Indio Networks

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Q1. What are the key supply-side constraints affecting Public Wi-Fi proliferation in India? What targeted policy or regulatory measures may be required to address these supply-side constraints? Please provide your response in detail with justification.

Indio Answer:

According to us, the following supply-side constraints are affecting public Wi-Fi proliferation in India:

1. Expensive Internet backhaul for Wi-Fi hotspots. TSP/ISPs charge high tariff for PDOs. There is no enforcement of the recent GR of maximum 2 times the cost of retail Internet.
2. Unreliable Internet backhaul. Wi-Fi hotspots are totally dependent on the Internet backhaul. If the backhaul is unreliable, then the service will be intermittent and unpredictable. Users are never going to accept unreliable Internet connectivity when the 4G/5G options are highly reliable
3. No Business Model: This is the main issue with PMWANI or any public Wi-Fi scheme. If people are not going to generate revenue from Wi-Fi hotspots then the scheme will never become sustainable
4. Right of way : While the central government wants to promote PMWANI scheme, the ground realities are completely different. A small PDO has to struggle to get fiber to his location and then permissions to install outdoor Wi-Fi AP from the local government agencies.
5. Fragmented ecosystem: The whole Wi-Fi ecosystem is completely fragmented and there is no standardization on equipment, expertise and software deployed. As a result users get different experience each time they connect to Wi-Fi. There is urgent need to have standardization (similar to UPI) along with a central implementation so the entire Wi-Fi hotspot installation, deployment, working and maintenance becomes same across the country.
6. TSP resistance: Most TSPs view Wi-Fi hotspots are threat to their business model. Instead, public Wi-Fi should complement their offering by making Wi-Fi offloading as TSP obligation and TSP should support certain number of PMWANI WI-Fi hotspots as part of their licensing.

Solutions for supply side constraints:

1. ISP compliance monitoring for charges on PMWANI bandwidth. Setup complaint window with quick resolution for any complaints regarding overcharging or denial of bandwidth
2. Ensure BharatNet connections are operational in phase-wise manner. Ensure BharatNet connections are available to PDOs in villages to setup Wi-Fi hotspots.
3. Use viability gap funding to offer interest free loans for setting up Wi-Fi hotspots to PDOs.
4. RoW to municipal assets like poles, temples, government buildings, etc with single window clearance
5. Allocating E and V band to service providers to create wireless backhauls and mesh networks
6. Open Roaming adoption for seamless interoperability
7. Wi-Fi offloading obligation for TSPs and PMWANI deployment mandates for TSPs and ISPs

Q2. What are the major demand-side constraints limiting the uptake of Public Wi-Fi services in the country? What targeted policy or regulatory measures may be required to address these demand-side constraints? Please provide your response in detail with justification.

Indio Answer:

Here are the major demand-side constraints for public Wi-Fi services in the country:

1. Free WiFi expectation: Users expects that Wi-Fi service is always free and government should offer the service free of cost to its citizens.
2. User Onboarding and Login process: The current process is very cumbersome requiring users to navigate through various screens. Moreover, the fragmented nature of PMWANI make the login experience different for each Wi-Fi hotspot further frustrating the users.
3. No marketing/promotion/advertisement: Unlike other countries, there is little awareness of availability of Wi-Fi hotspots in India. Users just don’t know that there is Wi-Fi hotspot in the vicinity
4. Skills Gap: Most users in rural India are not tech savvy so they are unable to use Wi-Fi which requires multiple steps to connect
5. Low perceived utility of Wi-Fi: People really don’t see much difference in speeds or content available on Wi-Fi Vs 4/5G. As a result, people don’t need to specially connect to PMWANI hotspot

6. No roaming and fragmented Wi-Fi ecosystem: There is no coordination between PDOA, App providers and other agencies involved in PMWANI scheme. There is no policy for roaming settlements.

