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Гунаван Індра

ВПЛИВ ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ ТЕХНОЛОГІЙ НА РЕГІОНАЛЬНЕ ЕКОНОМІЧНЕ ЗРОСТАННЯ В ІНДОНЕЗІЇ

Сьогодні інформаційно-комунікаційні технології стають важливою частиною економічного розвитку. Швидкий розвиток інформаційних і комунікаційних технологій змінив спосіб життя індонезійського суспільства в сільській або в міській місцевості. Це відбулося, оскільки наявність різноманітних програм соціальних медіа швидко поширювалася. Крім того, цей розвиток автоматично вплинув на зростання регіональної економіки. Це дослідження відзначило вплив інформаційно-комунікаційних технологій на економічне зростання в Індонезії, яке було представлено вартістю ВВП у 33 провінціях Індонезії у 2014 та 2015 роках. Зразком були користувачі стільникових телефонів, домогосподарства з доступом до Інтернету,

домогосподарства, які використовують доступ до Інтернету, який представляв собою домогосподарство, яке користувалося Інтернетом протягом останніх трьох місяців, домогосподарство, що володіло комп'ютером і могло управляти комп'ютером, і домогосподарство з провідним телефоном. Це дослідження розглянуло кожну категорію зразків і порівняло їх, щоб визначити вплив на валовий регіональний внутрішній продукт. Дані оброблялися за допомогою програми SmartPLS версії 3.2.7. Результати показали, що категорія вибірки, яка значною мірою вплинула на валовий регіональний внутрішній продукт, була домогосподарством, яке використовувало Інтернет, тоді як інші категорії не мали значного впливу. На кожне 1% підвищення росту домогосподарств, що використовуює Інтернет, було б стимульовано 0,66% валового регіонального внутрішнього продукту. Незважаючи на те, що багато домогосподарств користувалися доступом до Інтернету, це не мало позитивного впливу на економічний розвиток, якби Інтернет використовувався рідко. Тому, якщо регіон бажає поліпшити своє економічне зростання на регіональному рівні, це можна зробити за рахунок збільшення використання Інтернету в домогосподарствах.

Ключові слова: валовий внутрішній продукт, регіональний продукт, інформаційні технології, комунікаційні технології, економічне зростання, доступ до Інтернету.

Gunawan Indra

THE EFFECT OF INFORMATION & COMMUNICATION TECHNOLOGY TOWARDS REGIONAL ECONOMIC GROWTH IN INDONESIA

Nowadays, information and communication technology is becoming important part within the economic development. The rapid development of information and communication technology has changed the lifestyle of Indonesian society, either in rural or urban area. This occurred since the presence of the variety of social media applications spread rapidly. Furthermore, this development

was automatically affected the growth of regional economy. This study observed the influence of information and communication technology towards regional economic growth in Indonesia that was represented by value of Gross Regional Domestic Product in 33 provinces in Indonesia in 2014 and 2015. The variable of information and communication technology was obtained by purposive sampling. The sample were cellular phone users, household with internet access, household that use internet access which represented by the household that accessed internet in last three months, household that had and could operated computer, and household that had wired telephone. This study examined each sample category and compared them to identify the effect toward Gross Regional Domestic Product. The data were processed using SmartPLS software version 3.2.7. The results showed that sample category that significantly affected Gross Regional Domestic Product was the household that used internet, while the other categories did not have significant influence. For every 1% enhancement of household growth that used internet would encourage 0.66% of Gross Regional Domestic Product. Even though, many household used internet access, it did not have positive impact on economic development if the internet was rarely used. Therefore, if a region wanted to improve its regional economic growth, it can be done by increasing the use of internet household.

Keyword: gross domestic product, regional product, information technology, communication technology, economic growth, internet access.

