

Tariff Implementation Monitoring Strategy
For
Fixed Internet and Mobile Voice and Data Services Tariff
Implementation Monitoring Systems



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GOVERNMENT OF BHUTAN THIMPHU, BHUTAN

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1. Background

The Bhutan InfoComm and Media Authority (Authority) as a regulator of the Information, Communications and Media sector in Bhutan, has been mandated with numerous functions related to ICT and Media services. One of the most important objectives of the Authority is to ensure affordability of ICT services for the people of Bhutan. Towards achieving this objective, the Authority is actively involved in developing and reducing tariffs related to voice calls, SMS, cellular data, fixed broadband and leased line internet, fibre infrastructures sharings etc.

While ensuring affordability is important, at the same time it is also equally essential to monitor whether such tariffs are implemented by the ICT service providers as per the approved tariffs. This is also as per the Information Communication and Media (ICM) Act of Bhutan 2018 where the Authority's one of the important functions is to "Protect consumers of ICT and Media services, among others, the rates charged for, and the quality and variety of ICT services provided". With these functions, it is essential that the Authority carry out effective monitoring and evaluation exercises to assess the quality, reliability and costs (tariffs charged to customers) of the ICT services in the country.

The issue of inaccurate cellular data charges is one of the most raised issues at this point of time where such issues are not only often raised in social media platforms by the public but also are received formally by the Authority. Considering the importance of achieving the objectives of ICT services affordability and providing the consumer the rights to use ICT services as per the approved rates and tariffs, the Authority has carried out an in-house study on how to enhance the monitoring strategy of assessing whether the ICT service providers are implementing the approved tariffs.

2. Scope of this paper

The Authority after consulting the relevant agencies and stakeholders on its Consultation Paper on "**Fixed internet and Mobile Voice and Data Services Tariff Implementation Monitoring Strategies**" has now developed the Strategy document on Tariff Implementation Monitoring.

Based on this strategy document, the Authority will be implementing respective monitoring strategies for different fixed and mobile services in the country.

Besides highlighting the strategies to be implemented for monitoring fixed and mobile services, this document has also highlighted studies on some of the existing mechanisms practiced locally and globally in ensuring that operators provide accurate tariff rates to its service users.

3. Services to be monitored for accurate tariff implementation

The Authority will be monitoring the tariff implementation of all the fixed and mobile services mentioned below. The tariff rates are as per the rates approved by the Authority.

- a. Fixed broadband service

- b. Leased line internet service
- c. Cellular/Mobile broadband service
- d. Cellular Voice service

In addition, the Authority will also monitor the tariff implementation in sharing the dark fibre and leasing fibre bandwidth. The tariff rates for dark fibre and fibre bandwidth are as per the Telecommunication Tariff (Amended) Order 2009¹.

4. Existing complaint redressal system for ICT services

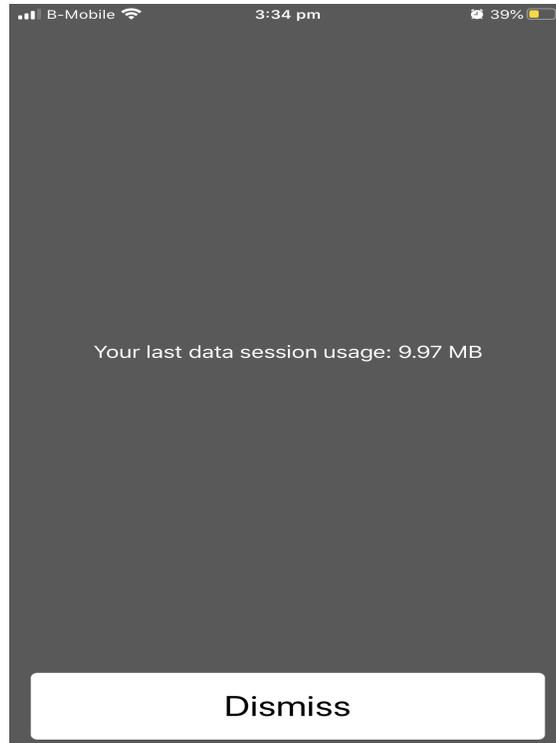
- a. Any of its customers, for any ICT services provided by the telecom operators and ISPs, can lodge a complaint to the service providers either in written application or through the customer care services (telephone call/walk-in).
- b. To address complaints such as overcharging or unexpected consumption/deduction of data, the service provider reviews the complaint, checks its network systems and provides evidence of the total data consumption by the subscribers along with the classification of data consumed by different apps and services.
- c. It is also informed by the service provider that the complainant usually visits the service provider's office in person and the service provider physically checks the mobile handset of the complainant together and explains how the unexpected data consumption had taken place.
- d. Moreover, the service provider also assists the complainant on how to reduce the data consumption by putting off the background app which runs behind even though the subscribers do not use the data.
- e. The Authority also has in place the complaint redressal systems where the Authority intervenes to solve the issues provided that the subscribers/complainant submit for Authority's intervention in writing.

