

The Use of Blockchain to Support Sustainable Supply Chain Strategy

J Parung

Department of Industrial Engineering, University of Surabaya, Raya Kalirungkut, Surabaya, 60293, Indonesia

Abstract. This paper aims to identify, and analyze how the use of blockchains technology can support sustainable supply chain management strategies. This support is seen from environmental, economic and social aspects. The paper explains the various advantages of using Blockchain technology to reduce the use of transportation, and other resources that have the potential to damage the environment. From an economic aspect this technology has the potential to increase cost and time efficiency. Blockchain technology also has the potential to provide social benefits for the companies involved because of the increasingly good reputation of the organization. The paper provides three examples of implementation of the blockchain in three different industries. This paper also explains the potential disadvantages of using this technology for supply chains that can threaten supply chain sustainability.

Keywords: blockchain technology, sustainable supply chain

1. Introduction

In the 21st century, awareness of environmental care in organizations is a trend. Environmental awareness of organizations grows towards sustainability which is not only related to care for the environment but also economic and social. The concept of sustainability has been introduced to many fields as a strategy to improve the operations of the organization. This strategy has also been implemented in the supply chain to support efforts to improve organizational performance in the supply chain. This strategy is called Sustainable Supply Chain Management (SSCM).

The process to achieve sustainability in the supply chain often does not run smoothly due to various factors including inaccurate data or lack of smooth flow of information between members in the supply chain, data asynchronous, and inefficiency in fulfilling supply and demand. These constraints occur mainly because the availability of data on each supply chain member is centralized and often kept secret for the benefit of the member concerned so that it often cannot be anticipated by other members. Related to this situation, another approach is needed to reduce the constraints in SSCM. The approach that has been tested in several industries is the use of blockchain technology.

Blockchain is a new technology for storing and moving data. All data is held in one place, the data is atomized and spread over thousands of points throughout the network (Marsal-Llacuna, 2018). Distribution of data on the blockchain is based on the principle of decentralization, so intermediaries between members in the supply chain can be eliminated. Thus, the need for banks or other financial intermediaries can be eliminated. Transactions can be directly carried out between buyers and sellers. Payments can be done quickly and smart contracts are executed after all the underlying conditions or obligations are fulfilled (Al-Saqaf and Seidler, 2017).

2. Literature Review

This blockchain technology is believed to be able to overcome the lack of smooth flow of data and inefficiency in a sustainable supply chain.

2.1. Supply Chain Management and Sustainable Supply Chain Management

The term Supply Chain Management (SCM), according to the Council of Supply Chain Management (CCSCM), refers to the planning and management of all activities involved in procurement, conversion, and all logistics management activities. Importantly, this also includes coordination and collaboration with member's partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and throughout the company. SCM's main objective is to meet consumer demand with more efficient use of resources including labor, inventory, stock and distribution capacity. In this regard, SCM aims to integrate key business functions and business processes within and throughout the company into cohesive and high-performance business models that can quickly react to dynamic market demand and rapidly changing features.

In each supply chain many members are involved in performing different tasks. As a result the whole process becomes broad, long, slow, and inefficient. In this long process, the supply chain does not have an audit or centralized mechanism to ensure that contracts between supply chain actors are enforced according to the rules. Consumers do not have a way to know whether goods such as shoes that they have bought are fake, the drugs he bought were original, or whether the food he consumed was contaminated with bacteria or not. In this case, conventional supply chains have serious transparency and traceability issues.

Sustainability is known as an integral component of supply chain management, but no single definition of Sustainable Supply Chain (SSC) is universally accepted (Chkanikova, 2012). On the other hand, SSC is often explained as a green supply chain or triple bottom line supply chain. SSC is a growing movement to show the concern of SC members for the environment without forgetting economic or social factors as covered in the triple bottom line. Carter and Rogers (2008) define SSC as a strategic step, with transparent integration, to achieve organizational, social, environmental, and economic goals in systemic coordination of business processes among key organizations to improve the long-term economic performance of each company and its supply chain.