Гунаван Индра

ВЛИЯНИЕ ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫХ ТЕХНОЛОГИЙ НА РЕГИОНАЛЬНЫЙ ЭКОНОМИЧЕСКИЙ РОСТ В ИНДОНЕЗИИ

Сегодня информационно-коммуникационные технологии становятся важной частью экономического развития. Быстрое развитие информационных и коммуникационных технологий

изменил образ жизни индонезийского общества, или в сельской или в городской местности. Это произошло, поскольку наличие различных программ социальных медиа быстро распространялась. Кроме того, это развитие автоматически повлияло на рост региональной экономики. Это исследование отметило влияние информационно-коммуникационных технологий на экономический рост в Индонезии, которое было представлено стоимостью ВВП в 33 провинциях Индонезии в 2014 и 2015 годах. Образцом были пользователи сотовых телефонов, домохозяйства с доступом к Интернету, домохозяйства, используют доступ к Интернету, который представлял собой домохозяйство, которое пользовалось Интернетом в течение последних трех месяцев, домохозяйство, обладавшее компьютером и могло управлять компьютером, и домохозяйство с проводным телефоном. Это исследование рассмотрело каждую категорию образцов и сравнило их, чтобы определить влияние на валовой региональный внутренний продукт. Данные обрабатывались с помощью программы SmartPLS версии 3.2.7. Результаты показали, что категория выборки, которая в значительной степени повлияла на валовой региональный внутренний продукт, была домохозяйством, которое использовало Интернет, тогда как другие категории не имели значительного влияния. На каждый 1% повышения роста домохозяйств, использует Интернет, было бы стимулировано 0,66% валового регионального внутреннего продукта. Несмотря на то, что многие домохозяйств пользовались доступом к Интернету, это не имело положительного влияния на экономическое развитие, если бы интернет использовался редко. Поэтому, если регион хочет улучшить свой экономический рост на региональном уровне, это можно сделать за счет увеличения использования интернет-домохозяйств.

Ключевые слова: валовой внутренний продукт, региональный продукт, информационные технологии, коммуникационные технологии, экономический рост, доступ к Интернету.

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Introduction. Information and communication technology is an important matter in economic development, either in a country or region. Almost all families now are using telephone, hand-phone, smart-phone, computer and internet to conduct business or to offer service and in every activity in daily life. There are many changes resulted from the use of information and communication technology in daily life, either facilitate the communication or facilitate and enhance the data processing ability. Through information and communication technology software, people could find, explore, analyze and exchange information efficiently and effectively. It also enhances the productivity in industry world by changing the way people promote the product using digital advertisement, such as the use of algorithm. The use of algorithm can provide advertisement or promotion in more accurate way to the consumers. Thus, the product can only be visible and offered to people who really interest on the product. People can also choose what kind of advertisement or promotion they will get.

Information and communication technology also push the appearance of payment systems and electronic financial transaction which facilitate the transaction between seller and buyer, such as E-Banking, Phone Banking, Internet Banking, SMS Banking, and e-money. Moreover, the appearance of online services, such as online transportation, including Grab and Gojek, can facilitate people's activity with cheap price in wider range. Further, the telecommunication grows rapidly so that it changes society's lifestyle both in city and rural societies. The changing of lifestyle and behavior was caused by the emergence of various applications, social media and it is supported by high speed internet access.

Furthermore, there were various affordable smart-phones that changed society's lifestyle widely. The behavior changing happened rapidly and massively because information can spread in spite of society's heterogeneity, time and place differences. Thus, it made information and communication technology greatly affected in daily life.

According to internet world statistic in 2015, Indonesia was the eighth of highest internet user countries. It was influenced by the increase of cellular phone users. In 2015, 88.04% household in

Indonesia had at least one cellular phone. The amount was higher than the condition in 2008 that only 51.99%. Contrary, the amount of household that used wire telephone in 2015 was only registered 4.01%. It highly decreased because in 2008 the household that used wire telephone was 11.67%.

From the table above, it can be seen that the most rapid development was on the cellular phone users that increased continually, until 2015 it was about 56.92%. It showed that people are willing to spend their salary to get cellular services. Information and communication technology nowadays is a symbol of technological revolution and it is the key factor to encourage economic development in industrial society.

