

THE ENERGY DYNAMICS OF DECENTRALIZATION FROM 2004 TO 2020

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Abstract

The purpose of this research article is to find out the dynamics of decentralization from 2004 to 2020. Using research data archiving on SCOPUS sources, with a focus on decentralization. The results of this study found that the dynamics of decentralization in the perspective of research from 2004 to 2020 showed increasing numbers, with the use of 16 languages used in the document. The implication of this research increase is the increase in the type of document in the type of publication. Recommendations in this decentralized research require further research in the relationship to the regions in a country.

Keywords : Decentralization, Dynamics and Energy

A. INTRODUCTION

In the latest government system, the centralization system or regional autonomy which gives a part of the authority that had to be decided on the central government no longer applies to the central government can now be decided at the regional government or regional government level. The advantage of this system is that most decisions and policies in the regions can be decided in the regions without interference from the central government. But the drawback of the decentralized system of special autonomy for the regions is excessive euphoria in which this authority only enhances the interests of groups and groups and is used to rake in personal or individual profits. This happens because it is difficult to be controlled by the government at the central level.

Decentralization in the field of government is the delegation of authority from the Central Government to the governmental organizational units in the region to carry out all the local interests of a group of residents who inhabit the area. (Rothenberg, 2017) is the transfer of legal power to be able to handle certain fields or functions to an autonomous region. (Gropello, 1999) is the creation or strengthening of financial and legal aspects of subnational government units whose implementation is substantially outside the direct control of the central government. (Rondinelli, 1983) is the transfer of planning, decision-making, or administrative authority from the central government to a regional organization, regional administrative unit, semi-autonomous organization, regional government, or non-governmental organization or non-governmental organization.

The purpose of decentralization, namely (1). Prevent financial centralization, (2) as an effort to democratize local governments to include those responsible for government administration. (3) Preparation of programs for socio-economic improvement at the local level so that they can be more realistic. The purpose of decentralization or its essence is how to deal with the challenges of government systems in dealing with failures and system problems that are considered not ideal in absolute power. So in this study, deepening to know the dynamics of decentralization.

B. METHODOLOGY AND DATA SOURCES

In May 2020, a search was carried out with the Scopus online literature database to identify publications with the following search strategy: "decentralized" TOPIC. This strategy looks for related papers that contain words in the title, abstract, or keywords. The data used is archiving research data on Scopus, with 2000 journal data. thus limiting the number of years, the type of document, the language most widely used in research, the most widely used type of access, and the most researchers' documents in the dynamics of decentralization.

C. GENERAL RESULT

Scopus has published 2000 documents as of May 10, 2020, considering 1398 articles, 229 conference papers, 130 book chapters, 126 reviews, 4 conference reviews, and 5 notes. Figure 1 shows the types of documents that have been issued by Scopus regarding decentralization since 2004.

Figure 1 Types of Documents in the topic of decentralization

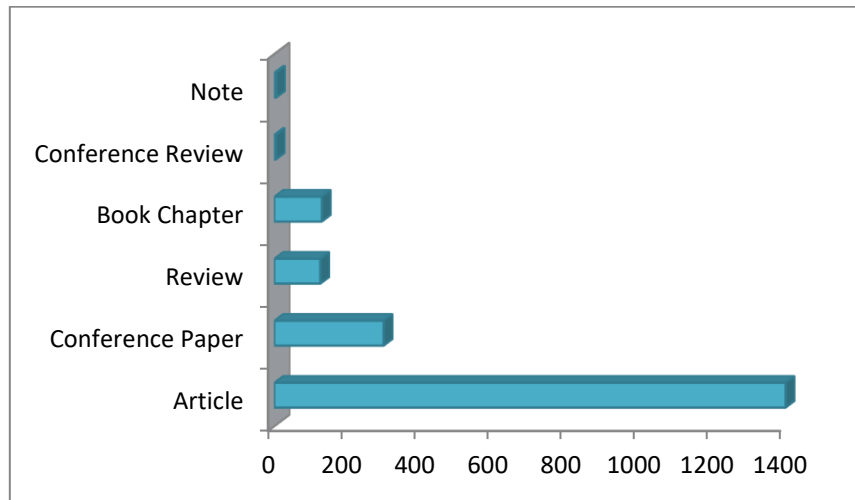


Figure 2 illustrates the evolution of various types of documents during the period 2004-2020. The graph shows that the number of documents issued annually has increased since 2015 with a total of 270 documents. Research on decentralization is increasingly interesting, evidenced by the number of documents that are almost doubling each year, and journal articles contribute the most to growth.