Furthermore, Seuring and Muller (2008) define the SSC as "the management of material, information, and capital flows as well as cooperation between companies throughout the supply chain while taking the objectives of the three dimensions of sustainable development, namely, economic, environmental, and social, into accounts originating from needs of customers and stakeholders. In a sustainable supply chain, environmental and social criteria must be met by members to remain in the supply chain, while it is expected that competitiveness will be maintained by meeting customer needs and related economic criteria.

In all the SSC definitions discussed above, it can be seen that the integration and objectives expected by SSCM are always emphasized so that the achievement of SSC objectives must be carried out with a strategy that integrates and considers the internal and external conditions of the organizations involved in SSC.

2.2. Blockchain and Cryptocurrency

Blockchain is a digital information recording method that can record data using the logbook approach and with certain characteristics. Operationally, Blockchain is known as a large decentralized and distributed ledger that keeps records of digital transactions in such a way that makes them accessible and visible to many members in a gated network (Treiblmaier, 2018).

Blockchain consists of cryptographically connected data blockchains. Blocks are chained in sequence using cryptographic hashes. A hash is a fixed-length number that originates from the message or document provided. Cryptography is the study of mathematical techniques related to aspects of information security, such as data confidentiality, data validity, data integrity, and data authentication.

Cryptocurrency is a digital currency created using the concept of cryptography. Cryptography was developed for online information and financial exchange activities. Thus, cryptocurrency becomes a currency that cannot be falsified because the security code is quite sophisticated. One type of cryptocurrency that is most widely known and in demand right now is Bitcoin. This currency was developed by Satoshi Nakamoto (2008).

3. How does Blockchain Technology Support SSCM Strategy?

To answer the question above, let's take a case example. If we buy drugs at the pharmacy, then, of course, we want to get a guarantee from the pharmacist, that the drug is safe, has not expired, is accurate, and is genuine. But the problem is that pharmacists cannot convince us that the drug is exactly what we expect it to be, so to ensure that there is a need for technology that can help us. Suppose we tag the microchip as an internet implementation for a drug package. Then, we trace the journey of the drug through each stage of the supply chain sequence.

The process to track the origin of raw materials, production locations, product carriers, storage and retailers to buy products can be done easily using the Internet of things (IoT) combined with blockchain technology. The buyer only needs to scan the package using his cellphone to retrace the supply chain route that the product goes through before it reaches us. The conditions described above indicate that consumers can now reject a product if the source or ingredients are suspicious or if the trip from the supplier to the retail store changes the quality of the product..

We know that the conventional supply chain management system is a centralized SCM system. This system cannot present data in real-time. The data sent will take time to process and present it, so the use of blockchain technology allows all members in any SC to access the network safely and quickly. Because blockchain is a decentralized database, no one controls or owns it and after the data is uploaded to the blockchain, the data cannot be changed so that the data cannot be corrupted or faked. Blockchain technology provides an opportunity to improve supply chain operations in a transformable manner.

The great potential of blockchain technology has moved various industries to conduct trials and even implement this technology in their companies. But a common question that often arises for researchers is how is blockchain step used in SSCM?

Blockchain is a simple, clever and quick way to convey transaction information between two parties automatically. If one party buys books from one supplier, then the supplier starts the process by making a book block and this block is verified by a group of computers connected to the Internet. Next the verified book block is added to the chain, which is distributed in a special book network (blockchain). On the verified block, a unique note will be written in the form of a secret code (cryptography) and can only be opened by buyers who pay using cryptocurrency (for example bitcoin), see Figure 1 for the steps.

