

Summary

‘Digital ODA’, a much-discussed topic in the international community, is an international development cooperation activity that supports the digital transformation of developing countries in terms of ensuring that the achievements of ‘digital transformation’ are not the exclusive property of developed countries, but that the entire globe can enjoy them together. Discussions and activities related to digital ODA are being conducted very actively in the international community. Nevertheless, not only do the underprivileged of digital transformation still exist, but even if they experience digital transformation, do they still appear to be marginalized from the benefits?

This study presupposes that the cause of this phenomenon is due to the limitations of the perspective on digital transformation. The existing perspective has focused on the quantitative growth of digital transformation, prepared related indices, and promoted digital ODA according to that standard. Accordingly, this study argues that it is necessary to take a more comprehensive approach to the scope of digital transformation and pay attention to the creation of a sociocultural environment in which more people can satisfactorily enjoy the digital services they want. In short, this study aims to develop a better digital inclusion index and, based on this, seek a digital ODA promotion strategy that allows more people to satisfactorily enjoy the benefits of digital transformation.

“Better digital inclusion,” which this study aims to address, includes the existing inclusive discussions, meaning that more people can use digital services tailored to their needs with a higher frequency, with more trust, and with more satisfaction do. In other words, this report not only includes discussions to reduce the gap between countries, gender gap, regional gap, and generation gap, which have traditionally been dealt with in digital inclusion discussions, but also alleviates or prevents the side

effects of expanding digital inclusion stemming from sociocultural backgrounds. Promote broader digital inclusion discussions, including. However, as this study is an initial study related to digital ODA, the subject of better digital inclusion index is limited to the Central Asian region. The specific research contents can be summarized as follows.

The first part of Chapter II deals with companionship and discussions related to digital transformation and digital ODA. Regarding 'digital inclusion', which is emphasized in the recent 'digital ODA' discussion, researchers believe that the key to resolving inequality is to improve the economic production potential of the underprivileged and improve access to social services such as education, health, environment, and public administration. It was seen as ICT utilization ability and environment creation, which ultimately contributes to resolving inequality by enhancing efficiency, effectiveness, and transparency in the government, business, and social sectors. In addition, in a situation where digitalization is accelerating and becoming mainstream in the national, social, and economic (production) areas, the digital divide between social classes is a risk factor that can hinder social integration, recognized as a key factor. In this context, the international community has emphasized the issue of digital inclusion. The ITU established 'Connect 2020' in consideration of the SDGs in 2014. It included the goal of achieving equality and securing communication and ICT accessibility for people with disabilities in all countries. In 2016, the initiative (hereinafter referred to as 'EQUALS') is being promoted with UN Women to achieve the goal of enhancing women's empowerment through the use of SDG 5. In addition, since 2018, the G20 has emphasized the need for support for strengthening the rights and participation of women, girls, the vulnerable, the disabled, and remote residents in developing countries. It focuses heavily on digital inclusion issues.

While the international community is striving to increase inclusiveness in the digital transformation process, there has also been a recognition that it is necessary to respond to side effects and problems that occur in the digital transformation process along with efforts to increase digital inclusion. For example, the mobile money

(currency) system that is spreading in Africa with the advent of the digital age makes it easy for the poor to access financial services, but the lack of economic and financial knowledge and the use of financial services that are not linked to income generation. Cases that operate as a risk factor that turns these extremely poor into financial bankruptcy are confirmed. In addition, the lack of adequate regulatory mechanisms increases the exposure of these poorest people to financial crime, while illicit arms trade, corruption, trafficking in illegal goods, drug trafficking, trafficking in stolen cars, wildlife trafficking, counterfeit money, and human trafficking linked to mobile money. However, research results can also confirm that it is linked to illegal money laundering or terrorism. Various other side effects can be found.

While the international community is actively discussing digital inclusion and side effects in the process of digital transformation in ICT ODA, Korea ranks second in terms of ICT ODA based on CRS code 220, and 22040 equivalents to ICT ODA. Ranked first in terms of code, Korea is one of the top countries in terms of ICT ODA scale. In addition, in terms of the accumulated ICT ODA from 2015 to 2022, pure ICT is about KRW 358.9 billion (about 1.7% of the total), and when expanded to the convergence ICT sector, it is known that it will increase to about KRW 1,787 billion (about 9% of the total). In particular, although it is not a pure ICT business, it is confirmed that the proportion of convergence ICT business that reflects ICT elements in the business is continuously expanding. However, so far, KOICA's digital ODA projects have not identified customized projects that focus on realizing the 'principle of inclusivity', and as one of several projects, digital accessibility improvement for the digitally underprivileged and remote areas, digital literacy education and capacity. In other words, it is judged that there has been no approach or goal-level project to improve inclusiveness in digital transformation or to solve the problem of side effects in digital transformation, which is the core subject of this study.

