11th ADB International Education and Skills Forum

Applying a Fresh Lens to Unlock the Power of Human Capital

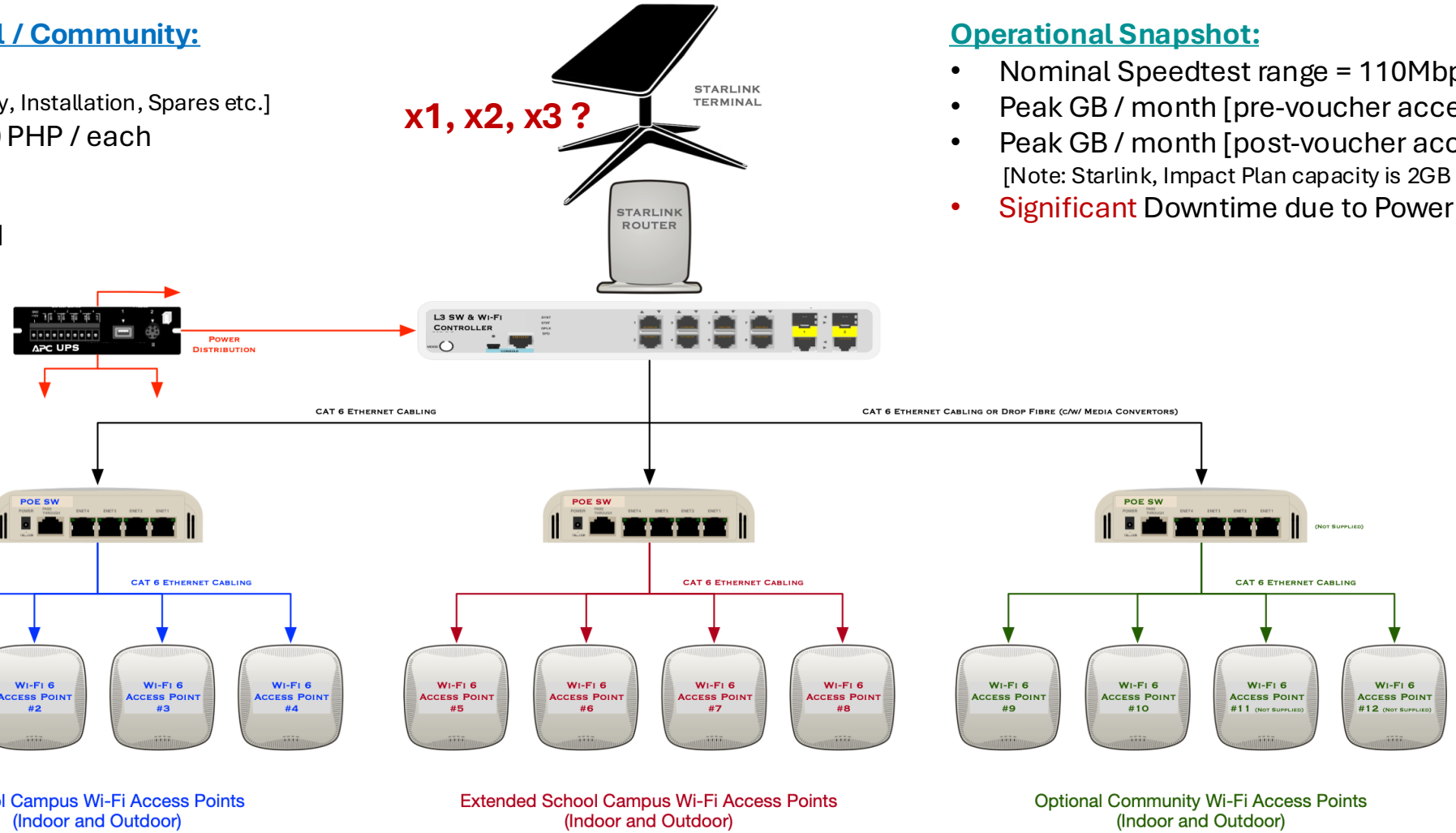
3-5 December 2025 | Metro Manila, Philippines