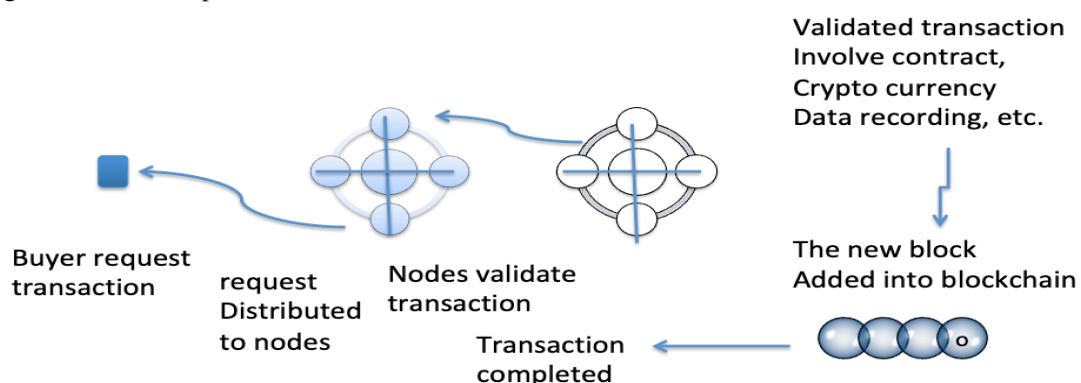


Figure 1. Blockchain steps in a supplier-buyer transaction (adapted from World Economic Forum)

From various literatures, it is known that several large international organizations have tested and implemented it for various purposes. Blockchain has been applied for tracking and tracing the origin of the product as was done in the Abu Dhabi National Oil Company (ADNOC) in collaboration with IBM. The idea was to track oil delivery from well to customers, while simultaneously automating transactions along the way. ADNOC, which produces oil about 3 million barrels per day, will benefit from tracking all the oil produced and reducing the time and costs associated with shipping if blockchain technology is fully implemented (<https://www.worldoil.com/news/2018/12/10/>).

A research conducted by Walmart in collaboration with JD.com, IBM, and Tsinghua University found ecoli bacteria that contaminate the food sold. It takes a long time to find where the food is contaminated so the research was trying to increase food transparency and shipment efficiency with blockchain technology. The efforts were divided into two sections: Walmart and JD.com handled production and shipment of produce, while IBM and Tsinghua University handled the research and maintaining the blockchain. This project was completed in 2017 and Walmart announced that it would require suppliers of its domain and other leafy greens to upload their data to the blockchain by September 2019 (<https://www-03.ibm.com/press/us/en/pressrelease/53487.wss>).

As food safety is the main concern of every individual, and then the blockchain technology is expected to be used by every supply chain food corporation that guarantees the delivery of quality products to the public. Guaranteeing healthy and safe food and high quality directly or indirectly enhances the company's reputation in the eyes of consumers. Unilever, Kroger, Nestle, and Tyson Foods all plan to collaborate as the project advances, with more food corporations to join along the way. Furthermore, a software company Provenance is collaborating with designer Martine Jarlgaard to support the efforts of more transparency in the fashion industry (<https://www.provenance.org/case-studies/martine-jarlgaard>). Their first-ever garment tracked with blockchain was presented at the Danish Fashion Show in 2017. The goal is to track every aspect of a garment's life through all the development phases. With more transparency, consumers will always know the clothing they purchase is legitimate and that it was produced in factories providing acceptable working conditions. This example shows that blockchain applications directly support sustainability of supply chain management in terms of social aspects.

In order to understand how blockchain technology is used in the supply chain, please see Figure 2, which is the adoption of the Applicature consultant below (applicature.com).