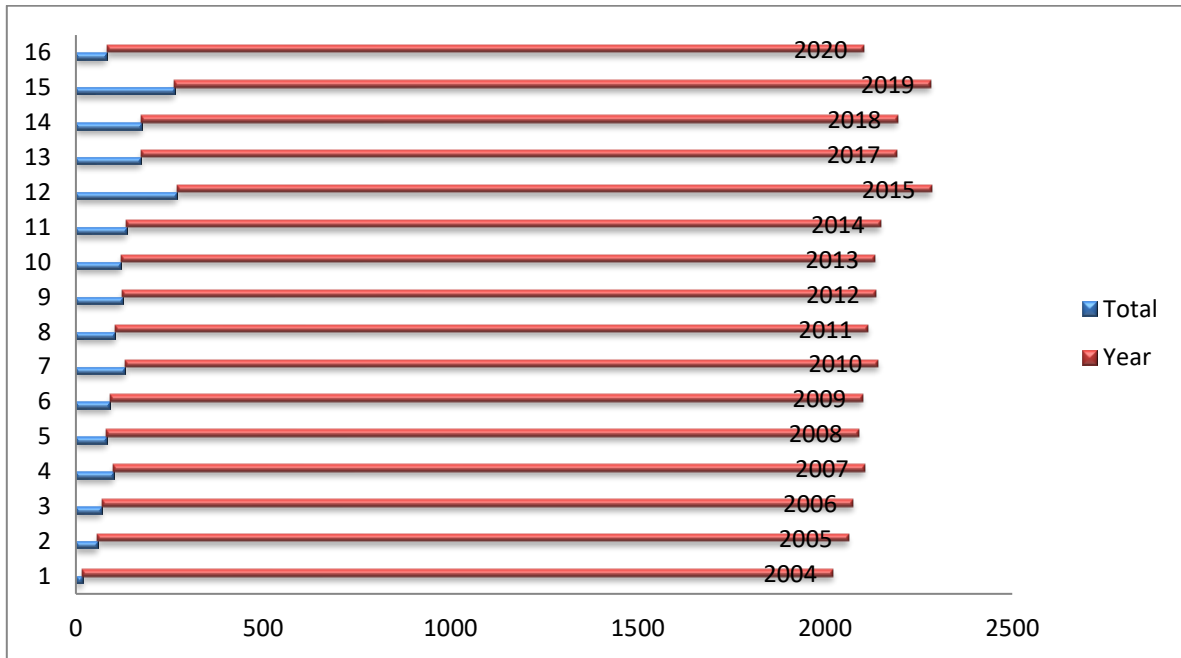


Figure 3 shows the most documents at publication in 2004 to 2020 are Zhang, y with 25 documents with 11 total link strength, li, y 20 documents with 17 total link strength, li, y 20 documents with 12 total link strength, Liau, j 16 documents with 14 total link strength, money, y 12 documents with 13 total link strength, and huang, y 12 with 8 total link strength.

