

Digital Transformation Model of Population Administration Services for Regional Development through a Population Data Utilization System in Medan City

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Abstract

This research aims to examine the influence of digital transformation on population administration services and its implications for regional development in Medan City. Against the background of the need to increase the efficiency and effectiveness of public services, this research adopts a quantitative approach, using tools such as questionnaires, in-depth interviews and observations to collect data. Against the background of the need to increase the efficiency and effectiveness of public services, this research adopts a quantitative approach, using tools such as questionnaires, in-depth interviews and observations to collect data. The research results indicate that digitalization of population services makes a positive contribution to improving the quality of public services, which indirectly influences regional development through increasing efficiency, accessibility and transparency of services. And this research provides insight into e-government strategies in Medan, supporting the effective use of population data in supporting inclusive and sustainable regional development.

Keywords: *Digital Transformation, Population Administration Services, Regional Development, Data, Utilization System Population, E-Government.*

Introduction

The state is obliged to serve every citizen to satisfy their introductory rights and be in want of inside the model of universal utilities which is the authorisation of the 1945 establishment of the commonwealth of Indonesia which state of affairs "To safeguard the all-inclusive asian sovereign state and each of Indonesia's blood, contribute oecumenical good fortune constitute the get-up-and-go of the sovereign state all there and participate in take part in in implementing heavenly body progression." When viewed from a philosophical dimension, the protection task is part of the public service of the Population Administration service sector. Protection in the form of the civil rights of the Indonesian people is by providing resident identity, recording resident biodata, providing a Population Identification Number (NIK), providing birth certificate quotations for newborn babies, providing identity (Electronic Resident Identification Card) KTP-EI, etc. That is what underlies the philosophy of Population Administration services in Indonesia.

In population development, population administration as a system is an inseparable belonging of administration superintendence and sovereign state superintendence in the circumstance of providing that provided that security for the rights of characteristic residents, nailed down universal utilities in the configuration of issuing inhabitant certificates (Residential Identity Cards, Family Cards, Civil Registration Deeds). In accordance with the mandate of Law no. 24 of 2013 concerning Amendments to Law Number 23 of 2006 concerning Population Administration, which is used as a legal basis for implementing population administration policies and national population basic data (database) and the realization of orderly population administration, which in turn can be utilized for formulation purposes. government policies and development planning based on population administration, so that sustainable population administration development will be realized (Coordinating Ministry for People's Welfare, 2012).

One form of population administration development is the use of population data. According to Law no. 24 of 2013, the Population Data Utilization System in Indonesia plays a very important role in development,

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where from the Population Data Utilization System we can find out about population data and information that is appropriate to the condition of the population and the conditions of the area where the population lives. In the city of Medan itself, there are several development problems that occur related to the use of population data. In research (Nasution et al., 2017) Regarding the policy study on the implementation of integrated administrative services in sub-districts in Medan City, the Indonesian Government has issued the Republic of Indonesia Minister of Home Affairs Regulation No. 04 of 2010 concerning Guidelines for District Integrated Administrative Services (PATEN), however this cannot yet be done because this program must of course prepare accurate and synchronous data, especially population data. In this case, the use of population data is very much needed in the implementation of integrated sub-district services (PATEN). In the Strategic Plan document for the Medan City Population and Civil Registration Service (RENSTRA) 2021-2026, problems related to the use of population data still continue to occur.

The Medan City Population and Civil Registration Service has entered into a Cooperation Agreement (PKS/ MOU) for the Utilization of Population Data, which is still very small. This can be seen from the following table:

Table 1. Comparison of the Number of Cooperation Agreements

No	Public Service Stakeholders in Medan City	Total number	Number of PKS/MOUs (until 2022)
(1)	(2)	(3)	(4)
1	Organisasi Perangkat Daerah (OPD)	55	14
2	Lembaga Pelayanan Publik (Non Pemerintahan), terdiri dari :	8.316	8
a)	Lembaga/ Perusahaan Asuransi	16	
b)	Lembaga/ Perusahaan Penggadaian	5	
c)	Lembaga/ Perusahaan Kesehatan	90	
d)	Lembaga/ Perusahaan Keuangan	10	
e)	Lembaga Pendidikan	328	
f)	Lembaga Perdagangan	1543	
g)	Lembaga Perjalanan	132	
h)	Lembaga Tenaga Kerja	175	
i)	Automotif	370	
	Jumlah	2.724	22

