



# Reconceptualization of the concept of digital literacy as a theoretical and methodological background for its study

## Reconceptualización del concepto de alfabetización digital como fondo teórico y metodológico para su estudio

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#### ABSTRACT:

Digital literacy is the key indicator of safe and effective use of the advanced achievements in the sphere of information and communication technologies (ICT) by the population and its readiness to the integration into the global digital space. The process of improvement of the level of digital literacy requires the systemic approach and purpose-oriented influence by the state, the effectiveness of which is determined by true and relevant information about its current status. To date, scientific development of the methodological background for the assessment and organization of studies of the digital literacy is not sufficient. Conceptually, the index is calculated with regard to the federal districts of Russia with a possibility for subsequent segmentation to the level of constituent entities of the Federation and does not reflect users' and professional level of the ICT utilization. It does not correlate with the requirements to the models of digital communications. Retrospective analysis of the evolution of the concept

#### RESUMEN:

La alfabetización digital es el indicador clave del uso seguro y efectivo de los logros avanzados en el ámbito de las tecnologías de la información y la comunicación (TIC) por parte de la población y su disposición a la integración en el espacio digital global. El proceso de mejora del nivel de alfabetización digital requiere el enfoque sistémico y la influencia orientada a un propósito por parte del estado, cuya efectividad está determinada por información verdadera y relevante sobre su estado actual. Hasta la fecha, el desarrollo científico de los antecedentes metodológicos para la evaluación y organización de los estudios de alfabetización digital no es suficiente. Conceptualmente, el índice se calcula con respecto a los distritos federales de Rusia con la posibilidad de una segmentación posterior al nivel de las entidades constitutivas de la Federación y no refleja el nivel de usuarios y profesionales de la utilización de TIC. No se correlaciona con los requisitos de los modelos de comunicaciones digitales.

of digital literacy indicated necessity for its reconceptualization taking into account the strategy of digital transformation of the economy and society. In this paper, in order to improve the methodology and technology of identification of the level of digital literacy of the population of the Russian Federation, the authors propose a model defining basic categories and levels of the digital competence that is a conceptual background for the formation of the integral indicator adapted to the models of digital competences of different groups of population taking into account spheres of their professional activity. The cyclical character and the expanding structure of the model allow executing periodical actualization of requirements to the structural components of levels of the digital literacy, to introduce amendments into the system of indicators, characterizing them, and in the methods of measuring. The results of this research are focused on the harmonization of methodology of study of the digital literacy with the models of competences of digital economics.

**Keywords:** Reconceptualization, digital literacy, competence, ICT, model, level

El análisis retrospectivo de la evolución del concepto de alfabetización digital indicó la necesidad de su reconceptualización teniendo en cuenta la estrategia de transformación digital de la economía y la sociedad. En este documento, con el fin de mejorar la metodología y la tecnología de identificación del nivel de alfabetización digital de la población de la Federación Rusa, los autores proponen un modelo que define las categorías y niveles básicos de la competencia digital que es un trasfondo conceptual para la formación del indicador integral adaptado a los modelos de competencias digitales de diferentes grupos de población teniendo en cuenta las esferas de su actividad profesional. El carácter cíclico y la estructura expansiva del modelo permiten ejecutar la actualización periódica de los requisitos a los componentes estructurales de los niveles de alfabetización digital, para introducir enmiendas en el sistema de indicadores, caracterizarlos y en los métodos de medición. Los resultados de esta investigación se centran en la armonización de la metodología de estudio de la alfabetización digital con los modelos de competencias de la economía digital.

**Palabras clave:** Reconceptualización, alfabetización digital, competencia, TIC, modelo, nivel.

## 1. Introduction

Information technologies are, on the one hand, the products of development of the productive forces and social relations, and the catalysts for the development of society, on the other hand. In their development, they have passed several evolutionary stages. In the initial period, the change of stages has been determined by the technical progress and development of the new technological tools of the data search and processing.

Contemporary status of evolution of the information technologies is characterized by the shift in direction of their development vector from broadening of use of hardware and software to the achievement of the strategic priority in economy.