5. Mobile voice and data billing notification systems to subscribers

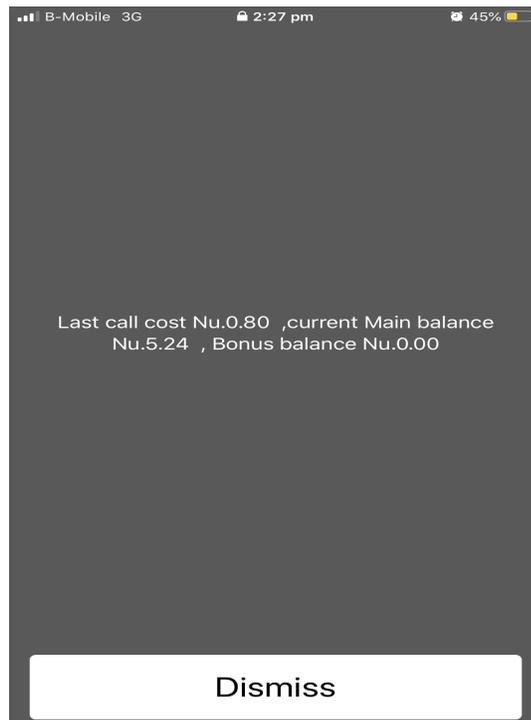
- a. Currently, the subscribers are notified of the amount of data consumed at the regular interval as shown in the figure below, as well as informed via SMS whenever the 90% of total data volume allocated has been used. This helps in reminding the subscribers of their data usage but not to the greater extent **as the subscribers usually experience a bill shock when they are notified with 90% consumption later.**

1

https://www.bicma.gov.bt/bicmanew/data/publications/rules-regulations-guidelines/Tariff_Order_First_Amendment_2009.pdf



- b. The subscribers are also informed of the charges on the last voice call made, however, the duration of the call made is not reflected as shown in the figure below. **The reflection of voice call duration similarly would be more transparent in voice call cost.**



- c. Meanwhile, the subscribers can also view the remaining talk time and data balance by dialling the *170# for BTL service and *770# for TICL as shown in the figure below:



- d. All such notifications are certain ways to provide transparency to the subscribers **but the service providers can improve on providing more information such as the details of data usage and the duration of the call made etc.**
- e. In India, the telecom operators issues the notification to the customers on the usage of data at the regular intervals through the USSD (Unstructured Supplementary Service Data) or SMS². In 2015, the Telecom Regulatory Authority of India (TRAI) mandated every mobile operator to send information about the usage to data users at every 10MB of data consumption except for the customers opting for special packages.

For customers using special data packages, the operator is required to inform customers whenever the limit of data usage reaches 50 percent, 90 percent and full exhaustion of the allotted data limit. However, the customers are to be provided with an option to opt out if they do not desire to receive such information.