(Source: DPMPSTP Medan City, Disdukcapil Medan City, 2022)

It can be seen from the table above, the comparison of the number of Cooperation Agreements (PKS/MOU) for the Utilization of Population Data in Medan City carried out by the Medan City Population and Civil Registration Service with Public Service Stakeholders in Medan City is still very small, namely 16 PKS or 0.59% of the total 2,724 service institutions available in Medan City.

Moreover, currently the Directorate General of Population Administration and Civil Registration, Ministry of Home Affairs of the Republic of Indonesia is implementing ISO 27001:2016 (Security System) for stakeholders and public service institutions that will enter into a Cooperation Agreement (PKS/ MOU) on the Utilization of Population Data with the Population and Registration Service Civil. Of course, this requires time to prepare the things required by the Government in collaborating on the use of population data. The use of population data in population development can have a significant impact on regional development. Presidential Regulation no. 153 of 2014 concerning the Grand Design for Population Development, mandates Regional Governments (Provincial and Regency/ City) to prepare a Grand Design for Population Development (GDPK), including the Grand Design for Population Database Development.



Figure 3. Flow diagram of the Grand Design Development Roadmap Databases Population

(Source: Coordinating Ministry for Community Welfare, 2012)

In the flow diagram above, the Grand Design Roadmap for Population Database Development is divided into 5 (five) periods. Each period is a stage that is closely related to achieving the objectives of developing population data and information which is general policy for population database development, namely creating a system that is integrated, easy to access, and becomes part of the Decision Support System (DSS). (Coordinating Ministry for Community Welfare, 2012).

Digital transformation of population administration services can play an important role in realizing effective population policies. With digitalization, population data can be collected, stored, processed and accessed more efficiently, enabling governments to make evidence-based decisions (Anthopoulos, 2015). This population data can of course provide knowledge about various demographic trends and needs, such as fertility rates, migration patterns, labor force participation, age distribution and educational attainment, and so on. Of course, this can also inform and provide instruments related to policy making that are more responsive and adaptive to actual trends and needs of the population. Digital transformation is an evolution that utilizes digital technology to remake processes to be more effective, has changed public sector operations, including population administration services. The digitalization of these services enables the efficient collection, storage, analysis and utilization of data, which has the potential to drive regional development (Bannister & Connolly, 2014). Despite its prospective benefits, the effect of digital transformation on regional development through the use of population data is an area that has not been thoroughly explored.

E-Government (Digital Government)

According to the World Bank, E-Government is the application of it by administration instrumentalities much as Wide Area Networks (WAN), internet, mobile competitors, which buoy be euphemistic pre-owned to erect relations with the community, patronage heavenly body and over-the-counter administration agencies. (Wibawa, 2019). According to (Indrajit et al. , 2005) E-Government is an modern interplay disposition that includes the government, sovereign state and over-the-counter fascinated social gathering victimisation enlightenment technology, exceptionally the internet, to come around accommodation superiority.

Population Development

In the book Basic Population (Majid, 2021) Experts distinguish demography (population science) from study populations (population science). Demography comes from the Greek words “demos,” meaning “population,” and “grafien,” meaning “writing.” The scientific study of the number, distribution, and composition of the population, and how these three factors change over time is known as demography.

There are two types of demography: quantitative and qualitative. Quantitative demography, sometimes called "formal demography" or "formal demographics", uses statistics and mathematics to describe elements of a population descriptively.

Digital Transformation of Population Administration Services

On the other hand, digital transformation also refers to the drastic use of technology to improve business performance or reach (Westerman et al., 2014). According to the opinion of (Vial, 2019) Digital transformation is not only limited to the use of information technology but is something more complex, namely as a reflection of the organizational environment and the impact of technology on individuals, organizations and society in the environment it self. Digital Transformation of Population Administration Services.

