

PAPER • OPEN ACCESS

## Impact of GDP Information Technology in Developing of Regional Central Business (Case 50 Airports IT City Development in Indonesia)

To cite this article: Joko Suyono *et al* 2017 *J. Phys.: Conf. Ser.* **930** 012045

View the [article online](#) for updates and enhancements.

### You may also like

- [The effect of axial ion parameters on the properties of glow discharge polymer in  \$T\_e/B/H\_e\$  plasma](#)  
Xing Ai, Xiao-Shan He, Jing-Lin Huang et al.
- [Cost of preventing workplace heat-related illness through worker breaks and the benefit of climate-change mitigation](#)  
Jun'ya Takakura, Shinichiro Fujimori, Kiyoshi Takahashi et al.
- [Economic growth dominates rising potential flood risk in the Yangtze River and benefits of raising dikes from 1991 to 2015](#)  
Wei Qi, Lian Feng, Hong Yang et al.

# Impact of GDP Information Technology in Developing of Regional Central Business (Case 50 Airports IT City Development in Indonesia)

Joko Suyono<sup>1</sup>, Agus Sukoco<sup>1</sup>, M Ikhsan Setiawan<sup>1\*</sup>, Suhermin<sup>2</sup> and Robbi Rahim<sup>3</sup>

<sup>1</sup>Narotama University, Jl. Klampis Semalang VII No.33, Surabaya 60117, Indonesia

<sup>2</sup>Sekolah Tinggi Ilmu Ekonomi Indonesia, Jalan Menur Pumpungan 30 Surabaya 60118, Indonesia

<sup>3</sup>School of Computer and Communication Engineering, Universiti Malaysia Perlis, Malaysia

\*ikhsan.setiawan@narotama.ac.id

**Abstract.** Indonesia a great number of populations and demand of air transportation services keep increasing by the year in line with the increasing of population and welfare its people. Need for telematics solutions to support goods transport and distribution in cities is mainly due to the complexity of the processes taking place in urban transport systems and the importance of the optimisation of transport operations via ensuring adequate availability of linear and point infrastructure, while reducing the adverse impacts of the transport system on the environment. Efficient infrastructure supports economic growth, improves quality of life, and it is important for national security. Impact of GDP Information Technology in developing of Regional Central Business especially SME Business, are very large correlations and very significant supported by Passenger Arrival and Departure, Baggage Loaded and Unloaded, Cargo Loaded and Unloaded, Separated regional asset, Grant, Capital Expenditure, Investment of Regional Gov., GDP Agriculture-Forestry-Fishing, GDP Manufacturing, GDP Electricity-Gas, GDP Water supply-Sewerage-Waste Management-Remediation Activities, GDP Financial-Insurance Activities, GDP Business Activities, GDP Public Administration and Defense-Compulsory Social Security, GDP Education and GDP Other Services Activities

## 1. Introduction

Indonesia a great number of populations and demand of air transportation services keep increasing by the year in line with the increasing of population and welfare its people. Air transportation has dominant role, especially involved with the demand for fast transportation, which means the only one choice is air transportation. On the implementation of air transportation activities, there are two systems that need to be highlighted, they are airport as operators of supporting facilities and airline companies that operate the aircraft. Airport is the most vital part of air transportation. It is different with harbor as sea transportation support, or terminal as land transportation support. Without airport, air transportation activities cannot be done, especially for aircraft that has fixed wing and need landing pads that fulfil



several requirements. Airport is an area that has necessary facilities and equipment to accommodate arrivals and departures of aircraft along with their passengers and cargo carried.