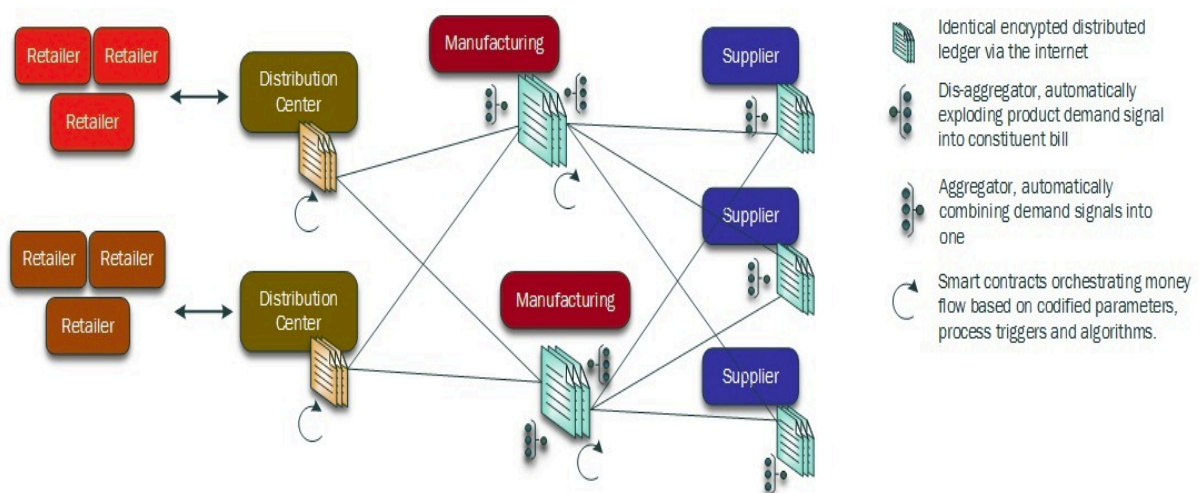


Figure.2 Blockchain in Supply Chain (adapted from Applicature consultant)

In addition to the various benefits of using blockchain in SCM, there are potential losses that can also be identified. Hald and Kinra (2019) point out various disadvantages that SC members may face, that is, SC is difficult to achieve its full potential because it is blocked from areas that might be more beneficial individually for one SC member. Another obstacle, namely: too much SC transparency can endanger data privacy issues. Another thing is companies can no longer maintain a kind of information asymmetry to maintain an organization's competitive advantage and to further reduce the risk of information leakage.

4. Conclusion

The use of blockchain can support the SSCM strategy to reduce environmental impacts while still providing economic benefits and providing social benefits for all stakeholders in the supply chain. Environmental benefits include pollution reduction due to the use of transportation in more appropriate shipping. Economic benefits for members because it can reduce costs by adopting more efficient production and transportation methods. In other hand kind of businesses can increase revenue by reducing delays. While, the social impact is the customers feel safe, comfortable in using the product because they can transparently trace the product flow while increasing reputation for all members in the supply chain.

5. References

- [1] Marsal-Llacuna ML. 2018 Future living framework: Is blockchain the next enabling network? *Technological Forecasting and Social Change* **128** pp 226-34
- [2] Al-Saqaf W, Seidler N. 2017 Blockchain technology for social impact: opportunities and challenges ahead. *J. Cyber Policy* **2** (3) pp 338-54
- [3] Olga CH. 2012 *Sustainable supply chain management: Theoretical literature overview*. (Sweden: International Institute for Industrial Environmental Economics, Lund University)
- [4] Seuring S, Müller M. 2008 From a literature review to a conceptual framework for sustainable supply chain management. *J. Cleaner Prod.* **16** (15) pp 1699-710
- [5] Treiblmaier H. 2018 The impact of the blockchain on the supply chain: a theory-based research framework and a call for action. *Supply Chain Management: An International Journal.* **23** (6) pp 545-59
- [6] Nakamoto S. 2008 *Bitcoin: A peer-to-peer electronic cash system*
- [7] Hald K.S and Kinra A 2019 How the blockchain enables and constrains supply chain performance *International Journal of Physical Distribution & Logistics Management* Vol. 49 No. 4, 2019 pp. 376-397
- [8] (<https://www.worldoil.com/news/2018/12/10/>) access 29st July at 8.00 pm
- [9] (<https://www-03.ibm.com/press/us/en/pressrelease/53487.wss>). Access 30th July at 7.00 am
- [10] (<https://www.provenance.org/case-studies/martine-jarlggaard>). Access 30th July at 9.00 pm

