



Jurnal Terapan Manajemen dan Bisnis is licensed under  
A Creative Commons Attribution-Non-Commercial 4.0 International License.

## Application of e-procurement in fraud prevention and it's implications in a circular economy.

Canny<sup>1)</sup>, Didi Sundiman<sup>2)</sup>

1) Universitas Universal, Indonesia

E-mail: [cannykwk@gmail.com](mailto:cannykwk@gmail.com)

2) Universitas Universal, Indonesia

E-mail: [sundimand@gmail.com](mailto:sundimand@gmail.com)

### Abstract

This study aims to know and determine the application of e-procurement to fraud prevention for its implication of a circular economy. This research is using qualitative research. The data collected by using Web scraping, by mining the data from news articles on the internet and the research about of 2,237 news articles. This study is using Natural Language Processing (NLP) between humans and computers, Bigram as a text and language processing to identify topics in news articles by using topic modelling with Latent Dirichlet Allocation (LDA) method to determine the trend topic. The result from the research shows that implementation of e-procurement is considered as a way to improve the wheels of economy.

**Keywords:** *E-procurement, Fraud, Circular Economy, Natural Language Processing.*

### Introduction

*Procurement* has an important part in a process on doing business in a company because of the process of procurement works to fulfill all business needs that corresponds to the quality of the product. Procurement conventionally or manually is considered waste time and cost as well as obtaining information that effected to the quality of procurement (Tatsis et al., 2006).

Procurement of good and services through electronic procurement is an optimistic answer towards prosperous and peaceful Indonesia to eradicate and clean from acts of corruption. The commercial sector (Companies) and public sector (government agencies) cannot be seperated from various acts of fraud or deception commited by both parties, inside and outside organization. Fraud cases are common due to personal gain or a group within the organization or even outside the organization that can directly harm the other parties.

Research conducted by (Nugroho et al., 2015) Says that transformation from procurement to e-procurement has an impact on preventing fraud in the procurement of goods and services. Dewi, (2018) also examined that e-procurement has a positive effect on the prevention of fraud in the procurement of goods and services.

Based on the background from above, the researchers wants to examine the problem of the application e-procurement system for fraud prevention and its implication in a circular

economy. The purpose of the research is to determine the application of e-procurement system to the prevention of fraud and its implications in circular economy.

**Benefits of Research**

The expected benefits of this study are to be a comparison for other researchers, expand insights and knowledge, this research also expected to become one of source information and reference for future researchers, hopefully this research can bring benefits to the government and management to prevent or minimize fraud in the procurement process of goods / services.

**Conceptual Framework of Research**

A) Circular Economy

The Circular Economy (CE) defined as an economic model aimed for efficient resource use through waste minimalization, long-term retention value, reduction of key resources and materials within protection limits as well as social economic benefits. CE has the potential to lead as a sustainable development by separating economic growth from negative consequences for resource depeltion and environmental degradation (Hofmann, 2019); Murray et al., 2017).

According to Ellen Macarthur Foundation (2012) circular economy is a system that is formed to have restorative and regenerative characteristics, where restoration replaces the concept of “end of life” for products, energy systems that are diverted to renewable technologies, chemical toxin that interfere with reuse are eliminated and as much as possible waste is eliminated through design, material and product improvements. Another definiton of circular economy from (Mentink, 2014) is an economic system with rotation of closed materials. From some definition of circular economy from above, it can be concluded that circular economy is a system that aims to extend life and value from the product, resources and materials in the economy as long as possible to maximize the minimalization of waste.