Solutions:

1. Ask TSPs to bundle Wi-Fi access along with their offering
2. Setup venues with freemium models
3. Adopt Passpoint/Open Roaming with simple one-time eKYC. There is need for centralized PMWANI system to make simple and intuitive UI/UX for Wi-Fi access for all users across India
4. Promote creation of signage and promote PMWANI across all government building and panchayat offices
5. Create a business model which will ensure that local youth will run PMWANI hotspots who can help villagers with eKYC, onboarding and connection to PMWANI hotspots
6. Ensure various government content is available on PMWANI portals so users will find it easy to access government programmes from PMWANI welcome page
7. Single signon across all PMWANI hotspots with single e-wallet for recharge

Q3. Despite the PM WANI initiative, scaling the number of public hotspots across diverse geographies, especially in remote and underserved regions, remains uneven. What are the key challenges in expanding both the density and geographic spread of hotspots, and what strategies could help accelerate more balanced, nationwide coverage? Please provide your response in detail with justification.

Indio Answer:

Here are the key challenges in expanding PMWANI scheme in remote and underserved regions:

1. There is no market viability in remote regions to establish PMWANI hotspots
2. BharatNet or FTTH or any backhaul connectivity is not available in these regions.
3. Physical and Topographical challenges
4. Power supply is not reliable
5. No Universal Service Obligation for WiFi
6. Uneven state government capacity to implement central schemes like PMWANI

Solutions:

1. Start PMWANI implementation in government offices, public buildings to generate the necessary momentum in the underserved regions

2. FTTH is unviable in these regions. Best option is to leverage satellite backhaul like Starlink, OneWeb to implement Satellite-based WiFi hotspots in these regions. Indio Networks has successfully implemented this model across 4000 locations in Africa.
3. Create solar-based Wi-Fi hotspots to tackle power supply issues. Indio Networks has developed a fully integrated solar WI-Fi hotspot solution that can power a WiFi hotspot completely offgrid.
4. Provide full USO status for WiFi hotspots for remote, underserved regions
5. Provide technical and financial assistance to weaker states to roll our Wi-Fi hotspots in government building and public places to generate momentum

Q4. What changes, if any, are required in the existing PM-WANI framework to improve revenue certainty and long-term sustainability for PDOs/PDOAs? Please provide your response in detail with justification.

Indio Answer:

The current PMWANI framework is very fragmented and not scalable. It is also cumbersome to implement for a PDOA and doesn't support interoperability between PDOs. PMWANI users find it difficult to find hotspots, register for the service, login and pay for the services.

Each PDOA operates independently and without a limited geography. The service is offered as-is i.e. if is works great otherwise good luck finding a working PMWANI hotspot. There is little incentive for PDOs to keep the service operational. Lastly it doesn't offer a viable business model.

Here are the changes we suggest to the PMWANI framework:

1. We advocate a single, unified, countrywide PMWANI platform. We also recommend removing the technical and operational overheads for PDOA and they will recommend to use the central PMWANI platform instead.
2. The PDOA will only focus on building the business case for PMWANI i.e. they will setup WiFi hotspots and aggregate multiple PDOs and help facilitate the onboarding and working of the PMWANI hotspot
3. All PDOs will subscribe to central PMWANI platform which will offer standardized UI/UX for the end users
4. The central PMWANI platform will also use open standard WiFi hardware e.g. OpenWiFi which will offer Zero-Touch provisioning and central WLC for PDOs.
5. Having open standard WiFi APs and Controller will ensure that there is no vendor lock-in and will significantly reduce the TCO cost for PDOs

6. All PMWANI end users will have single account that will be valid across the country so they don't need to maintain multiple PMWANI accounts and wallets. This will also ensure seamless roaming across all PMWANI certified WiFi hotspots in India
7. The central platform will also facilitate roaming between PDOs and perform revenue sharing settlements
8. We also recommend that the backhaul (BharatNet, TSP provided or satellite provided) should be pay-per-use i.e. PDO should be charged only for the bandwidth consumed and not a lumpsum amount each month. This will ensure that there is no operational overhead to the PDO when there is no business on their PMWANI hotspot during the initial days or during the lull period in the year e.g. monsoon