ISSN 1742-6596

IOP Conference Series

Materials Science and Engineering

2nd International Conference
on Robotics and Mechantronics

517

VOLUME 517 – 2010

6–11 November 2010
Singapore

EDITOR
Meng Joo Gi

The open access journal for conference proceedings
iopscience.org/jpc

IOP Publishing


 **NOTICE:** Ukraine: Click here to read IOP Publishing's statement.

Table of contents

Volume 703

2019

◀ Previous issue Next issue ▶

**International Conference on Informatics, Technology and Engineering 22–23 August 2019,
Bali, Indonesia**

Accepted papers received: 06 November 2019

Published online: 05 December 2019

Open all abstracts

Preface

OPEN ACCESS 011001

Preface

+ Open abstract  View article  PDF

OPEN ACCESS 011002

Peer review statement

+ Open abstract  View article  PDF

Papers

Green Manufacturing and Green Processes

OPEN ACCESS 012001

The use of blockchain to support sustainable supply chain strategy

J Parung

+ Open abstract  View article  PDF

OPEN ACCESS 012002

Green chemical engineering: challenges in chemical industrial processes for a better life

L Riadi

+ Open abstract  View article  PDF

-
- OPEN ACCESS** 012003
Xylanase production from combined *Reutealis trisperma* with potato dextrose broth by *Trichoderma reesei*: the effect of pretreatment
Y E Agustin, L Riadi and T P Utami
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012004
Regulatory performance of two different tuning methods for milk cooling control system
R Agustriyanto
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012005
The solubility correlation of azobenzene derivatives in supercritical carbon dioxide: a short review
R S Alwi and A S Iryani
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012006
Container storage tariff policy analysis using combining game theory and system dynamics approach
A G Budianto and B Wirjodirdjo
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012007
Effect of NR-g-cellulose coupling agent into NR-cellulose composite dispersibility and its physical properties
H Handayani, A Cifriadi, A S Handayani, M Chalid, S Savetlana and M Christwardana
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012008
Formulation and characterization of chitosan-alginate freeze dried matrices loaded with oleoresin extract of red ginger
E A Krisanti, A Safiya and K Mulia
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012009
The effects of electroculture on shoot proliferation of garlic (*Allium sativum* L.)
Von Louie R Manguiam, Ashley Marie N. Margate, Rose Danielle G Hilahan, Harold Gian L Lucin, Kristopher Ray S Pamintuan and Adonis P Adornado
[+](#) Open abstract [View article](#) [PDF](#)

-
- OPEN ACCESS** 012010
Preparation and characterization of polyvinyl alcohol-chitosan-tripolyphosphate hydrogel for extended release of anti-tuberculosis drugs
K Mulia, S A Chadarwati, A J Rahyussalim and E A Krisanti
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012011
The surface roughness analysis using sound signal in turning of mild steel
Anayet U Patwari, A A Zamee, M H Bhuiyan and S M Sakib
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012012
A review of a machine design of chocolate extrusion based co-rotating twin screw extruder
P Pitayachaval and P Watcharamaisakul
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012013
Tofu wastewater treatment through a combined process of coagulation-flocculation and ultrafiltration
P Prawati, A Oktariany, S S Putri, I Aditya and S Kartohardjono
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012014
Carbon emission modelling in container terminal operations planning using a system dynamics approach
D N Prayogo
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012015
Effects of initial concentration, adsorbent mass, pH and temperature to personal care products waste removal with activated carbon as adsorbent
H R Priyantini, L Riadi, C Effendi, F Effendi and A Mitayani
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012016
The integration of social responsibility into business operation: case study of Indonesian manufacturing industry
E D Rinawiyanti, C Huang and S As-Saber
[+](#) Open abstract [View article](#) [PDF](#)

OPEN ACCESS 012017

A kinetic study of oil-in-water emulsion formation stabilized by rice husk ash and lecithin

L Sapei, S W Kurniawan and A P Siantoro

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012018

A systematic literature review for developing sustainability assessment tool: formulating the state of the art and future direction

Y Sari, A Hidayatno, A Suzianti and M Hartono

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012019

Controlled release fertilizer based on starch chitosan encapsulation

E Savitri, E Purwanto, A N Kodrat and E Yonathan

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012020

Price and inventory policy strategy model in a price sensitive dual channel supply chain structure considering product substitution

R Y H Silitonga and N Christina

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012021

Assessing materials from hoarded mobile phones: hidden e-waste subject for reverse logistics

R Siringo, H Herdiyansyah, R D Kusumastuti and A E Lucianto

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012022

Optimisation of subtractive rapid prototyping process parameters using response surface methodology