The leading countries of the world are steadily moving to the digital economy, the key factor of which are data in the digital form. Utilization of the perspective end-to-end digital platforms and technologization in different spheres of socio-economic relations create strategic advantages in ensuring technological leadership of the state and its effective participation in the process of formation of the global ecosystem of digital economics and global digital space. The global community defines digitalization as one of the conditions for preservation of sovereignty in the situation of globalization and implementation of programs of digital development by other players on the world market. Creation of ecosystem of national and global digital space suggests the need for developing digital literacy of the population as the important factor of implementation of the concept of digital economy.

## 2. Problem Statement

The end-to-end penetration of digital technologies to all spheres of socio-economic relations puts forward new requirements to the digital competence of the population, that have to ensure effective interaction of the society, business and education in the situation of digital economy.

At the international level, there are studies of indicators, which to the certain extent are the parameters of digital literacy. So, World Economic Forum (WEF) together with the World Bank (WB) and International business school (INSEAD) since 2002 have been identifying the level of the index of the network readiness (NRI) that characterizes a readiness of countries' economies to the use of information with maximum utilization of ICT. The European Commission assesses the level of digital competitiveness and development of ICT in the member states of the European Union on the basis of DESI index. International consulting company "Boston Consulting Group" (BCG) identifies the level of digitalization for 85 countries of the world. In Russia, since 2015 regional public organization "The Center of the

Information Technologies" (ROTsIT) has been implementing the research project focused on measuring and analysis of the dynamics of the index of digital literacy with regards to the federal districts of the Russian Federation and the country as a whole. To January 2017, results of the three annual researches have been published, and each of them contained an extensive methodology and methods of carrying out a research. Further need in making methodology more comprehensive is determined by the need for its actualization in accordance with the requirements of the formation of the digital economy ecosystem in Russia.

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### 3. Research Questions

For identification of the conceptual principles of development of methodology of research of levels of digital literacy of the population the following work has been done:

- Retrospective analysis of the evolution of the concept of digital literacy in the context of development of information and communication technologies;
  - System analysis of requirements to the models of competences of digital economy;
  - Critical analysis of existing approaches to the assessment of the level of digital literacy of the population and digitalization of the economy.
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### 4. Purpose of the Study

The purpose of this research is to elaborate theoretical and methodological provisions of the study of the level of digital literacy of the population of Russia based on the reconceptualization of the concept "digital literacy" for subsequent actualization of the system of indicators (indexes and sub-indexes) and methods of their measurement.

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### 5. Research Methods

The methodology of this study is based on the use of methods of logical, structural, comparative, cognitive and system analyses.

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### 6. Findings

**For the first time the term "digital literacy" was introduced by Paul Gilster in 1997**

Gilster's concept of digital literacy is based on the principles of network interaction of users and the "caution", and its key components are media and information literacy, and communicative and creative competence (Glister, 1997). Further transformation of this concept and its structural elements has touched upon the change of the accents between the technological and information components (Manovich, 2001, 2017; Belshaw, 2012; Jenkins, n.d., and others). Nowadays, the concept of digital literacy expanded from the technical aspects to more global understanding of possibilities of use of digital technologies in the economic and socio-cultural spheres (Sharikov, 2016; Soldatova & Rasskazova, 2014).

The current status (2017) of Russia at the global digital market is characterized by significant lagging behind the world leaders (45th rank in the ICT Development Index, IDI, 57th rank in the development of technologies (World Economic Forum, WEF), 11th rank in the Global Cybersecurity Index (International Telecommunication Union, ITU), 26th rank in the Bloomberg Innovation Index, etc. (*Russia in the ICT...*, 2017). In this situation, the development of the level of digital literacy of the population becomes one of the priority state directions of digitalization of the Russian economy and the important condition of ensuring technological leadership of the country.