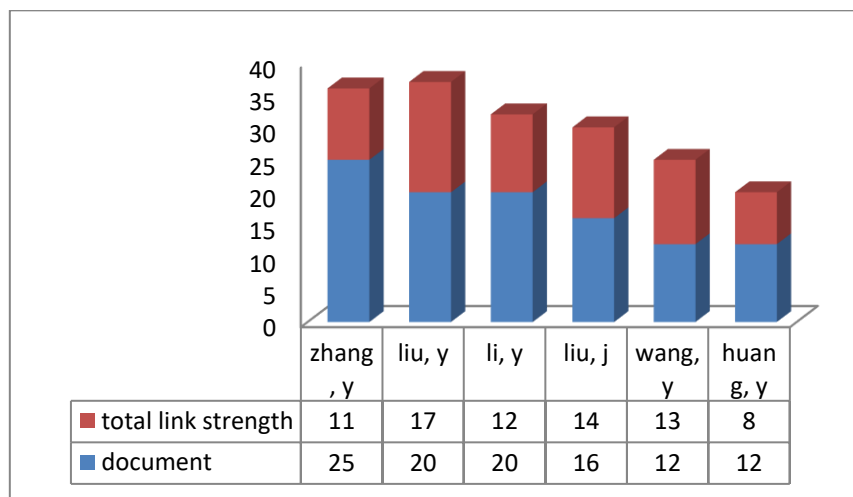


Figure 4 shows the Access Type in 2000 documents published by Scopus with the topic of decentralization is Open Access 18% or 449 documents. With Scopus sources a total of 2000 documents.

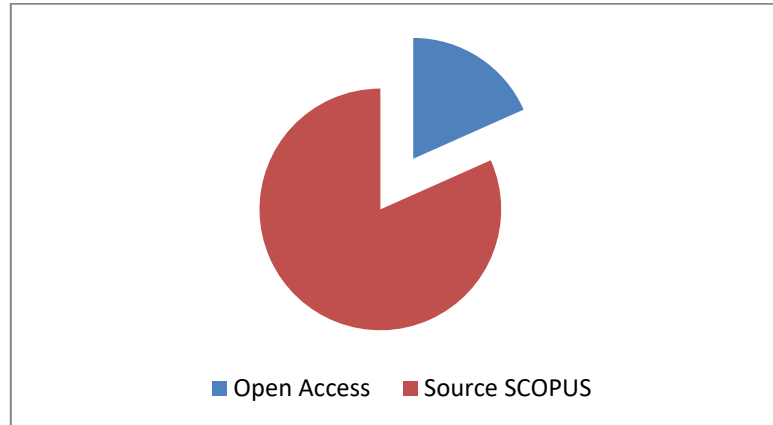
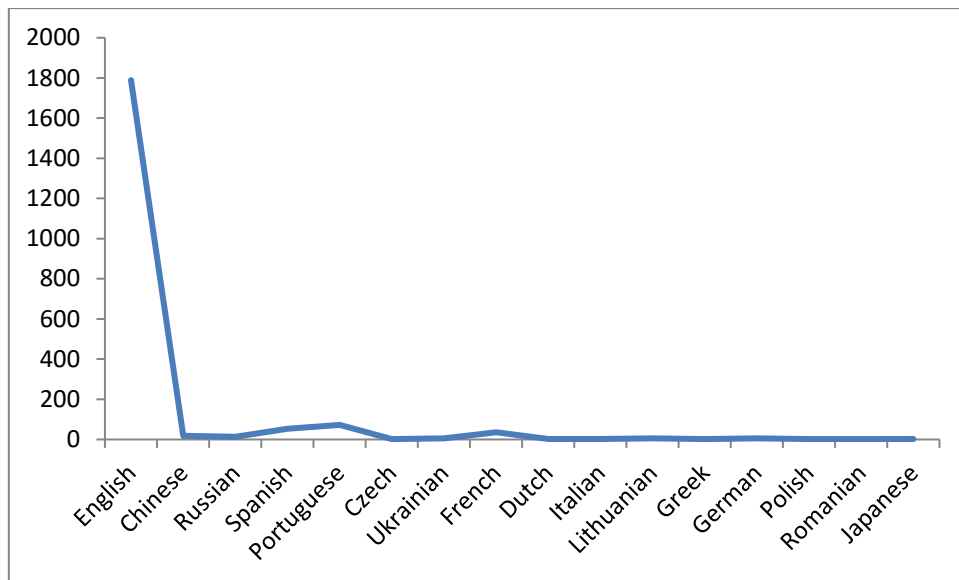


Figure 5 shows the languages most widely used in 2000 documents from 2004 to 2020 with 1789 English documents, 73 Portuguese documents, 54 Spanish documents, and 36 French documents.



