard to get right – Infocom tried many years ago when it was Infomail. The billing is almost impossible to get correct and customers get annoyed. However, Infocom do have the software in place. Retrying this would be more of a corporate decision from MSI for Africa, than a local one for Uganda.[8]

Connections to the Internet

Infocom have two earth stations and two direct satellite links: one to the States and one to the Netherlands (though that link is going to Norway currently).

The winning game in this country is based on what you pay for your bandwidth, the cheaper your bandwidth, the cheaper you can charge, the longer you survive. Infocom pays:

$27,595 for the US link: 1.5 Mbps down and 0.25 Mbps up

$12,700 per month for the European link, 0.5 Mbps down and 0.25 Mbps up

So in total Infocom pays $40,295 per month for 2 Mbps of Internet downlink capacity. This is 400 bps per customer account, which costs $8 per month per customer. There are no other links and no peering.

Prospects for a Ugandan IXP

In Infocom's view, a Ugandan IXP will not work. It's not designed for this market, where expertise is low. It was tried in Kenya and no-one involved in instigating the IXP would provide any figures. Infocom know that in-country and local traffic is maybe 12%, which is very low; this is mostly e-mail so

[6] E-mail only rates were reduced very recently in April 2001 from $30 per month to $15 per month, and the full access rate is expected to drop from June, though Infocom were unwilling to confirm this.

[7] Based on the cost of bandwidth figures discussed below, e-mail only clients pay about $3 per month (20% of their subscription fee) for international bandwidth.

[8] Africa Online offers an off-peak access rate at $40 per month against $50 per month for the all-day service.

there is little bandwidth usage.[9] There is no point sending in a team and kit from Europe or the States. USAID and DFID should be aware of these views. Revenue share with UTL is the crucial issue.

ISPs in Uganda can interconnect locally, if that proves necessary, just by putting in leased lines. For example, Infocom and Africa Online will have a leased line connection. All the other ISPs will then also want the advantages of that IXP connectivity, and the early interconnectors will lose their competitive edge

Infocom's cost and revenue structure

One can see why there are many ISPs who make little profit, globally, and from an African perspective (which means Uganda comes off well), power, infrastructure and skills are major cost factors. Power generation, building, maintenance and hardware costs are high.

Expertise here is a major cost. Skilled staff include expatriates and locally recruited and trained people. These people are very expensive and in high demand by the NGOs & Aid Agencies.

Having recruited and trained staff, Infocom cannot match the NGOs and Aid Agencies salaries. Instead staff are retained by a good working atmosphere and social scene.

International component of Infocom's costs

The bandwidth cost, nowadays, is not the issue. It would be easily subsidised by interconnect, or the revenue share, because a lot of money is made by the national operator.

Bandwidth sold in the private sector has to be good quality. Russian satellite capacity is available, but hard to sell. There are too many unhappy customers.

If anybody could get the satellite companies to bring down the cost of bandwidth to developing countries, that would be an amazing feat.

To end users, it is the kit that actually costs the money. Uganda has helped a lot by removing relevant taxes: hardware can be brought in without paying import duty and the VAT can be recovered. Buying locally is inadvisable.

[9] It may be short sighted to base IXP decisions on current local traffic percentages instead of future potential, disregarding East African peering and local content creation possibilities in the process. Also, the above answer is what might be expected from an 'incumbent' ISP, as a Ugandan IX would make it easier for new ISPs to enter the market.

Revenue share as a source of bandwidth subsidy

This is how ISPs in Europe survive. Infocom spend $28 with UTL per telephone line and there are no discounts. From that, Infocom generates for them, around $150,000 per month. Therefore, Infocom should get something back. Without revenue share, competitive ISPs will all go out of business and Uganda will go back to being a monopoly.[10]

The international bandwidth component cost to your dial-up users

$15 per month for Internet clients, $3 per month for e-mail clients, average out at $6.60 per month. The breakdown, could be misleading, it is best to work with the average cost of $6.60 per month.

Plans for the future

Infocom is owned by MSI, mother company of Celtel, which is a mobile, operator, so added value services are probably the way ahead, following the first world.

3.4 Interview with Charles Musisi, MD of Uganda Online

Charles Musisi is a leading figure in Uganda's ICT sector and he was asked to comment on UTL's ISP service launch. He said he was unsure whether or not UTL would dominate the market. He pointed out that Infocom have presided over a (near) ISP monopoly for a long time, and are now scared that they are about to be wiped out.

He said that UTL has deep pockets and a fixed line network. There is nothing in the Telecom statute that prevents them from pricing their service competitively by say using their national copper land line network to offer "heavily" underpriced service for an interim period to wash away competition. This could come by way of offering very low cost ("free") dial-up Internet, by having a number to dial at the same charge across the entire country.

He also pointed out that some of UTL's services are already overpriced, for example, leased access costs US$ 4000/month, which is well beyond what anyone can afford in the Ugandan market.

[10] Charles Musisi (see 3.4) questioned why UTL should offer revenue share. He was unsure whether or not the European model applies here yet. The assumption is that UTL should reward people who give others a reason to use their services. He regards that argument as weak.

4 International Bandwidth Costs

4.1 Total Cost of Internet Service to Customers

Total costs of Internet access are high in Uganda. The average user in Kampala pays a total of $82 per month for 10 hours of full Internet access per month. Including VAT, this amounts to $96 per month. Outside Kampala, the high cost of phone calls drives the cost up to $146 including VAT.

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Uganda Internet Prices - US$, excluding VAT

	Hours/Mo	Kampala Full Access	Kampala e-mail only	Outside Kampala Full Access	Outside Kampala e-mail only
ISP Price excl VAT per month		$50.00	$15.00	$50.00	$15.00
Estimated Cost of International Bandwidth per subscriber per month	10	$15.00	$3.00	$15.00	$3.00
Average Cost of International Bandwidth per Subscriber Hour		$1.50	$0.30	$1.50	$0.30
UTL phone line Rental		$5.75	$5.75	$5.75	$5.75
UTL Call Charge per Hour standard rate		$2.62	$2.62	$6.90	$6.90
Dial-up Cost - Phone calls only					
A	30	$78.60	$78.60	$207.00	$207.00
B	20	$52.40	$52.40	$138.00	$138.00
C	10	$26.20	$26.20	$69.00	$69.00
D	5	$13.10	$13.10	$34.50	$34.50
Total Monthly Cost to Subscriber Including Phone Line and Internet Subn					
A	30	$134.35	$99.35	$262.75	$227.75
B	20	$108.15	$73.15	$193.75	$158.75
C	10	$81.95	$46.95	$124.75	$89.75
D	5	$68.85	$33.85	$90.25	$55.25
Estimated Cost to ISP of International Bandwidth					
A	30	$45.00	$9.00	$45.00	$9.00
B	20	$30.00	$6.00	$30.00	$6.00
C	10	$15.00	$3.00	$15.00	$3.00
D	5	$7.50	$1.50	$7.50	$1.50
Estimated Cost of International Bandwidth as % of Total Cost to Subscriber					
A	30	33.5%	9.1%	17.1%	4.0%
B	20	27.7%	8.2%	15.5%	3.8%
C	10	18.3%	6.4%	12.0%	3.3%
D	5	10.9%	4.4%	8.3%	2.7%
Cost of UTL Calls as % of Total cost to Subscriber					
A	30	58.5%	79.1%	78.8%	90.9%
B	20	48.5%	71.6%	71.2%	86.9%
C	10	32.0%	55.8%	55.3%	76.9%
D	5	19.0%	38.7%	38.2%	62.4%