The second part of Chapter II mentions the need for a new perspective on digital transformation, analyzes existing indices, and proposes a better digital inclusion index as a new index. To this end, among existing indices, ICT development index,

inclusive Internet index, digital economy and society index, and digital transformation index are analyzed. As a result of the analysis, the ICT development index does not contain a sufficient level of discussion on digital transformation, and the digital economy and society index relatively sufficiently emphasizes inclusiveness in terms of social and cultural aspects, but does not fully reflect the characteristics of developing countries because it targets only European Union member states. It has a limitation that it cannot be used, so it was not adopted. In addition, in the case of the digital transformation index, in which the importance of socio-cultural competency was most emphasized, it was judged that the appropriateness of the index for the country was not sufficient because it was an index for companies. On the other hand, the inclusive internet index is relatively appropriate in that it describes relatively diverse inclusiveness. However, the better digital inclusiveness index of this study is newly proposed by improving the following. In terms of better inclusiveness, in the case of the existing inclusive Internet index, first, it has focused on absolute diffusion rather than harmonious diffusion. For example, it has limitations such as evaluating the level of Internet use by residential area rather than regional differences. Therefore, better inclusiveness modifies the indicator with gap as the key word. Second, since the low weight of the existing social and cultural competency aspect is observed as a limitation, the weight is modified and introduced into the study. In addition, coordination indicators that can suggest coordination between various actors are added to increase sociocultural acceptance. Third, by adjusting the weights of the technical, human, and socio-cultural competency transitions that have been dealt with in the previous discussions, the proportion of social and cultural aspects is increased. However, the weighting for the adjustment index is limited to 10%. This reflects that it is in charge of a secondary function as an adjustment instrument compared to basic indicators. In other words, the role of the adjustment index is only possible when the transformation of technological competency, human competency, and socio-cultural competency takes place. Considering this, the weight is limited to 10%.

Chapter III examines the difficulties common to inland Central Asian countries in

digital transformation. In addition, the five countries seek ways to improve digital inclusion between countries through regional cooperation as a regional community rather than as individual countries. It calls attention to the implementation of state-led strategies and emphasizes the need for an understanding of how each government consults with various actors.

Chapter IV contains an analysis of Uzbekistan. Since April 2020, many educational institutions in Uzbekistan have moved quickly to offer remote learning opportunities to students due to the COVID-19 pandemic. However, many schools struggled to provide quality education due to technological problems such as lack of digital infrastructure and slow internet speeds. This problem was particularly noticeable in rural areas, where students in rural areas often had difficulty accessing information necessary for learning despite high digital literacy. The digital education gap between regions was also revealed in the survey. Despite the rapid digital transformation of education due to the COVID-19 pandemic, the experience of using e-learning services among local residents was significantly lower than that of cities.

The digitalization of education further exacerbated the problem of the lack of professional manpower endemic in Uzbekistan's education system. In Uzbekistan, where the number of skilled educators is absolutely lacking due to low wages, e-learning, which can provide quality education to many at the same time, is emerging as an alternative to compensate for this. Ironically, however, the lack of educational personnel leads to a lack of experts who can modify teaching methods to meet the online learning requirements, and has acted as an obstacle to building quality online educational content.

Therefore, the researchers propose the introduction of a coordination mechanism through which various stakeholders such as teachers, education experts, information and communication technology experts, and education-related government departments can communicate and cooperate in the process of digital transformation of education, and examine the existence and operation of such a mechanism. We suggest using it as an adjustment index for the BDI-Index. The top-down education

digitization promoted by the central government of Uzbekistan does not sufficiently reflect the difference in technological and human capacity between provinces and cities, and has failed to introduce appropriate technology suitable for the local reality. In other words, even though Wi-Fi and computers are secured in local educational institutions, there are frequent cases where digital technology is not used in education due to defects in communication infrastructure or teachers' lack of understanding of digital textbooks. Therefore, it is important to involve teachers who know the reality and difficulties of the local education field best in the digital education dissemination process. Through this, it will be possible to reduce the widening digital and educational gaps between regions that occur as a side effect of the digital transformation process. In addition, digital technology utilization and online teaching methods must be provided so that teachers can provide digital classes suitable for students' digital literacy level and school's level of digital technology, so that digital technology can be actively used in the learning field.

Chapter V is a case study of Kyrgyzstan. As Kyrgyzstan moves through its digital transformation, a comprehensive effort is needed to promote digital inclusion within Kyrgyzstan. Most importantly, there is a lack of reliable data on the state of Kyrgyzstan's digital transformation. For example, according to government statistics, 88% of internet users are, but the ICT Regulatory Authority Annual Report 2021 51% of the population of the Kyrgyz Republic uses the Internet. There are also differences in statistics between international sources, such as the World Bank, ITU, UN e-Government Assessment, and Telegiography. Therefore, both governments and international organizations need to work together to collect reliable statistical data.