D. CONCLUSION

The results of this study are in Figure 1 explaining the Types of Documents in the topic of decentralization which are Article, Conference Paper, Review, Book Chapter, Conference Review, and Note. Then in Figure 2 explains the total publication of documents published on Scopus from 2004 to 2020. The picture describes the author with the most documents. Figure 4 is a description of the sources and open access published. And Figure 5 explains the language most widely used in document publications. The implication of this research is that we can measure and map literature on publications on the topic of decentralization. The researcher recommends further research on the topic of decentralization in all countries.

REFERENCE

- Adjei, P. O.-W., Agyei, F. K., & Adjei, J. O. (2020). Decentralized forest governance and community representation outcomes: analysis of the modified taungya system in Ghana. *Environment, Development and Sustainability*, 22(2), 1187–1209. <https://doi.org/10.1007/s10668-018-0243-7>
- Aiyar, Y., & Kapur, A. (2019). The centralization vs decentralization tug of war and the emerging narrative of fiscal federalism for social policy in India. *Regional and Federal Studies*, 29(2), 187–217. <https://doi.org/10.1080/13597566.2018.1511978>
- Alghamdi, T. G., Said, D., & Mouftah, H. T. (2019). Decentralized Electric Vehicle Supply Stations (D-EVSSs): A Realistic Scenario for Smart Cities. *IEEE Access*, 7, 63016–63026. <https://doi.org/10.1109/ACCESS.2019.2916917>
- Alhamad, B. M., & Aladwan, R. (2019). Balancing centralization and decentralization management at University of Bahrain. *Quality Assurance in Education*, 27(2), 237–250. <https://doi.org/10.1108/QAE-01-2018-0005>
- Andriyana, W., & Hognl, K. (2019). Decentralization drivers beyond legal provisions: The case of collaborative forest management in Java Island. *Forests*, 10(8). <https://doi.org/10.3390/f10080685>
- Armbruster, S., & Hintermann, B. (2020). Decentralization with porous borders: public production in a federation with tax competition and spillovers. *International Tax and Public Finance*, 27(3), 606–642. <https://doi.org/10.1007/s10797-019-09572-7>
- Azad, M. A., Bag, S., Hao, F., & Shalaginov, A. (2020). Decentralized Self-Enforcing Trust Management System for Social Internet of Things. *IEEE Internet of Things Journal*, 7(4), 2690–2703. <https://doi.org/10.1109/JIOT.2019.2962282>
- Bajpai, M., Katoch, S. S., & Chaturvedi, N. K. (2019). Comparative study on decentralized treatment technologies for sewage and graywater reuse – A review. *Water Science and Technology*, 80(11), 2091–2106. <https://doi.org/10.2166/wst.2020.039>
- Belyaev, P. S., Ven-Tsen, K., Varepo, L. G., Makhanova, Z. A., Belousov, O. A., & Ussenova, A. (2019). Decentralized optimal control of multicomponent reactor systems in petrochemical and oil-and-gas production based on situational decomposition method. In M. A.V., L. V.A., & Y. V.L. (Eds.), *Oil and Gas Engineering Conference, OGE 2019* (Vol. 2141). <https://doi.org/10.1063/1.5122144>
- Bergamante, F., & Marocco, M. (2019). Employer association fragmentation and decentralization of the collective bargaining structure in Italy. *E-Journal of International and Comparative Labour Studies*, 8(2), 52–76. Retrieved from <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85074984227&partnerID=40&md5=6cce072a31f295704088375840108111>