Additionally, we also recommend following changes:

1. Mandatory TSP offloading on PMWANI WiFi hotspots to make TSPs stakeholders in PMWANI framework
2. Regulated per GB compensation to PDOs
3. Mandatory TSP bundling of PMWANI access to their broadband subscribers
4. Escrow account for PDOs so revenue sharing will be done instantaneously to all PDOs
5. VGF for providing loans to PDOs to purchase PMWANI WiFi hotspot
6. Price standardization for WiFi hotspot kit that will be offered to PDOs
7. Integration of PMWANI with e-portals of government schemes to create e-CSC centers at PDOs

Q5 Are there any other challenges currently faced by PDOAs/PDOs? If yes, what changes can enhance the participation of entrepreneurs under the PM-WANI framework? Please provide your response in detail with justification.

Indio Answer:

As per Indio Networks assessment, here are the list of challenges that PDOA and PDOs current face:

1. Low Revenue
2. Unclear business models
3. No government subsidy or funding for PMWANI schemes
4. Awareness and technical gap
5. Dependencies on TSPs and ISPs
6. Interoperability and roaming issues

Indio's Solution:

1. Lower the cost of PMWANI hotspot deployment and/or offer low-interest loans using VGF funds
2. Setup single, unified and nationwide PMWANI platform to standardize and centralize all PMWANI deployments across PDOAs
3. Setup clear, simple and flexible payment plans across the country to make the business model predictable and enforceable
4. Lower Internet backhaul charges – create pay as you use model so PDOs are not burden when they setup PMWANI hotspots to pay monthly recurring fees
5. Create marketing and promotion campaigns to build awareness

Q6 Are there improvements needed in the Authentication, Authorization, Roaming, and Payment architecture of the PMWANI Framework? Please share suggestions, if any. Please provide your response in detail with justification.

Indio Answer:

The current AAA, Roaming and payment architecture of PMWANI framework have the following gaps:

1. Inconsistent, non-standard and tedious AAA architecture of PMWANI. Each PDOA runs his own captive portal and AAA server without uniform and standardized login process across ecosystem
2. There is no cross token standard between PDOAs. As a result the authentication tokens are siloed within each PDOA
3. Roaming across PDOs is completely absent. Users have to repeated register and login for each PDOA
4. Lack of standard payment system. The payment methods are non-existent or fragmented. Each PDOA manage their own billing, settlement process.

Suggestions:

1. National PDOA (NPDOA) : Similar to UPI central model. The NPDOA will transform the existing fragmented system into coherent, interoperable and intuitive network creating a harmonized public Wi-Fi fabric
2. Solution is similar to UPI - a neutral national infrastructure layer that standardizes authentication, enables roaming, and clears payments, while letting PDOAs compete on service quality on top of it.

Q7. In the Indian context, which of the following models would be more appropriate for the proliferation of Public Wi-Fi?

Indio Answer:

a. A model where the Government actively ensures hotspot deployment through direct funding and implementation support, including backhaul provision; or

b. A model where the Government primarily ensures availability of robust backhaul infrastructure and intervenes in hotspot deployment only in cases of market failure.

Please provide your response in detail with justification.

Indio Answer:

We recommend using the option B. The government can focus on maintaining robust backhaul infrastructure and leave the WiFi hotspot deployments on the market forces. Exceptions will be remote, under served regions (e.g. Northeast India) where PMWANI will take time to establish and government will need to providing VGF funds.

Government should invest in building National PDOA which will help address some of the challenges in the existing PMWANI framework. The government can award the work to build central PMWANI platform to institutions like CDOT or private players who have deep expertise in building similar platforms and potential to operate the system at scale.

The Government should also utilize the funds to provide VGF to build the central PMWANI platform and offer low-interest loans to PDOs to install the PMWANI hotspots.

Q8. Is there a need to adopt separate strategies for Public Wi-Fi proliferation in rural and urban areas? If yes, suggestions may be provided. Please provide your response in detail with justification.

Indio Answer:

Yes, different strategies are needed for public WiFi proliferation in urban and rural areas.

