

The Implementation Of Internet Of Things (Iot) In Enhancing Productivity And Efficiency Of Micro, Small, And Medium Enterprises (Msmes)

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Abstrak

The rapid development of MSMEs allows for the application of technology to maximize potential and increase income. However, several challenges such as high implementation costs, limited information technology infrastructure, and lack of understanding of the benefits of the Internet of Things need to be a concern for MSME players. The purpose of this study is to determine the Application of the Internet of Things (IoT) in Improving Productivity and Efficiency of Micro, Small and Medium Enterprises (MSMEs). The research method uses a bibliometric study through a Google Scholar database search using Publish Or Perish and VOSviewer software. The results showed that a number of authors were interested in the theme of the application of IoT in the development of MSMEs in the period 2020-2024 with a network of keywords connected to each other.

Keywords: Internet of Things; Micro, Small, and Medium Enterprises; bibliometric study.

1. Introduction

Micro, Small, and Medium Enterprises (MSMEs) have a very important role in the Indonesian economy, both in terms of job creation and contribution to Gross Domestic Product (GDP). However, MSMEs often face challenges in adopting advanced technology, especially in implementing the Internet of Things (IoT).

IoT refers to a network of physical devices connected and communicating with each other via the internet, which enables the automatic collection, transmission, and exchange of data. In the context of MSMEs, the implementation of IoT can provide great benefits, such as improving operational efficiency, optimizing supply chains, and expanding market reach.

Research in recent years shows that IoT adoption has become an increasing trend among MSMEs in Indonesia. Study by Suprpto [1] shows that IoT adoption can increase the operational efficiency of MSMEs by improving manufacturing processes and inventory management. In addition, Purwadi and Wijaya [2] found that IoT can also help MSMEs in improving supply chain efficiency and product delivery to consumers.

Although IoT adoption promises many benefits, MSMEs are still faced with several challenges, such as high implementation costs, limited information technology infrastructure, and lack of understanding of the benefits of IoT. Therefore, support from the government, financial institutions, and other stakeholders is needed to facilitate the adoption of IoT by MSMEs in Indonesia.

This research aims to provide an overview of the current utilization of IoT in business development through bibliometric analysis using VOSviewer software. The main objectives of this study are to identify the influence of IoT utilization in the development of MSMEs, to determine the articles with the highest number of citations regarding IoT in MSME business development, and to determine the development of publications based on related keywords.

2. Methodology

This research uses a quantitative descriptive approach with bibliometric method. The data used comes from scientific publications on IoT. The data collection technique used is secondary data. The research was conducted by searching through the Google Scholar database using the Publish Or Perish software with the keywords "IoT" or "MSME" and filtering the years 2020-2024. A total of 1000 articles were found. Next, researchers visualized the development of research using VOSviewer. Article data is compiled in RIS format, then the RIS format is imported into VOSviewer to analyze keywords based on the title and abstract of the article..

3. Result and Discussion

The Influence of IoT in MSME Business Development

The implementation of IoT has become a key factor in improving the productivity of MSMEs in Indonesia. IoT integration allows MSMEs to optimize various business processes, from manufacturing to inventory management. According to research by Santoso [3], IoT gives MSMEs the ability to monitor and control devices automatically, significantly improving operational efficiency. In addition, research by Cahyani [4] shows that IoT adoption can help MSMEs improve customer experience through faster and more efficient services.

The implementation of IoT also allows MSMEs to collect real-time data, which can be used for better decision-making. Study by Indriani and Hadi [5] found that IoT helps MSMEs monitor operational performance and identify areas that require improvement. With IoT, MSMEs can increase productivity, reduce operational costs, and increase their competitiveness in an increasingly complex market.

Article Citation IoT in MSME Development 2020-2024

The search results show that of the 1000 articles indexed in the Google Scholar database related to digital marketing in the business development of Micro, Small and Medium Enterprises (MSMEs), there are 10 top articles that are most cited. The article entitled "The Impact of Covid-19 on MSMEs in Indonesia" written by A. Amri is ranked first with 671 citations. Other articles included in the top 10 list can be seen in Table 1 below.