## 2. Literature Review

BPS (2017), GDP is defined as the total value added at basic price of all production units in a country during a given period (usually one year) plus net taxes on product (taxes less subsidies on products). The production units are grouped into 17 sections of industry, namely: (A) Agriculture, Forestry and Fishing, (B) Mining and Quarrying, (C) Manufacturing, (D) Electricity and Gas, (E) Water supply, Sewerage, Waste Management and Remediation Activities, (F) Construction, (G) Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles, (H) Transportation and Storage, (I) Accommodation and Food Service Activities, (J) Information and Communication, (K) Financial and Insurance Activities, (L) Real Estate Activities, (M,N) Business Activities, (O) Public Administration and Defense; Compulsory Social Security, (P) Education, (Q) Human Health and Social Work Activities, and (R,S,T,U) Other Services Activities

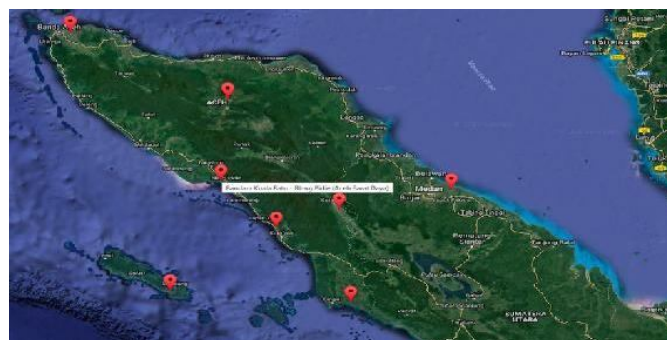
Małecki, Krzysztof, Iwan, Stanisław, Kijewska, Kinga (2014) need for telematics solutions to support goods transport and distribution in cities is mainly due to the complexity of the processes taking place in urban transport systems and the importance of the optimisation of transport operations via ensuring adequate availability of linear and point infrastructure, while reducing the adverse impacts of the transport system on the environment. Chen, Xiaohong, Lin, Hangfei and Yang, Chao (2007), ITS (Intelligent Information System) plays an important role in promoting the performance of a city's overall transport system. Under the pressure of both urbanization and motorization, most cities in China require establishing an informational, integrated and intelligent transport system for vital homeland security. Considering the current conditions of China's infrastructure and the competence of transport technology priority should be given to technical skills and decision-making which can provide support for the scientific decision-making of transport planning and construction. Bin, Xu, Xiaohong, Chen, Hangfei, Lin and Chao, Yang (2013), To meet the requirements of present urban development in China, establishing ITS (Intelligent Information System) platform is mainly to support the planning decision making. The major function of this tool is by using abundant data resource and computing power, as well as Data Mining technique such as Fuzzy Analysis, Neural Network Study and Forecasting to analyze and dig the data in much deeper levels, which include the evolution laws of city traffic condition, the distribution characteristics of the contradiction between city traffic supply and travel demand clusters, the data calculation for Transport Monthly/Annual Report, the achievement of Automatic Transport Report, the evaluation of qualitative and quantitative research for current traffic situation, the identification of traffic problems and traffic regulation objects, and the support for developing the traffic improvement schemes. Miller, Harvey J (2011), Geographic Information Systems (GIS), provide an environment for managing, exploring, analyzing transportation data and communicating transportation information. Social computing can allow travelers to be active participants in the organization of the system rather than just passive recipients of transportation information. GIS – as well as the underlying geographic information science – have matured to the point that they can serve as a vital component of a smarter transportation system. Particularly relevant is the increasing ability of GIS to maintain and display spatio-temporal and moving objects data, improving capabilities for exploring and analyzing complex and massive spatio-temporal data, science and tools for simulating transportation, urban and other human systems from the “bottom-up” (at the level of the individual person, vehicle or object), and the development and adoption of data standards and information infrastructures for integrating and interoperating data.

Jimenez, Edgar, Claro, João and de Sousa, Jorge Pinho (2014), According to the space available, or the ability of the airport to acquire surrounding land or partner with its tenants, the business approach may turn into the development of the airport city concept. Chung, Tae-won (2009), the particular business type such as aircraft chartering and sale, aircraft repairing and maintenance & assembling, and aircraft parts. It is needed to develop these businesses since world airport market is experiencing a consistent increase in airfreight demand, passenger demand and aircraft demand as the world agreed to

open sky policy. From this point of view, if Incheon is able to attract the global firm that is doing business with aircraft chartering and sale related service, Incheon international airport will become a hub airport in Northeast Asia and this will stimulate activation of financial market that is related to aircraft intermediary so as to give the positive impact on the economy of Incheon. Wang, Ying, Chou, Chien-chang and Yeo, Gi-tae (2013), the development strategies for the Incheon and Taoyuan aerotropolises. It shows that the Incheon aerotropolis is primarily motivated by tourism, followed by the development of an airport-related industry zone and a residential zone. However, for the Taoyuan aerotropolis, the creation of an airport-related industry zone is the driving, followed by tourism and a residential zone