²<https://gadgets.ndtv.com/telecom/news/telcos-must-notify-customers-about-data-usage-at-regular-intervals-725459>

6. Monitoring voice and data billing system in other countries

- a. The Telecom Regulatory Authority (TRAI), for instance, have instituted the auditing of voice and data billing systems of telecom service providers³ under the amended 'Quality of Service (Code of Practice for Metering and Billing Accuracy) Regulation 2006'. As per the regulation, the TRAI may from time to time notify the panel of auditors to audit the billing systems. The auditors will audit the metering and billing system of the service providers where all the data records of a month shall be audited in each quarter of a year and also any complaints may be verified and investigated by the auditors furnishing a report to the TRAI. The auditors will be certified with the professional capacity to carry out billing auditing.
- b. Meanwhile, although it is not actually the system to monitor the billing systems, there is also a mobile application developed by the TRAI in India which basically monitors the quality of call services and data speed and the feedback can be automatically sent to the operators and the regulators on the call quality and data speed. For example, the mobile application called TRAIAPP contains three TRAI Apps on a single platform namely MySpeed, MyCall apps and DND 2.0⁴.

The MyCall app provides a platform to all telecom service subscribers in India to crowdsource their opinion through a feedback rating process. The app helps mobile users to rate their experience about voice call quality in real time and helps TRAI gather customer experience data along with network data.

The TRAI Myspeed App allows the subscribers to measure the data speed experience and sends the results to TRAI. The application captures and sends coverage, data speed and other network information along with the device and location of the tests. The app enables TRAI to obtain test-data from users in all service areas, without any action by the users. The app does not send the personal user information. All results are reported anonymously.

The Do Not Disturb (DND 2.0) app helps smartphone users to register their mobile number in India under DND to avoid unsolicited commercial communication/telemarketing calls/SMS.

- c. In Bahrain, the Telecommunication Regulatory Authority (TRA) of the Kingdom of Bahrain, through the consulting firm, carries out the evaluation on the accuracy of the billing systems used by the mobile network operators, from an end-user perspective⁵. The evaluation is carried out for the key services such as National Calls, National Short Message Services (SMS), Data, International Calls, Roaming etc.

³ https://www.taxmanagementindia.com/visitor/detail_article.asp?ArticleID=5474

⁴ <https://traigov.in/portals-apps/tra-apps>

⁵ https://www.tra.org.bh/Media/Documents/Market-indicators/TRA%20AUDIT%202018_Billing_V21.pdf

In 2018, the TRA of the Kingdom of Bahrain selected Directiqu, an international consulting firm to conduct the assessment.

- d. Besides, there are numerous mobile apps developed by the telecom service provider themselves which allows the subscribers to monitor the call data information, data usage and the account statement of account. For example, Reliance Jio in India has their own mobile app called “My Jio App” which provides information about the data usage as well as the account usage information⁶.

Similarly, Virgin Mobile in Australia also has its own mobile app called “Virgin Mobile App” to help subscribers access information related to their data usage and account information.

Some of the most common mobile call and data monitoring apps developed by the telecom service providers are such as “My Airtel App” in India, “My Vodafone App” in India, “My Optus App” in Australia etc which enable the users to monitor their data usage details.

- e. Similarly, both the operators BTL and TICL in the country have their own Mobile App (My BT App for BTL and My TashiCell for TICL). However, these Apps do not provide the subscribers, the detail on the classification of how the data is consumed rather it just provides the total data consumed and the remaining data balance available. It may provide more transparency to the subscribers if certain classification of data consumption details can be provided through the App, for instance the data consumed by Facebook, Youtube, Applications, Downloads, Updates etc rather than just the blank total data.
- f. Nevertheless, there are also other free mobile apps or third party apps available for Android and IOS phones which can help the subscribers monitor their data usages. These mobile apps provide in detail the data consumption by each application, services and software updates as shown in the figure below. Some of the commonly used third party mobile apps to monitor the data usage are “My Data Manager”, “DataMan Next”, “Data Usage”, “DataEye” etc.

⁶ <https://www.youtube.com/watch?v=ysCqfSxsvlg>



- g. Besides, the Android and IOS phones also have inbuilt settings which can project the total data consumption with classifications of consumption.

