COL334 Assignment 5

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January 16, 2021

1. Low-cost Communication for Rural Internet Kiosks Using Mechanical Backhaul

The problem is "Internet-Connectivity" in rural areas of developing countries like India written by A. Seth, D. Kroeker, M. Zaharia, S. Guo, and S. Keshav at School of Computer Science, University of Waterloo Waterloo, ON, Canada, N2L 3G1.

2. Short summary of the main points in the paper and the key take-away messages

1. In developing countries rural areas are poor and hence unable to afford high charges of "Internet-Connectives". Majority of the population don't have system to access Internet and knowledge to operate them.
2. In order to access any internet service, rural population need to visit Kiosks. This paper talks about providing low cost, reliable, high bandwidth, disconnection tolerant internet to them.
3. The goal of low cost was met by sharing every component of the system which increases the risk of data security and provides less flexibility. This paper talks about data privacy, user mobility, and interoperability.
4. This was an optimization problem where existing technology does not fit because they are designed for laptops with high connectivity speed and very less disconnected periods. These solution focus less on low cost, low usage and reliability.

3. What are the key strengths of the paper, why is the study relevant

1. Strength of the paper is that it solves the very relevant problem of providing internet services to a significantly large rural population in developing countries.
2. The goal of paper to reduce the cost for low internet usage is not common in developed countries and hence existing technologies is insufficient to solve the problem.
3. Per person internet usage is very low in rural area and hence to reduce the cost we need to share the resources to exploit which could not be done individually.
4. Rural areas in developing countries are prove to power shutdown and hence it should be tolerant to dis-connectives. Some services may allow large delay and hence we trade cost with delays.
5. Allowing application to optimally to the underlying internet technology to data transfer to achieve minimum possible cost. Memory is cheap and hence exploiting it to make system reliable by judicious use of replication, both of data, as well as of hardware, by carrying spares in the ferries.

6. Existing transportation networks are also exploited for data transfer to lower the cost. Delay Tolerant Architecture was used to tolerate disconnections.

4. Any weaknesses in the paper, unreasonable assumptions, how could it be improved

1. This is temporal solution. Our main problem is to connect the whole country through internet and not just providing them bare minimum connectivity but providing them quantity with quality. Ultimately we need to deploy modern technology and connect the village.
2. If we can improve modern technology cost and we should try because one day they temporary solution will not meet the demand of the rural population when they will head towards development. This is clear from coronavirus situation. Good internet connectivity is basic need.

5. How it applies to the current Internet

1. Considering this paper was written long ago and the development in the technology has rapid in last recent years. This solution may not be relevant in most of the rural areas of India since most of them not have 3G tower and the connectivity is reliable, reasonably cost effective, fast, secure and advance with respect to the connectivity promised by the paper.
2. The problem is changed now to not just provide bare minimum connectivity for email, online form, documents transfer but now considering the new normal due to coronavirus situation, we need to provide them fast reliable secure internet connectivity for online education, online meetings and such things which now require relatively high connectivity speed.