### 3. Methodology

Research sampling is 50 airports in Indonesia, there are: Sultan Iskandar Muda (Aceh Besar), Teuku Cut Ali (Aceh Selatan), Kualanamu (Medan), Binaka-Gunung Sitoli (Nias), Minangkabau (Padang Pariaman), Sultan Mahmud Badaruddin II (Palembang), Silampari (Musi Rawas), Raja Haji Fisabilillah (Tanjung Pinang), Ranai (Natuna), Halim Perdanakusuma (Jakarta Timur), Husein Sastranegara (Bandung), Nusawiru (Ciamis), Tunggul Wulung (Cilacap), Adi Sucipto (Sleman), Juanda (Sidoarjo), Abdul Rachman Saleh (Malang), Ngurah Rai (Badung), Bandara Internasional Lombok - BIL (Mataram), Muhammad Salahudin (Bima), Eltari (Kupang), Gewayantana-Larantuka (Flores Timur), DC Saudale Lekunik (Rote Ndao), A.A. Bere Tallo, Haliwen-Atambua (Belu), Komodo-Labuhan Bajo (Manggarai Barat), Frans Sales Lega Satar Tacik (Manggarai), Terdamu Sabu (Kupang), Umbu Mehang K-Waingapu (Sumba Timur), Supadio (Pontianak), Nangah Pinoh (Melawi), Iskandar - Pangkalan Bun (Kotawaringin Barat), Tjilik Riwut (Palangkaraya), H. Asan - Sampit (Kotawaringin Timur), Kuala Kurun (Gunung Mas), Syamsuddin Noor (Banjar Baru), Sepinggan (Balikpapan), Temindung (Samarinda), Bontang (Badak Bontang), Nunukan (Nunukan), Seluwing (Malinau), Naha-Tahuna (Kep. Sangihe), Mutiara(Palu), Kasiguncu (Poso), Syukuran Aminuddin Amir (Banggai Luwuk), Sorowako (Luwu Timur), Haluoleo (Konawe Selatan), Rendani (Manokwari), Wasior (Teluk Wondama), Moppah (Merauke), Nabire (Nabire) and Tolikara (Karubaga). Data collection from BPS (Statistics Institution) and Financial Ministry, to see impact of GDP Information Technology in developing of Regional Central Business especially SME Business. GDP Information Technology as Dependent variable and Independent/predictor variables are Passenger Arrival and Departure, Baggage Loaded an Unloaded, Cargo Loaded and Unloaded, Separated regional asset, Grant, Capital Expenditure, Investment of Regional Govt, GDP Agriculture-Forestry-Fishing, GDP Mining-Quarrying, GDP Manufacturing, GDP Electricity-Gas, GDP Water supply-Sewerage-Waste Management-Remediation Activities, GDP Wholesale and Retail Trade-Repair of Motor Vehicles and Motorcycles, GDP Accommodation-Food Service Activities, GDP Financial-Insurance Activities, GDP Business Activities, GDP Public Administration and Defence-Compulsory Social Security, GDP Education, GDP Human Health and Social Work Activities and GDP Other Services Activities. Institute for Digital Research and Education (2017), Statistic analysis use SPSS tools included Overall Model Fit, Anova Table and Parameter Estimates.