7. Existing fiber tariff implementation monitoring system in Bhutan

- a. The tariffs rates for leasing the dark fibre and fibre bandwidth are specified in the “Telecommunications Tariff (First Amendment) Order 2009”⁷. The ICT Facility provider owning the dark fibres and fibre bandwidth are required to share the infrastructure to others with the rates as per the tariff rates mentioned in the “Telecommunications Tariff (First Amendment) Order 2009”.
- b. Currently, the Ministry of Information and Communications (MoIC) of Bhutan allocates a pair of dark fibre for free to the applicable Internet Service Providers (ISPs)⁸.
- c. Meanwhile, those private ICT Facility providers who own their own dark fibre and fibre bandwidth have to abide by the Telecommunications Tariff (First Amendment) Order 2009 if it leases its dark fibre and fibre bandwidth facilities to the others.

⁷https://www.bicma.gov.bt/bicmanew/data/publications/rules-regulations-guidelines/Tariff_Order_First_Amendment_2009.pdf

⁸<https://www.unescap.org/sites/default/files/ICT%20Co-Deployment%20with%20the%20Electricity%20Infrastructure%2C%20The%20Case%20of%20Bhutan.pdf>

- d. Currently, the lease of dark fibre or fibre bandwidth between the two parties are implemented through maintaining the legal agreement between both the parties and negotiating wherever possible on the rates from the approved tariff rates. The contract agreement and the tariff rates negotiated need not have to be submitted to the Authority.
- e. The Authority only intervenes if there is any disagreement between the two parties (lessor and the lessee) on the tariff rates during the negotiation or after the negotiation.
- f. Moreover, the Authority also reviews the implementation of dark fibre and bandwidth tariff by the ICT facility providers whenever the Authority receives written complaints from the lessee.

8. Existing leased line services monitoring system in Bhutan

- a. The Authority monitors the leased line services provided by the telecom operators and ISPs in the country. Since the leased line services offer fixed bandwidth and unlimited browsing capacity, the Authority only monitors the bandwidth speed offered to the subscribers.
- b. The Authority monitors the leased line services provided by the telecom and ISP to its subscribers, randomly selecting few of its subscribers through sampling.
- c. The Authority's secretariat office also has subscribed to the leased line services of both Bhutan Telecom Limited and Tashi InfoComm Limited and conducts the routine speedtest of the leased line services.
- d. The internet speed of the leased line can be measured through the browser using testing tool such as <https://www.speedtest.net/>
- e. Moreover, the Authority monitors the internet speed test in the field whenever the Authority receives written complaints from the leased line subscribers.

9. Existing fixed broadband internet services monitoring system in Bhutan

- a. Since the fixed broadband internet services also provide fixed internet data as per the subscription package, it is similar to the mobile data services where the data subscription is fixed as per the subscription package.
- b. The Authority has not been able to monitor the tariff implementation by the fixed broadband service provider to its subscribers at the moment.
- c. In order to monitor the broadband data usage at the subscriber's (user) end, the modem connected at the subscriber's end should be capable of logging and recording the data usage and indicate the amount and details of the data used by the subscribers.

- d. The majority of the modem or routers provided by the ISPs to its broadband subscribers may not be capable of recording and indicating the data usage by the broadband subscribers.
- e. Moreover, the fixed broadband subscribers can only view their total data consumption in their broadband log-in dashboard but not the details of how they consumed the data.
- f. Such detailed consumption may be available in the systems of telecom operators and ISPs but they are not provided to the subscribers. It may be important to provide the detailed broadband data consumption in the subscriber's log-in dashboard by the service provider.