To improve regional connectivity, cross-country routes concerted efforts are needed to diversify routes (including routes through China and Afghanistan) and strengthen cooperation among Central Asian countries. Build relationships with satellite Internet companies (OneWeb, Starlink, etc).¹⁾ Central Asian governments and various

1) See trans-Caspian submarine cable

stakeholders should acknowledge Russia's dependence on Internet traffic and seek viable alternatives, such as low-orbit satellite companies that can provide a way to connect remote and hard-to-reach areas. Competition within countries should also be encouraged. Sharing and joint construction of infrastructure based on public-private partnership will promote construction of communication infrastructure, especially fiber optic networks and wireless communication towers, and significantly reduce construction costs. This will help connect remote and hard-to-reach areas faster, cheaper and easier.

Furthermore, the Kyrgyz government has adopted “Infrastructure Sharing”, “Co-Building”, “Dig Once”, “Cloud First”, “Open by Default”, “Cybersafety Design.” Policies and regulations in urban and regional areas should be differentiated, and policies or regulations targeting local areas should be simplified or exempted.

In terms of content, the development of local language content should be encouraged. Language is particularly important in Kyrgyzstan as it can widen the digital divide between cities and provinces. The increase in vernacular content means more educational opportunities and training programs are needed to expand digital literacy. And increasing the digital literacy of rural populations can empower communities and reduce the digital divide between cities and rural areas. As a result of visiting and interviewing local communities, it seems that the level of digital technology in rural areas needs to be improved. Even basic skills like opening an email account can seem complicated. Among the activities to improve digital skills in rural areas are EU-sponsored initiatives such as Sanarip Insan (digital citizens), DigiKonush (digital neighbors) and Digital Ishker (digital workers).

In order for Kyrgyzstan, a latecomer to digital transformation in Central Asia, to build a more inclusive and inclusive digital environment, close communication and cooperation between government and non-governmental organizations are essential. As noted in this chapter, there are a number of NGOs supported by governments and

<https://kaztag.kz/amp/news/prokladku-optovolkna-po-dnu-kaspiya-poobeshchali-zavershit-v-2021-2022-gody>

international organizations working to improve Internet connectivity and digital literacy in underserved rural areas. These organizations are expanding their activities to remote areas beyond the reach of the government, and are partnering with local communities in their own creative ways. In addition, it contributes to expanding social inclusion by providing information and digital education opportunities to women and girls belonging to conservative rural communities who have traditionally been marginalized. Activists from NGOs can provide key insights and experience in adapting top-down national digital policies to local conditions, and continue to call for improvement in areas where governments are less interested, such as privacy protection. By doing so, it plays a role in bringing about an improvement in the overall digital environment. Therefore, the researchers proposed to include the existence and operation of communication and cooperation mechanisms between the government and non-governmental organizations as adjustment indicators of the BDI-index, and consideration of these adjustment indicators will promote the expansion of digital inclusion in Kyrgyzstan in the manner described above.

Chapter VI conducts research on Kazakhstan. This chapter proposes to introduce a mechanism to evaluate the technology adaptability of users before the Kazakhstan government upgrades e-government and online public service platforms or introduces new technologies, and reflects this as an adjustment index of the BDI-Index. Such mechanisms are considered to be particularly important when governments work with private technology companies and fintech companies to increase the convenience and efficiency of e-government services. In the course of our research, we found that IT and fintech companies at home and abroad provide impressive innovative technologies to attract government investment, but if these new technologies are not tested for users' technological adaptability before they are widely deployed, it will widen the digital divide in the traditional sense. It has been confirmed that it can cause side effects.

The reason why satisfaction with digital services is higher in cities is because cities have better information and communication infrastructure than rural areas, and the

reason why high-income people are higher in satisfaction is because they have income to consume quality Internet services than low-income people. I can guess. In other words, it seems that technical factors determine satisfaction. However, technical descriptions only show one side of the digital transformation. In the summer of 2022, the government of Kazakhstan announced plans to introduce new login technologies such as face recognition and shape recognition to enhance the convenience of e-government users. Rostislav Konyashkin, chairman of State Information Technology JSC, a quasi-governmental organization in charge of digitization of public services, said, “Digital ID based on biometrics will enable the provision of a wider variety of e-government services than the one-time SMS authentication currently used. It is very easy and saves time,” he said, persuading citizens who expressed concerns about the security of biometric data based on the convenience of the new technology. However, in the fall of 2022, the government of Kazakhstan presented the same reason and announced the introduction of QR-Code technology to replace the digital ID authentication system. Technological upgrades such as biometric data or QR-codes improve the efficiency and convenience of e-government. And in Central Asia, where the government, not the market, plays the role of an investor in innovative technology, the continuous upgrade of e-government technology is also used as a route to disseminate new digital technology to the private sector.