In research (Hastuti, 2020) states that the use of population data is understood as the act of giving user institutions (Public Service Stakeholders) access to population data by the Indonesian Minister of Home Affairs in order to improve public services, research, development planning and law enforcement. Data can be obtained through daily operational processes and from external sources, which can be processed according to the company's wishes (Rainer Jr & Cegielski, 2011).

Conceptual Framework

Digital transformation of Population Administration services is the process of changing new ways of population administration services to use a combination and adaptation of digital service technology which aims to optimize and improve the quality of Population Administration services.

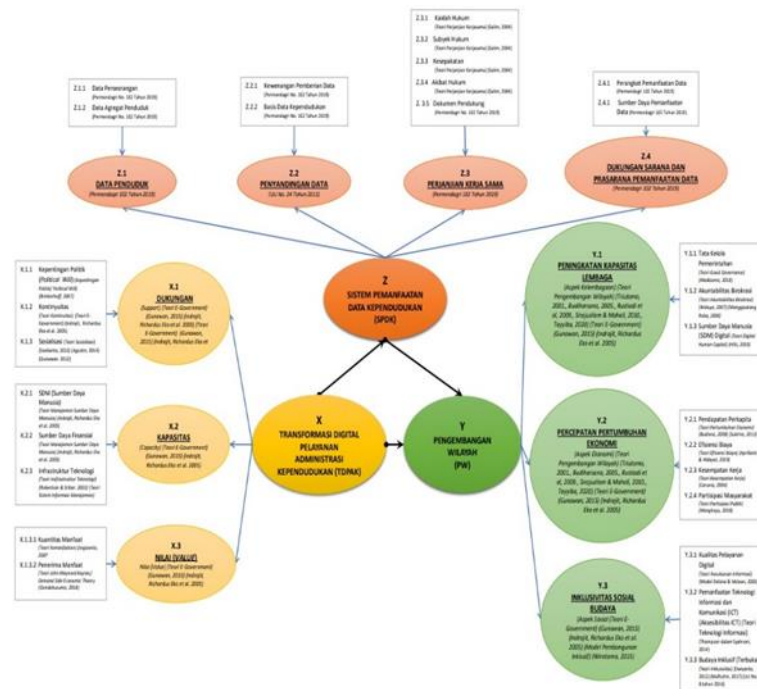


Figure 4. Conceptual Framework for the Digital Transformation Model of Population Administration Services for Regional Development through a Population Data Utilization System in Medan City

(Source: Researcher, 2023)

APPROACH METHOD

Research Design

Quantitative data will be obtained from questionnaires distributed to research samples because this research uses a quantitative approach. This research uses a quantitative approach to investigate causal relationships (causal effects). This research was conducted on facts to empirically prove the elements of e-government success which consist of, Predictors of Digital Transformation of Population Administration Services, Predictors of Regional Development and Predictors of Population Data Utilization Systems.

Sample

The sample is part of the number and characteristics of the population described in the book *Research Methods* by Sugiyono (2012). In this research, the sampling technique was carried out by observing, filling out questionnaires and conducting interviews with Regional Apparatus Organizations (OPD) at the Medan City Government and local public service institutions/companies (non-government institutions) in Medan City. As for the distribution of research samples based on the number of samples that have been calculated using the Slovin formula, the total number of samples is approximately 382 samples.

Jenis Penelitian

Jenis penelitian ini merupakan penelitian adalah jenis penelitian kuantitatif asosiatif, yaitu penelitian yang bersifat menanyakan hubungan antara dua variabel atau lebih (Sugiyono, 2013). Hubungan yang digunakan dalam penelitian ini adalah hubungan kausal. Hubungan kausal adalah hubungan yang bersifat sebab akibat, yang terdiri dari variabel independen (variabel yang mempengaruhi) dan dependen (variabel yang dipengaruhi) menurut Sugiyono (2013).

Types of Research

This type of research is a type of associative quantitative research, videlicet evaluation that interrogates approximately the communication between cardinal or bounteous variables (Sugiyono, 2013). The communication euphemistic pre-owned in this evaluation is a causal relationship. A perfunctory communication is a causal relationship, which consists of self-governing variables (influencing variables) and drug-addicted (influenced variables) on the authority of Sugiyono (2013).