- Bowen, H., Yi, L., Li, F., Xinhua, D., & Ping, C. (2019). Blockchain-based Access Control Data Distribution System. *5th IEEE International Conference on Computer and Communications, ICC 2019*, 1231–1236. <https://doi.org/10.1109/ICCC47050.2019.9064149>
- Cahyaningsih, A., & Fitriady, A. (2019). The impact of asymmetric fiscal decentralization on education and health outcomes: Evidence from Papua Province, Indonesia. *Economics and Sociology*, *12*(2), 48–63. <https://doi.org/10.14254/2071-789X.2019/12-2/3>
- Cao, Y., Meng, K., Chen, Z., Wang, P., Li, S., & Tang, N. (2019). From decentralization to integration: the development of social welfare services for disabled veterans in China. *Disability and Society*, *34*(6), 998–1003. <https://doi.org/10.1080/09687599.2019.1604352>
- Chen, H. (2019). Ubi-care: A decentralized ubiquitous sensing healthcare system for the elderly living support. *17th IEEE International Conference on Dependable, Autonomic and Secure Computing, IEEE 17th International Conference on Pervasive Intelligence and Computing, IEEE 5th International Conference on Cloud and Big Data Computing, 4th Cyber Science and Technolo*, 543–547. <https://doi.org/10.1109/DASC/PiCom/CBDCCom/CyberSciTech.2019.00108>
- Cheng, S., Fan, W., Chen, J., Meng, F., Liu, G., Song, M., & Yang, Z. (2020). The impact of fiscal decentralization on CO2 emissions in China. *Energy*, *192*. <https://doi.org/10.1016/j.energy.2019.116685>
- Danko, Y. I., Medvid, V. Y., Koblianska, I. I., Kornietskyy, O. V, & Reznik, N. P. (2020). Territorial government reform in Ukraine: Problem aspects of strategic management. *International Journal of Scientific and Technology Research*, *9*(1), 1376–1382. Retrieved from <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85078775298&partnerID=40&md5=0cee05271ab22188f0cc677331fb6684>
- Essén, A., & Ekholm, A. (2019). Centralization vs. Decentralization on the blockchain in a health information exchange context. In *Digital Transformation and Public Services: Societal Impacts in Sweden and Beyond* (pp. 58–82). <https://doi.org/10.4324/9780429319297-4>
- Fernandez-Carames, T. M., & Fraga-Lamas, P. (2019). A Review on the Application of Blockchain to the Next Generation of Cybersecure Industry 4.0 Smart Factories. *IEEE Access*, *7*, 45201–45218. <https://doi.org/10.1109/ACCESS.2019.2908780>
- Ferreira, D. C., & Nunes, A. M. (2019). Technical efficiency of Portuguese public hospitals: A comparative analysis across the five regions of Portugal. *International Journal of Health Planning and Management*, *34*(1), e411–e422. <https://doi.org/10.1002/hpm.2658>
- Ghosal, V., Stephan, A., & Weiss, J. F. (2019). Decentralized environmental regulations and plant-level productivity. *Business Strategy and the Environment*, *28*(6), 998–1011. <https://doi.org/10.1002/bse.2297>
- Golan Gueta, G., Abraham, I., Grossman, S., Malkhi, D., Pinkas, B., Reiter, M., ... Tomescu, A. (2019). SBFT: A Scalable and Decentralized Trust Infrastructure. *49th Annual IEEE/IFIP International Conference on Dependable Systems and Networks, DSN 2019*, 568–580.