Today, there is a work ongoing on the elaboration of standard structure of the models of competences for different segments of the labor market in the Russian Federation, which suggest different levels of competence in use of digital technologies. The methodic of assessment of the index of the digital literacy utilized by ROTsIT (Tsifgram, 2016; Tadviser, 2018) does not fully allow characterizing the extent, to which its current state corresponds to the requirements of the models of digital economy competences. Changes in the priorities

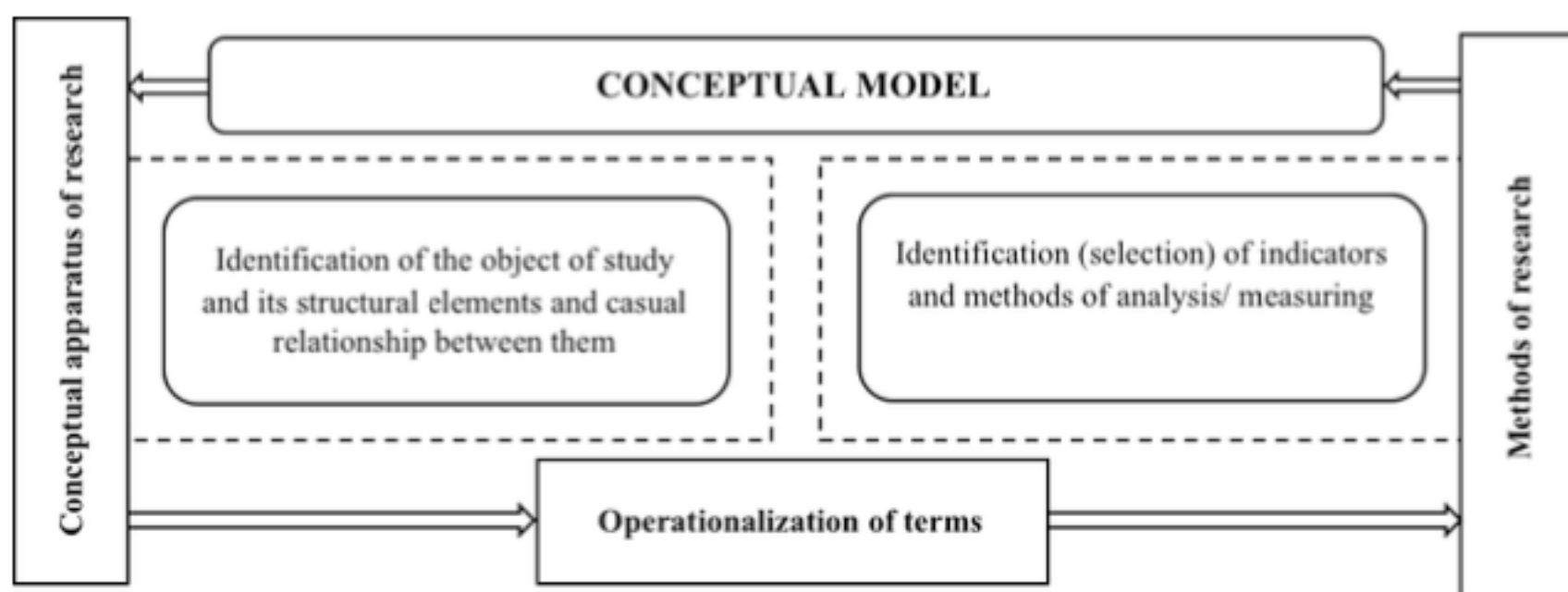
of scientific and technological, and economic and social development require transformation of the concept of digital literacy and its components taking into account different levels of approaches to its assessment.

The methodology of our research on reconceptualization of the concept of “digital literacy” is based on the following conceptual model (Figure 1).

The conceptual apparatus of the research has been defined based on the system approach with identification of basic categories of the concept of digital literacy and levels of its formation.

