

## ЕКОНОМІКА ТА УПРАВЛІННЯ ПІДПРИЄМСТВАМИ (ЕКОНОМІКА ЗВ'ЯЗКУ)

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### EVALUATION OF QUALITY OF SERVICES AND SERVICE OF MOBILE COMMUNICATION IN CONDITIONS OF ECONOMIC DIGITALIZATION

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### ОЦІНКА ЯКОСТІ ПОСЛУГ ТА ОБСЛУГОВУВАННЯ МОБІЛЬНОГО ЗВ'ЯЗКУ В УМОВАХ ДІДЖИТАЛІЗАЦІЇ ЕКОНОМІКИ

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### ОЦЕНКА КАЧЕСТВА УСЛУГ И ОБСЛУЖИВАНИЯ МОБИЛЬНОЙ СВЯЗИ В УСЛОВИЯХ ДИДЖИТАЛИЗАЦИИ ЭКОНОМИКИ

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**Abstract.** The article states problems encountered in assessing the quality of services during the formation of the digital economy and society. These problems include the need to transform approaches for assessing the quality of services by taking into account new techno-economic trends and the needs of consumers, the permanent appearance of new services and the need to assess the quality of service. The analysis of the state of development of the market of communication services and informatization is carried out. Structuring the services market and mobile communication have shown that trends in demand decline due to increased demand for Internet access services, however, remain prevalent over other types of communications by income and number of subscribers. The basic criteria of quality evaluation system services include network availability and suitability, availability, adequacy and continuity of services. The main shortcomings of the existing criteria are in terms of operator interaction with consumers, including the lack of accounting requirements and expectations. The transition from quality assurance system to quality management system with customer orientation and quality of service is proposed. To identify the gap between the expected and real level of service quality and mobile service, a consumer survey was conducted that identified the main gaps: lack of understanding by the operator of customer expectations, inaccessibility of information to customers about quality standards, lack of confidence in the proper service, inconsistency of the declared quality of service the actual level, lack of dialogue with consumers, etc. Proposed quality indicators that most closely reflect the requirements of consumers regarding the quality of services and services in the development of digital telecommunication services, namely materiality, reliability, responsiveness, reliability, image, user-friendliness of the interface, correctness of financial relations, digitalization.

**Key words:** quality, mobile communications services, maintenance, digitalization, evaluation, indicators, consumers.

**Анотація.** В статті сформульовані проблеми, що виникають у сфері оцінки якості послуг під час формування цифрової економіки та суспільства. До цих проблем віднесено: необхідність трансформації підходів до управління й оцінки якості послуг шляхом урахування нових техніко-економічних трендів та потреб споживачів, перманентної появи нових послуг та необхідність оціни якості обслуговування. Проведено аналіз стану розвитку ринку послуг зв'язку та інформатизації. Здійснено структурування ринку послуг та визначено, що мобільний зв'язок демонструє тенденції щодо спаду попиту через збільшення попиту на послуги доступу до мережі Інтернет, втім, залишається таким, що превалює над іншими видами зв'язку за показником доходів та кількості абонентів. Сформульовано основні критерії системи оцінки якості послуг, до яких віднесено придатність та доступність мережі, доступність, повноцінність та безперервність послуг. Визначено основні недоліки існуючих критеріїв з погляду взаємодії операторів зі споживачами, зокрема, відсутність врахування вимог та очікувань споживачів. Запропоновано перехід від системи констатації якості до системи управління якістю з орієнтацією на споживача та на якість обслуговування. Для виявлення розриву між очікуваним і реальним рівнями якості послуг та обслуговування мобільного зв'язку проведено опитування споживачів, яке визначило основні розриви: нерозуміння оператором очікувань клієнтів, недосяжність для споживачів інформації щодо стандартів якості, відсутність впевненості у відповідному обслуговуванні, невідповідність задекларованої інформації про якість послуг фактичному рівню, відсутність діалогу зі споживачами тощо. Запропоновані показники якості, які найбільш відбивають вимоги споживачів щодо якості послуг та обслуговування в умовах розвитку цифрових телекомунікаційних сервісів, а саме: матеріальність, надійність, чуйність, переконливість, імідж, зручність інтерфейсу, коректність фінансових відносин, діджиталізація.