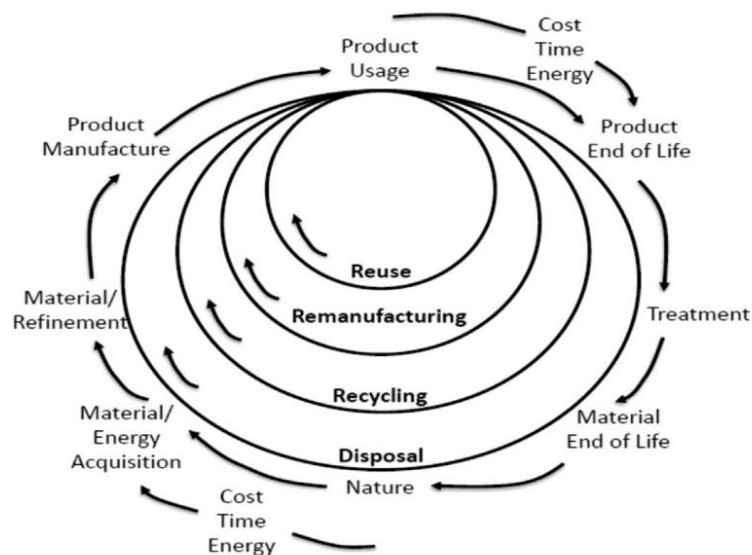


Figure 1. CE Concept

Source: Mihelcic *et al.*, (2003)

The conceptual framework aims to better understand the concept of research, namely the effect of e-procurement on fraud prevention and its implications for the circular economy

because the conceptual framework is a link or relationship that is related to one concept and another.

From the problem of fraud cases in the procurement, an effort is needed to prevent fraud and public service providers with good principle of efficiency, effectiveness and reflect openness and transparency to realize good governance. Technology is now more advance, to bring changes in various activities, one of which is the procurement of goods and services. The steps in procurement process of goods and services can now be done indirectly by utilizing information and communication technology (ICT).

### **Research Method**

In conducting a research there needs to be a method so that the research can be developed and proven so as to solve the problem of the research. Judging from the type of data, the research approach used in this study is qualitative research. According to Sugiyono, (2016) qualitative research methods are research methods used to examine the condition of natural objects where the researcher is the key instrument.

The object of research can be said to be a social research situation in which we want to know what is going on in it. The object of this research is information or data related to e-procurement and fraud in e-procurement and the implications of e-procurement for the circular economy.

Population is an area consisting of objects or subject that have a certain qualities and characteristics that can be used to be studied or researched by the researchers to get the desired conclusion. The population in this study is an object related to e-procurement in both government agencies, companies and research articles. The sample is part of the designated population (Sugiyono, 2015). The sample in this study is information articles or data related to e-procurement (from several news portal in Indonesia such as, Okezone.com, Tribunnews.com, Detik.com, etc. Which will certainly be taken on rangkings from Alexa Rank).

The data used is data mining using python (beautiful soup) package in python. Python is a programming language that can be used for software development and can be run through various operating systems. Python was made by Guido Van Rossum in 1991 (Belajarpython.com, n.d.). Nowadays, python is a popular language for data science and analytics. This is because python language support for libraries which includes data analysis and machine learning functions, data preprocessing tools, and data visualization. When creating a data mining project in Python, you can also use Anaconda, where Anaconda has provided several Python tools that are more specific for your data analysis needs (Edwardo, 2018).

### **Results and Discussion**

#### **a) Discussion Data**

The data source used is from several news portal in Indonesia. News portal have the advantage of more quickly presenting an informational news compared to conventional news such as magazines or newspapers.

The news portals that researcher use are 12 news portals consisting of Detik.com, Kompas.com, Tribunnews.com, Okezone.com, Liputan 6, Bisnis.com, Kontan.co.id,

Merdeka.com, Jpnn.com, Grid.id and Viva.co.id. The research used a total of 2,237 news articles as data along with the news period starting from 2015-2021.

b) Analysis Results of Discussion

From the discussion data, researcher using web scraping techniques in online news articles to find out the application of e-procurement towards fraud prevention and its implication in a circular economy.

The results can be known based on the results from data search and modelling topics using LDA, it is know that e-procurement can preven fraud. This is in line with Topic 1 which explain 52,8 from the phenomena contained in the article and it can be interpreted as perception and events that occurs in the community shows that electronic procurement has been able to support the process of preventing fraud.

