



Open Swahili Tablet PC – Research Concept Note

I. Research Project Baseline

• Introduction

I am a German IT professional, who spent lots of time in front of the computer together with a variety of local Tanzanians – sharing knowledge and teaching skills. Over the course of that past decade, again and again I couldn't help but notice their substantial different mindset, as if this culture group was running on another "operating system"?

This case definitely called for investigation! Eventually the amazing findings became an integral part of my research paper "*ETEC Concept Notes*"¹, namely between pages 8 to 31.

About this difference in a nutshell:

• "Understanding Media"²

"Once any new technology penetrates a society, it saturates every institution of that society", while "all other functions of that society tend to be transmuted to accommodate that new form"³. Just imagine today's ubiquitous individuals, completely absorbed by their smartphones, oblivious to their surroundings to understand, that media indeed is constituting a "revolutionizing agent"^{ibid.} – with a disruptive impact on the human balance of sensory perception:

"Tribal [or acoustic] man partook of the collective unconscious, lived in a magical integral world patterned by myth and ritual, its values divine and unchallenged, whereas literate or visual man creates an environment that is strongly fragmented, individualistic, explicit, logical, specialized and detached". Thus, adopting the Western mindset ultimately is tantamount "to wrench the individual from [...] a seamless web of tribal kinship and interdependence".

Notably, those quotes date back to the 1960s, when the same mastermind already predicted, that electronic media would eventually shape a "global village". That very Marshall McLuhan also postulated that in order to "understand media", one must take into account the entire "environmental matrix" they spawn.

• The Environmental Matrix of East African Information Technologies

Accordingly, first and foremost it should be imperative to recognise the forest for the trees! However, for example, inspired by the conviction to pioneer an universal unidirectional human development, experts at UNCDF appear baffled by the fact that "adults in Tanzania still prefer to borrow informally", instead of eagerly welcoming their "financial inclusion"⁴?

Well, on one hand, the "institutionalized biases of literate man" are presupposing independent decision-making of isolates actors. On the other nonetheless, human beings are driven by a "deeply emotional corporate family feeling"! This advantageous kind of integral mindset, rooting in "trust, reciprocity and cooperation", developed, as scientifically proven, over the course of human evolution to safeguard everybody's "probability of long term survival".⁵

1 Pauschel, "ETEC Concept Notes", Aug 2022: <https://etec.international/documents/>

2 Wikipedia, "Understanding Media", https://en.wikipedia.org/wiki/Understanding_Media

3 Herbert Marshall McLuhan, "The Playboy Interview", Playboy magazine, Mar 1969: <https://tinyl.io/4GT2> + cf. Notes pg. 10, 8

4 Morrow et al., "Insights for Tanzania: What global data reveals about financial inclusion for women", Mar 2023: <https://tinyl.io/8Oog>

5 Ostrom, "Green from the Grassroots"; Axelrod, "The Evolution of Cooperation": cf. Notes pg. 30



Not that Tanzanians have not embraced mobile networks and the Internet! On the contrary, they adopted it in their own very creative fashion — even inventing “M-Pesa”⁶ (mobile money transfer) before it was assimilated by corporations! As omnipresent communicators, (smart-)phones serve perfectly well as “*technological extension*”³ in order to cultivate close kinship relations — mainly within the familiar “*acoustic space*”³ or by short text messages. On the other hand though, with their tiny screens, such devices are hardly applicable to extend to and convey visual literate content.

- Analysing the Environmental Matrix of East African Media

The UN Secretary General is proposing “*universal access to the Internet as a human right*”⁷. However, with academic credentials in physics and electrical engineering, Mr. Guterres⁸ understands perfectly well that: “*Energy is the golden thread that connects all the Sustainable Development Goals.*”⁹

As known, the general use of “*the Internet*” is hinging on a continuous interaction of 3 components: 1. server «–» 2. network «–» 3. terminal. By 2020 the empowerment of world-wide Information and Communication Technologies (ICT) was using up “*~3% of global primary energy consumption (GPEC), ~7% of global electricity use (GEU), and ~5% of global CO2 emissions*”¹⁰. Accordingly, the inevitable prerequisite for “*participation*” is to power-up some kind of class 3. device.

Although “*electricity access*” [...] “*is defined as having an electricity source that can provide very basic lighting, and charge a phone or power a radio for 4 hours per day*”, this “*very low cutoff*”¹¹ will only be passed by ~40% of the Tanzanian people, with DR Congo at ~19%, and Burundi under ~12% [sic!].

Given such dismal figures, any attempt of Digital Inclusion should start by acknowledging, “*that a shift to power efficient tablets and smartphones – in favour of laptops and desktops – reduces the overall power use more than the increased amounts of power efficient devices shipped and installed.*”¹⁰

On this note, only a computer architecture optimised for “*minimal power consumption*”¹² will provide a viable platform to sustainably enlarge the environmental matrix of sub-Saharan media. Yet there is still so much more to be improved and tweaked for the ultimate objective: a device for indigenous communities, simple to comprehend and applicable to any task area of a common laptop. In the short term, improving compatibility would facilitate collaboration between local projects and international organizations, be it for exchanging documents, online collaboration or hosting workshops. On the long run, as that novel user-experience gets around at the grassroots, ensuing gradual mainstreaming may up-lift domestic digital practicalities to a desktop-like level.