**Figure 1.** Airport Location in Aceh, Sumatera, Indonesia

#### 4. Result and Analysis

The results of statistical analysis shows Overall Model Fit, ANOVA Table and Parameter Estimates of dependent variable GDP Information Technology and independent variables include Passenger Arrival and Departure, Baggage Loaded and Unloaded, Cargo Loaded and Unloaded, Separated regional asset, Grant, Capital Expenditure, Investment of Regional Gov., GDP Agriculture-Forestry-Fishing, GDP Mining-Quarrying, GDP Manufacturing, GDP Electricity-Gas, GDP Water supply-Sewerage-Waste Management-Remediation Activities, GDP Wholesale and Retail Trade-Repair of Motor Vehicles and Motorcycles, GDP Accommodation-Food Service Activities, GDP Financial-Insurance Activities, GDP Business Activities, GDP Public Administration and Defense-Compulsory Social Security, GDP Education, GDP Human Health and Social Work Activities and GDP Other Services Activities.

R value represents the simple correlation and is 0.996 (the "R" Column), which indicates a high degree of correlation. In this case, 99.6% can be explained, which is very large.

a. Dependent Variable: Informasi dan Komunikasi/ Information and Communication

b. Tolerance = .000 limit reached.

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.999 <sup>a</sup>	.998	.996	215.33423

a. Predictors: (Constant), Jasa lainnya/ Other Services Activities, Cargo Bongkar/ Unloaded, Pertanian, Kehutanan, dan Perikanan/ Agriculture, Forestry and Fishing, Pertambangan dan Penggalian/ Mining and Quarrying, Pengadaan Listrik dan Gas/ Electricity and Gas, Pengadaan Air, Pengelolaan Sampah, Limbah dan Daur Ulang/ Water supply, Sewerage, Waste Management and Remediation Activities, Industri Pengolahan/ Manufacturing, Penyediaan Akomodasi dan Makan Minum/ Accommodation and Food Service Activities, Cargo Muat/ Loaded, Administrasi Pemerintahan, Pertahanan dan Jaminan Sosial Wajib/Public Administration and Defence; Compulsory Social Security, Bagasi Bongkar/ Unloaded, Jasa Keuangan dan Asuransi/ Financial and Insurance Activities, Pesawat Datang/Arrival, Hibah, Belanja Modal, Penumpang Berangkat/ Departure, Jasa Pendidikan/ Education, Jasa Kesehatan dan Kegiatan Sosial/ Human Health and Social Work Activities, Hasil pengelolaan kekayaan daerah yang dipisahkan, Perdagangan Besar dan Eceran; Reparasi Mobil dan Sepeda Motor/ Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles, Pendapatan, Bagasi Muat/ Loaded, Penyertaan Modal (Investasi) Daerah, Jasa Perusahaan/ Business ...

**Figure 2. GDP Model Analysis**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	551029892.6	25	22041195.70	475.345	.000 <sup>b</sup>
	Residual	1112851.938	24	46368.831		
	Total	552142744.5	49			

a. Dependent Variable: Informasi dan Komunikasi/ Information and Communication

b. Predictors: (Constant), Jasa lainnya/ Other Services Activities, Cargo Bongkar/ Unloaded, Pertanian, Kehutanan, dan Perikanan/ Agriculture, Forestry and Fishing, Pertambangan dan Penggalian/ Mining and Quarrying, Pengadaan Listrik dan Gas/ Electricity and Gas, Pengadaan Air, Pengelolaan Sampah, Limbah dan Daur Ulang/ Water supply, Sewerage, Waste Management and Remediation Activities, Industri Pengolahan/ Manufacturing, Penyediaan Akomodasi dan Makan Minum/ Accommodation and Food Service Activities, Cargo Muat/ Loaded, Administrasi Pemerintahan, Pertahanan dan Jaminan Sosial Wajib/Public Administration and Defence; Compulsory Social Security, Bagasi Bongkar/ Unloaded, Jasa Keuangan dan Asuransi/ Financial and Insurance Activities, Pesawat Datang/Arrival, Hibah, Belanja Modal, Penumpang Berangkat/ Departure, Jasa Pendidikan/ Education, Jasa Kesehatan dan Kegiatan Sosial/ Human Health and Social Work Activities, Hasil pengelolaan kekayaan daerah yang dipisahkan, Perdagangan Besar dan Eceran; Reparasi Mobil dan Sepeda Motor/ Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles, Pendapatan, Bagasi Muat/ Loaded, Penyertaan Modal (Investasi) Daerah, Jasa Perusahaan/ Business ...

