How we are fixing the World with e-Learning Centre & Internet In a Box

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Volunteer – Retired after 40 years in IT

Working with Charities like The Turing Trust & & Global Community of Software Developers

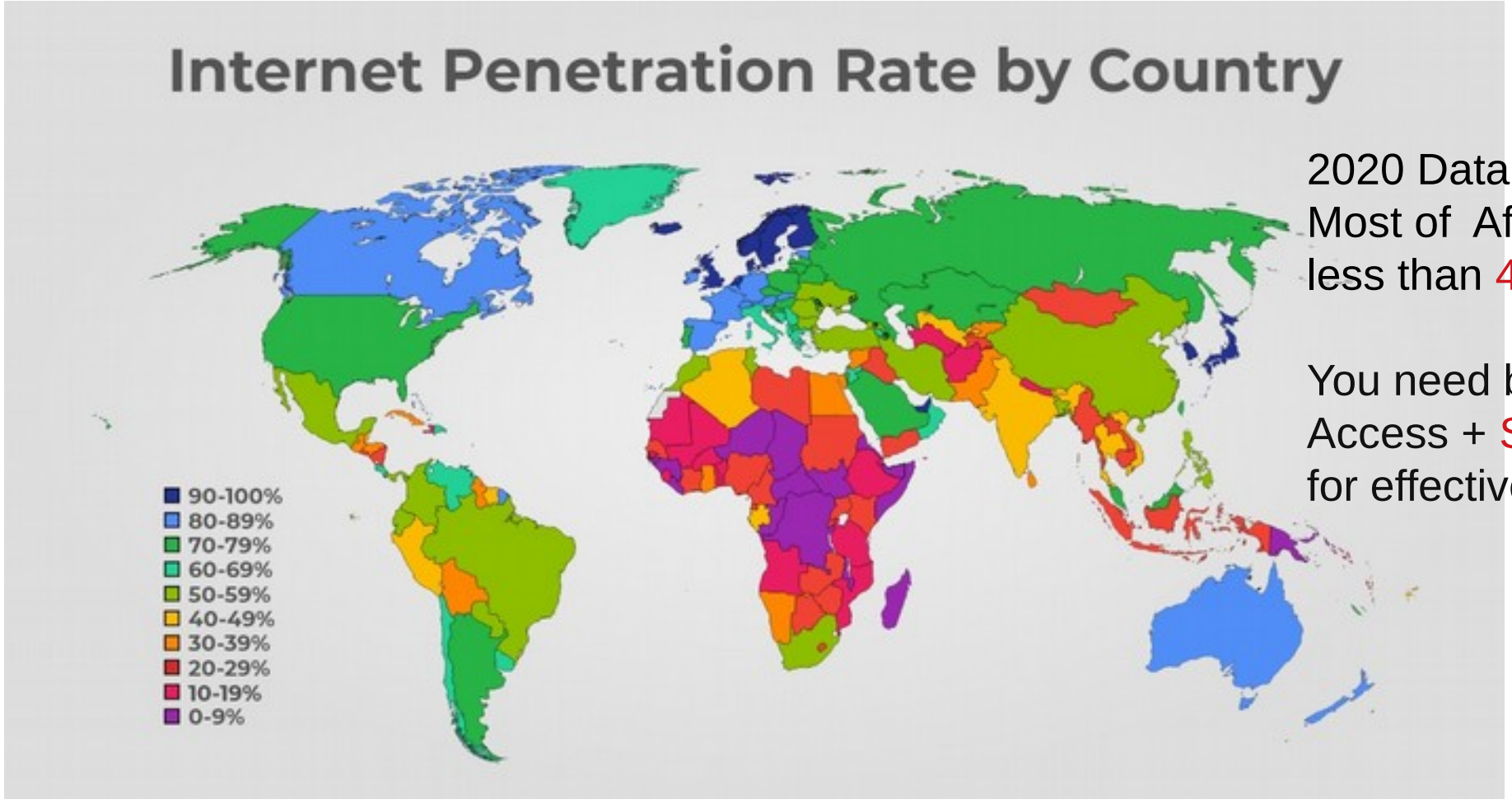
People who make it possible to share World's free & open source knowledge

Objectives

- How do we “Fix the World” and who benefits?
- What is e-Learning Centre and where can we use it?
- What is Internet In a Box (IIAB) and what does it deliver?
- Show how simple it is do build an e-Learning Centre.
- How to use IIAB.
- Create some Interest so that we can get more people to contribute to Fixing the World.

What are we fixing?

- There is huge “Digital Divide” and billions of people around the World do not have access to the Internet and/or mains Grid Power.
- They are missing out on the benefits that Internet Access brings in terms of sharing knowledge which is essential for economic development.
- We can provide simple & cheap technical solutions like E-Learning Centres to fill the gap.
- Communities benefit by having access to free & open source knowledge in digital content format.
- The “fix” is to create better opportunities for improving Education and Learning for Teachers and Pupils.



2020 Data
Most of Africa is less than 40%

You need both Access + Speed for effective use

What is an e-Learning Centre ?

- ICT facility using Internet In A Box (IIAB).
- Built using computers such as Raspberry PIs, Refurbished Desktops, Laptops and Tablets.
- Uses re-cycled items like monitors, keyboards, mice, head phones, home Routers – items that may end up as e-Waste.
- A Local Area Network with Desktops and Servers – all using Open Source Software – no licence or usage costs for the software.
- Designed for schools and clinics for Communities who do not have access to traditional Internet Services.
- Users can access the latest digital content in a safe & self contained environment – no bills to pay.
- Can be viewed as a Virtual Library and Classroom with thousands of electronic books, videos, & reference material which can be used for teaching, self learning and doing research.