Table 1 Ten articles with the highest number of citations during the period 2020-2024

No	Tahun	Penulis	Judul	Sumber	Penerbit	cites
1	2020	A. Amri	Dampak Covid-19 Terhadap UMKM Di Indonesia	BRAND Jurnal Ilmiah Manajemen Pemasaran	http://ejournals.umma.ac.id/	671
2	2021	AD Putri	Maksimalisasi Media Sosial Untuk Meningkatkan Pendapatan Dan Pengembangan Diri Generasi Z Di Man 1 Pesawaran	Journal of Social Sciences and Technology for Community Service (JSSTCS)	https://ejurnal.teknokrat.ac.id/	311
3	2020	MA	Tren Penggunaan	Professional:	https://jurnal.unived.ac.id/	230

		Harahap, S Adeni	Media Sosial Selama Pandemi Di Indonesia	Jurnal Komunikasi Dan Administrasi Publik	c.id/	
4	2020	H Irfani, F Yeni, R Wahyuni	Pemanfaatan Digital Marketing Sebagai Strategi Pemasaran Pada Ukm Dalam Menghadapi Era Industri 4.0	JCES (Journal of Character Education Society)	https://journal.ummat.ac.id/	173
5	2021	HS Harahap, NK Dewi, EP Ningrum	Pemanfaatan Digital Marketing Bagi UMKM	Jurnal Loyalitas Sosial	https://www.researchgate.net/	88
6	2022	A Asnawi	Kesiapan Indonesia Membangun Ekonomi Digital Di Era Revolusi Industri 4.0	Journal of Syntax Literate	https://www.semanticscholar.org/	67
7	2020	X Legina, IP Sofia	Pemanfaatan Software Pembukuan Akuntansi Sebagai Solusi Atas Sistem Pembukuan Manual Pada UMKM	Jurnal Neraca: Jurnal Pendidikan dan Ilmu Ekonomi Akuntansi	https://jurnal.univpgri-palembang.ac.id/	65
8	2020	R Komalasari, P Pramesti, B Harto	Teknologi Informasi E-Tourism Sebagai Strategi Digital Marketing Pariwisata	Jurnal Pariwisata Indonesia (ALTASIA)	https://ojs.digitalartisan.co.id/	61
9	2020	S Cay, J Irnawati	Strategi Pemasaran Untuk Meningkatkan Penjualan (studi kasus UMKM di Tangerang Selatan)	Jurnal Mandiri : Ilmu Pengetahuan, Seni, Dan Teknologi	https://www.jurnalmandiri.lkd-pm.com/	45
10	2022	D Firmansyah, D Saepuloh	Daya Saing : Literasi Digital dan Transformasi Digital	Journal of Finance and Business Digital	https://journal.formosapublisher.org/	45

Top Keywords

In this study, it was found that there are 10 keywords that often appear in the results of research on IoT in MSME business development in Google Scholar data, as shown in table 2.

Table 2 Top Keywords

Term	Occurences
UMKM	393
Internet	331
iot	121
Industri	73
Covid	66
Teknology	44
Strategy	25
Development	22
Product	19
Business	19