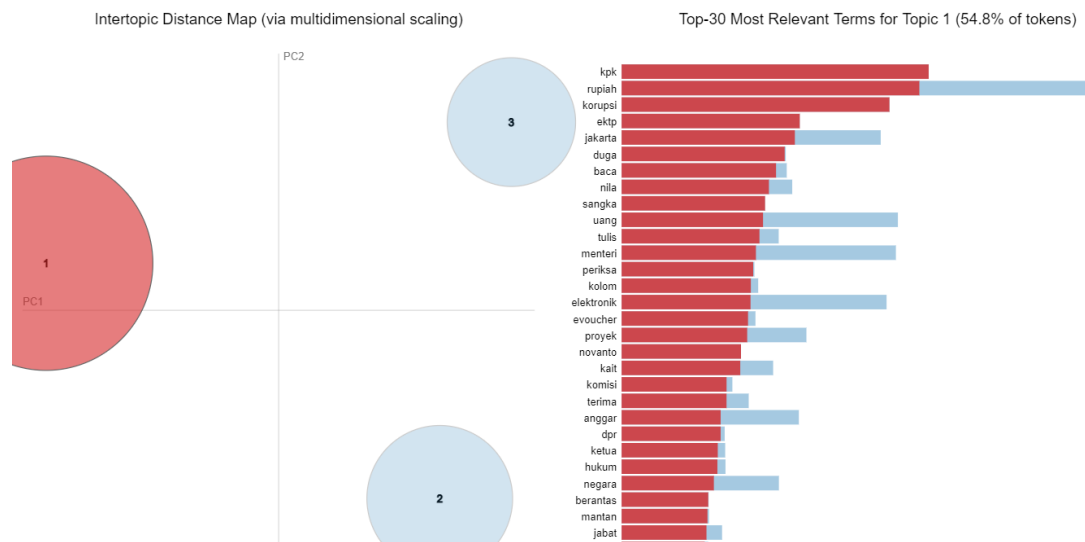


Figure 2. Topic 1

From Figure 4.1 there are main word or 10 dominant keyword namely “*KPK, rupiah, korupsi, ektp, jakarta, duga, baca, nila, sangka, and uang*” in line with the bigram data of the 100 main word there are words eradication of corruption, government services, corruption eradication commisions, corruption kpk, procurement porjects, criminal acts, procurement corruption, electronic id card, law ITE, alleged corruption, procurement of ktp. From the text and word can be concluded that the first proposition is acceptable like electronic procurement (e-procurement) is very closely related to the fraud prevention.

For Hayie Muhammad, Director of Indonesia Procurement Watch (IPW), the many problem that kpk acted on became one of the indexes of procurement projects of goods/services as a place of abundant corruption in Indonesia and there is also a lack of maximum control in the procurement process of goods/services so that the gap will appear and used by the party in obtaining their own benefits. Electronic procurement is one way of the way to prevent and eradicate corruption. Electronic procurement is considered to improve effectiveness, efficiency and transparency in the procurement process of government goods /services and minimize potential fraud and opportunities for irregularities in procurement. With Transparent procurement, various kind of fraud or corruption in the procurement of government goods/services can be prevented. Prevention of corruption by involving the KPK is also important to reduce the popularity of corruption in government institution.

The e-ktp procurement project is one of the corruption cases uncovered by the corruption eradication commission (KPK). To strengthen the eradication of corruption supported by the prevention of KPK on projects related to government services and there is also a law on information and electronic transactions (ITE Law) that has been strengthened. From the results of Dewi's previous research (2018) shows that the implementation of the electronic goods and services procurement system is running well and plays a role and contributes to the prevention of fraud and the process of procuring goods and services to be more open and transparent so as to create healthy competition.

**Implementation of Procurement in Curcular Economy**

From the results of previous research, Bag et al., (2020) shows that digitization in procurement plays an important role in the supply chain and the performance review of procurement 4.0 can affect buyers' intentions to optimize business processes and play a key role in improving circular economy performance.