**Ключові слова:** якість, мобільний зв'язок, послуги, обслуговування, діджиталізація, оцінка, показники, споживачі.

**Аннотация.** В статье сформулированы проблемы, которые возникают в процессе оценки качества услуг в условиях формирования цифровой экономики и общества. К этим проблемам отнесены: необходимость трансформации подходов к управлению и оценке качества услуг, путем учета новых технико-экономических трендов и потребностей потребителей, перманентное появление новых услуг и необходимость оценки качества обслуживания. Проведен анализ состояния развития рынка услуг связи и информатизации. Осуществлено структурирование рынка услуг и определено, что мобильная связь демонстрирует тенденции спада спроса из-за увеличения спроса на услуги доступа к сети Интернет, при этом, остается преобладающим над другими видами связи по показателю доходов и количеству абонентов. Сформулированы основные критерии системы оценки качества услуг, к которым отнесена пригодность и доступность сети, а также доступность, полноценность и непрерывность услуг. Определены основные недостатки существующих критериев с точки зрения взаимодействия операторов с потребителями, в частности, отсутствие учета требований и ожиданий потребителей. Предложен переход от системы констатации качества к системе управления качеством с ориентацией на потребителя и на качество обслуживания. Для определения разрыва между ожидаемым и реальным уровнями качества услуг и обслуживанием мобильной связи, проведен опрос потребителей, который показал основные разрывы: непонимание оператором ожиданий клиентов, недосягаемость для потребителей информации относительно стандартов качества, отсутствие уверенности в соответствующем обслуживании, несоответствие задекларированной информации о качестве услуг фактическому уровню, отсутствие диалога с потребителями и т.п. Предложены показатели качества, которые наиболее отражают требования потребителей относительно качества услуг и обслуживания в условиях развития цифровых телекоммуникационных сервисов, а именно: материальность, надежность, чуткость, убедительность, имидж, удобство интерфейса, корректность финансовых отношений, диджитализация.

**Ключевые слова:** качество, мобильная связь, услуги, обслуживание, диджитализация, оценка, показатели, потребители.

The processes of globalization and the transition to a digital economy (digitalization), international integration and convergence of services require a rethinking of many parameters of the activities of enterprises operating in national and international markets. The concept of the development of the digital economy and society of Ukraine [1] states that the digitalization processes will lead to the development of an open information society based on information and communication technologies (ICT). Therefore, the successful development of ICT, their implementation in all areas of the socio-economic life of society is the basis for the successful

development of the digital economy. At the same time, the characteristics of communication services and information on the development of ICT in many ways affect the consumers of services in the conditions of forming the basis of the demand on competition of its consumer priorities. In turn, these priorities are based on both operator tariffs, and on quality indicators of services and maintenance. Therefore, the quality of services and services is one of the most important facets that create the factors for the successful development of both ICT and the digital economy and society as a whole.

In this way, in the conditions of digitalization of the economy, there is a problem of transforming approaches to managing and assessing the quality of communication services and informatization, based on the need to take into account both new technical and economic trends and permanently changing consumer needs for service. New ICT allows the introduction of an increasing number of services and force the world telecommunication community to look at the issues of assessing the quality of services and quality management system as one of the most important factors in the development of effective national and global markets. This is caused by the relevance of research and experimentation towards the development of new approaches to the management and evaluation of service quality and service in the field of mobile communication.

The quality of telecommunication services and services is addressed in the research of many scientists, among which are the works of Bazhanov T.T, Granaturov V.M., Vorobienko S.P., Zaplotinsky B.A., Tikhvinsky V.O., Hoyer R. and others [2-6]. The noted scientific papers are devoted to the analysis of methods and approaches to the evaluation of traditional communication services. However, there are few studies on the scientific problem of the effect of thought and the level of customer satisfaction and service quality service quality in terms of constant changes of customer requirements. Therefore there is a need for improved approaches to assessing the quality of telecommunications services in the new environment of economic development to meet the requirements of consumers, i.e. the formation of approaches to assessing service quality and service.

Based on the fact that one of the most developed segment of the market of communication services and information is the mobile segment, it is advisable to focus on it. Therefore, the goal is an improvement of approaches to assess which mobile services.

