

## BUSINESS CASE OF MANAGEMENT DECISIONS FOR ARRANGEMENT OF DIRECT INTER-OPERATOR RELATIONS

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**Keywords:** management decision, tariff, communication services, expenses, pricing, economical effect, discount of money flow, cost price.

In this article the feature of the process of granting communication services, an economic substantiation of tariffs for communication services, the basic problems of pricing the telecommunication companies are considered and analyzed.

Management decision making for arrangement of direct communication with other service providers often causes a lot of questions. On one hand direct connection affords to save money for transit services for net operators, with whom the connection exists, but on the other hand it makes operators to incur additional expenses for formation and interfacing.

All services for traffic transmission, in accordance with the legislation of the Russian Federation, can be divided in two main groups: call termination services and triggering services. For easier understanding it is necessary to clarify which operator provides a service for the abonent. In case of call triggering the direction of payments for inter-operator services is quite the opposite to the direction of abonent call, and in case of call completion the payments direction coincides with abonent call direction.

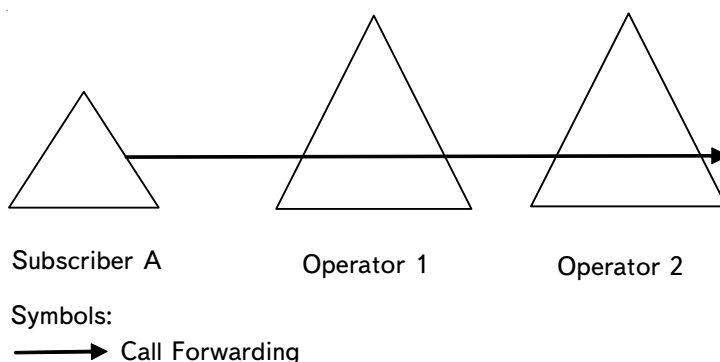
In the figure you can see that abonent A makes a call, which goes through the net of Operator 1 and the net of Operator 2. If the abonent pays for the call to Operator 1, so Operator 2 provides the call completion service to Operator 1.

And if the abonent is provided with the service from Operator 2 or Operator N, which is out of the net of Operator 2 and, accordingly, pays for this service to Operator 1 or Operator N, so we come across triggering call service, which Operator 1 provides to Operator 2 (payment direction is opposite to call direction).

Taking into account the identity of triggering call service and call completion service (the main difference is the direction of call services) hereafter we can consider one of these services and talking about traffic transmission it means the call completion services.

Call completion services can be divided into three groups:

- ◆ Call completion services to the net of the operator, providing these services (Abonent A, which is the abonent of Operator 1, performs the call of the abonent of Operator 2),
- ◆ Call completion services to the nets of other operators (Abonent A performs the call of the abonent of Operator N, the net of which is out of the net of Operator 2)
- ◆ Transit calls services. In practice these services are usually provided if the net of Op-



*Fig. Flow chart of call forwarding*

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erator 1 is not integral and calls of abonent of Operator 1 to the other abonents of Operator 1 goes through the net of other operators. In the general case transit call service is a component of call completion service in the net of other operators, increasing the cost of this service adding transit component to the call completion service to the in-house network.

In general the total expenses of the operator for obtained services by traffic transmission can be presented in the following way:

$$C = C_0 + C_D + C_T, \quad (1)$$

where  $C_0$  - is the sum of expenses for the call completion services to the net of the operator;  $C_D$  - is the sum of expenses for obtained call completion services to the nets of other operators;  $C_T$  - sum of expenses for call transit services.

Presenting expenses as the product of time and cost components we have the following formula:

$$C = \sum t_i^0 \cdot V_i^0 + \sum t_i^D \cdot V_i^D + \sum t_i^T \cdot V_i^T, \quad (2)$$

where  $V$  - is the volume of transit traffic;  $t$  - is a tariff for rendering the service.

Taking into account that  $t^D$  is always more than  $t^0$  and  $t^T$ , it can be decomposed on  $t^0$  and  $t^T$ , so the operator can contest the reduction of 3t or even the full exception of this component by means of his policy concerning the arrangement of direct interstation communication with other operators. Operator has a variant to change expenses of obtained services by traffic transmission to investment and operating expenses, concerning the organization of new interstation lines. If we take into account that interstation lines is the complex of technological tools, which include the part of station equipment of the operator (common equipment ATS (ATS) and transmission system equipment (SE) in the part, associated with junction line) and physical line (PL) along the whole extension between ATS of connecting operators, so the organization expenses can be presented in the following way:

$$C_{MSS_{invest}} = C_{aat_{invest}} + C_{se_{invest}} + C_{pl_{invest}}, \quad (3)$$

Accordingly the expenses for the operating-technical service will be:

$$C_{MSS_{TO}} = C_{ats_{TO}} + C_{se_{TO}} + C_{pl_{TO}}, \quad (4)$$

Economical effect from the organization of direct connection at each step of count will be identified by the following formula:

$$E = C_T - C_{MSS_{TO}}, \quad (5)$$

Taking into account capital expenses and discount of money flow in accordance with the "Guidelines for assessing the effectiveness of investment projects and their selection for funding" the formula will be the following:

$$E' = \sum_{t=1}^T \frac{E_t}{(1+q)^t} - C_{MSS_{invest}}, \quad (6)$$

where  $q$  - is discount norm;  $t$  - is a step of count which is equal to one month within  $T$  calculation horizon,

Using the formula (6) it is possible to identify the period of pay-off of expenses spent to the organization of direct connection and make a decision concerning its advisability. But there can be a situation when the formula (6) will be insufficient to make decisions. For example the volumes of traffic between considered nets are not enough and it does not allow to make the conclusion about advisability of connection, but the operator beyond the completion in his net can offer the completion in the net of another operator by prices  $V^D$ , which are lower than  $V^D$  before the organization of direct connection. Then the formula (6) will be changed in the following way:

$$E' = \sum_{t=1}^T \frac{E_t + (C_{Tn_t} - C'_{Tn_t})}{(1+q)^t} - C_{MSS_{invest}}, \quad (7)$$

where  $C_{Tn}$  и  $C'_{Tn}$  - are the expenses for traffic transit to the net which does not take part in considered connection, with which the direct connection does not exist before and after connection organization accordingly.

Taking into account the fact that the service provider does not only consume the services by traffic transmission, but also renders these services, the formula (7) will be the following:

$$E' = \sum_{t=1}^T \frac{E_t + (C_{Tn_t} - C'_{Tn_t}) + D_t}{(1+q)^t} - C_{MSS_{invest}}, \quad (8)$$

where  $D'$  - stands for additional expenses, which the operator can obtain from the organization of direct connection.

Thus, on the basis of our research it is possible to formulate specific management objectives for the departments of telecommunications companies to implement various schemes of communication and the development of tariffs for the interaction of operators, which will allow to increase the effect of activity or decrease the cost of passes and termination traffic.

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Federal Law "About the telecommunication" № 186-FZ dated 23.12.2003, "Rules of the accession of telecommunication networks and their inter-

actions" approved by the RF Government Decree № 161 dated 28.03.2005, "The requirements to build telephone network connection" approved by Order Mininforsvyazi № 97 dated 08.08.2005, " Requirements to order traffic in telephone networks" approved by Order Mininforsvyazi № 98 dated 08.08.2005.

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*Received for publication on 21.04.2009*