10. Recommendations for tariff implementation monitoring systems/strategies

A. For Cellular/Mobile Voice and Data

- a. Similar to some countries like India and Bahrain, the billing systems of the voice and data services of telecom service providers may be audited based on quarterly/biannually/annually with the help of qualified and certified auditors or through the qualified/certified consulting firms. The auditing of voice and data billing systems may be based on sampling methodology where certain subscribers' usage may be audited by the auditors.
- b. Or the telecom service providers may be mandated to have external auditors audit their voice and data billing systems quarterly/biannually/annually and submit the report to the Authority. Similarly, the auditing of voice and data billing systems may be based on sampling methodology where certain subscribers' usage may be audited by the auditors.
- c. Or, the Authority can mandate the telecom service providers to submit to the Authority the call data records (CDR) and the cellular data usage records of the subscribers without sharing the subscribers identity. These data submissions by the telecom service provider may be based on the trust and should be considered the last option. While sharing the information on voice and data usage by the telecom service provider, the sharing of subscribers' identity and its mobile numbers may not be recommended as it is in breach of data privacy.
- d. The Authority shall also mandate the telecom service providers to develop certain mobile apps which can process information of the backhand billing system and transparently share information to its subscribers on the data consumption details so that the subscribers can be informed and satisfied with the billing charges levied by telecom service providers. This may be required only for data charges since the billing charges for voice calls along with the duration of call appears in the mobile screen as soon as the call is completed.
- e. The Authority may also explore developing its own mobile app similar to the TRAI mobile app to furnish such information to the subscribers and also to collect such information by the regulator without having to send mobile numbers ensuring anonymity and thus preserving the data privacy

rights of the subscribers. Such mobile apps may also serve as one form of monitoring the data charges.

- f. Besides, as it is technically possible through the billing systems, the telecom service providers may be mandated to share the voice call and data usage details of the subscribers to the subscribers based on daily/weekly/monthly. For data usage, it may be possible to share the data consumption details consisting of the consumption by each mobile application or services, if the detailed information on data usage is not possible. These may ensure the transparency of billing systems to the subscribers.
- g. Or else, if the telecom service providers cannot share the voice and data consumption and charges information regularly to its subscribers, the service providers may be mandated to share such information to the subscribers whenever the subscribers requests for the details or lodges a complaint directly or through the Authority.
- h. In addition to the sharing information message on the cost incurred for voice call, the duration of the call made shall also be shared.
- i. As a preliminary measure of auditing voice and data billing systems of telecom service providers, the Authority shall institute some form of basic procedure/systems to monitor the tariff implementation of cellular/mobile voice and data.

(i) Voice Call Monitoring

- The voice call tariff implementation monitoring will be carried out using a random number SIMs (say for “n” number of SIMs).
- Certain voice calls can be made from each mobile SIMs in a month and the billing charges can be monitored taking into account the duration of voice calls, duration of the day, to which operator’s SIM the call is made etc.
- The detailed information of voice calls made by each SIM can be recorded as shown in the table below.

Sl. No	Voice call from	Voice call to	Duration of the Day (Time of the call made)	Duration of call	Total billing charged	Tariff/unit charged	Is the call charge as per the approved tariff?
1.	SIM of Operator 1	SIM of Operator 1					
2.	SIM of Operator 1	SIM of Operator 2					

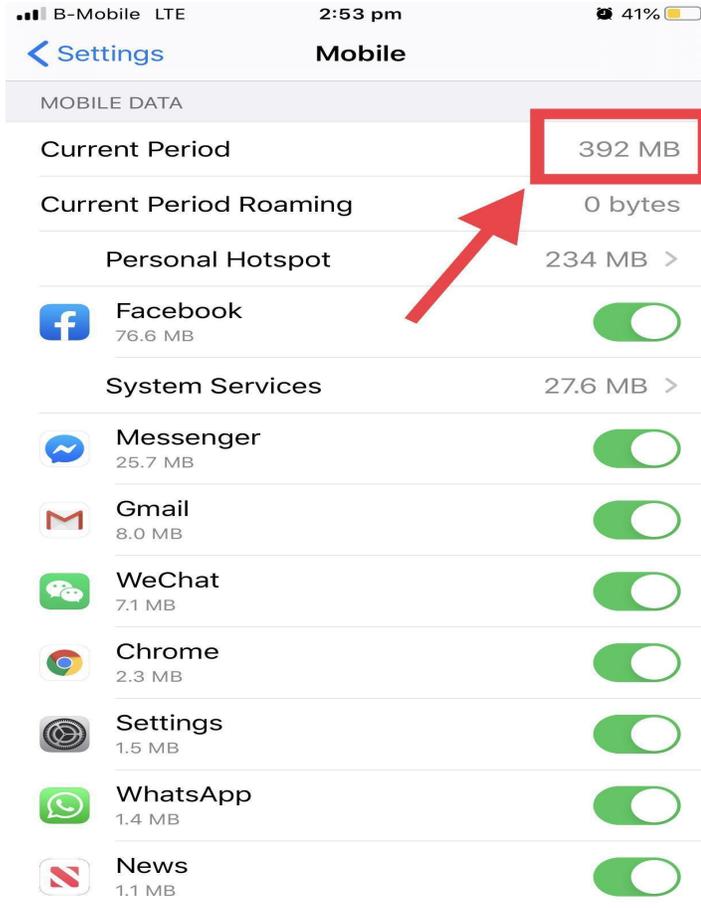
3.	SIM of Operator 2	SIM of Operator 1					
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- All the voice call data carried out by all the “n” number of SIMs as per the table above will be collected, analysed and compiled. And the report will be compiled/regenerated and the Authority will have to take necessary action if there are any violations by the service providers.