However, it is understood that the introduction of new technologies and technological upgrades in e-government services are occurring so rapidly that citizens do not have enough time to adapt to the new technologies. This is also confirmed by the analysis results of the survey and oral responses. Many respondents reported frequent glitches, such as freezing of QR codes or digital signature (EDS) authentication used to identify individual users and logging into e-government services, or repeatedly requesting login information. Some respondents said they were confused by the lack of relevant information about the frequent changes in e-government services available online. While it is agreed that privatization of public services increases efficiency and convenience, there were also concerns that it could undermine service

quality, transparency, and protection of personal information. Overall, citizens of Kazakhstan feel that they have no other choice but to rely on online services and information, but do not feel that services not provided by the government or public authorities are safe or completely reliable. Respondents therefore argued that the government should strengthen countermeasures against online fraud and virus attacks through internet monitoring.

Currently, Kazakhstan's national digital strategy does not include an institutional coordination mechanism to promote communication between different stakeholders in the digital transformation and effectively coordinate the different views. The site Open.egov.kz, which provides public data as part of the e-government system, has an online forum for asking questions and evaluating policies of government ministries, but it does not address digital transformation. By listening to the opinions of citizens who are the main users of e-government and directly affected by digital transformation, citizens' trust in e-public services and the government that provides them will be increased. Furthermore, by inducing public digital technology innovation that reflects citizens' opinions, technological adaptability, and expectations, it will be able to contribute to not only quantitative but also qualitative expansion of digital inclusion.

Chapter VII describes Korea's digital ODA promotion strategy for Central Asia using the K-BDI index. Korea and the five Central Asian countries have developed cooperative relations through bilateral and multilateral cooperation after the dissolution of the Soviet Union, and in this process, the field of international development cooperation has also developed. As a result, Korea's ODA to the five Central Asian countries increased from less than \$100,000 in 1992 to about \$80 million in 2020, and the proportion of ODA to the total of developing countries rose from 2.21% to 4.18%. In particular, among Korea's ODA to Central Asia, the proportion of ODA to Uzbekistan is high, and recently, the proportion of ODA to Kyrgyzstan is also increasing. In the same vein, among Korea's digital ODA to Central Asia from 2016 to 2020, most of pure digital ODA was donated to Uzbekistan and Kyrgyzstan.

When reviewing the digital ODA policy, whose importance is being emphasized in the development of international development cooperation with the five Central Asian countries, from the K-BDI perspective, the following limitations are identified. First of all, in terms of promotion strategy, ‘digital inclusion’ is being applied in a narrow manner, and there is a limit to not being able to properly respond to relevant regional issues. In terms of the current status of digital ODA policy promotion to Central Asia, responses to problems such as wide-area network construction, local language digital content development, and digital divide between cities and provinces are lacking, and it is judged that there is room for improvement in terms of the promotion system. Therefore, in order to improve Korea's digital ODA promotion strategy for developing countries, including Central Asia, it is first necessary to systematically identify the needs of partner countries (recipient countries). Based on this, it is necessary to consider the preparation of regional digital ODA strategies, prioritization of tasks required by regions or individual countries, strategic linkages with other ODA projects, and cross-sector-oriented digital ODA strategies. In addition, in the process of promoting this, efforts are needed to strengthen the cooperation mechanism between the government and non-governmental sectors and the basis for systematic support.

This study is very meaningful as it is a preliminary study related to the development of an index for preparing a digital ODA strategy. Nevertheless, it is revealed that it has the following limitations. First, in relation to the index proposal, due to the limitations of the size of the research team and the research period, only a limited level of index measurement for Central Asian countries and a macroscopic index proposal were implemented. Therefore, despite the proposal of a new index, it was not possible to properly measure each country based on the index. The measured index values are presented through the attachment.

Therefore, additional research on preparing a specific measurement method should be conducted, and measurement of the missing indicator value is proposed as a future study. After the work is done, country-level evaluation using a better inclusiveness

index can be meaningfully progressed. Second, reflecting the expertise of local researchers in Central Asia, it contains only the contents of specific fields by country, so the uniformity of the research report is found to be damaged. Through future research, a detailed and consistent analysis of the relevant countries should be added.

Lastly, this study is the result of the process of building partnerships with researchers in the field of international development cooperation in Korea, local researchers in the Central Asian region, and Central Asian researchers in the UK. During the year of the research, the newly established digital network among researchers was of great help in strengthening mutual digital capabilities, and I would like to thank KOICA for their financial support throughout the research process.