**Figure 3. Model Summary and ANOVA Analysis**

Regression model predicts the dependent variable significantly well, at the "Regression" row and go to the "Sig." column. This indicates the statistical significance of the regression model that was run. Here, p is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the model (i.e., it is a good fit for the data).

Significant level below 0.05 included Passenger Arrival and Departure, Baggage Loaded and Unloaded, Cargo Loaded and Unloaded, Separated regional asset, Grant, Capital Expenditure,



Investment of Regional Gov., GDP Agriculture-Forestry-Fishing, GDP Manufacturing, GDP Electricity-Gas, GDP Water supply-Sewerage-Waste Management-Remediation Activities, GDP Financial-Insurance Activities, GDP Business Activities, GDP Public Administration and Defense-Compulsory Social Security, GDP Education and GDP Other Services Activities.

Coefficients <sup>a</sup>					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Pergerakan Modal (Investasi) Daerah	-9.579E-9	.000	-.2164	-3.895	.001
Pertanian, Kehutanan, dan Perikanan/ Agriculture, Forestry and Fishing	-.091	.041	-.069	-2.228	.036
Pertambangan dan Penggalian/ Mining and Quarrying	.026	.014	.022	1.848	.077
Industri Pengolahan/ Manufacturing	-.008	.004	-.050	-2.111	.045
Pengadaan Listrik dan Gas/ Electricity and Gas	3.662	1.375	.366	2.663	.014
Pengadaan Air, Pengelolaan Sampah, Limbah dan Daur Ulang/ Water supply, Sewerage, Waste Management and Remediation Activities	17.940	3.282	.381	5.466	.000
Perdagangan Besar dan Eceran, Reparasi Mobil dan Sepeda Motor/ Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles	.085	.060	.282	1.060	.300
Penyediaan Akomodasi dan Makan Minum/ Accommodation and Food Service Activities	-.240	.155	-.227	-1.548	.135
Jasa Keuangan dan Asuransi/ Financial and Insurance Activities	-.279	.125	-.162	-2.238	.035
Jasa Perusahaan/ Business Activities	2.675	.911	1.811	2.936	.007
Administrasi Pemerintahan, Pertahanan dan Jaminan Sosial Wajib/ Public Administration and Defence, Compulsory Social Security	-.422	.116	-.267	-3.656	.001
Jasa Pendidikan/ Education	.456	.198	.500	2.306	.030

Figure 4. GDP Education Services 1

Coefficients <sup>a</sup>					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Jasa Kesehatan dan Kegiatan Sosial/ Human Health and Social Work Activities	-.198	.515	-.050	-.384	.704
Jasa lainnya/ Other Services Activities	1.407	.465	.654	3.026	.006

Figure 5. GDP Education Services 2

## 5. Conclusion

A high degree of correlation, 99.6% is very large between dependent variable GDP Information Technology and independent variables Passenger Arrival and Departure, Baggage Loaded and Unloaded, Cargo Loaded and Unloaded, Separated regional asset, Grant, Capital Expenditure, Investment of Regional Gov., GDP Agriculture-Forestry-Fishing, GDP Mining-Quarrying, GDP Manufacturing, GDP Electricity-Gas, GDP Water supply-Sewerage-Waste Management-Remediation Activities, GDP Wholesale and Retail Trade-Repair of Motor Vehicles and Motorcycles, GDP Accommodation-Food Service Activities, GDP Financial-Insurance Activities, GDP Business Activities, GDP Public Administration and Defence-Compulsory Social Security, GDP Education, GDP Human Health and Social Work Activities and GDP Other Services Activities.