<https://doi.org/10.1109/DSN.2019.00063>

- Gorelov, M. A., & Ereshko, F. I. (2019). Awareness and Control Decentralization. *Automation and Remote Control*, 80(6), 1109–1122. <https://doi.org/10.1134/S0005117919060092>
- Gundelach, B., & Fatke, M. (2019). Decentralisation and political inequality: a comparative analysis of unequal turnout in European regions. *Comparative European Politics*. <https://doi.org/10.1057/s41295-019-00197-y>
- Gropello, E. Di. (1999). Los modelos de descentralización educativa en América Latina. *Revista de La CEPAL*.
- Han, H., Ko, K., & Cho, S. Y. (2019). Does the longer tenure of local government heads affect the performance of local governments? The Korean case. *Asian Journal of Political Science*, 27(1), 127–144. <https://doi.org/10.1080/02185377.2019.1598451>
- Harguindéguy, J.-B. P., Cole, A., & Pasquier, R. (2019). The variety of decentralization indexes: A review of the literature. *Regional and Federal Studies*. <https://doi.org/10.1080/13597566.2019.1566126>
- Hilmawan, R., & Clark, J. (2019). An investigation of the resource curse in Indonesia. *Resources Policy*, 64. <https://doi.org/10.1016/j.resourpol.2019.101483>
- Hubble, L. J., & Wang, J. (2019). Sensing at Your Fingertips: Glove-based Wearable Chemical Sensors. *Electroanalysis*, 31(3), 428–436. <https://doi.org/10.1002/elan.201800743>
- Jia, J., Ding, S., & Liu, Y. (2020). Decentralization, incentives, and local tax enforcement. *Journal of Urban Economics*, 115. <https://doi.org/10.1016/j.jue.2019.103225>
- Kigume, R., & Maluka, S. (2019). Decentralisation and health services delivery in 4 districts in Tanzania: How and why does the use of decision space vary across districts? *International Journal of Health Policy and Management*, 8(2), 90–100. <https://doi.org/10.15171/ijhpm.2018.97>
- Kuo, T.-T., Gabriel, R. A., & Ohno-Machado, L. (2019). Fair compute loads enabled by blockchain: Sharing models by alternating client and server roles. *Journal of the American Medical Informatics Association*, 26(5), 392–403. <https://doi.org/10.1093/jamia/ocy180>
- Kwon, Y., Liu, J., Kim, M., Song, D., & Kim, Y. (2019). Impossibility of full decentralization in permissionless blockchains. *1st ACM Conference on Advances in Financial Technologies, AFT 2019*, 110–123. <https://doi.org/10.1145/3318041.3355463>
- Labrianidis, L. (2019). The moving frontier: The changing geography of production in labour-intensive industries. In *The Moving Frontier: The Changing Geography of Production in Labour-Intensive Industries*. <https://doi.org/10.4324/9780429052682>
- Li, L., & Jabari, S. E. (2019). Position weighted backpressure intersection control for urban networks. *Transportation Research Part B: Methodological*, 128, 435–461. <https://doi.org/10.1016/j.trb.2019.08.005>

- Lopes, V., Pereira, N., & Alexandre, L. A. (2019). Robot workspace monitoring using a blockchain-based 3D vision approach. *32nd IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops, CVPRW 2019, 2019-June*, 2812–2820. <https://doi.org/10.1109/CVPRW.2019.00340>
- Monteiro, G. P., Hopkins, A., & Frutuoso e Melo, P. F. (2020). How do organizational structures impact operational safety? Part 1 – Understanding the dangers of decentralization. *Safety Science*, 123. <https://doi.org/10.1016/j.ssci.2019.104568>
- Noerfitri, Sutiawan, Wahyono, T. Y. M., & Hartono, P. A. (2019). Influence of decentralization and type of patient on loss to follow-up among multidrug-resistant tuberculosis patients in Indonesia from 2014 to 2015. *Kesmas*, 13(3), 105–111. <https://doi.org/10.21109/kesmas.v13i3.2710>
- Ogwezzy, M. C. (2019). Decentralization of governance through the restructuring and devolution of powers entrenched under the constitution of Nigeria. *Telos*, 2019(189), 183–196. <https://doi.org/10.3817/1219189183>
- Ohashi, H., Fukasawa, K., Ariga, T., Matsui, T., & Hijioka, Y. (2019). High-resolution national land use scenarios under a shrinking population in Japan. *Transactions in GIS*, 23(4), 786–804. <https://doi.org/10.1111/tgis.12525>
- Otter, P., Hertel, S., Ansari, J., Lara, E., Cano, R., Arias, C., ... Alvarez, J. A. (2020). Disinfection for decentralized wastewater reuse in rural areas through wetlands and solar driven onsite chlorination. *Science of the Total Environment*, 721. <https://doi.org/10.1016/j.scitotenv.2020.137595>
- Park, S., Park, M.-G., & Nam, K.-M. (2019). Growth effects of fiscal decentralization with weak economic motivation: the case of South Korea. *Annals of Regional Science*, 63(3), 399–436. <https://doi.org/10.1007/s00168-019-00936-9>
- Permana, Y. S. (2019). Politicizing the fear of crime in decentralized Indonesia: An insight from central Lombok. *Southeast Asian Studies*, 8(1), 99–116. https://doi.org/10.20495/seas.8.1_99
- Phansalkar, S., Kamat, P., Ahirrao, S., & Pawar, A. (2019). Decentralizing AI applications with block chain. *International Journal of Scientific and Technology Research*, 8(9), 362–370.
- Pieterse, E. (2019). Urban governance and spatial transformation ambitions in Johannesburg. *Journal of Urban Affairs*, 41(1), 20–38. <https://doi.org/10.1080/07352166.2017.1305807>
- Radtke, R., & Kontio Jr, J. (2019). An A11Y-ance: Approaches for transferring expertise to build accessibility liaisons in the campus community. In H.-S. B., M. K., & L. B. (Eds.), *47th ACM SIGUCCS Annual User Services Conference, SIGUCCS 2019* (pp. 82–85). <https://doi.org/10.1145/3347709.3347797>
- Riesco, R., & Villagr a, V. A. (2019). Leveraging cyber threat intelligence for a dynamic risk framework: Automation by using a semantic reasoner and a new combination of standards