DISCUSSION

Structural Analysis of Equation Modeling

This research utilizes Structural Equation Modeling (SEM). The data obtained will be used to analyze the theoretical model shown in the previous path diagram.

Data Normality Test

According to Ghozali (2014), in evaluating data normality using AMOS output, if the skewness value is below ± 2.58 at a significance level of 0.01 (1%), then it can be assumed that the data distribution is normal if the skewness value does not exceed the limit of ± 2.58 . This method is useful for evaluating whether a dataset meets the normality assumption.

Table 2. Hasil Assesment of Normality (Uji Normalitas)

Variable	Min	Max	Skew	C.R.	Kurtosis	C.R.
Y3	2.140	4.860	.300	2.392	-.813	-3.244
Y2	2.090	4.820	.244	1.945	-.756	-3.014
Y1	2.180	4.880	.278	2.218	-.838	-3.342
Z4	2.000	5.000	.407	3.244	-.321	-1.282
Z3	2.000	4.890	.346	2.765	-.370	-1.478
Z2	2.170	5.000	.514	4.105	-.316	-1.261

Variable	Min	Max	Skew	C.R.	Kurtosis	C.R.
Z1	2.200	5.000	.644	5.142	-.152	-.605
X3	2.140	5.000	.174	1.391	.457	1.822
X2	2.000	5.000	.257	2.052	.385	1.537
X1	2.090	5.000	.071	.565	.792	3.159
Multivariate					-2.214	-1.396

(Source: Normality Test Results, 2024)

Based on the calculation results in table 4.1, all indicators have skewness values below ± 2.58 . The data from the indicators is normally distributed and suitable for use.

Confirmatory Factor Analysis Test (CEA) Digital Transformation of Population Administration Services (X)

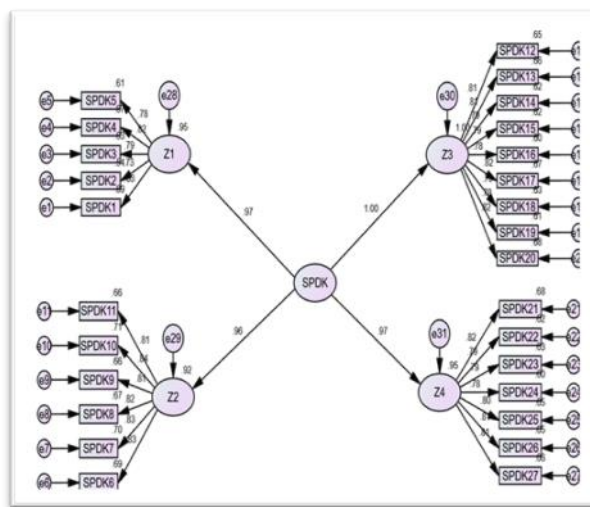


Figure 5. Confirmatory Factor Analysis (CFA) Digital Transformation of Population Administration Services (TDPAK) (X)

(Source: Data Processing Results, 2024)

The construct validity test for the Digital Transformation of Population Administration Services (X) is a test to ensure that the construct dimensions of the exogenous variables studied.

Confirmatory Factor Analysis (CEA) Test for Regional Development (Y)

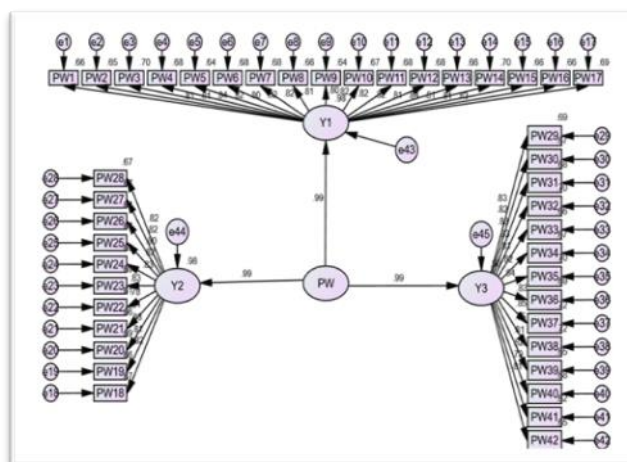


Figure 6. Confirmatory Factor Analysis (CFA) Pengembangan Wilayah (PW) (Y)

(Source: Data Processing Results, 2024)

The construct validity test for Regional Development (Y) is a test to ensure that the construct dimensions of the endogenous variables studied.