II. Project Proposal

This Research Concept Note is suggesting to provide the ideal “green” digital ecosystem for the Kiswahili culture. Swahili is not only official language of the African Union (AU) and the East African Community (EAC) but also lingua franca in the Great Lakes region up to half of the DR Congo. “*The broadcast media have also contributed immensely to the spread and popularization of Swahili [making it] probably the most widely used African language in radio broadcasts in the world.*”¹³

6 <https://en.wikipedia.org/wiki/M-Pesa#:~:text=using%20airtime%20as%20a%20proxy%20for%20money%20transfer>

7 “Our Common Agenda – Report of the Secretary-General”, United Nations, Aug 2021, PDF, pg. 6: <https://tinyurl.com/9UYM>

8 Wikipedia, “António Guterres | Early life, education, and early career”: <https://tinyurl.com/5ZGh>

9 “Secretary-General’s remarks at High-Level Symposium on Global Energy Interconnection”, UN, Nov 2017: <https://tinyurl.com/4GjC>

10 Andrae, “Hypotheses for...Energy use...of Global Computing...”, WSEAS 2020, PDF, pg. 50 + 54: <https://tinyurl.com/8PNN>

11 Our World in Data, “Electricity access”; World Bank, World Development Indicators dataset: <https://tinyurl.com/27ec8sa3>

12 https://en.wikipedia.org/wiki/ARM_architecture_family#:~:text=minimal%20power%20consumption

13 Mohochi, Wairungu, “Kiswahili”, Stanford University Swahili Department, Jun 2007: <https://tinyurl.com/8Ruh>



Accordingly, if broadcasting “*financial inclusion*” is the order of the day, providing an office suite with a Swahili graphical user interface (GUI) to do accounting using a spreadsheet and a word processor to prepare documents, might eventually turn out quite conducive? For these tasks however, the tiny smartphone display is an absolute no-go, and therefore mentioned “*power efficient tablet*” is going to feature as indispensable must-have!

III. Swahili Tablet Specification Highlights

- Hardware
 - ✓ 14.1 inch touchscreen display¹⁴ – laptop-size;
 - ✓ ≈10,000mAh battery capacity – min. double uptime of a smartphone + simpler replacement.
 - ✓ Wifi + 4G network. Inserting a SIM-card is enabling mobile telephony and video conferencing via data channel. During meetings, one device may work as hotspot, tethering a local network and Internet access for all.
 - ✓ Interface for external keyboard.

Thus, in principle, here might be a device that offers considerable advantages compared to a laptop – but there is a catch:

- Software

Today, without doubt, Google's Android is the most widespread operating system on the planet¹⁵. Moreover, in the Least Developed Countries (LDCs), even at remote grassroots, people understand how to use it. Yet there is boon and bane: Since Chinese Original Equipment Manufacturers (OEMs) first and foremost seek to sell devices – and extra low-budget to LDCs – the expense factor of software custody is passed to Google, who may market access user data either way. Such business strategies, also known as *Planned Obsolescence*¹⁶, create a perfect storm of end-of-service-life (EOSL) devices. At the bottom line, the unnecessarily shorted lifespan is nullifying all former “green” hardware credit by early retiring still practical electronics to toxic waste!

Hence, the natural thing to do is to take care of the missing support from the scratch: **1.** by choosing a capable OEM partner and **2.** by implementing compatible “*Free and Open Source Software*” (FOSS):

- ✓ Android Open Source Project (AOSP) operating system¹⁷ with Linux kernel;
- ✓ & Unlocking/locking the bootloader;
- ✓ & Keeping the operating system maintained and upgraded e.g. with security packages;
- ✓ Optional Google Mobile Services¹⁸ – or a private Nextcloud¹⁹ server suite for organisations;
- ✓ Localising and maintaining the Swahili GUI for LibreOffice²⁰/Collabora²¹:
 - For creating texts, graphics, spreadsheets and presentations – no Internet required;
 - “*Excellent interoperability with Microsoft Office and Open Document Standard.*”^{bid.}

Ultimately, the *total value of ownership* is maximised, while its *environmental footprint* minimised.

14 Exemplary offer by a Chinese Original Equipment Manufacturer (OEM): <https://tinyl.io/8TSQ>

15 Operating System Market Share Worldwide: <https://gs.statcounter.com/os-market-share>

16 Jones, “*Planned obsolescence has led to ridiculous product cycles...*”, Digital Trends, May 2016: <https://tinyl.io/4Gjd>

17 “*Android unites the world. Use the open source Android operating system to power your device.*”: <https://source.android.com/>

18 The Open GApps Project provides up-to-date Google Apps packages: <https://opengapps.org/> | microG: <https://microg.org/>