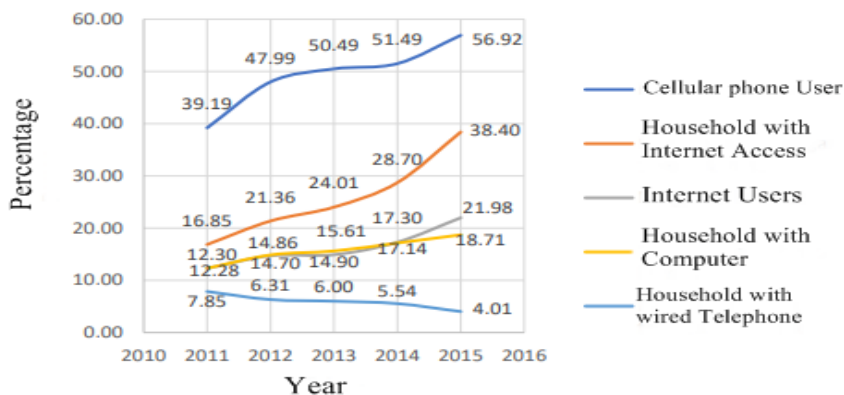


Figure 1. Information and Communication Technological Indicator Development in Indonesia, 2011-2015

(Source: Statistics Indonesia, Survey on National Social Economy)

In this study, the researchers examined the effects of information and communication technology toward regional economic development that was represented by value of Gross Regional Domestic Product in 33 provinces in Indonesia. The variable of Information and Communication Technology was obtained by purposive sampling. The sample were cellular phone users, household with internet access, the household that use internet were represented by the household that accessed internet by last three

months, the household that had and could operate computer and the household that had wire telephone. Then, those categories showed the most significant and the stronger impact on regional economic development that shown by the value of Gross Regional Domestic Product.

The productivity of a region is reflected by the domestic product while the prosperity level could be seen through the income. Generally, gross regional domestic product is the total added value produced by the whole business unit within a certain region or total value of product and service produced inside the domestic region which continued for society's final consumption. Gross regional domestic product on the value of valid price describes the added value of product and service which counted using prevailing price every year. While the gross regional domestic product on the value of constant price shows the added value of product and service which counted using prevailing price in a certain year as a principle.

Literature Review.The influence of Information and Communication Technology towards economic growth has been analyzed by many researchers in last decade. Most of the studies confirmed the positive effect of Information and Communication Technology towards economic development before the middle of 1990. Oliner and Sichel (year) used the main component of information and communication technology such as computer, software and communication tools including capital and its occupation as input. Further, they verified the great effect of information and communication technology toward economic growth in the end of 1990. However, there were no strong evidence that there was a positive correlation between information and communication technology toward economic growth before middle of 1990. Moreover, Jorgenson and Stiroh (2000) proved the contribution of information and communication technology toward economic growth in United States of America. However, it was happened because of the changing of computer hardware and other services related, not because of technological change.

Some researches that analyzed on the effect of information and communication technology towards economic growth had been conducted by some researchers such as Brynjolfsson and Yang

(1996); Motohashi (1997); and Kraemer and Dedrick (2001). Jalava and Pohjola (2002) identified that the usage information and communication technology and production quality were the most important factors in the economic growth of United States of America in 1990. Moreover, they also proved that information and communication technology improved economic growth in Finland from 0.3% to 0.7% between early and the end of 1990. Schreyer (2000) examined the effect of information and communication technology and its contribution towards economic growth in four nations such as United states of America, Canada and Japan between 1990-1996 was about 0,17% - 0,29%.

Method. The variable of Information and Communication Technology in this study was obtained by purposive sampling. The sample were cellular phone users, household with internet access, the household that use internet were represented by the household that accessed internet by last three months, the household that had and could operate computer and the household that had wire telephone. The data were obtained from Statistics Indonesia in 2014-2015 in 33 provinces in Indonesia. This study examined each sample category and compared them to identify the effect toward Gross Regional Domestic Product. The data were proceeded using SmartPLS software version 3.2.7. The independent variables were each categories that was compared to the dependent variable that was economic growth.

Table 1

Model Evaluation Cronbach's Alpha

Variable	Cronbach's Alpha	Composite Reliability
Internet in house	1	1
Computer	1	1
PDRB Growth	1	1
Internet users	1	1
Cellular phone	1	1
Telephone	1	1

The output results above illustrated that each variables had Composite Reliability that was quite high more than 0,7 as recommended by Straub (1989), and Cronbachs Alpha was high enough more than 0,7. Thus, it could be concluded that the construction had good reliability.

Outer Model Measurement.