We believe the needs for public WiFi is far more in rural India than in urban India. Most urban regions of India are well connected with mobile broadband and users are also comfortable using mobile broadband for Internet access. Moreover, the urban regions have lot of government programs like Smart Cities that offer the Wi-Fi services.

On the contrary, the rural India lack reliable mobile broadband access and there is greater need for Wi-Fi services. Additionally, compared to urban India, rural India can make better use of outdoor WiFi since there is less likelihood of channel interference from other WiFi systems.

We also believe the speed of mobile broadband is generally slow in rural areas (compared to urban areas) so Wi-Fi can offer better speed and near unlimited data access thus making a stronger case for paid Wi-Fi model.

Lastly, wireless backhaul will be best technology for last-mile connectivity within the village where FTTH will be cost prohibitive and expensive to maintain. Wireless backhaul coupled with Wi-Fi hotspots will make a strong case of connecting the unconnected at affordable cost.

Q9. What measures can be taken to improve the deployment and uptake of Public Wi-Fi networks in high-footfall areas for both outdoor (such as bus stops, roadside transit points, open public parks, markets, tourist sites), and indoor (such as airports, railway stations, malls, public institutions)? Please provide your response in detail with justification, separately for outdoor and indoor scenarios.

Indio Answer:

India is one of the few large countries were there is little adoption of public Wi-Fi in high footfall areas. The main reasons for these are as follows:

1. No visible signages and advertisement of Wi-Fi availability in indoor and outdoor areas
2. End users do not trust or rely on public WiFi because most Wi-Fi systems are not working and are not maintained properly
3. Public Wi-Fi is in catch-22 situation since no demand leads to unmaintained systems and non-working systems leads to less demand
4. Cumbersome process to connect to WiFi. No common SSID leads, complex process of registration and onboarding, variable speeds and coverage
5. Lack of public awareness or interest in using public Wi-Fi

Indio recommends the following to improve usage of public WiFi both in indoor and outdoor venues:

1. Bring public Wi-Fi deployments in airports, public institutions, bus stops, public parks, tourist sites, market places under single platform like National PDOA (NPDOA).
2. Create a single national SSID that will be available under the national PDOA for all public Wi-Fi deployments so users will connect seamlessly to PMWANI hotspots across the country
3. Ensure single signon for all end users.

4. Promote public Wi-Fi hotspots by clear marking/advertisement in public areas e.g. National Wi-Fi available here.

Q10. If the Government decides to provide financial support for the proliferation of Public Wi-Fi, which funding mechanisms would be most suitable for India? Should a uniform funding mechanism be adopted nationwide, or should differentiated funding mechanisms be used for rural, urban, and highfootfall areas? Please provide your response in detail with justification.

Indio's Answer:

If government decides to financially support the proliferation of Public Wi-Fi, I will recommend the funds to be allotted for the following activities:

1. Finalize the specifications for central PMWANI technology stack (National PDOA) and provide viability gap funding to institution/companies that will build and operate this stack on behalf of the government. (similar to UPI technology stack)
2. Allot gap funding for operating the National PDOA stack for a period of 3-4 years with a clear mandate to make the platform self-sustaining using the commissions earned from the PDOs
3. Government should not be in the business of installing and operating Wi-Fi hotspots. Instead, it should encourage young people to setup Wi-Fi hotspots in their respective areas and operate the Wi-Fi as a service business. To facilitate this, government should us the funds to offer low-interest loans and training programs to young graduates to take up this program
4. Allocate funds for promotion and advertisement of public Wi-Fi across the country. Make the funds available to young graduates to purchase banners, boards and other promotion material from registered vendors
5. Invest government funds in strengthening Internet backhaul connectivity and keeping it operational e.g. BharatNet, SATCOM, etc.

Q11. What criteria should govern the allocation and disbursement of funds across rural, urban, and high-footfall areas, respectively? Please provide your response in detail with justification.