Confirmatory Factor Analysis (CFA) Test for Population Data Utilization System (Z)

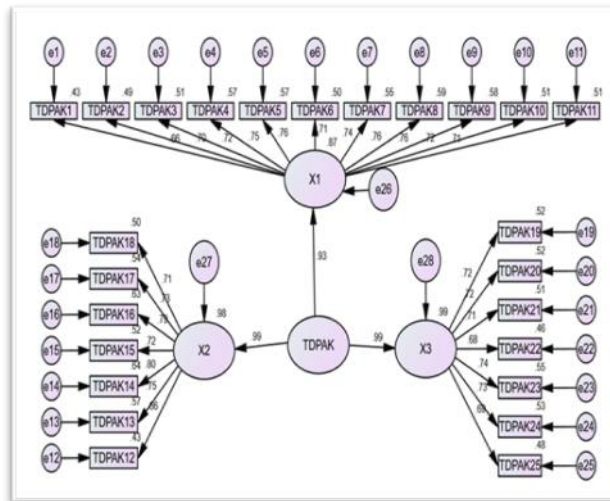


Figure 7. Confirmatory Factor Analysis (CFA) Population Data Utilization System (SPDK) (Z)

(Source: Data Processing Results, 2024)

The construct validity test of the Population Data Utilization System (Z) is a test to ensure that the construct dimensions of the endogenous variables studied.

Confirmatory Factor Analysis (CFA) Test on 3 (Three) Constructs (XYZ)

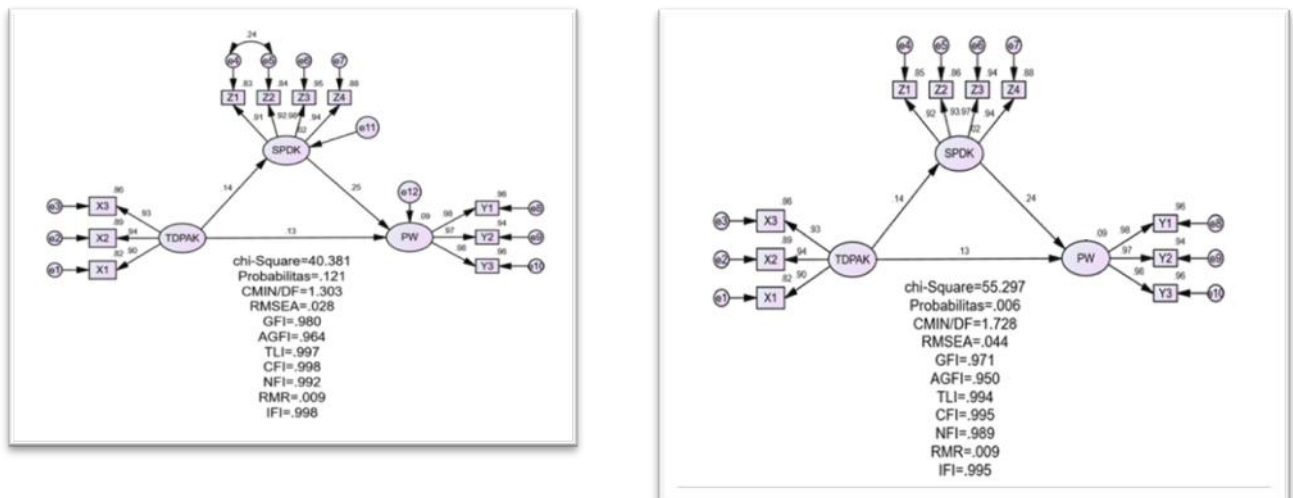


Figure 8. Confirmatory Factor Analysis Test on 3 Constructs

(Source: Data Processing Results, 2024)