Typical Installation Environment

Generic Network Topology

Estimated Pricing per School / Community:

- CAPEX: ~400K PHP / site
  [incl. Starlink, W-Fi, Solar, Battery, Installation, Spares etc.]
- Devices / Tablets: >10,000 PHP / each
- OPEX: ~7,000 PHP / mth
  [incl. Backhaul, MSA + Support]
  [Starlink Impact Plan = 3.5K PHP]



School Campus Wi-Fi Access Points
(Indoor and Outdoor)

Extended School Campus Wi-Fi Access Points
(Indoor and Outdoor)

Optional Community Wi-Fi Access Points
(Indoor and Outdoor)

Operational Snapshot:

- Nominal Speedtest range = 110Mbps to 160Mbps
- Peak GB / month [pre-voucher access] = 7.8GB
- Peak GB / month [post-voucher access] = 3.2GB
  [Note: Starlink, Impact Plan capacity is 2GB to 5G]
- Significant Downtime due to Power Issues

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'In the Field' Lessons Learned

- **General Observations:**
- The Primary cause of connectivity downtime is Unreliable Power ["The Elephant in the Room"].
- No operational quality differences 'observed' between Starlink 'Standard' & 'High Performance' Terminals..... Yet !! [significant CAPEX difference]
- Starlink Impact Plan Fees not available due to Reseller 'MSA' contracts.
- Limited Automated NMS functionality restricts enhanced MEL activities.
- DepEd, Schools & DICT alignment is recommended to reduce duplication.

- **Local Access Network [Wi-Fi]:**
- Uncontrolled access to Starlink services can lead to significant data usage fees, especially when connectivity is extended to community stakeholders.
- Implementing a 'Wi-Fi Voucher Access' solution limits Data utilization and can keep GB use within Starlink 'Impact Plan' limits [i.e. 2GB to 5GB / mth.]
- Technology solutions are not the main drivers of success, but they help !!
- No major operational quality / reliability differences 'observed' between the different Wi-Fi equipment vendors piloted.

- **Tablets, Digital Skills, Capacity Building:**
- Commercial Off the Shelf [COTS] Devices are best [Cheap, Repairable].
- Mobile Phones increase the number of devices, enhancing Digital Access.
- Increased Device / Tablet access enhances Digital Literacy.
- "BYoD" [Bring your own device] can enhance student Digital Access and Digital Inclusion – Key elements for 'Digital Transformation' in Education.
- Training for ICO's, Local ICT Coordinators enhances Digital Literacy Mentoring, Digital Access Quality and an 'Operational' sense of ownership.

- **Appropriate Content Controls / Firewall:**
- Each School has WEB blocking lists, but they are not unified or managed.
- Centralized control of content / blocking lists should be considered by DepEd to ensure a common & 'appropriate' internet experience for learners.
- Restricting Open Internet Access in classrooms is important to prevent disruption and can facilitate 'Own Device' use for lessons in school.
- Community Connectivity Sharing requires different Firewall configurations, to remove most / all internet restrictions for certain user groups.
- Different user groups and Access Control solutions play an important role.

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Digital Transformation in Education

- **Digital Transformation:**
- Changing how organizations, services & communities work by using digital tools to deliver better outcomes, not just digitizing old processes.
- Empowering individuals, communities, businesses and government through digital skills.
- Ensuring sustainability by aligning technology with financial, operational, organizational, community and regulatory realities.
- Future Ready Communities have; Digital Access, Digital Literacy, Digital Inclusion mindset.

- **Why Invest in EdTech:**
- Standardize national curriculum delivery and quality.
- Strengthen teacher capacity via continuous professional development.
- Improve learning outcomes at scale through personalized digital learning.
- Prepare students for digital economies, future jobs & Digital citizens.
- Build education resilience for disasters and crises.
- Enhance rural digital inclusion and local economic participation.