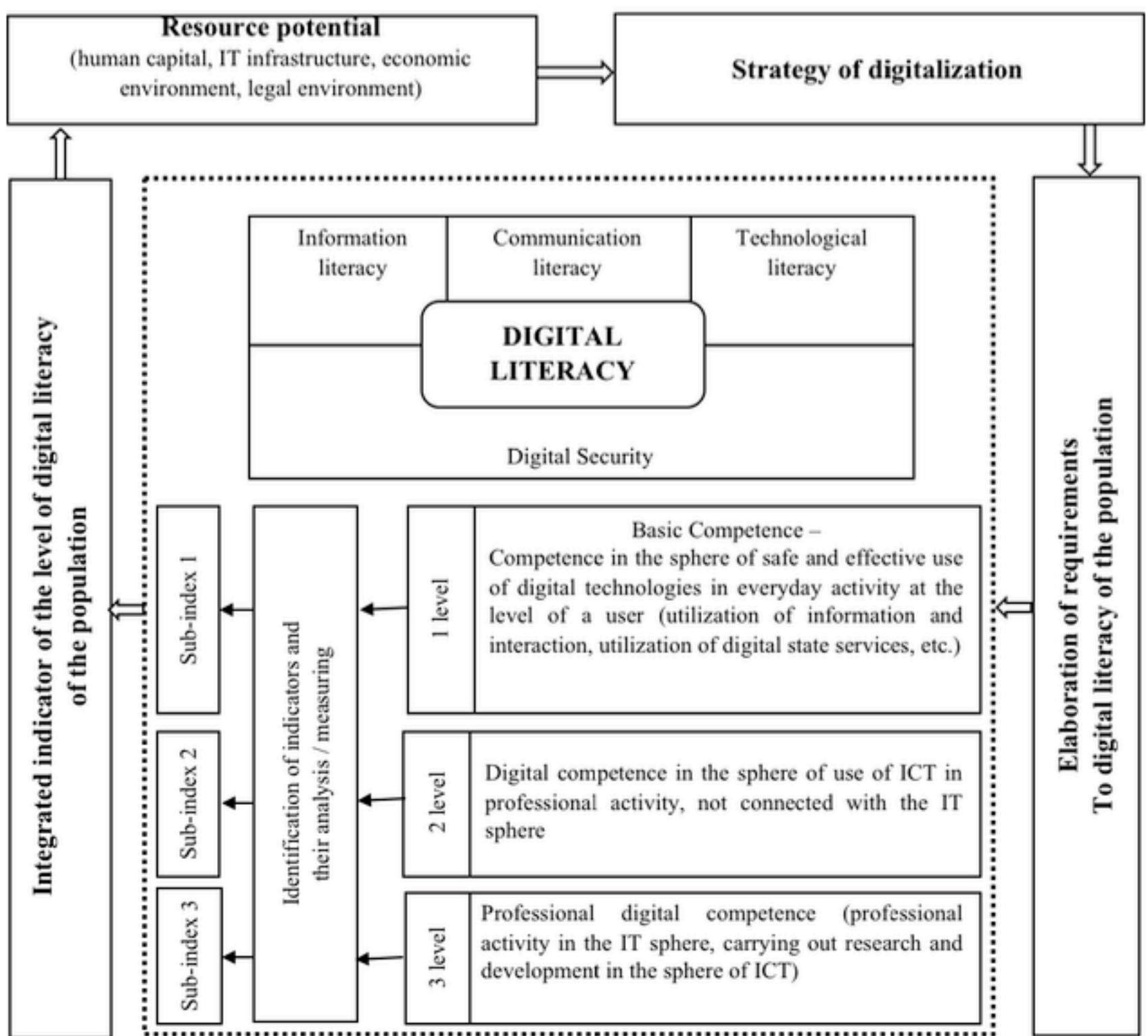
As a result of the analysis of the strategic directions of development of the digital economy of Russia, the conclusion has been made about necessity to change the conceptual scheme of assessment of the levels of digital literacy. As the key aspect, we suggest using not territorial parameters but requirements to the digital competence of different groups of population taking into account their employment, sphere of activity, etc. It makes sense to rank the research entities in accordance to the three levels of digital competence identified by the authors.

**Figure 1**  
Conceptual model of research



Implementation of this model allowed to elaborate a model of transformation of digital literacy of the population of the Russian Federation (Figure 2).

**Figure 2**  
The model of transformation of digital literacy of the population of the Russian Federation



## 7. Conclusion

The elaborated model demonstrates a cyclical nature of change of digital literacy of the population of the Russian Federation caused by the transformations of the resource potential and subsequent actualization of strategies of digitalization and requirements to the models of digital competences. The model can be used as the methodological basis for further studies on operationalization of the concept of digital literacy in order to identify its qualitative and quantitative indicators, and also for the development of methods of their measurement.

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