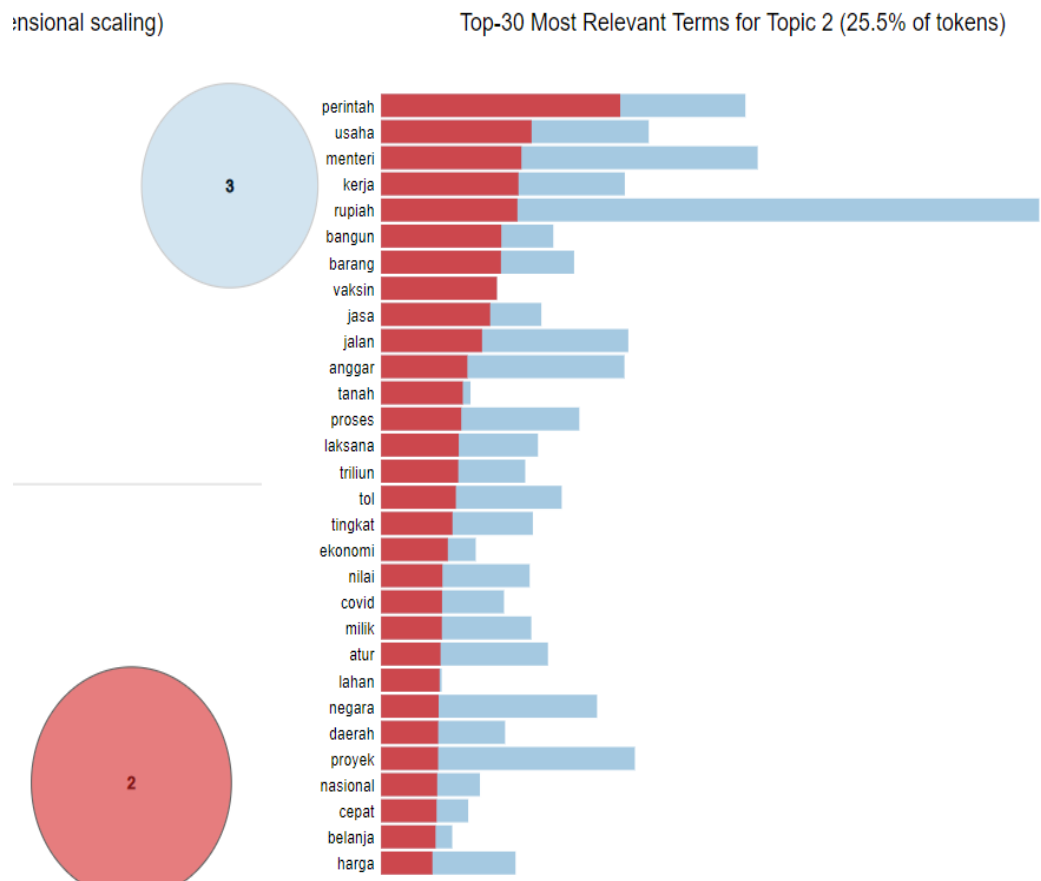


Figure 3. Topic 2

ling)

Top-30 Most Relevant Terms for Topic 3 (19.8% of tokens)