The current state of development of the domestic market of telecommunication services and informatization shows that the revenues from the sale of services (for 9 months of 2018) amounts to 53292.8 million UAH, which is 10.9% more than for the same period in the previous year. At the same time, the revenues from the provision of telecommunication services in comparison with the same period last year increased by 9.8% and amounted to 49062.2 million UAH, their share in total revenues of the communications industry is 92.1%. The main segments in the telecommunications market are mobile communications, fixed-line telephony and Internet access services, the share of which in total revenues from telecommunication services is 84.8% [7, 8].

The main operators of mobile communication are: PJSC Kyivstar, PJSC «VF Ukraine», LLC «Lifesell», LLC «International Telecommunications», LLC «Trimob», PJSC «Telesystems of Ukraine» and PJSC «Ukrtelecom». During 9 months of 2018, revenues from the provision of mobile communication services increased by 9.4% compared to the same period last year and amounted to UAH 28393.9 million. The number of mobile communication subscribers amounted to 54682.8 thousand people, which is by 2.1% less than in the same period last year. The population's coverage of mobile communications per 100 inhabitants in Ukraine is 129.8%.

Despite a slight reduction in revenues and subscriber base, mobile communications is a popular type of connection as it provides not only voice, but other access services to the Internet, the demand for which is growing.. Proceeding from this, the share of revenues from the provision of mobile communication services in the total revenues of communication and informatization is (as at the beginning of 2019) 53.3% [7, 8]. The importance of mobile communication services makes scientific and practical interest in the development of this particular segment of the market.

Today global and national markets mobile services in the development oriented technology transition to the fourth and fifth generations (4G, 5G), which affects both the technological and economic aspects of the operators. In terms of market saturation, competition and availability of advanced capabilities replacement mobile Internet voice services (IP-telephony, Skype, etc.) one of the regulatory elements of the market of mobile services in terms of digitalization economy is the quality of service.

Most international and national mobile operators in the provision of new generation services stress the primary criterion of speed. Thus, in the fourth generation networks it is only effective packet data unlike the existing batch transmission, combined with the transmission of voice traffic, which eliminates the "braking" technology and replace them with productive, leaving and thus improving their functionality and speed. In 4G networks speeds have been reached of 1 Gbit/s to the subscriber at a speed of movement of 20 km/h, which is quite high for existing technologies [6]. Network parameters are also important for determining the quality of services.

The existing set of indicators and parameters of the quality of services reflects the main criteria for the quality of interaction of the consumer with the telecommunication network and service as a commodity. Characteristics of the service quality criteria are as follows:

- network availability (Network Availability) - the ability of the network to provide the customer with the services of the MT;
- access network (Network Accessibility) - the ability of the network to provide consumer (user) after a request to obtain a signal of readiness, in which is possible to perform a successful registration with the PLMN;
- service availability (Service Accessibility) - the ability to provide the customer with the opportunity to use the ordered service as quickly as possible;
- service value (Service Integrity) - the service's ability to provide the required quality during its use;
- service continuity (Service Retainability) - the ability to provide the service without interruptions over the required time interval.

As you can see, this is mainly about technological aspects of quality. It can be noted that the existing system for assessing the quality of mobile communication services is based on indicators that do not take into account the consumer's response to the quality of services. This creates differences between the estimated and actually provided level of quality, reduces the efficiency of efforts of telecommunication operators to maintain and improve the quality of the service itself and the quality of customer service. The main drawbacks that determine such a state of the existing quality assessment system can be attributed [9]:

- the system provides for the use of indicators, the quantitative assessment of which is calculated on the basis of data for a certain period in the past, which does not allow them to be used for planning the level of quality of telecommunication services in on-line mode;
- the indicators used to assess the quality level, in most cases, either do not take into account or take into account the consumer's response indirectly (through the registration of complaints). That is, the existing system of service quality indicators is mainly focused on the operator, on compliance with standards, and not on the perception of the service consumer. It does not take into account the quality of service;
- there is no system for determining the relationship and interaction of the level of quality and economic performance of the operator.

Therefore, in our opinion, it is advisable to give equal attention to both the quality of services and the services themselves, since in a competitive environment, customer service satisfaction depends largely on its relationship to a particular operator, and, as a consequence, the continued use of its services.