T J Suteja and M A Hadiyat

[+ Open abstract](#) [View article](#) [PDF](#)

Green Design and Innovation

OPEN ACCESS 012023

Green dynamic capability for enhancing green innovations performance in a manufacturing company: a conceptual framework

R Amaranti, R Govindaraju and D Irianto

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012024

Combined structural equation modelling – artificial neural networks model for predicting customer loyalty

M A Hadiyat

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012025

The use of consumer behavior to identify the flow mapping of waste cooking oil: A finding from Semarang, Indonesia

S Hartini, D P Sari and A A Utami

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012026

Perceived kansei and performance-based usability impact on satisfaction for web-based applications

M Hartono

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012027

Measurement of student satisfaction and loyalty using service quality model for higher education (HedQual) at industrial engineering department University of Pelita Harapan

N Hartono, Laurence and B F Tjahjadhi

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012028

Expertise-based decision makers' importance weights for solving group decision making problems under fuzzy preference relations

E Herowati

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012029

Organic-inorganic nanocomposite membranes for molecular separation and bioapplications

J Hou, P D Sutrisna, L Li and V Chen

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012030

Tensile Properties of Kenaf Fiber by Alkalinization Treatment: Effect of different concentration

Ismojo, K A Zahidah, E Yuanita, E Kustiyah and M Chalid

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012031

How do the Indonesian ecologically conscious millennials value upcycled clothing?

C A Parung

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012032

Passive design implementation as sustainable development approach on vertical housing case study: Sentra Timur Residence

T Riotama and H Herdiansyah

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012033

Development and usability evaluation of virtual guide using augmented reality for Candi Gunung Gangsir in East Java

I M Ronyastra, I Hapsari and F P Pani

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012034

The Role of Ergonomics in Supporting Supply Chain Performance in Manufacturing Companies: a Literature review

N Sampouw and M Hartono

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012035

Fluazinam Potential as a Fungicide in Liquid Culture System for the Growth of *Haematococcus pluvialis* Microalgae

J R Witono, V Novianty, H Santoso, A Miryanti and A J Kumalaputri

[+ Open abstract](#) [View article](#) [PDF](#)

Power System and Green Energy Management

OPEN ACCESS

012036

The use of pyrolusite to remove Pb and Cd in aqueous solutions: isotherm and thermodynamic

Y Fransiscus, M W B Kembie and N M Tanusaputra

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012037

Power generation in a plant-microbial fuel cell assembly with graphite and stainless

steel electrodes growing *Vigna Radiata*

K R S Pamintuan and K M Sanchez

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012038

Gas sensitive properties of ZnO nanorods formed on silicon and glass substrates

V V Petrov, A P Starnikova, Y N Varzarev, K A Abdullin and D P Makarenko

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012039

The study of the properties of lead zirconate-titanate films on silicon substrate after halogen lamps rapid thermal annealing

V V Petrov, A S Kamentsev, V V Polyakov and Y N Varzarev

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012040

Temperature Dependence of Electrical Properties of ZnO Nanorods Array

V V Petrov, Y N Varzarev and K A Abdullin

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012041

The kinetics oxidative degradation of chitosan in formic acid with the presence of hydrogen peroxide

E Purwanto, J Connor and Y Ngothai

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012042

Drying of celery leaves (*Apium graveolens L.*) using a PV/T solar dryer

L Sapei, E Tarigan, D N Sugiarto and D Gianluca

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012043

Mass transfer kinetic model and removal capacity of acid blue 29 adsorptions onto activated carbon

P Setyopratomo, H R Priyantini and R Agustriyanto

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012044

Utilization of rice straw and used paper for the recycle papermaking

N Suseno, T Adiarto, M Sifra and V Elvira

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012045

Current Perspectives and Mini Review on Zeolitic Imidazolate Framework-8 (ZIF-8) Membranes on Organic Substrates

P D Sutrisna, E Savitri, N F Himma, N Prasetya and I G Wenten

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012046

The Influence of water and catalyst leach process toward propane oxidation on MoVTenb catalyst

R K Widi

[+ Open abstract](#) [View article](#) [PDF](#)