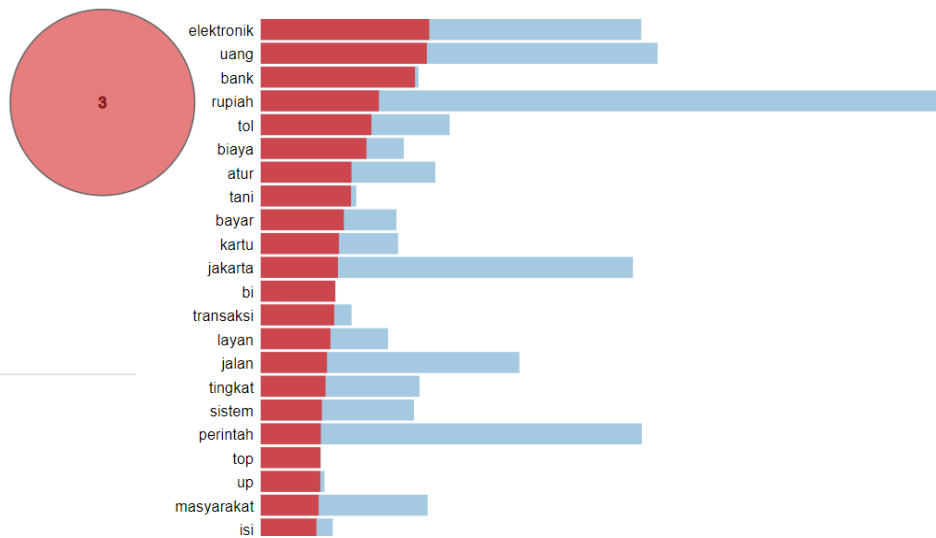


Figure 4. Topic 3

Figure 4. shows the 10 dominant keyword, namely "perintah (order), usaha (business), menteri (minister), kerja (work), rupiah (rupiah) ,bangun (build), barang (goods), vaksin (vaccines), jasa (services), jalan (road)" and from the Bigram data there are 100 main words related to them namely local government, service goods, government services, policies, lkpp government, business actors, business economy, business entitites, lkpp government services, work copyrights, micro-enterprises so it can be concluded that from the text it can prove that electronic procurement is closely related to the circular economy process in Indonesia.

Figure 4. also shows the dominant words, namely "elektronik (electronic), uang (modey), bank (bank), tol (toll), biaya (cost), atur (manage), tani (farmer), bayar (pay), kartu (card)" related to the words on Bigram, namely "Bank Indonesia (Bank of Indonesia), Pupuk Bersubsidi (Subsidized fertilizer), pupuk Indonesia (Indonesian fertilizer), transaksi elektronik (electronic transactions), sumber daya (resources), elektronik Ipse (electronic Ipse), transaksi elektronik (electronic transactions)" so it can be concluded that electronic transactions procurement is closely related to the circular economy process in Indonesia.

Topic 2 shows the topics generated fro LDA model with a percentage of 25.5% of the topics discussed. The economic growth of an area will increase and generate additional income for the community, because basically a growing economy will increased production factors for producing goods and services (Wika sanjaya et al., 2017). Topic 3 shows a percentage of 19.8% of the topics discuss about growing a circular economy in society. Procurement of government goods/services is now made easier by the presence of information technology. Small and medium entrepreneurs can participate as providers of goods/services in government. The government uses information technology to fulfill the principles of procurement.

According to researchers, in umkm certain industrial sectors or umkm especially as producers can apply the use of electronic procurement to manage and develop their business so that their performance is more optimal and umkm that are still working to meet their own needs, there is still no need for electronic procurement because the goods needed can still be used. obtained from other suppliers but if the business has started to develop and requires a

provider who is always ready, then procurement is required. Electronic procurement certainly has advantages such as using a more efficient and open system, as well as low waste in operational costs.

## **Conclusion and Suggestions**

### **A) Conclusion**

Based on the result of data analysis and the discussion that had been described in the previous chapters, it can be concluded that several things. First, E-procurement shows a significant role in preventing fraud and the implementation of e-procurement is a solution to various forms of irregularities in the procurement of goods and services. Second, with the existence of e-procurement, UMKM actors can develop their businesses and encourage the country's economy in a circular economy.

### **B) Suggestion**

Based on the results of this study, there are some suggestion for further studies which are expected to complement and add to the deficiencies of previous research. First, suggestions for the government are expected to improve performance and hold training or seminars on the procurement of goods/services in order to better understand how to operate them. Next, suggestions for business actors who provide goods/services with electronic procurement are expected to change their perspective and way of doing entrepreneurship by taking advantage of technological developments in running and developing a business. Hoped for futher researchers, that the can add or expand the objects and variable of the research as well as examine them with different methods.