Indio Answer:

Indio recommends the following criteria for allocation of funds for proliferation of public Wi-Fi in rural or urban areas:

1. Government should encourage young graduates/VLEs to take up PMWANI Wi-Fi hotspot as business opportunity. The government funding should be allotted to create and promote this program

2. Government should offer low/no interest loans to entrepreneurs who want to setup Wi-Fi hotspots and run this as a business.
3. The PMWANI hardware and installation should be subsidize to make it affordable for common people
4. Government should allocate funding to maintain Bharatnet or fiber infrastructure. Allocation of funds should be done based on SLA achieved for each Wi-Fi hotspot.
5. Government should utilize the funding for promotion of the PMWANI program especially in the rural areas

Q12. Is the lack of adequate and reliable last-mile connectivity a critical constraint for the proliferation of Public Wi-Fi in the country? If yes, what specific measures may be considered by the Central Government, State Governments, and local bodies to address the last-mile constraints? Please provide your response in detail with justification.

Indio Answer:

If the government can make existing BharatNet reliable, we believe there is no need to setup extra last-mile connectivity in villages in India. The current BharatNet infrastructure covers 2.5 Lakh village and there is a need to expand BharatNet infrastructure to all 6 Lakh+ villages in India. While we understand that not all village can be covered, government should make efforts to cover as many villages as possible with BharatNet.

Additionally, we recommend that the BharatNet fiber should extend to major places like school, PHC, Anganwadi, temple if possible. Alternative, Indio recommends using Wi-Fi backhaul (P2P or P2MP) radios for extending BharatNet across the village.

Indio has successfully deployed the Wi-Fi backhaul infrastructure in Satnavari village near Nagpur and is currently running 8 Wi-Fi hotspots in the village serving approximately 2500 villagers.

Q13. Is there a need for the Government to provide funding for provisioning of last-mile connectivity in the uncovered or underserved areas for Public Wi-Fi networks? If yes, which funding option is best suited in the Indian context, and what should be the criteria for rural, urban, and high footfall areas, respectively? Please provide your response in detail with justification.

Indio Answer:

Yes, we believe there is need to provide funding for last-mile connectivity in the uncovered and underserved areas. These areas are not served by current TSPs nor they can be covered easily through BharatNet program.

These underserved areas can be provided last-mile using satellite or microwave backhaul from the nearby village and then Wi-Fi can be used for providing access to the villagers.

Government should utilize USO fund for providing the last mile in these regions.

Q14. Are there any RoW challenges faced by service providers in accessing public places or street furniture to install Public Wi-Fi hotspots? If yes, details may be provided along with suggestions for improvements. Please provide your response in detail with justification.

Indio Answer:

There is definitely RoW challenges faced by service providers in urban areas. However, many ISPs work with local cable operator to overcome these challenges.

Based our experience, there aren't many RoW challenges in rural areas if the service provider works closely with the villagers/panchayat offices. Since the rural areas are devoid of connectivity options, the villager are more supportive of providing access for installing public Wi-Fi hotspots. Additionally there are less permissions or regulatory hurdles in installing Wi-Fi hotspots in the rural areas.

Improvements suggested:

1. Government should make PMWANI public Wi-Fi program as a part of its infrastructure program and make panchayat officers aware of this program. This will reduce the opposition from the villagers
2. Wi-Fi infrastructure can be integrated with street lights thus reducing the need for finding separate places for setting up Wi-Fi hotspots.
3. Wi-Fi backhaul meshing is good option for setting up this infrastructure. The government should delicense E or V bands

Q15. What facilitative roles can State Governments play in accelerating Public Wi-Fi deployment across rural, urban, and high-footfall areas, respectively? Should States consider deploying Public Wi-Fi networks at the municipal and gram panchayat level? Please provide your response in detail with justification.

Indio Answer:

Yes, Indio believes that central and state government should make it mandatory for installing Wi-Fi in all government building, gram panchayat offices and other government building under PMWANI. Existing Wi-Fi systems should be converted to PMWANI program so there is universal and common method applicable across all government offices to use public Wi-Fi.