The Role of IT in Innovation Enhancement

OPEN ACCESS 012047

Requirements analysis for the disaster logistics inventory information system to improve the effectiveness and efficiency of handling emergency response periods

N U Handayani, D P Sari, Y Widharto and G Basyir

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012048

Anchored instruction ITS: a novel approach to make learning programming interesting and effective

B Hartanto and J Reye

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012049

The evaluation of academic website using eye tracker and UEQ: a case study in a website of xyz

A H Kusumo and M Hartono

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012050

Computer vision system in measurement of the volume and mass of egg using the disc method

M Widiarsi, L P Santoso and J Siswantoro

[+ Open abstract](#) [View article](#) [PDF](#)

JOURNAL LINKS



←

Ads by Google

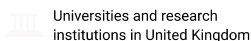
Stop seeing this ad Why this ad? ⓘ

IOP Conference Series: Materials Science and Engineering

Discontinued in Scopus as of 2021

COUNTRY

United Kingdom



SUBJECT AREA AND CATEGORY

Engineering
Engineering (miscellaneous)

Materials Science
Materials Science (miscellaneous)

PUBLISHER

IOP Publishing Ltd.

H-INDEX

44

PUBLICATION TYPE

Conferences and Proceedings

ISSN

17578981, 1757899X

COVERAGE


2009-2020

INFORMATION

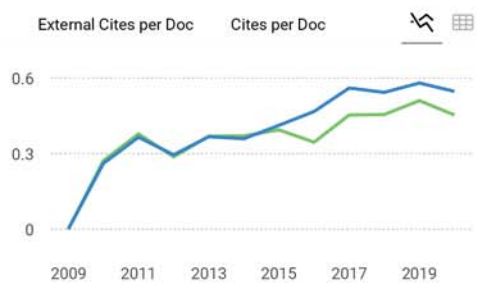
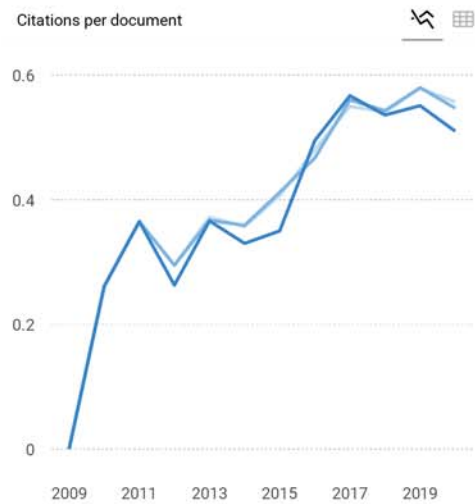
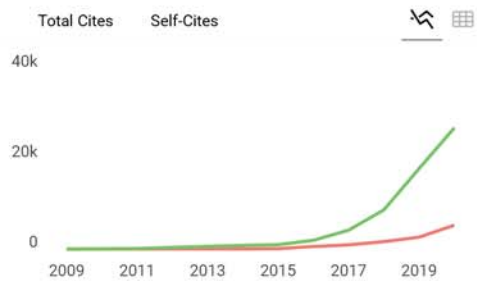
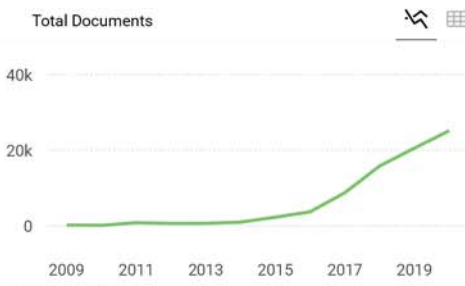
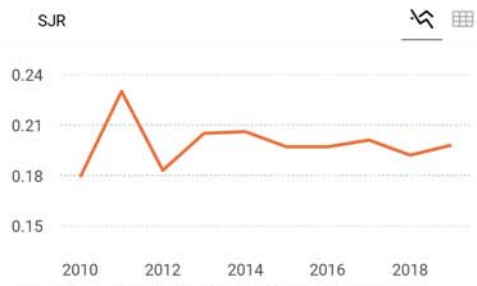
[Homepage](#)
[How to publish in this journal](#)
mse@iop.org