## **References**

- Arens, A. A., Elder, R. J., & Mark, B. (2014). Auditing and Assurance Service; an Integrated Approach. <https://lib.hpu.edu.vn/handle/123456789/22033>
- B. Schmitt, J., Christina A. Debbelt, & Schneider, F. M. (2017). Too much information? Predictors of information overload in the context of online news exposure.
- Bag, S., Wood, lincoln c, Mangla, sackhin k, & Luthra, S. (2020). Procurement 4.0 and its implications on business process performance in a circular economy.
- Belajarpython.com. (n.d.). Python. <https://belajarpython.com/tutorial/apa-itu-python>
- Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent dirichlet allocation. *Journal of machine Learning research*, 3(Jan), 993-1022. *Journal of Machine Learning Research*.
- Croom, S. R., & Brandon-Jones, A. (2004). Key Issues in e-procurement: procurement implementation and operation in the public sector. *Journal of Public Procurement*, 5(3), 367-387.
- Danuta, K. S. (2017). Crowe's Fraud Pentagon Theory dalam Pencegahan Fraud Pada Proses Pengadaan Melalui E-procurement. *Jurnal Kajian Akuntansi*, 1, 161-171.
- Dewi, V. (2018). Peran Penerapan Electronic Procurement Pengadaan barang dan jasa pemerintah untuk mencegah Fraud pada Biro Administrasi Pembangunan dan Pengadaan Barang/Jasa Provinsi Kalimantan Barat.
- Edwardo, T. O. (2018). Penggunaan Python untuk Data Mining. <https://socs.binus.ac.id/2018/11/16/penggunaan-python-untuk-data-mining/>
- ekon.go.id. (n.d.). Sukseskan-ekonomi-sirkular-pemerintah-dukung-pembangunan-industri-berkelanjutan.



- <https://ekon.go.id/publikasi/detail/2779/sukseskan-ekonomi-sirkular-pemerintah-dukung-pembangunan-industri-berkelanjutan>
- Ellen Macarthur Foundation. (2012). Towards the Circular Economy.  
<http://www.ellenmacarthurfoundation.org/business/reports>
- Faisol, I. A., Tarjo, & Musyarofah, S. (2014). Pengaruh Penerapan E-Procurement Terhadap Pencegahan Fraud Di Sektor Publik. JAFFA Oktober.
- Hasanuddin, M. (2013). 70 persen korupsi dari barang dan jasa. Antaranews.Com.  
<https://www.antaranews.com/berita/378389/70-persen-korupsi-dari-barang-dan-jasa>
- He, Q., Chang, K., & Lim, ee peng. (2007). Analyzing feature trajectories for event detection.
- Hofmann, F. (2019). Circular business models: Business approach as driver or obstructer of sustainability transitions? *Journal of Cleaner Production*.  
<https://doi.org/10.1016/j.jclepro.2019.03.115>
- Jumeilia, G., Hasan, A., & Rasuli, M. (2019). Faktor - Faktor yang mempengaruhi terjadinya kecurangan (Fraud) pada Pengadaan Barang dan Jasa di Kabupaten Pelalawan (Studi Empiris Pada Kabupaten Pelalawan). *Jurnal Akuntansi*, 7(2), 185 – 198.
- Kalmykova, Y., Sadagopan, M., & Rosado, L. (2018). Circular economy – From review of theories and practices to development of implementation tools. 135.
- Kirchher, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions.
- Kiswara, E. (2011). Analisa Faktor-Faktor Yang Mempengaruhi Fraud Pengadaan Barang/Jasa Pada Lingkungan Instansi Pemerintah di Wilayah Semarang. *Jurnal Fakultas Ekonomi*.
- Kompas.com. (2018). Pemerintah bangun jalur kereta api trans sulawesi.  
<https://biz.kompas.com/read/2018/11/26/102332828/pemerintah-bangun-jalur-kereta-api-trans-sulawesi%0A>
- Kompas.com. (2020). Pupuk Indonesia pastikan distribusi pupuk bersubsidi lancar di masa pandemi. <https://biz.kompas.com/read/2020/07/30/184116828/pupuk-indonesia-pastikan-distribusi-pupuk-bersubsidi-lancar-di-masa-pandemi>
- Lkpp.go.id. (n.d.). Peraturan Presiden Nomor 16 Tahun 2018.  
<https://jdih.lkpp.go.id/regulation/peraturan-presiden/peraturan-presiden-nomor-16-tahun-2018>
- Mentink, B. (2014). Circular Business Model Innovation: A process framework and a tool for business model innovation in a circular economy.
- Mihelcic, J. R., Crittenden, J. C., Small, M. J., Shonnard, D. R., Hokanson, D. R., Zhang, Q., Chen, H., Sorby, S. A., James, V. U., Sutherland, J. W., & Schnoor, J. L. (2003). Sustainability science and engineering: the emergence of a new metadiscipline. *Environmental science & technology*.  
<https://doi.org/https://doi.org/10.1021/es034605h>
- Moleong, L. J. (2019). Moleong, " Metodologi Penelitian Kualitatif Edisi Revisi". Bandung : Remaja Rosdakarya. PT. Remaja Rosda Karya.
- Murray, A., Skene, K., & Haynes, K. (2017). The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context. *Journal of Business Ethics*. <https://doi.org/10.1007/s10551-015-2693-2>
- Nugroho, Wanto, & Trisnawati. (2015). Pengaruh Implementasi Sistem Pengadaan secara Elektronik (E-Procurement) terhadap Fraud Pengadaan Barang/Jasa Pemerintah (Studi Pada Satuan Kerja Perangkat Daerah Kabupaten Magetan). 3.
- Nurharjanti, N. N. (2017). Faktor-Faktor yang Berhubungan dengan Fraud Pengadaan Barang/Jasa di Lembaga Publik. *Jurnal Akuntansi Dan Investasi*, 18(2), 209–221.
- Oktaviani, L. (2016). Pengaruh Penerapan E-Procurement terhadap Pencegahan dan Pendeteksi Fraud di Sektor Publik (Studi Empiris pada Satuan Kerja Perangkat