What is Internet In A Box - IIAB ?

- A small WI-FI hotspot to provide Internet type content
- A collective of people who develop that device.
- An aggregate of free/open software and content.
- Generally used in Medical and Educational settings but can be used in any situation including at home as well.
- Built on variety of hardware like Refurbished Windows Laptops, Intel PCs, Raspberry PIs & similar low cost small computers.
- Hosted on Linux OS distributions like Ubuntu & Debian.

Key Components of e-Learning Centre

- Laptops, PCs, Raspberry PIs with Linux Desktop builds like Linux Mint , Ubuntu & Raspbian.
- There are many Open Source LINUX based Desktops which work like Microsoft Windows & perform better on a variety of older hardware.
- IIAB Servers with Digital Content, again built on LINUX Open Source. Servers requires more powerful hardware compared to Desktops.
- Wired LAN using Routers and Ethernet Switches. Re-cycled broadband Routers work fine.
- LAN can be wired, wireless or a mixture
- A Solar Powered solution is also practical by using low powered computers like Raspberry PIs.

IIAB Delivers Multi-language Content – Few Examples

Wikipedia

Video Talks

Early Reading in African Languages

Science Simulation

Teaching Videos

e-Books

Literature

Learning Management System

Text Books

Learning Platform

Website Building

Short Video IIAB

- You Tube Video -
- https://www.youtube.com/watch?v=S79H7vYRMuM
- All software is freely available with on-going support from a Global community of volunteers.
- Detailed Release and User Notes can be found here - https://github.com/iiab/iiab/wiki

Turing Trust – Fixing the World

- Turing Trust (https://turingtrust.co.uk/) - Charity I support.
- Alan Turing is considered the father of modern day computing.
- Founded by Alan Turing's family.
- To continue his legacy by using technology to empower disadvantaged communities.
- Workes in Malawi and several other countries in Africa.
- Has sent 8,000 PCs enabling more than 55,000 students to gain a digital education in Malawi.
- Also helps to reduce waste, contributes to an environmentally friendly society and builds a more inclusive digital future.
- A PC is not considered old until it around 15 years old.
- Extending the life of 20 PCs gives a savings of 6 tonnes of carbon - equivalent of planting 14 trees.
- In energy terms , savings made from just one classroom of 20 PCs is enough to power 320 TVs for a year.

Example of Re-Cycling for Malawi

1. Items

Donated
in UK

2. Re-furbished by volunteers in UK DATA WIPED or DRIVES REPLACED

3. Shipped in a container to Malawi

4. Container made into Solar Powered e-Learning Centre in Malawi

e-Learning Centres in Africa

Recent Projects in Kenya with My Friends

Total 10 schools & orphanages

200 Desktops and 20 Servers & 20 Routers + 50 laptops for Teachers

10,000 students & Teachers learning digital skills

Less than £50K

Architecture: Client-Server

PC with IIAB software
External Router acts as
Access Point
with WI-FI name of u3a

Router provides
IP address for the server
e.g. 192.168.0.100

Router provides the
WI-FI hotspot and
the logical LAN
e.g. 192.168.0.xx.

IIAB

192.168.0.xx

Switch provides
Ethernet ports

Ethernet
Clients

Ethernet
Clients

WIFI
Clients

WI-FI clients
connect to
Router WI-FI
u3a

All clients use a Browser
and type the IP address
of the server
e.g. 192.168.0.100

Chrome, Chromium
Firefox work the best

Teacher Laptops. Community Cinema

- Teacher laptop is a combination of Linux Desktop & IIAB running in the background.
- Content is installed on a large capacity hard drive (500 GB or 1 TB).
- Laptop screen can be “mirrored” with a Projector. Speakers can provide Audio.
- Laptop + Projector + Speakers provides Teachers with a portable e-Learning Centre
- Can be used in a Classroom or outside.
- Can be turned into “Community Cinema”

Solar Powered PI Server

Raspberry PI
5V about 2.2 A, 10W

"head-less" WI-FI Server

5V Power Bank
Capacity 10000 to 20000 mA

"Pass-through" charging meaning
power drawn & delivered
at the same time

Power Bank
will keep PI running
for 4 to 7 hours depending
on its capacity

DC to DC Voltage
Controller

Input 12 to 24 V
Output 5V 5W

20 W Solar Panel
can generates about 17V & 1.2A

Variable output depending on
Sunlight

WI-FI Access to
server from mobile
devices

From Smart Phone or Tablet. WI-FI Connection

- Go to Settings on your Device & Connections & then WI-FI
- Look for these WI-FI names.

u3a	on PC Server
Internet In a Box	on Raspberry PI Server
iiab-medical	on PI Zero Server

- Connect to one of them. You may get a message like “Internet may not available”. Connect anyway.
- No password required as we are in a Trusted Environment.
- If Connection Fails, try “forgetting” previous connections and start again.
- Open up a Browser on your device like Chrome or Firefox. Safari may not work.
- Type the address of the server 172.18.96.1 to get the Home page of respective server.

From Desktop – Wired Connection

- Desktops and Servers can be connected using Ethernet LAN.
- With Wired Connections, the devices will work faster.
- From the Desktop, Open up a Browser like Chrome or Firefox.
- Type the address of the Server which will be something like

  192.168.0.100

- We can connect about 20 Desktops to one serrver using Wired LAN compared to about 10 on Wireless LAN.
- If the Desktop has a Wireless capability you can still use the Wireless method.

Any Questions?

My Contact:

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Please contact me at above Email if you wish to donate any items for re-cycling that can be used in an e-Learning Centre or want to know more about our Projects in Africa.

Many thanks

Shanti Bhardwa