For the solution of these and other problems it is necessary to move from the system of evaluation (actually establishing) the quality of services to the quality management system with

customer orientation and satisfaction with the quality of service.. This change should be based on the following procedures:

- study of customer requirements for quality of services in the short and long term, as well as in real time by polling through digital, commercial, service and other platforms;
- formation and management of demand based on the results of the study of consumer needs;
- management of service standards based on changes in the market situation (changes in market conditions, consumer priorities, scientific and technical progress), transition to new service methods based on innovative technologies;
- taking into account the processes of digitalization, convergence and globalization in determining the standards and parameters of the quality of services and services;
- ensuring the security of personal information, the preservation of trade secrets, the safety of children on the Internet; and
- harmonization of approaches to assessing the quality of communication services with EU standards.

The methodical basis for the transition from the ascertaining system to quality control in real time can be SERVQUAL [10]. This technique is based on the principle of "perception minus expectation" that analyzes estimated consumer expectations of services to its receipt, acceptance and service after receiving a defined gap between expectations and reality perception. The challenge is to reduce this gap.

The authors conducted a survey of mobile consumers on their expectations and perceptions of service quality and service. The survey gave the results shown in Table 1.

Table 1 - Results of the survey of consumers about the availability of the gap between expectations and perceptions of services and mobile services

Existing gaps	The content of the gap
Misunderstanding operator customer expectations	Ignorance or misunderstanding of the current needs of consumers in a difficult socio-economic situation and demands the availability of different services and different populations
Inaccessibility for consumers of technical information on quality standards	The lack of information about existing standards of service quality and service, the inability to obtain information on services received compliance standards
Lack of confidence in the proper service	Even with the availability requirements for quality of service staff can not always and/or wish to meet the existing quality of service
Inconsistency declared information about the actual quality of service рівню	Advertising generates high expectations (regarding speed network coverage, additional free services, etc.) that is not always true
The lack of dialogue with consumers	Availability of cases where the operator puts the consumer at the new rate automatically, without his consent or change package
Imperfect payment system for services	Cases of long-term period, cash deposit, the complexity of tracking costs for prepaid service, etc.

Source: authors' own development

All these and other gaps between expectations and perceptions of services and mobile communication services lead to a reduction in demand due to the refusal of dissatisfied consumers for the services of the operator, which, in turn, reduces incomes of operators. The availability of new digital services in the future will aggravate this problem, as dissatisfied consumers will be able to switch to more convenient Internet services by giving up mobile communication services.

In these conditions, there is a need for a timely response to reducing customer dissatisfaction by providing services and services. To this end, it is advisable to introduce a list of indicators that can be used to determine the gap between expectations and perceptions of the service. These indicators should be such that they can be easily obtained from consumers through a survey. That is, it is impractical to implement such indicators that require additional measurements, studies or calculations, since this will complicate management processes. Therefore, we propose the use of indicators that can reflect the quality of services and services in real time:

- materiality - the opportunity to see and feel the material base operator via online cameras monitor the company's activities in the office, appearance and competence of staff, advertising materials, additional services, etc.;
- reliability - the company's ability to timely provide full services, no interruptions holiday periods branching networks and access to services in transport (especially metro and railway);
- responsiveness - willingness to help the client in a convenient way (in person at the office telephone, the Internet, etc.), access to social assistance (care of persons with hearing or vision, the elderly or children), general culture and courtesy;
- credibility - staff competence, professionalism, availability of additional knowledge (foreign languages, financial literacy);
- image - the appearance of the office, the availability of places for recreation and customer expectations, the opportunity to use lavatories, etc.;
- user-friendly interface - ease of use WEbSite operator, availability of online cabinets, other services;
- correct financial relations - a warning about the state of balance, the rate rebalancing, the ability to control costs; and
- dizigitalization of services - the possibility of convergence services with other modes of communication, most Internet services, operator services listed match the realities of the digital economy and society, digital image changing nature (support *Internet of things*, *e-government* etc.).

However, it is necessary to improve the list of quality indicators by introducing impressions that highlight the consumer's suitability and competitiveness of the services, their conformity to changing requirements of consumers, and the ability to quickly implement the new services. That is to develop exactly the quality of service, which, in conditions of competition, is sometimes more significant for the conquest of the consumer. This will bring the quality of services and service to a new level of comprehension, which is typical of the emerging digital society.

In further research, it is planned to develop a methodological approach for calculating the quantitative significance of the proposed qualitative characteristics, methods of their integration into the existing system of evaluation and approach to the formation of an integrated indicator of the quality of services and mobile communication services.

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