- Daerah Kota Padang, Kabupaten Solok, Kota Solok, dan Kabupaten Pesisir Selatan).  
5.
- Ramadhan, A. (2020). KPK Sebut 70 Persen Kasus Korupsi Terkait Pengadaan Barang dan Jasa. Kompas.Com. <https://nasional.kompas.com/read/2020/08/26/14404821/kpk-sebut-70-persen-kasus-korupsi-terkait-pengadaan-barang-dan-jasa>
- Salim, M., Syarifuddin, & Syamsuddin. (2016). Efek Moderasi Komitmen Organisasi pada Pengaruh Implementasi E-procurement terhadap Pencegahan Fraud Pengadaan Barang dan Jasa Pemerintah. 5, 178 – 185.
- setjen.kemenkeu.go.id. (n.d.). Profil e-Procurement. <https://setjen.kemenkeu.go.id/in/post/profil-e-procurement>
- Sugiyono. (2015). Sugiyono, Metode Penelitian dan Pengembangan Pendekatan Kualitatif, Kuantitatif, dan R&D , (Bandung: Alfabeta, 2015), 407 1. Metode Penelitian Dan Pengembangan Pendekatan Kualitatif, Kuantitatif, Dan R&D.
- Sugiyono. (2016a). Memahami Penelitian Kualitatif. Bandung: Alfabeta.
- Sugiyono. (2016b). Triangulasi menurut Sugiyono. Article.
- Tatsis, V., Mena, C., Van Wassenhove, L. N., & Whicker, L. (2006). E-procurement in the Greek food and drink industry: Drivers and impediments. *Journal of Purchasing and Supply Management*. <https://doi.org/10.1016/j.pursup.2006.04.003>
- Wika sanjaya, M., Wayan sudirman, I., & Gede Sudjana budiasa, I. (2017). Pengaruh Pendalaman finansial dan keterbukaan perdagangan terhadap pertumbuhan ekonomi Provinsi Bali. *Jurnal Buletin Studi Ekonomi*, 22(1).
- Peraturan Presiden No 16 Tahun 2018 tentang Pengadaan barang/jasa pemerintahan