- (STIXTM, SWRL and OWL). *International Journal of Information Security*, 18(6), 715–739. <https://doi.org/10.1007/s10207-019-00433-2>
- Rønning, R. (2002). In defence of care: The importance of care as a positive concept. *Quality in Ageing and Older Adults*, 3(4), 34–43. <https://doi.org/10.1108/14717794200200025>
- Rondinelli, D. A. (1983). Implementing decentralization programmes in Asia: A comparative analysis. *Public Administration and Development*. <https://doi.org/10.1002/pad.4230030302>
- Rothenberg, I. F. (2017). Administrative decentralization and the implementation of housing policy in Colombia. In *Politics and Policy Implementation in the Third World* (pp. 145–169). Retrieved from <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85058733018&partnerID=40&md5=733135b113aa0840720315b510eff1cf>
- Sanjith, S. L., & George Dharma Prakash Raj, E. (2020). Decentralized bagged stacking ensemble mechanism (DBSEM) for anomaly detection. *Lecture Notes in Networks and Systems*, Vol. 89, pp. 755–766. https://doi.org/10.1007/978-981-15-0146-3_71
- Shi, W., Zhang, J., Zhang, R., & Hu, K. (2019). An Area-based offloading policy for computing offloading in MEC-assisted wireless mesh network. *2019 IEEE/CIC International Conference on Communications in China, ICCIC 2019*, 507–511. <https://doi.org/10.1109/ICCCChina.2019.8855931>
- Shon, J., & Cho, Y. K. (2020). Fiscal Decentralization and Government Corruption: Evidence from U.S. States. *Public Integrity*, 22(2), 187–204. <https://doi.org/10.1080/10999922.2019.1566427>
- Siwingwa, M., Nzala, S. H., Sikateyo, B., & Mutale, W. (2019). Perceptions on the feasibility of decentralizing phlebotomy services in community anti-retroviral therapy group model in Lusaka, Zambia. *BMC Health Services Research*, 19(1). <https://doi.org/10.1186/s12913-019-4386-5>
- Slembrouck, L., Darrigues, L., Laurent, C., Mittempergher, L., Delahaye, L. J., Vanden Bempt, I., ... Floris, G. (2019). Decentralization of Next-Generation RNA Sequencing-Based MammaPrint® and BluePrint® Kit at University Hospitals Leuven and Curie Institute Paris. *Translational Oncology*, 12(12), 1557–1565. <https://doi.org/10.1016/j.tranon.2019.08.008>
- Song, C., Jin, A., & Ma, X. (2019). Job-housing spatial relationship evolution in guangzhou analysis, reflection and coping strategies. *5th International Conference on Transportation Information and Safety, ICTIS 2019*, 1515–1520. <https://doi.org/10.1109/ICTIS.2019.8883775>
- Stojcic, N., & Tolic, M. S. (2019). Direct and indirect effects of fiscal decentralization on economic growth. *Ekonomicky Casopis*, 67(3), 280–306. Retrieved from <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85065019567&partnerID=40&md5=c7803035f7e8b6e50a243383364834cd>
- Taamneh, M., Rawabdeh, M. A., & Abu-Hummour, A. M. (2019). Evaluation of decentralization