Convergent Validity as the individual reflection was categorized as high if it was correlated more than 0.70 with the measured construct. However, preliminary research for the value measurement as 0.5 to 0.60 was adequate (Chin, 1998). The following model, all variables were meet standard because they have 1 loading outer value. Discriminant validity, Discriminant validity could be conducted by checking square value of root of average variance extracted (AVE). The recommended AVE value was >0,5 (Fornell and Larcker, 1981). In the following model, all variables met the standard because they had 1 AVE value. Inner Model examined the correlation between laten constructs in the model that identified path coefficient value and its significance level as seen on the table below. To obtain path coefficient value, bootstrapping was required to be conducted toward the model:

Tabel 2

Result

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (IO/STDEV)	P Values
Internet in House -->GRDP	-0.011	0.087	0.302	0.037	0.971
Computer -->GRDP	0.095	0.100	0.118	0.808	0.419
Internet User -->GRDP	0.660	0.571	0.289	2.283	0.023
Cellular Phone -->GRDP	0.133	0.121	0.238	0.560	0.576
Telephone -->GRDP	0.088	0.089	0.180	0.490	0.624

From the proceeded data above, it can be seen that the development of household that use internet was the independent variable that had significant effect that showed P values not more than 0,05 toward GDRP growth with coefficient as 0,66. Meanwhile,

the other independent variables did not affect GDRP growth significantly.

Test of structural model that identified value of R-square that was goodness-fit model test. The result of R2 was 0.67, 0.33 and 0.19 for latent endogen variable in structural model identified that the model were “good” “moderate” and “weak”.

Table3

GDRP Growth					
	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (IO / STDEV1)	P Values
GDRP Growth	0,488	0,537	0,086	5,642	0

Based on the criteria above, it can be concluded that the constructed model was good. GDRP growth had value of R square as 0,488. The other variables of GDRP growth that can be explained by other variables such as in house internet, computer, internet users, cellular phone, telephone were 48.8%. While 51.2% was explained by other variables outside this study.

Conclusion. Based on table 1.2, it illustrated that although the society had internet access but they did not use it, it did not affect economy. Every 1% enhancement of household that used internet, it would encourage the growth of Gross Regional Domestic Product as 0.66%. From the data above, it was interesting to observe that the big amount of cellular phone users did not affect significantly towards GDRP development. Perhaps, the cellular phone users did not use their cellular phones for activities that could develop regional economic growth. For instance, the users used it to access social media that did not affect economic because it only served social activity. Yet, this condition required further examination. Thus, building good ecosystem to increase internet usage must be established to enhance regional economic development. Good internet infrastructure in regional area must be maintained. Further, good internet price and good quality must be maintained to stimulate people especially household internet.

Moreover, both central and regional government must regulate policies that encouraged internet usage in household. The license facility in enabling infrastructure of information and communication technology would enhance and widen internet access that strengthened its quality. This condition encouraged people to use internet services both in their daily life and in their economic activities.

Internet provider must determine affordable prices for regional people. It could attract people to use internet in daily life. Further, the free internet services for students and academicians would be very useful for the students. The facility must be provided in public so that it could be a modern lifestyle that affected society and enhanced the society to use internet in daily life. Thus, it could emerge multiplier effect economically. The developed economy would enhance society's ability to provide and to utilize internet that positively affected business in internet services.

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JEL classification: A200, H750, I250, Q010, R100

Жарова Любов

ДОСТУПНІСТЬ ОСВІТИ ЯК ОСНОВА СТАЛОГО РОЗВИТКУ

У статті розглядається проблема доступності освіти в рамках сталого розвитку. Основна гіпотеза полягає в тому, що освіта як довготривалий процес, який будує мостик між попереднім досвідом та новими підходами і гарантує безперервність у створенні та розповсюдженні знань, повинен бути фундаментальним пунктом для сталого розвитку незалежно від рівня соціально-економічного розвитку країни. Основну увагу приділено аналізу доступності освіти в Україні, яка зазнала впливу демографічних проблем, економічної нестабільності та радянських традицій у сфері освіти, що потребує довготривалого часу. Автор підсумовує поточну ситуацію і пропонує рекомендації щодо розв'язання сучасних проблем. Дослідження зосереджувалося на витратах уряду