This initiative will make PMWANI the de-facto method that the government promote for setting up Wi-Fi hotspots across the country and will bring the entire Wi-Fi connectivity in government offices under one umbrella.

All the public Wi-Fi infrastructure can be brought under one, central PMWANI platform that Indio is advocating which will ensure single userID, predictable UI/UX and ease of use for all users using Wi-Fi in government buildings.

We believe this initiative will significantly improve the adoption of PMWANI in India (similar to UPI) and will encourage private players to adopt the same standard for offering paid/freemium WiFi connectivity in other public locations.

Q16. Should the State Government need to take initiatives to improve the availability of last-mile connectivity for Public Wi-Fi networks? If yes, what measures can incentivise States /municipalities to undertake city- and town-level fiberisation to ensure Public Wi-Fi network proliferation? Please provide your response in detail with justification.

Indio Answer:

Yes, we already explained in the previous question that government should improve the availability of last-mile connectivity for public Wi-Fi networks.

The existing BharatNet program is excellent backbone for implementing PMWANI public WI-Fi hotspots if it is utilized properly. We believe if government can spend money on maintaining and improving reliability of BharatNet then PMWANI public Wi-Fi will automatically proliferate in our villages.

Q17. What facilitative roles can local bodies play in accelerating the deployment and sustainable operation of Public Wi-Fi networks in rural and urban areas? Please provide your response in detail with justification.

Indio Answer:

The local bodies should remove regulatory hurdles and encourage people to deploy public Wi-Fi hotspots under the PMWANI program. They should also offer good law-and-order to protect the

Wi-Fi infrastructure from vandalism, theft and damage. They should provide RoW to companies or individuals who want to setup public Wi-Fi hotspots in the region.

Local bodies can also subsidize electricity cost for public Wi-Fi hotspots so there is incentive for individuals to setup and operate public Wi-Fi hotspots.

Q18. What regulatory or policy incentives, schemes or programs are required to promote active participation of TSPs and ISPs in Public Wi-Fi deployment? Please provide your response in detail with justification.

Indio Answer:

No answer since we are not experts in this topic.

Q19. What regulatory or fiscal incentives, schemes or programs may be required in the provisioning of bandwidth and backhaul for Public Wi-Fi networks? Please provide your response in detail with justification.

Indio Answer:

The following regulatory and fiscal incentives can be offered:

1. Interest free loans for purchasing the equipment for installing public Wi-Fi hotspots
2. No licensing fee for operating public Wi-Fi hotspots
3. No AGR or recurring fees for revenue generated from Wi-Fi hotspots
4. ISPs, BharatNet, BSNL or any other operator should sell bandwidth on a pay-as-you-use basis so PDOs are not unnecessarily burden to pay monthly fees if there is no usage. This will significantly reduce the stress of running Wi-Fi hotspots and will increase adoption
5. Promotion and advertisement of the PMWANI Wi-Fi program to generate public awareness

Q20. What measures can be adopted to incentivise private enterprises, commercial establishments, shop owners, community institutions, etc., to install Public Wi-Fi hotspots? Please provide your response in detail with justification.

Same as above.

Q21. Is there a need to strengthen the role of public or private entities as system integrators for the deployment of Public Wi-Fi networks? If yes, what policy or institutional support may be required? Please provide your response in detail with justification.

Indio answer:

Yes, there is need to strengthen role of both public and private entities as system integrators for deployment of public Wi-Fi. The main reason why public Wi-Fi fails is because there is no incentive for system integrators to maintain the infrastructure once deployed. Even when the state/central government invests money in deploying public Wi-Fi hotspots, the government is facing challenges in operating and maintaining these networks.

Indio believes that system integrators should be incentivize to run and maintain these networks and government should allocate viability gap funding to SIs to keep these systems running while giving them mandate to build business models like paid Wi-Fi, advertisement, cellular offloading, Voice over Wi-Fi, local content streaming to monetize these hotspots after specific years. The gestation period should be support by partial funding from the government.