19 Self-hosted collaboration solution: <https://nextcloud.com/>

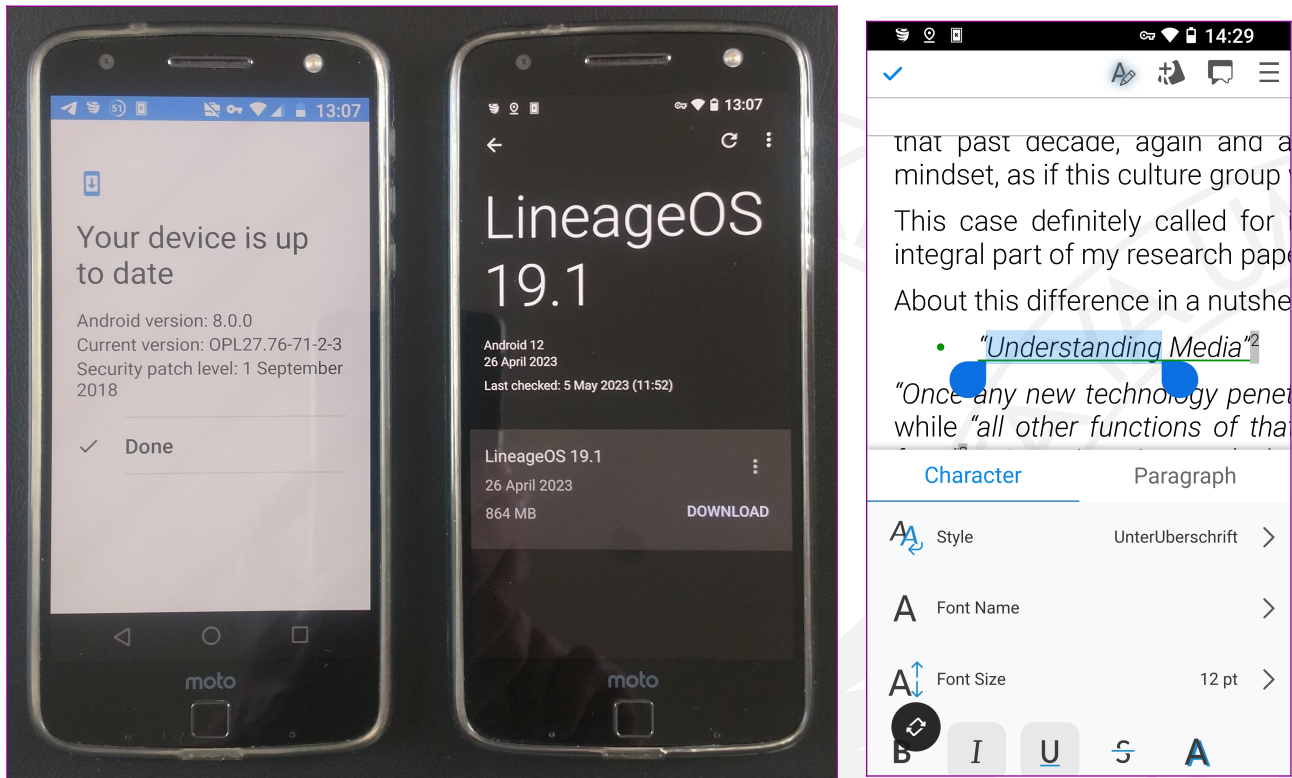
20 TDF Weblate – LibreOffice, Swahili (Tanzania): https://translations.documentfoundation.org/languages/sw_TZ/

21 Collabora Office for Android: <https://www.collaboraoffice.com/collabora-office-android-ios/>



IV. Proof of Concept

“Moto Z is an Android smartphone developed by Motorola Mobility. Unveiled on June 9, 2016, as its flagship model for the year”²². But 27 month later their ca. US\$ 650 prize exhibit was already put on end-of-service. ▼ Yet at present, my “liberated” ▼ Moto Z operates with an up-to-date Android 12!²³



There is state-of-the-art office functionality to privately create or edit all document ▲ types – primed and ready to be shared with the world...

V. The KUKU Project: “Free as in Freedom”²⁴

Since 10 years our Tanzanian KUKU Trust is researching into a “Kompyuta ya Umma Kiswahili Uhuru” – a “People’s Free Swahili Computer”. ‘Kuku’ means ‘chicken’ in Swahili and that popular, ubiquitous fowl is symbolising our wake-up call to participate in and contribute to the “Decolonisation of the Internet”²⁵.

Provided that sufficient seed capital is granted, already sowing just a thousand “KUKUs” across the designated East African area could bear much fruit – each one serving as condensation nucleus to accumulate, associate and incorporate a great multitude of information!

In addition, distribution of KUKU, instruction and training by a non-profit at cost will further facilitate the empowerment of unprivileged individuals and NGOs.



²² Moto Z: https://en.wikipedia.org/wiki/Moto_Z

²³ Android version history: https://en.wikipedia.org/wiki/Android_version_history#:~:text=Android%20Oreo

²⁴ As in Free and Open-Source Software (FOSS), this “free” refers to the concept of freedom, not to gratis: <https://www.fsf.org/faif>

²⁵ “Decolonizing the Internet: What is it about?": <https://whoseknowledge.org/initiatives/decolonizing-the-internet/>