- experience through political, administrative, and fiscal indicators: The case of Jordan. *Journal of Public Affairs*. <https://doi.org/10.1002/pa.2026>
- Thapa, R., Bam, K., Tiwari, P., Sinha, T. K., & Dahal, S. (2019). Implementing federalism in the health system of Nepal: Opportunities and challenges. *International Journal of Health Policy and Management*, 8(4), 195–198. <https://doi.org/10.15171/IJHPM.2018.121>
- van Duuren, D., van Alphen, H.-J., Koop, S. H. A., & de Bruin, E. (2019). Potential transformative changes in water provision systems: Impact of decentralised water systems on centralised water supply regime. *Water (Switzerland)*, 11(8). <https://doi.org/10.3390/w11081709>
- Van Rensburg, C., Berhanu, R., Hirasen, K., Evans, D., Rosen, S., & Long, L. (2019). Cost outcome analysis of decentralized care for drug-resistant tuberculosis in Johannesburg, South Africa. *PLoS ONE*, 14(6). <https://doi.org/10.1371/journal.pone.0217820>
- Wu, H.-T., & Lu, C.-Y. (2019). A Deep Learning Application System Based on Blockchain Technology for Clicks-And-Mortar Businesses. *2019 International Conference on Intelligent Computing and Its Emerging Applications, ICEA 2019*, 130–133. <https://doi.org/10.1109/ICEA.2019.8858318>
- Wu, H., Li, Y., Hao, Y., Ren, S., & Zhang, P. (2020). Environmental decentralization, local government competition, and regional green development: Evidence from China. *Science of the Total Environment*, 708. <https://doi.org/10.1016/j.scitotenv.2019.135085>
- Xia, X., Lin, X., Dong, W., & He, Z. (2019). Design of traceability system for medical devices based on blockchain. *2019 3rd International Conference on Electrical, Mechanical and Computer Engineering, ICEMCE 2019*, 1314(1). <https://doi.org/10.1088/1742-6596/1314/1/012067>
- Yacobi, H., & Tzfadia, E. (2019). Neo-settler colonialism and the re-formation of territory: Privatization and nationalization in Israel. *Mediterranean Politics*, 24(1), 1–19. <https://doi.org/10.1080/13629395.2017.1371900>
- Zhang, J., Cui, W., Ma, J., & Yang, C. (2019). Blockchain-based secure and fair crowdsourcing scheme. *International Journal of Distributed Sensor Networks*, 15(7). <https://doi.org/10.1177/1550147719864890>
- Zheng, Z., Xie, S., Dai, H.-N., Chen, W., Chen, X., Weng, J., & Imran, M. (2020). An overview on smart contracts: Challenges, advances and platforms. *Future Generation Computer Systems*, 105, 475–491. <https://doi.org/10.1016/j.future.2019.12.019>
- Zhou, Y., Kong, Y., & Zhang, T. (2020). The spatial and temporal evolution of provincial eco-efficiency in China based on SBM modified three-stage data envelopment analysis. *Environmental Science and Pollution Research*, 27(8), 8557–8569. <https://doi.org/10.1007/s11356-019-07515-7>
- Zou, X., Lei, C., Gao, K., & Hu, C. (2019). Impact of Environmental Decentralization on

Regional Green Development. *Journal of Environment and Development*, 28(4), 412–441.
<https://doi.org/10.1177/1070496519870276>

Zraunig, A., Estelrich, M., Gattringer, H., Kisser, J., Langergraber, G., Radtke, M., ... Buttiglieri, G. (2019). Long term decentralized greywater treatment for water reuse purposes in a tourist facility by vertical ecosystem. *Ecological Engineering*, 138, 138–147.
<https://doi.org/10.1016/j.ecoleng.2019.07.003>