Q22. Are users experiencing challenges with the authentication and authorization procedures for accessing Public Wi-Fi Networks? If yes, how can authorization and authentication processes be simplified while ensuring security and compliance? Please provide your response in detail with justification.

Indio Answer:

Yes, the current PMWANI system or public Wi-Fi hotspots are heavily challenged for authentication and authorization procedures.

Indio recommend the following items to simplify this process:

1. Create a central authentication and authorization platform to standardize and streamline the user authentication and on-boarding process
2. WiFi user should perform eKYC only once for a particular device
3. All subsequent usage should prompt the user to perform eKYC e.g. SMS/OTP again
4. The central system should make the user access of Wi-Fi hotspots extremely simple and easy (very similar to cellular). For this, there should be standard, fixed SSID for all PMWANI Wi-Fi hotspots across the country.
5. The central PMWANI architecture should adopt new standards like Passpoint or OpenRoaming to create certificate based standard authentication on PMWANI networks without requiring captive portals
6. User should be charged for public Wi-Fi access and this message should be given to end users. By charging, the entire PMWANI program will become self-sustainable and private companies will be interest in participating the program.
7. The central system should responsible for roaming between PDOs and accurately provide settlement based on the bandwidth consumed on the hotspot.

Q23. Is there a need for a centralized platform for authentication and payment systems in the Public Wi-Fi ecosystem? If yes, which entity is best suited for its implementation and management? Please provide your response in detail with justification.

Indio answer:

At present there is no centralized platform for authentication and payment system in public Wi-Fi ecosystem.

However, Indio Networks would strongly advocate creation of centralized platform for authentication and payment system. The reason for this are as follows:

1. Central system will ensure there is same user experience across all PMWANI hotspots in the country
2. End users will get predictable, reliable and safe UI/UX which is currently not the case
3. The central system will ensure seamless roaming between all Wi-Fi hotspots in the country
4. It will be possible to enforce same pricing scheme across all Wi-Fi hotspots
5. Central system will ease settlement between different PDOs and ensure that the settlement is correct and fair to all parties
6. It will ease PDOs or Wi-Fi hotspots operators from headaches of setting up complex AAA and billing systems and operating them
7. Central system will enable trust for Wi-Fi users and will prevent fraud for PDOs
8. The entire process of installation, configuration and commissioning of Wi-Fi hotspots will become standardized and easy thus ensuring fast scaling of the program

The government should select private or public companies who have deep domain experience and proven credentials for implementing this central platform.

Q24. What steps are required to achieve interoperability and seamless roaming among Public Wi-Fi networks? Should inter-hotspot roaming be made mandatory, and if so, should a “super-aggregator” be introduced to facilitate it? Please provide your response in detail with justification.

Indio Answer:

Again, having the central authentication and billing system will make it really easy to implement interoperability and seamless roaming among public Wi-Fi networks.

The central system can also integrate with international systems like Eduroam, Boingo and other Wi-Fi aggregators for providing roaming for international guests using public Wi-Fi hotspots in India. Moreover, Indian WiFi users can also use the international Wi-Fi hotspots seamlessly.

Q25. What monetisation models are most appropriate for rural, urban, and high-footfall locations, respectively? Please also suggest any additional monetisation models that may be suitable in the Indian context. Please provide your response in detail with justification.

Indio Answer:

There are many models for monetization and Indio Networks has successfully implement some of them outside India. Based on our experience, here are some ideas for monetization of Wi-Fi hotspots:

1. Charge end users to use Wi-Fi access (paid model). If PDOs want to charge, then they should offer reliable and fast service to end users. Certain SLAs should be gurantanteed to the end users. If the system is down, the PDO or backhaul operator should be penalized for the downtime
2. Advertisement based revenues
3. Wi-Fi offloading
4. Hyper local content streaming over Wi-Fi
5. Voice over Wi-Fi
6. E-Government portal access / digital CSC

Q26. Please provide any additional comments, observations, or suggestions related to the proliferation of Public Wi-Fi in the country, including any potential issues or considerations that may not have been covered in the sections above. Please provide your response in detail with justification.

None