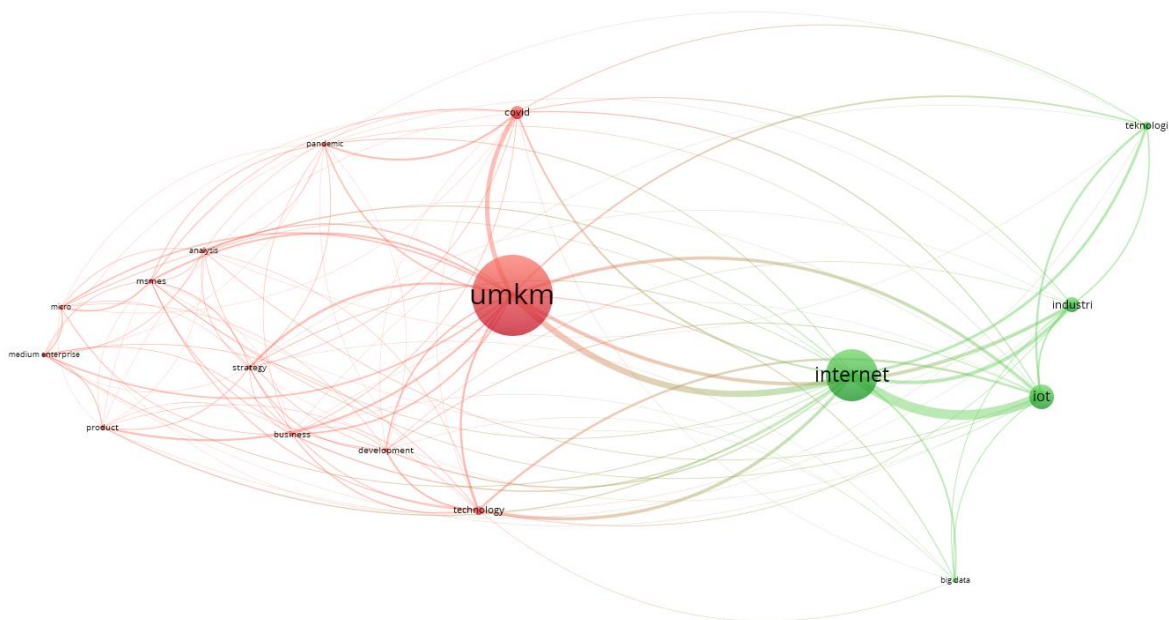


Figure 1 Map of publication development based on Network Visualization results

Based on the development of the Internet of Things publication in the development of MSMEs, there are 2 clusterizations, namely the red cluster with a total of 12 items consisting of MSMEs, technology, strategy, product, pandemic, msmes, micro, medium enterprice, development, covid, busines and analysis. While the green cluster has 5 items with details, namely the internet, big data, industry, iot and technology.

Through the Network Visualization publication development map, it illustrates the connection between keywords that are interrelated according to the theme of the internet of things in the development of MSMEs. This makes it easy for researchers to analyze keywords that often come out or are rarely used in previous studies so that novelty or novelty of research can be found.

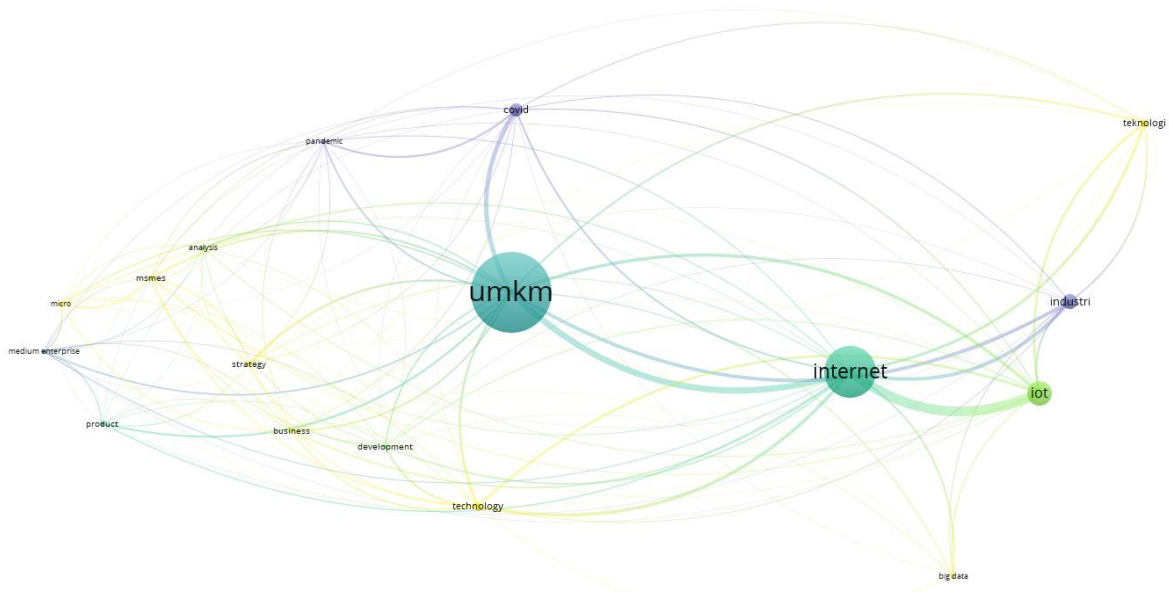


Figure 2 Map of publication development based on the results of Overlay Visualization

Based on the results of the *Overlay Visualization* above, it shows the use of keywords related to IoT in the development of MSMEs every year. Color clustering explains the topic and novelty of the research theme. The yellow cluster is research with the latest theme to the turquoise cluster which is a common theme. As the publication year increases, articles with the same theme are increasing, especially the covid-19 pandemic has created relevance and interest between all keywords.

4. Conclusion

This research uses bibliometric analysis and VOSviewer as an analysis tool. The findings of this study include 100 articles related to the keywords "IoT" or "MSME" over the past five-year period, namely 2020 to 2024. The analysis results show that many authors have a similar focus in their research. There are three dominant keywords in the articles, namely MSMEs, internet, and IoT. The most cited articles in this study include "The Impact of Covid-19 on MSMEs in Indonesia" [6] which was cited 671 times, "Maximizing Social Media to Increase Income and Self-Development of Generation Z at MAN 1 Pesawaran" [7] with 311 citations, and "Social Media Usage Trends During the Pandemic in Indonesia" [8] with a total of 230 citations. This research confirms that IoT can be a very useful tool in supporting MSME business development by enabling broader and more efficient product marketing.

5. Reference

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