Table 3. Standarizes Regression: (Group Number 1 - Default Model)

			Covariances - Estimate	S.E.	C.R.	P	Corellation Ultimate
SPDK (Z)	←	TDPAK (X)	0.171	.639	2.677	0.742	0.142
PW (Y)	←	SPDK (Z)	0.286	.604	4.729	***	0.246
PW (Y)	←	TDPAK (X)	0.191	.734	2.604	0.942	0.134

(Source: Data Processing Results, 2024)

According to the initial model examination, shown in figure 8, table 4.87 shows that the estimated parameters have positive signs and magnitudes, so they are in accordance with the expected theoretical relationships. Apart from that, none of the correlation values is greater than 1 (≥ 1). Therefore, even though the model does not have the right data (not fit), the indicators shown in the table above show that each model parameter is appropriate (fit or feasible).

Structural Equation Modeling (SEM) Test

In accordance with the method of determining values in the model, the model variables in this initial stage are grouped into exogenous variables and endogenous variables.

Figure 9. Full Model SEM

(Source: Data Processing Results, 2024)

The next analysis is a full Structural Equation Model (SEM) analysis, subsequently analysing the commensurate of unidimensionality and the pointers forming the potential variables which were well-trying victimisation Confirmatory Factor Analysis (CFA).

Hypothesis Test Results

To find out the results of hypothesis testing, it is finished by looking the distinct possibility expenditure or by sounding at the significance of the communication between each evaluation variable. The principle is that if $P < 0.05$ so the communication between variables is substantial and buoy be analysed as well and the other way around.

Hypothesis testing as proposed in the previous chapter is carried out based on the model. The full Structural Equation Model (SEM) can be seen in figure 9 and table 1.5

Table 4. Regression Weights and Standardized Regression (Group Number 1 - Default Model)

			Estimate	S.E.	C.R.	P	Standardized Estimate
SPDK (Z)	←	TDPAK (X)	0.166	0.633	2.635	.000	0.139
PW (Y)	←	SPDK (Z)	0.295	0.620	4.831	***	0.247
PW (Y)	←	TDPAK (X)	0.191	0.733	2.605	.000	0.134
X.1	←	TDPAK	1.000				0.904
X.2	←	TDPAK	0.109	0.358	3.060	***	0.942
X.3	←	TDPAK	0.102	0.344	2.970	***	0.929
Z.1	←	SPDK	1.000				0.912
Z.2	←	SPDK	0.106	0.303	3.509	***	0.915
Z.3	←	SPDK	0.112	0.302	3.723	***	0.977
Z.4	←	SPDK	0.104	0.317	3.274	***	0.937
Y.1	←	PW	1.000				0.978
Y.2	←	PW	0.984	0.170	5.772	***	0.969
Y.3	←	PW	0.102	0.160	6.329	***	0.979

(Source: Data Processing Results, 2024)

Hypothesis Test Results 1 The results of the Structural Equation Model (SEM) analysis show that the path coefficient for Digital Transformation of Population Administration Services (X) towards Regional Development (Y) in Medan City is 0.134 with a CR value of $2,615 \geq 2.0$ and prob. $0.000 < 0.05$, this shows that there is a positive and significant influence of Digital Transformation of Population Administration Services (X) on Regional Development (Y).

Hypothesis Test Results 2 The results of the Structural Equation Model (SEM) analysis show that the path coefficient for the Digital Transformation of Population Administration Services (X) towards the Population Data Utilization System (Z) in Medan City is 0.5 with a CR value of $2,635 \geq 2.0$ and prob. $0.000 < 0.05$, this shows that there is a positive and significant influence of Digital Transformation of Population Administration Services (X) on the Population Data Utilization System (Z) in Medan City.

Hypothesis Test Results 3 The results of the Structural Equation Model (SEM) analysis show that the path coefficient for the Population Data Utilization System (Z) towards Regional Development (Y) in Medan City is 0.139 with a CR value of $4,831 \geq 2.0$ and prob. $0.000 < 0.05$, this shows that there is a positive and significant influence of the Population Data Utilization System (Z) on Regional Development in Medan City.