- **The Challenge:**
- Schools & communities require more than simple connectivity to achieve digital transformation.
- Power solutions are just as important as connectivity solutions.
- A “Mindset Shift” [in School, Community, Family, Donors, Governments] will be the most Important catalyst to deliver sustainable Digital Transformation.
- One-off donor pilots rarely transition to stable, scalable & sustainable services.

- **What Can Work ?**
  - Private / Social Enterprise driven : Problem Solving 1st , Innovations, Operational Efficiencies, Responsible Business mindset
  - Connectivity Access : Affordability, Quality, ‘Any’ Device
  - Universal Inclusion, Age-appropriate skills and content.
  - Teacher Empowerment, Student Nurturing, Diversity & Ethical Lens’
- **What Won’t Work ?**
  - First World Technology Solutions looking for Rural Problems to Solve.
  - One Size Fits All !
  - Device-first procurement programs.
  - High-OPEX managed services.
  - Single-vendor lock-in.

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Digital Transformation in Education

So Far So Good !

[Digital Access >> Literacy >> Inclusion]

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Sustainability Requires a Holistic Approach

- **Why Sustainability Fails:**
- Financial:
  - Funder Fatigue, High CAPEX/OPEX [power, BW, MSA, O&M], Low ARPU
- Organizational:
  - Unclear Roles / Responsibilities, lack of trained staff / skills transfer.
- Technical / Operational:
  - Over scoped technology solutions, insufficient power solutions.
  - Network / Device spares, repairs, refresh timescales & costs.
- Community / Country:
  - Lack of Engagement limits Community buy-in & cost sharing potential.
  - Instability, local conflicts and limited access.
- Regulatory:
  - Restrictive regulations inhibit innovative community business models.

- **Enabling Technical / Operational Sustainability:**
- What does it takes to implement ?
  - Impact Funding Grants / Loans.
  - Innovative but 'Fit-for-purpose' Technology from the start [inc. power].
  - Commercial off the Shelf [COTS] solutions [availability, repairs]
  - Utilize locally available solutions where possible [e.g. solar / battery].
- What does it take to Operate ?
  - Capacity Building, Skills Transfer, Professional Development.
  - Optimize Starlink connection by hosting EdTech Content on local server – reduces GB and facilitates 'Community BW Sharing'.
  - Separate Firewall user group rules: Students, Teachers, Community.
  - Implement a Voucher Access system to manage scarce capacity.
  - Engage local entrepreneurs to provide Local Support Services.

- **Enabling Organizational Sustainability:**
- Technical Capacity Building:
  - Focused on ICO's and School IT Coordinators:
  - 'Train the Trainer', Digital Literacy, Support, Administrative Mgmt.
- Engage Locally:
  - Implement 'business structures' that work within Local Regulations.
  - Incentivize / Incubate Community ISPs as Local Support Partners.
  - Support self-sustainable community initiatives' using Grants / Loans.
- Practical Governance:
  - Clear Roles, Responsibilities, Incentive / KPI Driven.
  - Automated monitoring and 'Light' KPI's essential to minimize OPEX.

- **Enabling Financial Sustainability:**
  - Pay-as-you-go model rather than 'managed services'.
  - Scalable cross-subsidization mechanisms, not 'output based aid'.
  - Minimize out-of-area operational support costs.
- Practical Business Model based on Cost Recovery:
  - EdTech Connectivity for Schools & Anchor Institutions : Anchor Nodes
  - Coordinate with DICT for "Free-WiFi" Starlink services : Sharing
  - Engage Community Wi-Fi providers (e.g. PISO) : Wholesale Services
  - Efficient sharing of the connection with the community : Cost Recovery
  - Share Infra with Other Agencies : 'Free Wi-Fi', Disaster Recovery etc.
  - Innovative VAS services can add incremental revenues that scale.
  - Must be complemented with Regulatory Alignment & Compliance.

Rural Connectivity Sustainability Challenges : Its Not Easy !

Thank you.