SCOPE

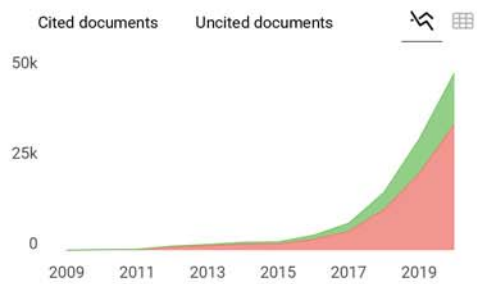
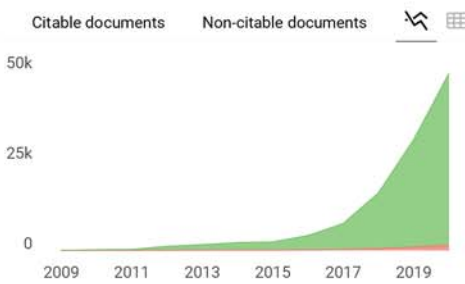
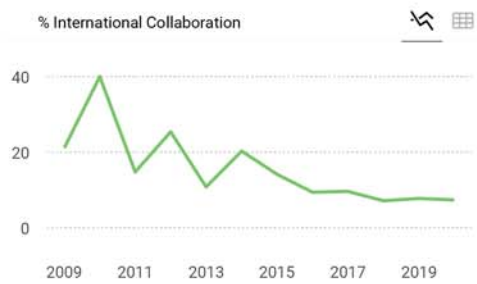
The open access IOP Conference Series provides a fast, versatile and cost-effective proceedings publication service for your conference. Key publishing subject areas include: physics, materials science, environmental science, bioscience, engineering, computational science and mathematics.

 Join the conversation about this journal





● Cites / Doc. (4 years)
● Cites / Doc. (3 years)
● Cites / Doc. (2 years)



IOP Conference Series: Materials Science and...

Not yet assigned quartile

SJR 2020 0

powered by scimagojr.com

← Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scimagojr.com/journalsearch.php?q=19700200831&tip=s..."
```

SCImago Graphica

Explore, visually communicate and make sense of data with our **new free tool**.

Get it





Source details

IOP Conference Series: Materials Science and Engineering

Scopus coverage years: from 2009 to 2021

(coverage discontinued in Scopus)

ISSN: 1757-8981 E-ISSN: 1757-899X

Subject area: Engineering: General Engineering Materials Science: General Materials Science

Source type: Conference Proceeding

[View all documents >](#)

[Set document alert](#)

[Save to source list](#) [Source Homepage](#)

CiteScore 2020

0.7



SJR 2019

0.198



SNIP 2020

0.484



[CiteScore](#) [CiteScore rank & trend](#) [Scopus content coverage](#)

CiteScore 2020

$$0.7 = \frac{49,696 \text{ Citations 2017 - 2020}}{68,224 \text{ Documents 2017 - 2020}}$$

Calculated on 05 May, 2021

CiteScoreTracker 2021

$$1.1 = \frac{67,190 \text{ Citations to date}}{62,145 \text{ Documents to date}}$$

Last updated on 06 March, 2022 • Updated monthly

CiteScore rank 2020

Category	Rank	Percentile
Engineering		
General Engineering	#228/297	23rd
Materials Science		
General Materials Science	#381/455	16th

[View CiteScore methodology >](#) [CiteScore FAQ >](#) [Add CiteScore to your site](#)

About Scopus

- [What is Scopus](#)
- [Content coverage](#)
- [Scopus blog](#)
- [Scopus API](#)
- [Privacy matters](#)

Language

- [日本語に切り替える](#)
- [切换到简体中文](#)
- [切换到繁體中文](#)
- [Русский язык](#)

Customer Service

- [Help](#)
- [Tutorials](#)
- [Contact us](#)

ELSEVIER

[Terms and conditions](#) ↗ [Privacy policy](#) ↗

Copyright © Elsevier B.V. ↗. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies.