Hypothesis Test Results 4 The results of the Structural Equation Model (SEM) analysis show that the indirect influence of Digital Transformation of Population Administration Services (X) through the Population Data Utilization System (Z) on Regional Development (Y) in Medan City can be calculated by the product of the coefficient of Digital Transformation of Population Administration Services (X) to the Population Data Utilization System (Z) with the path coefficient for the Population Data Utilization System (Z) to Regional Development (Y) in Medan City, which is $0.247 + 0.136 = 0.386$. The product of the indirect path coefficient of 0.139 is greater than the direct path coefficient The use of Population Data (Z) is greater than the influence of Digital Transformation of Population Administration Services (X) directly on Regional Development (Y) in Medan City.

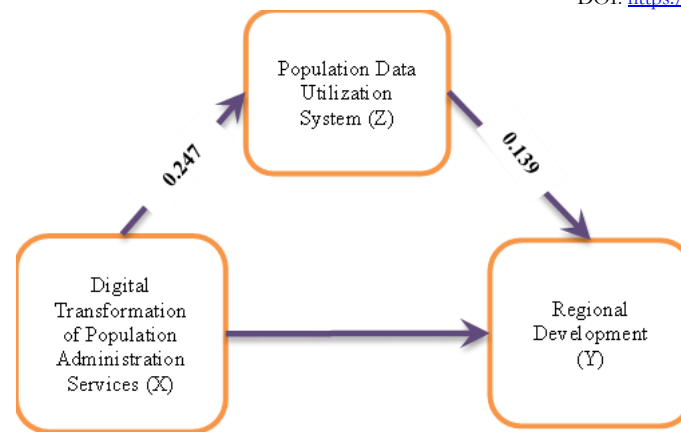


Figure 10. Model of Direct and Indirect Influence of Digital Transformation of Population Administration Services through the Population Data Utilization System on Regional Development in Medan City

(Source: Data Processed Results, 2024)

Following are the results of the complete path analysis of the respective variable constructs. The results of the analysis can be concluded in the following information:

- 1) Direct Influence $X \rightarrow Y = 0.134$
- 2) Direct Influence $X \rightarrow Z = 0.247$
- 3) Z's Direct Influence $Z \rightarrow Y = 0.139$
- 4) Indirect Influence $X \rightarrow Z \rightarrow Y = (0.247 \times 0.139) + 0.134 = 0,1683$

Based on the results of data analysis, it is known that the influence of Digital Transformation of Population Administration Services (X) on Regional Development (Y) through the Population Data Utilization System (Z) in Medan City is significant, where the indirect path coefficient of 0.1683 is greater (\geq) than the direct path coefficient X to Y which is 0.134, thus forming a model like in figure 10. From the model above, it can be said that the Digital Transformation of Population Administration Services and the Population Data Utilization System are variables that directly and indirectly influence Regional Development in Medan City. In other words, the existence of a Population Data Utilization System plays an important role in supporting the digital transformation of Population Administration services, which significantly contributes to regional development in Medan City.

Conclusions

Based on the results of the research and discussion in the previous chapter, it can be concluded as follows:

- There is an influence of digital transformation in population administration services in Medan City on regional development, which includes aspects of institutional structuring consisting of bureaucratic efficiency, institutional transparency and cross-sectoral collaboration.
- There is an influence that digital transformation in population administration services has on the population data utilization system in Medan City. Digital transformation in population administration services in Medan City brings positive changes to the way population data is managed and utilized, strengthening the basis for more effective decision making and more responsive and inclusive public services.

- There is an influence of the population data utilization system on regional development in Medan City, especially in the institutional structuring aspect which consists of increasing coordination between institutions and efficiency in decision making and policy implementation, data-based
- policies can produce policies that are more targeted, evidence-based and responsive towards the needs of citizens as well as administrative transparency in public services which will increase the trust of the people of Medan City in Government policies.
- There is an influence of digital transformation of population administration services through the Population Data Utilization System, on regional development in Medan City. Digital transformation of population administration services through the Population Data Utilization System contributes to institutional structuring, especially in bureaucratic efficiency in the Medan City Government.

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