Impact of GDP Information Technology in developing of Regional Central Business especially SME Business, are very large correlations and very significant supported by Passenger Arrival and Departure, Baggage Loaded and Unloaded, Cargo Loaded and Unloaded, Separated regional asset, Grant, Capital Expenditure, Investment of Regional Gov., GDP Agriculture-Forestry-Fishing, GDP Manufacturing, GDP Electricity-Gas, GDP Water supply-Sewerage-Waste Management-Remediation Activities, GDP Financial-Insurance Activities, GDP Business Activities, GDP Public Administration and Defence-Compulsory Social Security, GDP Education and GDP Other Services Activities

## Reference

- [1] Agénor, P-R., Moreno-Dodson, B. (2006), Public infrastructure and growth: new channels and policy implications. Banca d'Italia, Italia.
- [2] Baldwin, J.R., Dixon, J. (2008), Infrastructure Capital: What is it? Where is it? How much of it is there? Canadian Productivity Review. No 16. Ottawa: Statistics Canada.
- [3] Bin, Xu, Xiaohong, Chen, Hangfei, Lin, Chao, Yang (2013), Decision Oriented Intelligent Transport Information Platform Design Research - Case study of Hangzhou City, 13th COTA International Conference of Transportation Professionals (CICTP 2013), Procedia - Social and Behavioral Sciences 96 (2013) 2230 – 2239
- [4] BPS (2017), National Income Of Indonesia 2012-2016, BPS, Jakarta, Indonesia
- [5] Chen, Xiaohong, Lin, Hangfei, Yang, Chao (2007), City Traffic, vol. 5, no.5, pp.28-32
- [6] Chung, Tae-won (2009), A Study on Selections of Strategic Type of Business in Air-logistics Industry Clusters, The Asian Journal of Shipping and Logistics, Vol 25 No 1 June 2009, pp.83-102, email: logichung@idi.re.kr
- [7] Grundey, D. (2008), Managing sustainable tourism in Lithuania: Dream or reality? Technological and Economic Development of Economy, 14(2), 118-129.
- [8] Gu, W., & Macdonald, R. (2009), The Impact of Public Infrastructure on Canadian Multifactor Productivity Estimates. The Canadian Productivity Review. Research paper (21).
- [9] Institute for Digital Research and Education (2017), <https://stats.idre.ucla.edu/spss/output/regression-analysis/>
- [10] Jimenez, Edgar, Claro, João, de Sousa, Jorge Pinho (2014), The airport business in a competitive environment, EWGT2013 – 16th Meeting of the EURO Working Group on Transportation, Procedia - Social and Behavioral Sciences 111 (2014) 947 – 954
- [11] Laerd Statistics (2017), <https://statistics.laerd.com/spss-tutorials/linear-regression-using-spss-statistics.php>
- [12] Macdonald, R. (2008), An Examination of Public Capital's Role in Production. Economic Analysis Research Paper Series. No. 50. Ottawa: Statistics Canada.
- [13] Małeck, Krzysztof, Iwan, Stanisław, Kijewska, Kinga (2014), Influence of Intelligent Transportation Systems on reduction of the environmental negative impact of urban freight transport based on Szczecin example, 1st International Conference Green Cities 2014 – Green Logistics for Greener Cities, Procedia - Social and Behavioral Sciences 151 (2014) 215 – 229
- [14] Mamatzakis, E.C. (2008), Economic performance and public infrastructure: an application to Greek manufacturing. Bulletin of Economic Research (60), 307-326.
- [15] Martinkus, B., Lukasevicius, K. (2008), Investment environment of Lithuanian resorts: Researching national and local factors in the Palanga case. Transformations in Business & Economics, 7(2), 67-83.
- [16] Miller, Harvey J (2011), Collaborative mobility: using geographic information science to cultivate cooperative transportation systems, International Conference: Spatial Thinking and Geographic Information Sciences 2011, ~~Proc~~Procedia Social and Behavioral Sciences 21 (2011) 24–28
- [17] Snieska, V., Bruneckiene, J. (2009), Measurement of Lithuanian Regions by Regional Competitiveness Index. Inzinerine Ekonomika-Engineering Economics(1), 45-57
- [18] Wang, Ying, Chou, Chien-chang, Yeo, Gi-tae (2013), Criteria for Evaluating Aerotropolis Service Quality, The Asian Journal of Shipping and Logistics, Vol 29 No 3 December 2013, pp.395-414, email: yingmickey@naver.com