(ii) Cellular Data Charges Monitoring

Similar to the monitoring of voice call tariff implementation, the Authority shall also carry out the monitoring of data charges tariff implementation by instituting some procedure/systems of using the data packages in “n” number of SIMs.

- There are numerous applications which can monitor the data usage where we will be able to know how many volumes of data we have consumed for a certain duration. Moreover, the Android and IOS smartphone itself has the features to calculate the amount of data volume the applications and services have consumed in certain duration as shown in the figure below:



- Each “n” number of SIMs will be recharged/allocated with certain data packages in a month and the data consumption from the package will be monitored once a month/three months using the data tracking app or the inbuilt systems of Android/IOS smartphones.
- Once the allocated data package is consumed fully, the volume of data consumed which is reflected by the app or inbuilt features of smartphone will be compared with the allocated data package volume as shown in the table below:

Sl. No	Service providers	Total Package data allocated	Time of Package data allocated	Time of Package data consumed fully	Data volume consumed as per the App/Mobile device	Is the data package allocated as per the consumed data?
1.	Service Provider 1					
2.	Service Provider 2					

- All the data consumption carried out by all the “n” number of SIMs as per the table above will be collected, analysed and compiled. And the report will be compiled/regenerated for voice call charges monitored and the Authority will take necessary action if any violation occurs.

B. For fiber leasing

- The Authority will monitor the implementation of tariffs for dark fibre and fibre bandwidth leasing based on the agreement signed between the lessor and lessee.
- Any leasing of dark fibre and fibre bandwidth between the lessor and lessee shall be done through signing the agreement which shall specify all the lease costs.
- The Authority will monitor such tariff implementation whenever the Authority receives the complaints from any parties.

C. For leased line internet services

- The Authority shall monitor whether the leased line internet services provided to the subscribers are as per the required speed subscribed by the users.
- The Authority monitors the leased line services provided by the telecom and ISP to its subscribers, randomly selecting few of its subscribers through sampling without the information of service providers.
- Moreover, the Authority shall monitor the internet speed test in the field whenever the Authority receives written complaints from the leased line subscribers.
- The speed test verification shall be monitored in the following manner.

Sl. No	Services provided by	Time of the speed test	Measurement of bandwidth speed test result	Is the internet bandwidth speed as per the subscription?
1.	Service Provider 1			
2.	Service Provider 2			
3.	Service Provider 3			

D. For fixed broadband internet services

- The service provider shall provide broadband modem to the subscribers which should be capable of logging and recording the data usage and indicate the amount and details of the data used by the subscribers.
- The service provider shall provide the detailed broadband data consumption information in the subscriber's log-in dashboard rather than providing just the total amount of data consumed and data balance to the subscribers.
- The Authority shall monitor the broadband internet users randomly to verify whether the service providers are providing the volume of data as per their subscription.
- The verification of broadband data volume provided to the broadband users as per the package subscription shall be similar to the monitoring of mobile data verification where the comparison will be made with allocated data package and data consumed.